

National Broadcasting and Telecommunications Commission (NBTC)



NBTC

ANNUAL REPORT
2022



Communication is the essential factor of nation development, prosperity, stability, and security, especially in the rapid change situations in the world. The prompt and up-to-date of the communications are immensely important, and all parties including agencies related to nationwide communications should therefore provide cooperation to one another and share their achievements closely and harmoniously. Above of all, they should study and research both horizontal and vertical aspects about the technical and modern technologies, and select the good and effective parts to implement wisely and proactively that suits nation's situation and environment, so that the national communications are fully developed as facilitator of economic and social development, and truly support for nation stability.

Chitralada Villa
July 15, 1983

The Royal Proclamation was bestowed by
His Majesty King Bhumibol Adulyadej The Great
on the Occasion of the Centennial of the Post and Telegraph Department
and the National Communications Day, on August 4, 1983

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Preface

The National Broadcasting and Telecommunications Commission (NBTC) has prepared the NBTC Annual Report in accordance with Section 76 of the Act on the Organization to Assign Radio Frequency and to Regulate the Broadcasting and Telecommunications Services B.E. 2553 (2010) and its amendment, which stipulated that the NBTC has to prepare annual report about the spectrum management, broadcasting, television, and telecommunications services as the case may be, and submit to the Cabinet and the National Assembly within 120 days as from the ending date of each accounting year, as well as disclosure to the public.

Accordingly, the NBTC has conducted the NBTC Annual Report 2022, covering Major performances of the NBTC in 2022, report on market situation and competition in broadcasting, television, and telecommunications services in 2022, budget management in 2022, policies, work plan and expenditure budget plan in 2023, problems and obstacles in operating of broadcasting, television, and telecommunications services, which are important to people. Details are as shown in this report.

The National Broadcasting and
Telecommunications Commission
March 2023





Message from the Chairman of the NBTC

Clinical Professor
Dr. Sarana Boonbaichaiyapruck
Chairman of the NBTC
(April 13, 2022 – Present)

The present National Broadcasting and Telecommunications Commission (NBTC) was appointed by the Royal Proclamation as from April 13, 2022. I, as the Chairman of the NBTC, and all NBTC commissioners have performed our duties since then, by continuing on the major missions from the former NBTC to develop the nation's broadcasting, television and telecommunications services, and accelerating works and operations during the transition period, as well as prescribing significant mission policies for the substantial benefits to people. In 2022, the major performances are as follows:

1. Spectrum management, satellite and orbit management, and regulation on broadcasting, television, and telecommunications services.

The NBTC has prescribed spectrum management policies, spectrum usage revision, operations monitoring according to the radio frequency plan, and 3500 MHz spectrum utilization improvement preparation. The NBTC also held the satellite orbital slot package auction on January 15, 2023, regarded as a transformation from concession system to licensing system to promote fair competition for the benefit of the nation and people.

Furthermore, the NBTC has reviewed and amended laws relating to broadcasting, television, and telecommunications services regulation in compliance with the changing industry ecosystem.

2. Supporting and promoting continuous 5G technology deployment.

The NBTC has supported the project implementation under the National 5G Committee, and granted spectrum use permission for innovation experiment in Regulatory Sandbox, to drive effectively holistic 5G deployment, to create the competitive advantages, attractive investment context, and promote 5G technology for the nation's Socio-Economic benefits, as well as driving 5G and Artificial Intelligence (AI) adoption as a medical assistance in treating patients, which will leverage Thai people's quality of life nationwide.

3. Provision of Universal Service Obligations (USO) to leverage medical services and national public health.

The NBTC has proceeded the project on the provision of broadband internet service and mobile phone signal in border areas (Zone C+), in a total of 3,920 villages, and the





project on the provision of broadband internet service in remote areas (Zone C), in a total of 15,735 villages, aiming to reduce inequality in telecommunications services access, and to promote equal and fair accessibility in aspect of geography and society, to leverage quality of life of people and the residential target groups in areas through nationwide broadband internet networks provided by the NBTC. At present, the project has been completed by providing free-of-charge mobile services and broadband internet for 19,655 villages (29,748 service points) for 5 years (during 2022 – 2026).

4. Supporting and promoting research and development in the broadcasting, television, and telecommunications services for public interest.

In 2022, the NBTC reviewed the 4-year action plan (during 2020 – 2023) of the Broadcasting and Telecommunications Research and Development Fund for Public Interest (BTFP) for half-term period to ensure the effective proceedings according to the plan, and allocate the several projects fund to provide basic broadcasting, television, telecommunications services, and social services coverage in aspect of research and development, learning promotion and quality of life improvement, training and upskill, as well as media production, in a total of 2,372.61 million baht.

5. Consumer protection in the broadcasting, television, and telecommunications services.

The NBTC has prioritized regulation on consumer exploitation and has continually protected consumers in the broadcasting, television, and telecommunications services, to empower consumers, and to raise media awareness and understandings to people nationwide to keep pace with the rapid – changing technology, as well as integrating collaboration with other organizations that involve in consumer protection. In 2022, the NBTC also cooperated and solved call center scam and Short Message Service (SMS) fraud with corresponding organizations.

6. International Affairs.

In 2022, the NBTC, as a governmental administrative agency for international communication service management with the International Telecommunications Union (ITU), has put its best efforts to gather votes for Thailand in ITU Council Member Election for a term of office from 2023 – 2026, by organizing several meetings and activities. As a result, Thailand was elected from the Plenipotentiary Conference 2022 (PP-22), held during September 26 – October 14, 2022, at Bucharest, Romania. Accordingly, Thailand becomes a member of ITU Council during 2023 – 2026, with the 4th rank from 16 member countries in Asia and Australasia Region, and the 16th rank from 193 member countries worldwide, regarded as the highest rank that we have ever had from the previous elections.

On behalf of the present NBTC, I would like to thank the former NBTC board and partner organizations, as well as the Office of the NBTC's management team, officers and employees for carrying out their duties to the fullest extent of their capabilities with unwavering dedication to ensure the spectrum management and regulation on broadcasting, television, and telecommunications services and satellite and orbit management can keep up with the global dynamic context in economy, society, innovation, technology and environment.

Lastly, I commit that the NBTC and the Office of the NBTC, as a regulator, will never stop developing in several aspects, and will contribute with our best effort and integrity to manage spectrum and regulate the broadcasting, television, and telecommunications services, to maintain our leadership among ASEAN in digital economy and society by empowering the economy and society, as well as enhancing the people's quality of life to prosper with stability.

(Clinical Professor Dr. Sarana Boonbaichaiyapruk)
Chairman of the National Broadcasting and
Telecommunications Commission





Message from the Secretary-General of the NBTC

Mr. Trairat Viriyasirikul

Deputy Secretary-General,
Acting Secretary-General of the NBTC
(July 1, 2020 – Present)

The Office of the NBTC has driven the significant missions according to the NBTC's policies to develop the broadcasting, television, telecommunications, and satellite and orbit services by mainly adhering to benefits of the nation and people. In 2022, Major performance in broadcasting, television, and telecommunications services regulation and satellite and orbit management, for example, developing and amending related laws and regulations to comply with the dynamic context, preparing satellite orbital slot package auction, and accelerating communication line organization and bringing the cables underground, as given plan. The NBTC partly supported the budget for organizing communication lines in the priority areas in Bangkok with the fund allocated by the Broadcasting and Telecommunications Research and Development Fund for Public Interest (BTFP), and partly supported the budget

for non-priority routes. The operational costs can be deducted from the revenue submitting to the BTFP based on the Notification of the NBTC on Criteria and Procedure for Telecommunications Mission for Public Interest Expenditure Deduction from Revenue Allocations for Universal Service Obligations.

Besides, the office of the NBTC has been pursuing consumer protection in broadcasting, television, and telecommunications services. The significant contribution includes solving Short Message Service (SMS) fraud and scam calls. Thus, the Office of the NBTC set up the multilateral working group, consisting of 12 organizations, to cooperatively resolve the problems, and to reiterate all mobile operators to strictly abide by the related laws.

Furthermore, the Office of the NBTC has been continuously elevating itself to be a model government agency to maximize productivity





in public service with convenience, promptness, and transparency. In 2022, the Office of the NBTC won multiple awards including 1) Digital Government Awards 2022 (DG Awards 2022), the 1st rank from 1,935 participating agencies, 2) Public Sector Excellence Awards (PSEA) 2022 in the public service category with good level in the service development sub-category, 3) Digital Government Awards 2022 which is the award given to government agencies that committed to develop their organization towards digital government of Thailand, 4) Cybersecurity Excellence Award (Information Technology and Telecommunications), and 5) DIGI Data Awards 2022, which represents the effort to transform the organization to digital government with good governance and disclose government information to the public through the government open-source center. Regarding organization development with good governance, in 2022, the Office of the NBTC won the Integrity and Transparency Assessment (ITA) Awards 2022 **with the AA level for the third consecutive year, with the score of 99.58, ranked the 1st of the government agency category.** The Office of the NBTC was also awarded the certificate of commendation 2022 for integrity of the independent organizations in public and private sectors, as “Integrity Organization” under a category of independent organizations in public and private sectors. These achievements throughout the year were the result of our full extent of dedication to our duties and collaboration of all sectors involved.

On behalf of the Office of the NBTC, I would like to thank the Chairman of the NBTC, the NBTC commissioners, the management team, officers, and employees of the Office of the NBTC, as well as all sectors involved, in cooperatively supporting and achieving the NBTC missions through the challenges we face. The Office of the NBTC will support the NBTC missions in all aspects, which are important missions to the nation and people, with integrity, ethics and transparency adhering to good governance principles by focusing on value and utmost benefit to the people, and collaborating with all sectors to facilitate the prevention and suppression of corruption, as well as continuous development for sustainable growth in broadcasting, television, telecommunications, and satellite and orbit services of the country.

(Mr. Trairat Viriyasirikul)
Deputy Secretary-General
Acting Secretary-General
of the National Broadcasting
and Telecommunications Commission

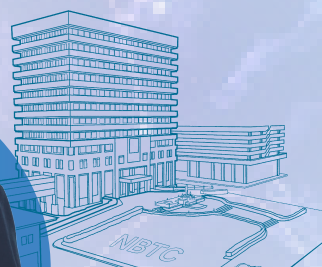


The National Broadcasting and Telecommunications Commission



General Sukit Khamasundara

NBTC Commissioner, Acting Chairman of the NBTC
(On duty from October 7, 2012 – April 12, 2022)



Colonel Natee Sukonrat

Vice-Chairman of the NBTC
(On duty from October 7, 2012 – April 12, 2022)



Associate Professor Prasert Silphiphat

NBTC Commissioner
(On duty from October 7, 2012 – April 12, 2022)



Lieutenant General Perapong Manakit

NBTC Commissioner
(On duty from October 7, 2012 – April 12, 2022)



Assistant Professor Thawatchai Jittrapanun

NBTC Commissioner
(On duty from October 7, 2012 – April 12, 2022)



Mr. Prawit Leesatapornwongsa

NBTC Commissioner
(On duty from October 7, 2012 – April 12, 2022)



The National Broadcasting and Telecommunications Commission

(On duty from April 13, 2022-Present)





Clinical Professor Dr. Sarana Boonbaichaiyapruk

Chairman of the NBTC

(On duty from April 13, 2022 – Present)

Education

- ⌚ Diploma, Medical Specialty, University of Southern California, California, USA
- ⌚ Doctor of Medicine, Chulalongkorn University

Work Experience

- ⌚ Energy Commissioner, the National Legislative Assembly
- ⌚ Public Health Standing Commissioner, the National Legislative Assembly
- ⌚ Member of the National Legislative Assembly
- ⌚ Vice Dean, Faculty of Medicine, and Clinical Professor
- ⌚ Cardiologist, Faculty of Medicine, Ramathibodi Hospital
- ⌚ Lecturer for Cardiology Division, Ramathibodi Hospital, Mahidol University
- ⌚ Cardiologist, American Board accredited at Kaiser Permanente, California, USA





Air Marshal Thanapant Raicharoen

NBTC Commissioner

(On duty from April 13, 2022 – Present)



Education

- ⌚ Doctor of Philosophy, Computer Science, Chulalongkorn University
(The Royal Golden Jubilee Ph.D. Scholarship)
- ⌚ Bachelor – Master of Computer Engineering, Munich University of the Federal Armed Forces, Germany
(Royal Thai Air Force Scholarship)
German Air Force Officer School, Class of 1983
(Royal Thai Air Force Scholarship)
Air Force Officer School, Class of 28 (1st Year)

Work Experience

- ⌚ Deputy Secretary-General of Regional Affairs Cluster, Office of the NBTC
- ⌚ Deputy Secretary-General of Spectrum Management and Regional Affairs Cluster, Office of the NBTC
- ⌚ Professional Expert, Office of the Permanent Secretary for Defence
- ⌚ Judge of Bangkok Military Court
- ⌚ Honorary Advisor, the Committee on Science, Information Technology and Mass Communication, the National Legislative Assembly
- ⌚ Sub-committee and Honorary Advisor, Ad-hoc Committee for Considering the Draft Act on the Organization to Assign Radio Frequency and to Regulate the Broadcasting and Telecommunications services (No. ...) B.E. ... B.E. 2560 (2017)
- ⌚ Sub-committee on Air Transportation, the National Legislative Assembly
- ⌚ Sub-committee on Space Law Development, the National Space Policy Committee
- ⌚ Staff Officer to Deputy Permanent Secretary for Defence (Senior Group Captain)
- ⌚ Planning and Engineering Division Director, Defence Information and Space Technology Department
- ⌚ Defence Information Division Director, Defence Information and Space Technology Department
- ⌚ Visiting Researcher, University of Maryland at College Park, USA
- ⌚ Programmer, SIEMENS, Munich, Germany





**Professor
Pirongrong Ramasoota**
NBTC Commissioner
(On duty from April 13, 2022 – Present)

Education

- Doctor of Philosophy in Communication, School of Communication, Simon Fraser University, Canada
- Master of Art in Communication, Department of Communication, University of Hawaii at Manoa, USA
- Bachelor of Arts in English (First-Class Honors), Chulalongkorn University

Work Experience

- Vice President for Social Outreach and Global Engagement, Chulalongkorn University
- Vice Dean, Division of Graduate Studies, Faculty of Communication Arts, Chulalongkorn University
- Head of Media Policy Research Unit, Faculty of Communication Arts, Chulalongkorn University
- Head of Department of Journalism, Faculty of Communication Arts, Chulalongkorn University
- Lecturer, Department of Journalism, Faculty of Communication Arts, Chulalongkorn University
- Board of Directors, Asian Media Information and Communication Centre (AMIC)
- Board of Directors, Communication Policy Research South (CPR South)
- Advisory Board, Privacy International (PI)
- Advisor to Joint Committee for considering the Draft Act on the Organization to Assign Radio Frequency and to Regulate the Broadcasting and Telecommunications Services B.E. ..., the House of Representatives
- Ad-hoc Committee of the Draft Act on the Organization to Assign Radio Frequency and to Regulate the Broadcasting and Telecommunications services B.E. ..., the House of Representatives
- Sub-committee on Political Development and Public Participation, the Senate
- Sub-committee on Public Communications, the Committee on Science, Technology, Communication and Telecommunications, the Senate.





Mr. Torpong Selanon

NBTC Commissioner

(On duty from April 13, 2022 – Present)



Education

- Master of Arts in Social Development Administration, Analysis and Social Planning, the National Institute of Development Administration
- Bachelor of Education in Special Education, Suan Dusit Rajabhat University

Work Experience

- President of Thailand Association of the Blind
- Advisor to the National Broadcasting and Telecommunications Commission for Consumer Protection and Civil Liberties Promotion
- Chairman of the Sub-committee on Non-Frequency Business, the National Broadcasting and Telecommunications Commission
- Advisory Director, the National Committee on Empowerment of Persons with Disabilities, Ministry of Social Development and Human Security
- Chairman of the Sub-committee on Broadcasting Licensing Consideration, the National Broadcasting and Telecommunications Commission
- Chairman of the Sub-committee on Empowerment of Persons with Visual Impairment, the National Committee on Empowerment of Persons with Disabilities
- Member of the National Reform Steering Assembly (NRSA)
- Committee and Assistant Secretary, Committee on National Social Reform Steering, the National Reform Steering Assembly (NRSA)
- Chairman of the Sub-committee on Education Reform for Person with Disabilities, Committee on Education Reform for Person with Disabilities, the Elderly, and the Underprivileged, the National Reform Steering Assembly (NRSA)
- Sub-committee on Regulation Reform of Media, Telecommunications and Information Businesses, Committee on Mass Communication and Information Technology Reform, the National Reform Council





Associate Professor Suphat Suphachalasai

NBTC Commissioner

(On duty from April 13, 2022 – Present)

Education

- ☉ Doctor of Philosophy in Economics, Australian National University, Canberra, Australia
- ☉ Master of Arts in Agricultural Development Economics, Australian National University, Canberra, Australia
- ☉ Master of Economics in Economic Development, the National Institute of Development Administration
- ☉ Bachelor of Economics (2nd Class Honors), Ramkhamhaeng University

Work Experience

- ☉ Director, Thammasat Institute of Area Studies
- ☉ Director, Thammasat Institute for Study of International Cooperation
- ☉ Australian Studies Centre, Thammasat University
- ☉ APEC Studies and Regional Cooperation Studies Centre, Thammasat University
- ☉ Lecturer, Faculty of Economics, Thammasat University
- ☉ International Economic Policy Commission
- ☉ Advisory Director in Trade Competition Commission
- ☉ Free Trade Agreement Strategy and Negotiation Commission
- ☉ National Research Council Committee, Economics
- ☉ Advisory Director, Committee on Research Fund Monitoring and Evaluation, The Thailand Research Fund





Police General Nathathorn Prousoonton

NBTC Commissioner

(On duty from October 22, 2022 – Present)



Education

- ⊕ Doctor of Political Science, Chulalongkorn University
- ⊕ Master of Public Affair, Kentucky State University, USA
- ⊕ Master of Arts (Translation), Chulalongkorn University
- ⊕ Master of Science (Computer), Chulalongkorn University
- ⊕ Bachelor of Laws, Ramkhamhaeng University
- ⊕ Bachelor of Political Science (RPCA 37), Royal Police Cadet Academy

Training

- ⊕ FBI (NA#239) FBI, Quantico, Virginia, USA
- ⊕ Police Management Development Program (PMDP#127) AIPM, Australia

Work Experience

- ⊕ Special Advisor, Royal Thai Police
- ⊕ Assistant Commissioner General
- ⊕ Commissioner, Immigration Bureau
- ⊕ Deputy Commissioner, Immigration Bureau
- ⊕ Commander, Immigration Division 2, (International Airport)
- ⊕ Director of International Law Enforcement Academy (ILEA)
- ⊕ Superintendent of Information Center (Computer), Royal Thai Police
- ⊕ Inquiry Official and Crime Protection and Suppression, Police Station Level





Executive Summary

2022 was the year of global and Thailand's economic recovery, including significant changing trends that affect in wide range in society, economy, environment, and technologies. Also, the COVID-19 pandemic has affected people's daily lives and accelerated digital technologies transformation. This borderless world, shifting towards technological convergence of our physical and digital realities or Metaverse, has been immensely affected lifestyle and business models. It becomes another challenging year for the NBTC and the Office of the NBTC to handle these changes. Thus, the NBTC has established regulatory policies to drive the nation's communications service regulation mission to keep pace with the changes, and encourage free and fair competition in broadcasting, television, telecommunications, and satellite industries for the maximum benefit of the nation and people.

In 2022, the NBTC has performed the significant missions as follows:

1. Spectrum Management.

1.1 The NBTC has conducted feasibility study and spectrum usage guideline for the spectrum management to optimize benefit of the nation and people such as 1) guidelines and propriety in determining timeframe for spectrum usage permission of the 450 – 470 MHz frequency bands for

International Mobile Telecommunications (IMT), 2) guidelines on the 3300 – 3400 MHz and 4800 – 4890 MHz frequency bands utilization for International Mobile Telecommunications (IMT), and 3) guidelines on the 28 GHz frequency band utilization. Furthermore, the NBTC has conducted public policy recommendations on spectrum management for spectrum sharing between international mobile telecommunication services, 5G technologies, and other businesses in the 3500 MHz and 28 GHz frequency bands in support of significant policy consideration.

1.2 The NBTC has revised the spectrum usage and monitored the radio frequency plan implementation, such as preparation on L-band termination (1427 – 1518 MHz) to support International Mobile Telecommunications (IMT), and the 50 – 54 MHz frequency bands usage improvement, etc.

1.3 The NBTC has coordinated with neighboring countries in spectrum management, international spectrum registration, and the nation's spectrum use notification to the International Telecommunication Union (ITU) and the neighboring countries, as well as collaborating in regulatory practices on spectrum usage along common border areas by joining Joint Technical Committee on Coordination and Assignment of Frequencies along Thailand and Neighboring Countries Common Border



(Myanmar, Cambodia and Lao PDR), and sharing regulatory updates and termination of aeronautical frequency interference with repeaters of Provincial Electricity Authority, solving the spectrum interference problem, and revising coordination parameters common agreement in broadcasting, television, mobile services, and radiocommunications services.

2. Satellite and Orbit Service Regulations.

2.1 The NBTC has prescribed the Notification of the NBTC on Licensing Criteria and Procedures for Satellite Orbital License Package, effective on November 5, 2022. Then, the NBTC allowed license applicants to submit their bid documents at the NBTC Head office on December 27, 2022, and held the auction on January 15, 2023. In this regard, the auction is a mechanism in allocating the national resources for maximum benefit by taking public interest into account, bringing about free and fair competition, and preserving satellite orbital right, which lead to the optimum benefits for the nation, people and the satellite and orbit management in Thailand. A total of 806.503 million baht was raised from 2 winning bidders of the satellite orbital slot package auction, which were Space Tech Innovation Company Limited for the second and the third packages, and National Telecom Public Company Limited for the fourth package.

2.2 The NBTC has granted licenses for foreign satellite orbital slots as follows:

- 1) Granting licenses for foreign satellite orbital slot according to Clause 16 of the NBTC Notification on Criteria and Procedure to License Foreign Satellite to Provide Domestic Services to National Telecom Public Company Limited, to temporarily use AsiaSat5 transponder for broadcasting the football match and the Volleyball Nations League 2022, and granting Directorate of Department Joint Communications, Royal Thai Armed Forces

Headquarters to temporarily use of ABS-2A slot to supporting military security missions.

- 2) Granting license to National Telecom Public Company Limited to use foreign satellite orbital slot to temporarily provide domestic services with AsiaSat5 from July 18, 2022, until the NBTC officially appoints the winning bidder to use the satellite orbital slot package or otherwise specified by the NBTC.

- 3) Granting license to TC Broadcasting Company Limited to use foreign satellite orbital slot to provide domestic services with Globalstar for a 5-year term, as from November 15, 2022.

3. Broadcasting and Television Services Regulations.

3.1 Broadcasting Services Regulation.

- 1) Organizing the FM frequency auction for commercial broadcasting service on February 21, 2022, in a total of 74 bands, to align with the expiration of spectrum holding of the broadcasting service providers on April 3, 2022, and to ensure uninterrupted broadcasting services which will not affect the broadcasting industry and consumer. It also offered an opportunity for new service providers to enter the spectrum licensing system. As a result, 68 bands were auctioned off by the winning bidders. Thus, according to the NBTC board special meeting No. 2/2022 on March 31, 2022, the NBTC board resolved to approve the bid results and granted 68 licenses with 7-year term to the winning bidders for commercial broadcasting services.

- 2) Granting permission for FM trial broadcasting according to the NBTC Notification on Criteria on FM Trial Broadcasting. In 2022, a total of 4,102 authorized radio broadcasting stations applied for trial broadcasting, categorized into commercial services for 3,274 stations, public services for 644 stations, and community services for 184 stations.



3) Trial broadcasting in Bangkok and its vicinity phase 2 by increasing transmitter capacity and antenna pattern to cover signal dead spots detected from the trial broadcasting phase 1.

3.2 Television Services Regulation.

1) Granting a new license for one channel for digital terrestrial television service to Thai Public Broadcasting Service (ALTV Channel 4) with a license period effective from June 15, 2022, to December 31, 2030. Also, the NBTC granted renewing licenses for 3 channels to (1) Thai Public Broadcasting Service (Thai PBS Channel 3), effective from June 1, 2022, to December 31, 2030, (2) Royal Thai Army by Royal Thai Army Radio and Television Station (TV5), effective from June 1, 2022 to December 31, 2030, and (3) Thai Government Public Relations Department (PRD) (National Broadcasting Services of Thailand Channel 2), effective from July 6, 2022, to December 31, 2030.

2) Granting permission for temporary tests or trials (digital TV) to Ministry of Education for digital television trial broadcasting on DLTV1 – DLTV12 from February 15, 2022 to August 14, 2022, and to Thai Public Broadcasting Service for temporary tests or trials, according to the digital terrestrial television trial broadcasting with UHD 4K technology project, from October 1, 2022 to March 31, 2023.

3) Revising compensation rate of frequency-use digital terrestrial television network rental based on service cost to ensure fairness and appropriateness to the network providers and users, according to Section 42 of the Broadcasting Businesses Act B.E. 2551 (2008), the Notification of the NBTC on Regulatory Guidelines on Broadcasting Tariffs, and the Notification of the NBTC on Calculation Standard on Compensation Rate of Digital Terrestrial Television Network Rental.

4) Preparing the Notification of the Office of the NBTC on Technical Guidelines for Proposal Assessment of Digital Terrestrial

Television Broadcasting with 4K Technology Test or Trial Project. According to the NBTC board meeting No.28/2022 on December 19, 2022, the NBTC board resolved to approve spectrum licensing for broadcasting and television services for digital terrestrial television temporary test or trial broadcasting with UHD (4K) technology for Thai Public Broadcasting Service. The NBTC also assigned the Office of the NBTC to publicize the digital terrestrial television trial broadcasting with UHD 4K technology project.

5) Improving the regulation in compliance with changing industry ecosystems. In 2022, the subcommittee on communication service provision via digital platforms was appointed in order to come up with the insights summary on situations, problem analysis, impact and trend of communication service provision via digital platforms on internet network, and study applicable laws and regulations related to the service provision via digital platforms, by collaborating with Department of Intellectual Property, Revenue Department, Electronic Transactions Development Agency, etc. to propose regulation amendment with the changing industry ecosystem, and to offer recommendations on empowering and regulating communication service provision via related digital platforms.

6) Considering approaches for the notifications and criteria revision to comply with the technological dynamic and competition in television industry, such as the Notification of the NBTC on Television Broadcasting Service Criteria (Must Carry), the Notification of the NBTC on Criteria for the Important Events which can be broadcasted only on Free Television (Must Have), and the Notification of the NBTC on Criteria on Television Services Ranking.

7) Considering complaints related to TV contents by inviting related agencies to provide information, and collaborating with Association of Media Professional in developing self-regulating model organization



while conducting a preparation on criteria for licensees, content providers and mass communication practitioners aggregation promotion measure by coordinating regularly with various professional associations such as the National Press Council of Thailand, the News Broadcasting Council of Thailand, Thai Broadcast Journalists Association, Association of Digital Television Broadcasting (Thailand).

4. Telecommunications Services Regulation.

4.1 Supporting and promoting continuous 5G use cases such as supporting 5G trial and use case development projects with universities by BTFP funding. In 2022, the NBTC granted permission for using spectrum for experiment purposes in Regulatory Sandboxes to (1) Burapha University, (2) Khon Kaen University, and (3) PTT Public Company Limited, Eastern Economic Corridor of Innovation. Such funding aimed to drive 5G management effectively, according to the Notification of the NBTC on Spectrum Licensing Criteria and Procedures for Innovation Experiments in Regulatory Sandbox.

4.2 Organizing communication lines and bringing communication lines underground by preparing integration plans with related agencies, including Bangkok Metropolitan Administration (BMA), Metropolitan Electricity Authority (MEA), Provincial Electricity Authority (PEA), telecom operators and related state agencies, about organizing communication lines on electric poles on main routes in Bangkok, and other provinces. The NBTC also supported the budget for organizing communication lines with the BTFP fund according to the Cabinet resolution on November 23, 2021, with a focus on infrastructure sharing, and excessive communication lines reduction on electric poles in priority areas, as well as enhancing Single Last Mile.

4.3 Resolving call center scam and Short Message Service (SMS) fraud by setting up a multilateral working group, to study and analyze measures and laws relating to the problems, provide complaints handling channel to cooperate with other agencies, and design scam handling and protection system to ensure efficient integration between corresponding agencies, which lead to a concrete practice. The working group comprised representatives from related agencies, including Ministry of Digital Economy and Society (MDES), Personal Data Protection Committee, Bank of Thailand, Technology Crime Suppression Division, Cyber Crime Investigation Bureau, Telecommunications Association of Thailand under the Royal Patronage, Thailand Consumers Council, and mobile operators. The working group also created a Sender Name database system for the mobile operators to review sender name duplication, and for the Office of the NBTC to use as a regulatory guideline, and to prepare regulatory practices in SMS sending for the telecom licensees.

4.4 Ensuring the availability of the project on the provision of broadband internet service and mobile phone signal in border areas (Zone C+), in a total of 3,920 villages, and the project on the provision of broadband internet service in remote areas (Zone C), in a total of 15,735 villages. The projects have been continually operated to reduce inequality in telecommunication services access, and to promote equality and fairness in aspect of geography and society, that will leverage better quality of life to people, teachers, students, the elderly, patients, and the residential target groups living in those areas. At present, the project has been completed by providing free-of-charge mobile service and broadband internet for 19,655 villages (29,748 service points) for 5 years (2022 – 2026).





5. Consumer Protection in Broadcasting, Television and Telecommunications Services.

5.1 Protecting consumers in broadcasting and television services with proactive regulatory practices against the actions considered as consumer exploitation by monitoring broadcasting and television services operations, handling complaints, collaborating with other related agencies to safeguard the consumers against exploitation. The NBTC also empowered consumers and enhanced their media literacy in order to protect their own rights by forming consumer network, promoting media literacy, and protecting the rights of the disabled and the underprivileged to equally access and utilize information from broadcasting and television programs, as well as developing criteria on broadcasting and television consumer protection with a focus on 3 key aspects including 1) prescribing regulation to prevent the actions considered as consumer exploitation with the proactive monitoring process and handling complaints effectively, 2) promoting and empowering consumer to participate in every step of regulatory practices, and 3) facilitating the disabled and the underprivileged in information access.

5.2 Protecting consumers in telecommunications services by continually promoting consumer awareness such as organizing workshops to establish knowledge, follow up and evaluate public network leaders, organizing meetings for stakeholders to understand the complaint handling process in 4 regions, and publishing papers on consumer rights to the public in various channels.

Furthermore, the NBTC appointed a multilateral working group for solving call center scam and SMS fraud, to study measures and laws relating to the problems, provide a complaint handling channel to cooperate with other agencies, and design scam handling and protection systems to ensure efficient integration between corresponding agencies.

6. International Affairs.

The Office of the NBTC, as an administrative state agency, performs duties on international communication service management with the International Telecommunications Union (ITU), and with other international organizations. In 2022, the Office of the NBTC attended the Plenipotentiary Conference 2022 (PP-22), and actively campaigned to gather votes for Thailand in the ITU Council Member Election. Accordingly, Thailand was elected as ITU council member states for a term of office from 2023 – 2026, ranking 16th among 193 member countries. Furthermore, the Office of the NBTC attended several meetings under ITU framework such as World Telecommunication Development Conference 2021 (WTDC-21), hosted the Girls in ICT Day Thailand 2022, etc., and participated in international service trade negotiation meetings. The Office also hosted and/or attended the bilateral cooperation conferences with corresponding agencies to encourage collaboration in communication regulation, and to prepare Memorandum of Understanding between organizations which will mutually elevate regulatory capabilities of both organizations.



7. Organization Development.

The NBTC and the Office of the NBTC recognize the importance of good governance by setting policies for the executive, officers, and employees of the Office of the NBTC to perform their duties adhering to good governance principles and maintain the implementation standard on the good governance principle and verification. The NBTC also emphasizes on digital technology upskill to accommodate the people and prepare the NBTC officers with academic excellence for the emerging digital economy. In 2022, the Office of the NBTC has maintained the standard of the Integrity and Transparency Assessment (ITA) 2022, with AA level for the third consecutive year, with the score of 99.58, ranked the 1st of the state agency category.

Accordingly, the Office of the NBTC was awarded the certificate and plaque of the ITA Awards 2022.

Furthermore, the Office of the NBTC has been awarded with various prestigious awards from many organizations for improving customer service with digital technology, including 1) Cybersecurity Excellence Award (Information Technology and Telecommunications), 2) Honorable mention certificate for moral organizations under independent organizations in public and private sectors category, as “Moral Promotion Organization” under the category of public and private independent organizations, 3) Public Sector Excellence Awards 2022 (public service) with good level in the service development sub-category, 4) Digital Government Awards 2022 (DG Awards 2022), 1st rank from 1,935 agencies, and Quality Organization Award 2022 in the digital workforce category, and 5) DIGI Data Awards 2022.





1

General Information



The NBTC and the Office of the NBTC



The Act on the Organization to Assign Radio Frequency and to Regulate the Broadcasting and Telecommunications Services (referred as the Act on the Organization) B.E. 2553 (2010) and its amendment by the Act on the Organization to Assign Radio Frequency and to Regulate the Broadcasting and Telecommunications services (No. 2) B.E. 2560 (2017), the Act on the Organization to Assign Radio Frequency and to Regulate the Broadcasting and Telecommunications services (No. 3) B.E. 2562 (2019), and the Act on the Organization to Assign Radio Frequency and to Regulate the Broadcasting and Telecommunications services (No. 4) B.E. 2564 (2021), published in the Royal Gazette and effective as of March 2, 2021, has revised the new recruitment and selection process

of the NBTC by repealing the provision of section 6 of the Act on the Organization (No.2) B.E. 2560 (2017) and stipulated that the NBTC board shall consist of 7 commissioners with expertise in the fields of broadcasting services, television broadcasting services, telecommunications services, consumer protection, and people's liberty and rights promotion, one of each. The other two commissioners shall have expertise in other fields that benefit the NBTC duties. The NBTC commissioners who still hold the office before the Act comes into force shall pursue their duties. In the case of any vacancy, regardless of the reasons, the NBTC board shall comprise the remaining commissioners until the appointment of the new NBTC board.





On December 20, 2021, according to the 12th Senate meeting resolution (2nd Annual General Ordinary Session), the appointment of 5 NBTC commissioners from 5 fields of expertise was approved, namely 1) Air Marshal Thanapant Raicharoen (broadcasting services), 2) Professor Pirongrong Ramasoota (television broadcasting services), 3) Clinical Professor Sarana Boonbaichaiyapruk (consumer protection aspect), 4) Mr. Torpong Selanon (people's liberty and rights promotion aspect), and 5) Associate Professor Suphat Suphachalasai (other fields that benefit the NBTC duties (b) economic aspect). Subsequently, Clinical Professor Sarana Boonbaichaiyapruk was voted to be Chairman of the NBTC by the board members on January 14, 2022.

On April 14, 2022, the Royal Gazette declared the notification of the Office of the Prime Minister that the appointment of the Chairman of the NBTC and the NBTC commissioners has been royally endorsed and has come into force from April 13, 2022, as follows:

1. Clinical Professor Sarana Boonbaichaiyapruk
Chairman of the NBTC
2. Air Marshal Thanapant Raicharoen
Commissioner
3. Professor Pirongrong Ramasoota
Commissioner
4. Mr. Torpong Selanon
Commissioner
5. Associate Professor Suphat Suphachalasai
Commissioner

On August 16, 2022, the 22nd Senate meeting (1st Annual General Ordinary Session) resolved to approve Police General Nathathorn Prousoontorn to hold the position of the NBTC commissioner (other fields that benefit the NBTC duties (a) law aspect).

On October 28, 2022, the Royal Gazette declared the notification of the Office of the Prime Minister that the appointment of the NBTC commissioner (Police General Nathathorn Prousoontorn) has been royally endorsed and has come into force from October 22, 2022, to present.

สำนักงานคณะกรรมการกิจการกระจายเสียง
กิจการโทรทัศน์ และกิจการโทรคมนาคมแห่งชาติ
Office of The National Broadcasting and Telecommunications Commission

NBTC





(Unofficial Translation)

Notification of the Office of the Prime Minister

RE: Appointment of the Chairman and the National Broadcasting and Telecommunications Commissioners

Pursuant to the Royal Proclamation to appoint the National Broadcasting and Telecommunications Commission, in a total of 11 commissioners, since October 7, 2011, according to the Notification of the Office of the Prime Minister, dated October 7, 2011; Whereas the Chairman and the National Broadcasting and Telecommunications Commissioners, in a total of 6 commissioners, retired as being seventy years of age, resigned, and was under prohibited qualifications according to the Act on the Organization to Assign Frequency and to Regulate the Broadcasting and Telecommunications Services B.E. 2553 (2010) and its amendment by virtue of the Act on the Organization to Assign Frequency and to Regulate the Broadcasting and Telecommunications services (No. 2) B.E. 2560 (2017), and subsequently the promulgation of the Act on the Organization to Assign Frequency and to Regulate the Broadcasting and Telecommunications services (No. 4) B.E. 2564 (2021) has been effective as of March 2, 2021, amending the Act on the Organization to Assign Frequency and to Regulate the Broadcasting and Telecommunications services (No. 2) B.E. 2560 (2017) in which relating to recruitment and selection of persons to be appointed as the new National Broadcasting and Telecommunications Commissioners. The on-duty commissioners, prior to this Act, shall maintain their positions, or continue performing the duties. In case of the vacancy regardless of the reasons, the commission shall consist of the remaining commissioners until the appointment of the new board of the National Broadcasting and Telecommunications Commission, based on Section 10 of the Act.

By virtue of Section 6 and Section 16 of the Act on the Organization to Assign Frequency and to Regulate the Broadcasting and Telecommunications services (No. 4) B.E. 2564 (2021), the 12th Senate meeting resolution (2nd Annual General Ordinary Session) on December 20, 2021, the list of 5 candidates for the National Broadcasting and Telecommunications Commission was approved, namely 1) Air Marshal Thanapant Raicharoen (broadcasting services aspect), 2) Professor Pirongrong Ramasoota (television broadcasting services aspect), 3) Clinical Professor Sarana Boonbaichaiyapruk (consumer protection aspect), 4) Mr. Torpong Selanon (people's liberty and rights promotion aspect), and 5) Associate





Professor Suphat Suphachalasai (other fields that benefit the NBTC duties (b) economic aspect). The Secretariat of the Senate invited those 5 candidates, approved by the Senate, to the meeting on January 14, 2022, to nominate one of the candidates to be a Chairman of the National Broadcasting and Telecommunications Commission. Consequently, Clinical Professor Sarana Boonbaichaiyapruk was voted as the Chairman of the National Broadcasting and Telecommunications Commission. The President of the Senate requested the proposal of the list to the King for Royal Command for appointing the Chairman and the National Broadcasting and Telecommunications Commissioners, in a total of 5 persons, as follows:

- | | |
|--|---|
| 1. Clinical Professor Sarana Boonbaichaiyapruk | Chairman of the NBTC |
| 2. Air Marshal Thanapant Raicharoen | Commissioner
(Broadcasting services aspect) |
| 3. Professor Pirongrong Ramasoota | Commissioner
(Television broadcasting services aspect) |
| 4. Mr. Torpong Selanon | Commissioner
(People's liberty and rights promotion aspect) |
| 5. Associate Professor Suphat Suphachalasai | Commissioner
(Other fields that benefit the NBTC duties (b) economic aspect) |

And the Secretariat of the Cabinet proposed the list to the King for Royal Command for the appointment.

In this regard, the King is graciously pleased to appoint the Chairman and the National Broadcasting and Telecommunications Commissioners as proposed.

This notification shall come into effect as of April 13, 2022.

Issued on April 13, 2022.

Countersigned by
General Prayut Chan-o-cha
Prime Minister



**(Unofficial Translation)**

Notification of the Office of the Prime Minister

RE: Appointment of the National Broadcasting and Telecommunications
Commissioners

Whereas the Royal Proclamation to appoint the Chairman and the National Broadcasting and Telecommunications Commissioners, in a total of 5 persons, since April 13, 2022, according to the Notification of the Office of the Prime Minister dated April 13, 2022, two vacant positions are still available. By virtue of Section 6 and Section 16 of the Act on the Organization to Assign Frequency and to Regulate the Broadcasting and Telecommunications services (No. 4) B.E. 2564 (2021), the 22nd Senate meeting resolution (1st Annual General Ordinary Session) on August 16, 2022, the Senate approved the appointment of Police General Nathathorn Prousoontorn as the National Broadcasting and Telecommunications Commissioner (other fields that benefit the NBTC duties (a) law aspect). The President of the Senate requested the proposal to the King for Royal Command for the appointment, and the Secretariat of the Cabinet proposed to the King for Royal Command for the appointment.

In this regard, the King is graciously pleased to appoint the person to be the National Broadcasting and Telecommunications Commissioner as of October 22, 2022.

Issued on October 28, 2022.

Countersigned by
General Prayut Chan-o-cha
Prime Minister





The NBTC Authorities and Duties

According to Section 27 of the Act on the Organization to Assign Radio Frequency and to Regulate the Broadcasting and Telecommunications Services B.E. 2553 and its amendment, the NBTC shall have the authorities and duties as follows:

1. To formulate Spectrum Management Master Plan, Table of National Frequency Allocation, Broadcasting Master Plan, Telecommunications Master Plan, Radio Frequency Plan, Satellite Orbital Right Management Plan, and Telecommunications Numbering Plan, and proceed according to the Plans, which shall align with the National Digital Economy and Society Development Plan and Policy.

2. To assign radio frequencies for the undertaking of broadcasting, television, radiocommunications, and telecommunications services.

3. To prescribe characteristics and categories of broadcasting, television, and telecommunications services.

4. To license and regulate the use of frequencies and radiocommunications equipment in the undertaking of broadcasting, television, and telecommunications services, or radiocommunications service, and prescribe licensing criteria and procedures, conditions, or licensing fees. In this regards, the NBTC may assign the Office of the NBTC to grant licenses on behalf of the NBTC only for the part of radiocommunications equipment licensing, according to the criteria and conditions specified by the NBTC.

5. To prescribe criteria for efficient use of radio frequency, without causing interference to the same type of business and other types of business.

6. To license and regulate the operation of broadcasting, television, and telecommunications services to ensure the service users have been provided with quality, efficiency, timeliness, reliability, and fairness services, and prescribe licensing criteria and procedures, conditions, or licensing fees.

7. To license and regulate the use of telecommunications numbers, and prescribe licensing criteria and procedures, conditions, or licensing fees.

8. To prescribe criteria and procedures for interconnection, and criteria and procedures for setting access charges or interconnection charges to be applied to the undertaking of broadcasting, television, and telecommunications services, both for the same type of business and other types of business, which shall be fair to services users, service providers, and investors, or between the telecommunications service providers with due regard to public interest.

9. To set the tariff structures and price structure for broadcasting, television, and telecommunications services which shall be fair to services users and service providers with due regard to public interest.

10. To set standards and required technical specifications for broadcasting, television, telecommunications, and radiocommunications services.

11. To prescribe measures for the prevention of anti-competitive conduct or unfair competition in broadcasting, television, and telecommunications services.

12. To prescribe measures for the provisions of telecommunications services universally and equally in accordance with Section 50.

(12/1) To reform the unused or underutilized frequencies, or reuse efficiently, as specified in the plan, which shall be determined in accordance with (1) from the licensees to reallocate in accordance with the criteria, procedures, and conditions prescribed by the NBTC. However, such conditions must define the method of compensation, reimbursement or remuneration for those whose frequencies have been reformed by taking their rights into account in each case.

13. To protect right and liberty of the people from being exploited by the operators, and protect individual right of privacy and freedom to





communicate by means of telecommunications, and promote right, freedom, and equality of the people in the access to, and use of frequencies in the broadcasting, television, and telecommunications services.

14. To act as a governmental administrative agency with the authority in international communication management with the International Telecommunication Union, or with other international organizations, governments and overseas organizations, under the NBTC duties and authorities or as assigned by the government, as well as supporting the public affairs, in order to obtain satellites or the rights to access satellite orbits, and to coordinate domestic and international spectrum management, in accordance with the plans aligned with (1) and the National Digital Economy and Society Development Plan and Policy.

(14/1) To obtain and maintain the rights to access the satellite orbit, which is a national treasure, and exercise the rights to maximize benefits for the nation and the people. In case that maintaining such rights creates a burden on the state beyond benefit gains, the NBTC may waive the rights as stipulated in the satellite orbital right management plan, and report to the Cabinet as well as announcing detailed reasons to the public. In exercising the satellite orbital right, the NBTC has the authority to prescribe criteria, procedures, licensing conditions, licensing application fees, and licensing application fees exemption, including related operating expenses that the license applicants or the licensees shall bear. The license fee after deducting the license cost shall be remitted as state revenue.

(14/2) To license and regulate the business operation under this Act by using foreign satellite transponders and prescribing licensing criteria, procedures, conditions and fees.

15. To determine and resolve issues relating to interference of frequencies.

16. To monitor and provide advice on the undertaking of broadcasting, television, and telecommunications services.

17. To set forth regulation on merger, cross ownership-holding or broadcasting and frequency-used television market dominance among mass media businesses or by any other

person, which has the effect of impeding the liberty of the public in perceiving information or obstructing public access to a diversity of information.

18. To promote a formation of licensees, broadcasters, and mass media professionals in the radio and television businesses into diverse forms of organizations which will have the mandate to set forth ethical standards and self-regulation pertaining to the occupation or profession under the ethical standards.

19. To issue rules or notifications with respect to general administration, human resource management, budgeting, finance and property, and other related operations of the Office of the NBTC according to Section 58.

20. To approve the expenditure budget of the Office of the NBTC, including financial allocation to the Broadcasting and Telecommunications Research and Development Fund for the Public Interest according to Section 52.

21. To determine and approve financial allocation for the fund as proposed by the Fund Management Committee according to Section 55.

22. To provide information and participate in negotiations or making agreements between the Kingdom of Thailand and foreign governments, or international organizations in matters relating to spectrum management, broadcasting, television, telecommunications services, or other related services.

(22/1) To provide information related to the operations of the NBTC and the authorized operators by the NBTC, in the digital-related aspects as requested by the Office of the National Digital Economy and Society Commission for utilizing and analyzing the National Digital Economy and Society Development Plan and Policy.

23. To give advice to the Cabinet for an issuance of, or amendment to, legislation related with frequency allocation and other matters relating to frequencies, broadcasting, television, and telecommunications services.

24. To prescribe rules, notifications, or orders under the NBTC authorities and duties.

25. To perform any other acts as prescribed in this Act or other laws.





The Office of the NBTC Authorities and Duties

In accordance with Section 56 and Section 60 of the Act on the Organization B.E. 2553 (2010) and its amendment, the Office of the National Broadcasting and Telecommunications Commission, or abbreviated as **“the Office of the NBTC”**, is a juristic person having a status of state agency, under the responsibility of the Chairman of the NBTC, and shall not be subject to government agency under the public administration laws, or state enterprise under the budgetary procedure laws or other laws. The Office of the NBTC shall have a Secretary-General of the NBTC who is responsible for the operation of the Office of the NBTC, and directly reports to the Chairman of the NBTC. Also, the Secretary-General shall be a chief of officers and employees of the Office of the NBTC. Section 57 prescribes the authorities and duties of the Office of the NBTC as follows:

1. Be responsible for the Office of the NBTC’s revenues and expenditures.
2. Prepare the Office of the NBTC’s annual expenditure budget and submit to the NBTC for endorsement. The annual expenditure budget shall include any expenditures with respect to the operations of the NBTC, the Monitoring and Evaluation Committee, and

the Office of the NBTC. Such annual expenditure budget shall be prepared with consideration of worthiness, cost effectiveness and efficiency. In case that any item or project that has been budget allocated but has not paid or created debt obligations within the fiscal year, those item or project shall be canceled, and the Office of the NBTC shall submit the budget as state revenue.

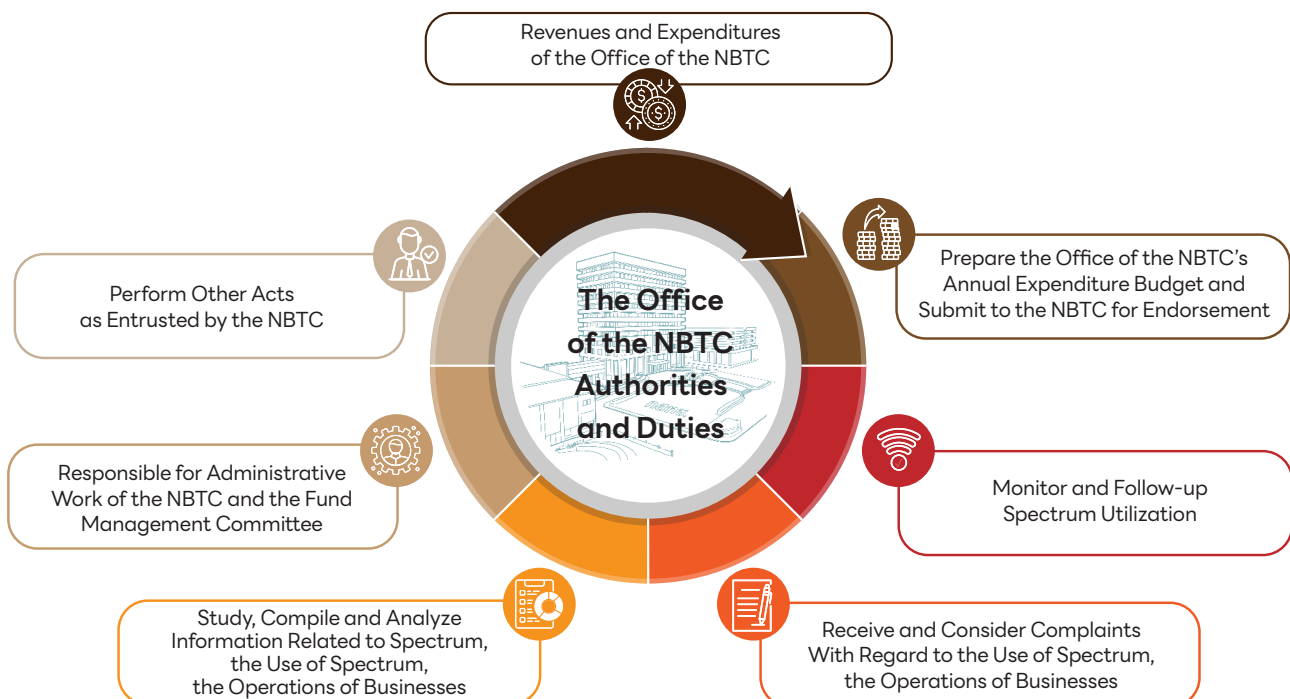
3. Monitor and follow-up spectrum utilization.

4. Receive and consider complaints with regard to the use of spectrum, the operations of broadcasting, television, and telecommunications businesses in order to examine and solve the problems or propose recommendations to the NBTC for consideration in accordance with the criteria prescribed by the NBTC.

5. Study, compile, and analyze information related to spectrum, the use of spectrum, the operations of broadcasting, television, and telecommunications businesses.

6. Be responsible for the administrative work of the NBTC and the Fund Management Committee.

7. Perform other acts as entrusted by the NBTC.





The Office of the NBTC Annual Expenditure Budget Preparation

According to Section 57(2) of the Act on the Organization B.E. 2553 (2010) and its amendment, it prescribes the Office of the NBTC to prepare the annual expenditure budget and propose to the NBTC for approval. The annual expenditure budget includes any expenditures related to operations under the duties of the NBTC, the Monitoring and Evaluation Committee, and the Office of the NBTC. Such annual expenditure budget shall be prepared with consideration of worthiness, cost effectiveness and efficiency. In case that any item or project that has been budget allocated but has not paid or created debt obligations within the fiscal year, the item or project shall be canceled, and the Office of the NBTC shall submit the budget as state revenue.

In addition, in the preparation of the annual expenditure budget under Section 57 (2) of the Act on the Organization B.E. 2553 (2010) and its amendment, prior to the NBTC approval, the Office of the NBTC shall submit the annual expenditure budget draft to the National Digital Economy and Society Commission for consideration. Subsequently, the Office of the NBTC shall consider the draft budget revision or amendment. Nonetheless, the expenditure budget for the Monitoring and Evaluation Committee shall be proposed to the Committee for further revision. In case that the Office of the NBTC or the Monitoring and Evaluation Committee disagree with the comments of the National Digital Economy and Society Commission, the Office of the NBTC shall propose the draft annual expenditure budget together with the comments to the NBTC for consideration. The Office of the NBTC shall disclose the annual expenditure budget, along with the items or projects approved, to the public through an information network system or other means as it deemed appropriate.

The Monitoring and Evaluation Committee shall propose the expenditure budget for the remuneration and other expenses, based on Section 71 paragraph seven, to the Office of the NBTC to address the committee's budget allocation in the draft annual expenditure budget. In this regard, the Office of the NBTC may provide opinions on the budget allocation in the annual expenditure budget proposal. Accordingly, the Office of the NBTC shall propose the draft annual expenditure budget to the National Digital Economy and Society Commission not less than ninety days prior to the beginning of the fiscal year, and the National Digital Economy and Society Commission shall complete the proceedings not less than thirty days prior to the beginning of the fiscal year. After receiving the comments or upon the expiration of such a period, the Office of the NBTC shall propose the draft annual expenditure budget to the NBTC for further proceedings.

Revenues of the Office of the NBTC

According to Section 65 of the Act on the Organization B.E. 2553 (2010) and its amendment, it prescribes that the Office of the NBTC revenues shall include licensing application fees and spectrum license fees regarding to Section 44/2 paragraph one, licensing application fees and business licensing fees regarding to Section 45 paragraph one, and license transfer fees regarding to Section 44/3. In addition, the revenues shall include income or benefits accrued from the performance under duties of the NBTC and the Office of the NBTC, income derived from the Office of the NBTC's properties, money, and donated assets, in accordance with the regulation set forth by the NBTC for the operations of the Office of the NBTC, and subsidies from the government. After deducted by the operation costs of the Office of the NBTC, necessary burden costs, and financial allocation to the Fund under Section 52, the EdTech Fund





under the national education law, and the Digital Economy and Society Development Fund under the law on the digital economy and society development, the remaining revenues shall be remitted as state revenue. In the case where the Office of the NBTC revenue is not sufficient for effective operations of the Office of the NBTC, and necessary burden costs, while no other revenue sources are available, the government shall allocate the national budget to the Office of the NBTC as necessary.

The Broadcasting and Telecommunications Research and Development Fund for Public Interest

According to Section 52 of the Act on the Organization B.E. 2553 (2010) and its amendment, the Broadcasting and Telecommunications Research and Development Fund for Public Interest (BTFP) has been established to fulfill the objectives as follows:

1. To ensure comprehensive and equal access of the people to broadcasting and telecommunication services, as well as promote the communities and support community service operators as per Section 51.
2. To promote and support communication resources development, research and development regarding broadcasting, television, and telecommunications services, including digital literacy on spectrum utilization, information technology, Technological Facilities for the disabled, the elderly and the underprivileged, as well as telecommunications industries and related industries.
3. To promote and support human resource development in broadcasting, television, telecommunications services, and information technology sector, as well as for the implementation of the organizations which is responsible for setting ethical standards of the occupations or professions under the law on broadcasting and television business operation.

4. To support, promote and protect the broadcasting, television, and telecommunications services consumers.

5. To support implementation under the Act on Safe and Creative Media Development Fund by allocating some money to the Safe and Creative Media Development Fund.

6. To support spectrum utilization for maximum effectiveness, and spectrum refarming from licensees for reallocation, as well as to support the compensation, reimbursement, and remuneration for spectrum refarming for the optimum efficiency in spectrum utilization.

According to Section 54, the BTFP Fund Management Committee shall consist of the Chairman of the NBTC, as the Chairman of the Committee, Permanent Secretary of the Prime Minister's Office, Permanent Secretary for Defence, Secretary-General of the National Economics and Social Development Council, Director of Budget Bureau, Comptroller-General, and Director of the National Electronics and Computer Technology Center, including other two qualified experts to be the committees.

According to Section 55, the BTFP Fund Management Committee shall have the powers and duties in the management of the fund and provide recommendations on the fund allocation for the objectives outlined in Section 52 to the NBTC for its approval. In the case where the NBTC's opinions differ from those of the Fund Management Committee, the NBTC shall give reasons for further consideration.





The Office of the National Broadcasting and Telecommunications Commission (Office of the NBTC) shall support the National Broadcasting and Telecommunications Commission (NBTC) in spectrum and satellite orbital rights management and regulation in broadcasting, television, telecommunications, satellite, and radiocommunications businesses with efficiency for the utmost benefit of the nation and people. Such missions are based on the duties as specified by law, including the Act on the Organization to Assign Radio Frequency and to Regulate the Broadcasting and Telecommunications services B.E. 2553 (2010) and its amendment, and other related laws.

Mission

Vision, Mission, and Core Values

Vision

The Office of the NBTC Being the leading international regulatory organization to develop communication business for the sustainable happiness and benefits of the nation and people.



Core Values

N

Navigating to International

B

Building Innovation

T

Teamwork and Transparency

C

Consistent Professionalism





Strategic Issues of the Office of the NBTC

and the Causal Relationship with the Government Policies,
the National Strategy, Master Plan under the National Strategy,
and the National Reform Plan

The 20 - Year National Strategy Plan



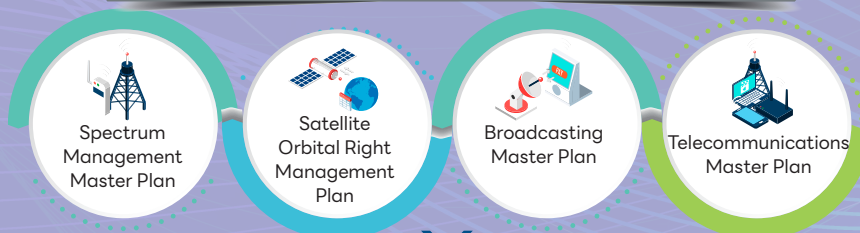
1. Thailand 4.0
 - Smart Enterprise and Startup
 - High Value Services
 - High Skilled Labors and Expertise Workforces
2. Government's Policies in 12 areas



National Digital Economy and Society Development Plan and Policy



Organizational Plan



The Strategic Plan of the Office of the NBTC No.3 B.E. 2565 - 2570 (2022 - 2027)





The High - Level Executives of the Office of the NBTC



Mr. Trairat Viriyasirikul

Deputy Secretary-General
Acting Secretary-General
(July 1, 2020 – present)



Mr. Trairat Viriyasirikul

Deputy Secretary-General
of Strategic and Internal Affairs Cluster



Asst. Prof. Phoomsith Mahavessiri

Deputy Secretary-General
of Broadcasting Cluster



Mr. Sutisak Tantayotin

Deputy Secretary-General
of Telecommunications Cluster



Mr. Sombat Leelapata

Acting Deputy Secretary-General
of Regional Affairs Cluster



Ms. Maneerat Kamjornkitjakarn

Acting Deputy Secretary-General
of Academic Cluster





The Principal Experts and Assistant Secretary-General



Mrs. Supinya Jampee

Principal Expert



Mr. Chanthaphat Kharnkhokgruad

Principal Expert



Mr. Saneh Saiwong

Principal Expert



Mr. Sombat Leelapata

Principal Expert



Ms. Achara Panyavanija

Assistant Secretary-General,
Strategic and Internal Affairs Cluster



Mr. Chalermchai Kokkeadtikul

Assistant Secretary-General,
Administration Cluster



Ms. Chitsata Sriprasertsuk

Assistant Secretary-General,
Telecommunications Cluster



Ms. Maneerat Kamjornkitjakarn

Assistant Secretary-General,
Broadcasting Cluster



Mr. Pichai Suwanakijboriharn

Acting Assistant Secretary-General,
Regional Affairs Cluster



Mr. Pasu Srihirun

Acting Assistant Secretary-General,
Academic Cluster





Organization Structure and Manpower of the Office of the NBTC

The NBTC is a constitutional independent state agency with obligations to allocate spectrum and regulate broadcasting, television, and telecommunication services, having the Office of the NBTC to support operations as assigned by the NBTC as required by laws. The office of the NBTC is committed to good governance principles, transparency, and accountability. The laws and regulations related to spectrum allocation and services regulation have been continually revised and kept up to date in line with the digital society age, and in compliance with the governmental agency practices to ensure efficient operations. However, for the purpose of discretion and transparency, the NBTC and the Office of the NBTC performance monitoring and evaluation processes have been set up both from internal and external agency to monitor and audit the operations and management of the NBTC and the Office of the NBTC, including the Monitoring and Evaluation Committee, established by Section 70 of the Act on the Organization B.E. 2553 (2010) and its amendment, and by the Senate approval, accountable for monitoring and evaluation performance and management of the NBTC, the Office of the NBTC, and the Secretary-General of the NBTC, and shall inform the assessment results to the NBTC within ninety days from the end of fiscal year. In addition, the Internal Audit Committee, established by Section 68 paragraph two of the Act on the Organization B.E. 2553 (2010) and its amendment, is independent in its operations without the intervention of the NBTC,

the Office of the NBTC, and any other agencies. The Internal Audit Committee shall propose the audit report to the NBTC for every one hundred and eighty days to ensure the effective and efficient audit in finance, accounting, supply, and management of the Office of the NBTC, as well as improving work quality, and enhancing the effectiveness of the risk management process, and orderly controlling and regulating, **which deemed as a significant mechanism in regulating, monitoring and balancing the operations under the authorities and duties with integrity and morality without prejudices, to conform with the intendment of the Constitution of the Kingdom of Thailand.**

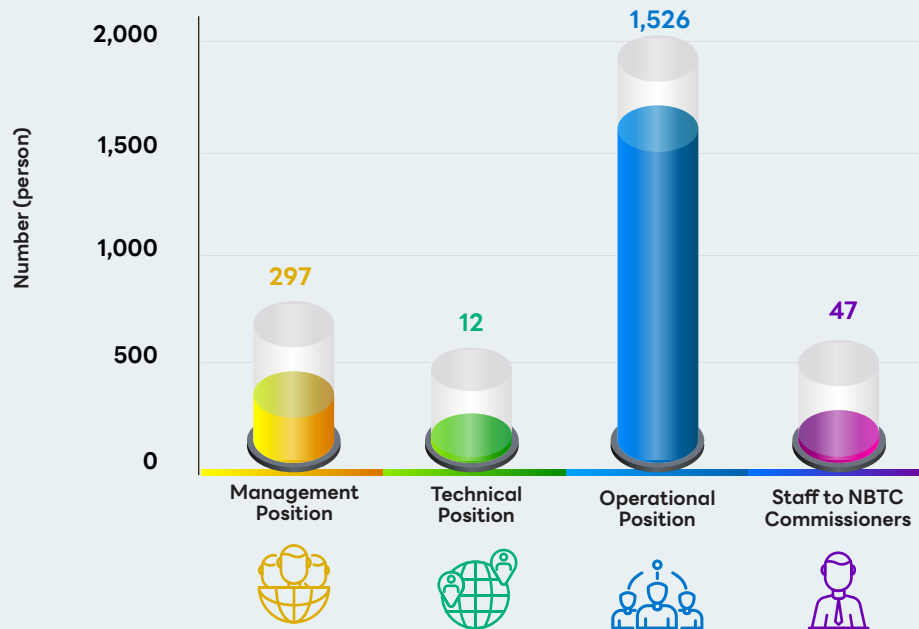
In 2022, the NBTC restructured the organization structure of the Office of the NBTC to comply with the powers and duties specified in the Act on the Organization (No.4) B.E. 2564 (2021) and the current situation upon technological convergence, and elevate into a fully digitalized organization with global standards, as well as implementing the NBTC's policies in constructing knowledge to upskill the academic competency of the NBTC officials to be academic expertise in both domestic and international framework to accommodate being the internationally recognized organization in international competition regulation. In 2022, the organization structure of the Office of the NBTC consists of 6 clusters, 47 bureaus, 4 regional offices, 1 institute, and 1 Hub. As of December 31, 2022, the manpower of the Office of the NBTC comprises in a total of 1,882 persons as shown in Chart 1.





Chart 1

Manpower of the Office of the NBTC in 2022



Manpower of the Office of the NBTC in 2022

Management Position



Acting Secretary-General	1 person
Deputy Secretary-General	3 persons
Assistant Secretary-General	4 persons
Executive Directors	43 persons
Division Directors	246 persons

Technical Position



Principal Experts	4 persons
Senior Experts	5 persons
Experts	3 persons

Operation Position



Senior Officers	517 persons
Middle-level Officers	422 persons
Junior Officers	453 persons
Employees	134 persons

Staff to NBTC Commissioners



Advisor/Secretary/Staff	47 persons
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Remarks: Data as of December 31, 2022

Source: Human Resources Management Bureau, Office of the NBTC

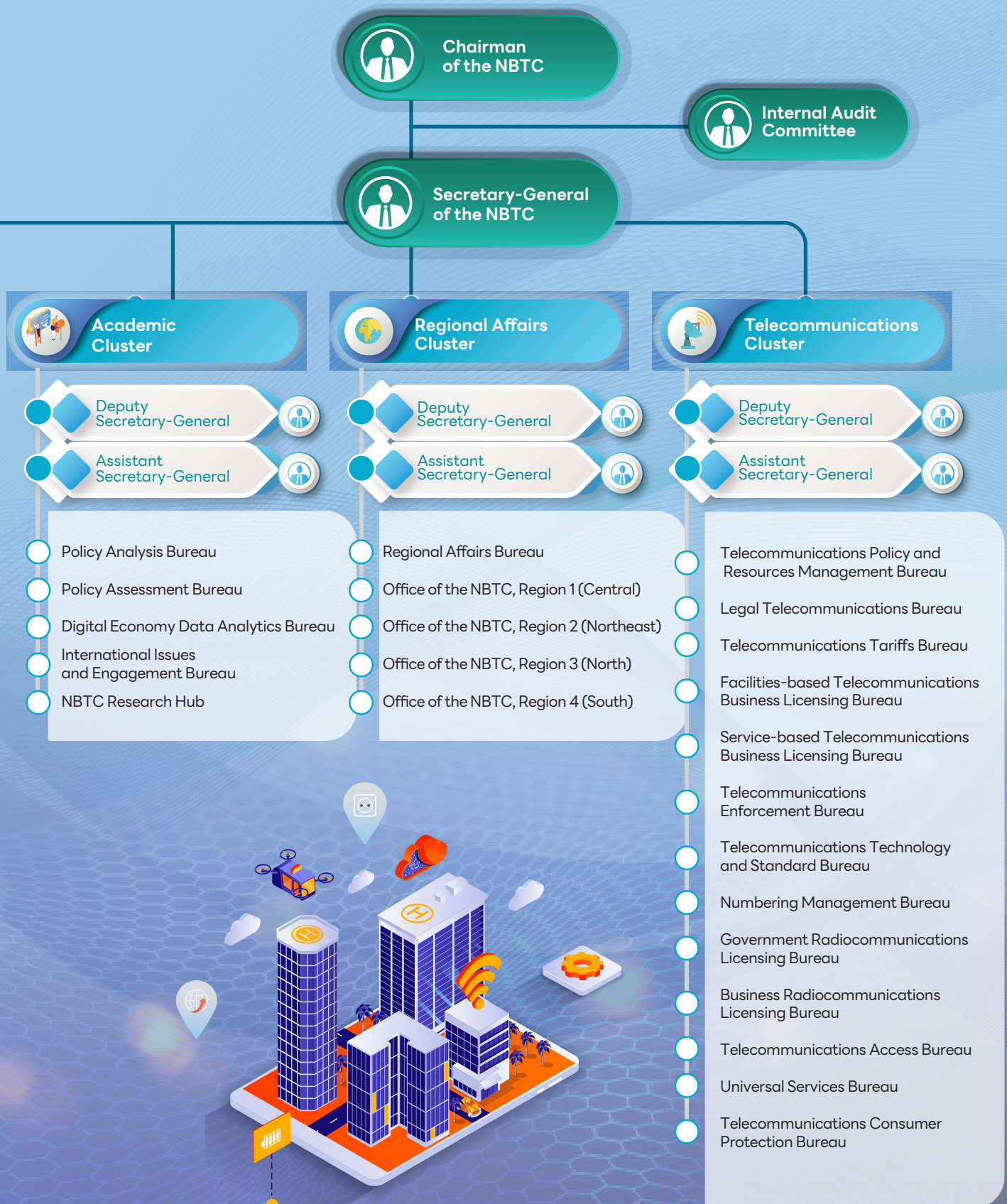




Organization Structure

of the Office of the National Broadcasting and Telecommunications Commission





Organization Structure of the Office of the NBTC consists of 5 Deputy Secretary-Generals, 6 Assistant Secretary-Generals, 47 Bureaus, 4 NBTC Regional Offices, 1 Institute, and 1 Hub
(Data as of December 31, 2022)



2

Major Performance of the NBTC in 2022



Spectrum Management

The NBTC carries out the mission in spectrum management for the utmost benefit of the nation and people by prescribing the spectrum management policies, regulating spectrum use, and coordinating spectrum management with both domestic and international organizations, to enhance communication infrastructure development, leverage the people's quality of life, and increase the nation's competitive competency. The major performance and achievements in 2022 are as follows:

1. Prescribing the Spectrum Management Policies.

1.1 Studying guidelines and propriety in determining timeframe for spectrum usage permission of the 450 - 470 MHz frequency bands for International Mobile Telecommunications (IMT).

According to the resolution of the NBTC meeting No.5/2565 on February 23, 2022 that approved the report on guideline and feasibility of the spectrum usage of the 450 - 470 MHz and 1427 - 1518 MHz frequency bands for International Mobile Telecommunications (IMT), proposed by the Office of the NBTC, and assigned the Office of the NBTC to study for propriety timeframe for spectrum usage of the 450 - 470 MHz frequency bands for IMT

to be specified in the Spectrum Management Master Plan. Thus, the Office of the NBTC studied and analyzed related information and organized a focus group meeting to get feedback from related agencies with questionnaires during July 25, 2022 to August 22, 2022, including the existing spectrum users, mobile operators, equipment manufacturers, and potential agencies in spectrum usage of the 450 - 470 MHz frequency bands for IMT, and prepared the study report on propriety in determining timeframe for spectrum usage of the 450 - 470 MHz for IMT with a suggestion that the suitable timeframe for spectrum usage of 450 - 470 MHz frequency band for the IMT should be within 2030.

1.2 Studying the feasibility and guidelines on the spectrum use in the 3300 - 3400 MHz frequency bands for International Mobile Telecommunications (IMT).

The 3300 - 3400 MHz frequency bands are assigned for radiolocation service as a primary utilization, and amateur radio services as a secondary utilization, as specified in the National Table of Frequency Allocation B.E. 2564 (2021) under the T-Amateur Footnote. At present, there are no licensees for such frequency band. The 3300 - 3400 MHz frequency bands are classified as Mid-band (1 - 6 GHz) for 5G technology, and put on the agenda 1.2 of the World Radiocommunication Conferences





2023 (WRC-23) to consider the spectrum band utilization for IMT in Europe, America, and Africa. Nowadays, at least 6 countries around the world tend to use C-band (3300 - 4200 MHz) for IMT with technology standards and equipment ecosystem readiness by 2021. Thus, the Office of the NBTC has studied and analyzed information related to the band usage status in Thailand and neighboring countries, related laws, technological standards, global usage, equipment ecosystem readiness, studies on spectrum sharing, and feedback from the focus group, and also conducted a study report on guidelines in determining the 3300 - 3400 MHz frequency band for IMT to submit to the NBTC with the following recommendations and approaches.

- 1) Specify the spectrum band for IMT by preparing a mid-term policy (3 - 5 years) for allocating the 3400 - 3700 MHz frequency bands.

- 2) Revise the Notification of the NBTC on the Spectrum Management Master Plan and the relevant parts of the National Table of Frequency Allocation and conduct the Radio Frequency Plan for IMT.

- 3) Propose an amendment to the Radio Regulations by adding Thailand in the international footnotes regarding the 3300 - 3400 MHz frequency bands utilization for IMT in the World Radiocommunication Conference 2023 (WRC - 23).

- 4) Coordinate with neighboring countries to prevent interference along border areas.

1.3 Studying the feasibility and guidelines on the 4800 - 4990 MHz frequency bands utilization for International Mobile Telecommunications (IMT).

Nowadays, the demand for spectrum usage in telecommunication services has been rising. Thus, as a limited resource, the spectrum usage should be considered for maximum benefit of the nation. At present, the 4800 - 4990 MHz frequency bands have been

used for IMT in many countries. The Office of the NBTC has studied and analyzed the relevant data and held a focus group meeting to get feedback from related agencies with questionnaires during July 18, 2022 to August 10, 2022, including mobile operators and equipment manufacturers, regarding demand and feasibility of the 4800 - 4990 MHz frequency bands for IMT, and conducted a guideline on the 4800 - 4990 MHz frequency bands for IMT report for proposing to the NBTC, with a suggestion to promote the 4800 - 4990 MHz frequency bands for IMT in which there are no existing users.

1.4 Studying the feasibility and conducting guidelines on the 28 GHz frequency band utilization.

The Notification of the NBTC on the Spectrum Management Master Plan (B.E. 2562) (2019) and its amendment stipulates the review of the spectrum usage of 27 - 29.5 GHz frequency bands is needed, according to Section 48 (4) of the Act on the Organization B.E. 2553 (2010) and its amendment, and Thailand Footnote of the National Table of Frequency Allocation (T-P12), imposing that the NBTC shall conduct the Criteria for licensing the spectrum utilization and radio frequency plan for international mobile telecommunications in the 27 - 29.5 GHz frequency bands. In this regard, specify conditions for the spectrum utilization of fixed services through satellite and international mobile telecommunications. The Office of the NBTC conducted a research project to provide public policy recommendations on spectrum management for spectrum sharing between international mobile telecommunication, 5G technology and other services with the frequency band of 3500 MHz and 28 GHz, by cooperating with King Mongkut's University of Technology North Bangkok. In this regard, according to the NBTC meeting No.29/2022 on October 26, 2022, the NBTC acknowledged the study report on spectrum sharing between international mobile telecommunication, 5G technology and other businesses with the





frequency band of 3500 MHz and 28 GHz. Subsequently, the Office of the NBTC held a focus group meeting regarding guidelines on the 28 GHz frequency band utilization with related agencies in Thailand, prepared the questionnaires to the foreign satellite operators, and proposed the guidelines on the 28 GHz frequency band utilization to the NBTC in the NBTC meeting No.29/2022 on October 26, 2022. The NBTC has approved the principles of the guidelines. Afterward, the Office of the NBTC held the focus group meeting regarding a draft notification on spectrum sharing between satellite services and International Mobile Telecommunications (IMT) in the 28 GHz frequency band, on November 29, 2022. Currently, it is in the process of public opinion gathering by the Office of the NBTC to submit to the NBTC for consideration.

2. Revising Spectrum Use and Monitoring the Radio Frequency Plan Execution.

2.1 The L-band (1427 - 1518 MHz) termination preparation for international mobile telecommunications.

The Notification of the NBTC on Spectrum Management Master Plan B.E. 2562 (2019) and its amendment prescribes the Office of the NBTC to complete the 1427 - 1518 MHz or L-band termination to prepare the bands for the International Mobile Telecommunications (IMT) within 2023. Also, the Thailand Footnote (T-P6) defined the timeframe for preparing the criteria and notifications related to the frequency band for the International Mobile Telecommunications (IMT) within 2025. In this regard, the Office of the NBTC held a focus group meeting with the agencies, as the actual users, including the Thai Meteorological Department and the National Telecom Public Company Limited. Currently, it is in the process of submitting the proposal to the Subcommittee on Spectrum and Technical Standards, prior to further submitting to the NBTC.

2.2 The revision of spectrum usage in the 50 - 54 MHz range.

The revision of spectrum usage in the 50 - 54 MHz range resulted from the reconsideration of the 50 - 54 MHz spectrum use. The Office of the NBTC prepared the principles of the spectrum use revision in the 50 - 54 MHz range in 2021 and submitted to the NBTC in the NBTC meeting No.3/2022 on January 28, 2022. The resolution of the NBTC meeting acknowledged the progress of the frequency band revision usage improvement preparation and assigned the Office of the NBTC to consult with the corresponding agencies to define propriety timeframe and guidelines on the revision of the 50 - 54 MHz frequency band utilization. Accordingly, the Office of the NBTC sent off the survey on the revision of the 50 - 54 MHz frequency band utilization to related agencies for comments and suggestions on the matter. Currently, it is in the process of submitting the proposal to the Subcommittee on Spectrum and Technical Standards, prior to further submitting to the NBTC.





2.3 The regulation on the 850 MHz and 900 MHz frequency bands utilization.

Regarding the regulation of the 850 MHz frequency band utilization by the National Telecom Public Company Limited and dtac TriNet Company Limited, the Office of the NBTC has monitored and collected data about filter circuit installation of both companies. Also, regarding the frequency interference, the NBTC Regional Offices have coordinated with related parties to solve the problems. In addition, the Office of the NBTC verified the USO fee deduction by expenditure of both companies for the accounting period of 2020 and 2021.

According to the spectrum use for rail transportation, the Office of the NBTC discussed with the State Railway of Thailand, the National Telecom Public Company Limited, and dtac TriNet Company Limited, regarding the field trials on the rail transport signaling system using the 885 - 890/930 - 935 MHz frequency bands. The Office of the NBTC also requested for location details of base stations nearby Thailand High-speed Rail Project areas, which is a cooperation project between the government of the Kingdom of Thailand and the government of the People's Republic of China to develop the high-speed rail system connecting Bangkok and Nong Khai (Phase 1 Bangkok - Nakhon Ratchasima), and submitted the details to the State Railway of Thailand, as well as monitoring progress of the field trials by considering quarterly progress reports from the State Railway of Thailand. Subsequently, pursuant to the resolution of the NBTC meeting No.3/2022 on January 28, 2022, the NBTC acknowledged the spectrum usage termination in the 850 MHz (839 - 844/884 - 889 MHz) of dtac TriNet Company Limited on October 25, 2021, and approved the revision of licensing criteria of the company for providing International Mobile Telecommunications (IMT) with the 900 MHz frequency band (890 - 895 MHz pairing with 935 - 940 MHz) under the telecommunication License type 3 No.TEL3/2550/002.

2.4 The preparation for the 3500 MHz spectrum usage revision.

According to the resolution of the NBTC meeting No.29/2022 on October 26, 2022, the NBTC acknowledged the study report on spectrum sharing utilization between International Mobile Telecommunications, 5G technology, and other services, with the 3500 MHz and 28 GHz, as proposed by the Office of the NBTC. Besides, there was a remark requesting the Office of the NBTC to put the Subcommittee on Spectrum and Technical Standards' advice into practice, regarding the 3500 MHz frequency band, and to conduct a survey on C-Band satellite television consumers to collect the number of consumers and impact assessment properly. Currently, it is in the process of submitting the survey results to the Subcommittee on Spectrum and Technical Standards, prior to proposing to the NBTC.

3. Coordinating with International Telecommunication Union (ITU) and the neighboring countries regarding to frequency management along border areas, international frequency registration, and regulatory guidelines on frequency use along border areas.

3.1 Registration of frequency usage along common border between Thailand and neighboring countries.

In 2022, Thailand filed the frequency registration with Malaysia for 1,156 items, Cambodia for 989 items, and the Lao's People Democratic Republic (Lao PDR) for 395 items, while Thailand recognized the frequency registration from Malaysia for 340 items.

3.2 Coordination neighboring countries in spectrum management along common border areas.

1) The 4th Meeting of the Joint Technical Committee on Coordination and Assignment of Frequencies along Thailand - Myanmar Common Border (JTC) was held via online platform during August 31 - September 2, 2022. The meeting discussed and exchanged





regulatory updates, resolved the aeronautical radio frequency interference with repeaters of Provincial Electricity Authority, and solved the frequency interference of 850 MHz, 900 MHz, 1800 MHz, and 2100 MHz. In addition, the meeting approved the frequency notification process for broadcasting and telecommunications services, parameter settings for the 2600 MHz frequency band coordination, specified the common frequencies for emergencies and disasters with HF frequency, and approved the guidelines for frequencies coordination of Thailand and Myanmar. The NBTC also notified the digital terrestrial television stations and radio stations located in the coordination areas, and announced the progress of the Notification of the NBTC on Radio Frequency Plan for Digital Terrestrial Television Business preparation, progress status of spectrum usage revision to shift the 700 MHz frequency band, including analog television termination, network improvement and readiness for IMT. The meeting acknowledged the information and operational progress of Thailand, as well as proposing guidelines for coordination and frequency registration practices and approved for an additional study on frequency parameters, registration of frequency band for FM radio broadcasting and specifying its registration higher than 1 Kilowatt transmission power broadcasting. The meeting also approved a further study on digital terrestrial television business by focusing on the field strength limit, frequency coordination types, and frequency coordination parameters.

2) The 9th Meeting of the Joint Technical Committee on Coordination and Assignment of Frequencies along Thailand - Cambodia Common Border (JTC) was held

at Chonburi during September 20 - 22, 2022. The meeting reviewed and exchanged information regarding regulatory updates, frequency registration, resolution of the aeronautical radio frequency interference with the 700 MHz frequency band, and preparation for frequency coordination guidelines, as well as acknowledging the progress and proposals of frequency registration for broadcasting and digital terrestrial television services, and revision of frequency coordination agreement in broadcasting, television, mobile services and other radiocommunication services.

3) The 11th Meeting of the Joint Technical Committee on Coordination and Assignment of Frequencies along Thailand - Lao PDR Common Border (JTC) was held in Mukdahan during November 22 - 24, 2022. The meeting reviewed and exchanged information regarding regulatory updates, frequency registration, frequency interference resolution, and revision of frequency coordination agreement in broadcasting, television, mobile service and other radiocommunication services.



The 11th Meeting of the Joint Technical Committee on Coordination and Assignment of Frequencies along Thailand - Lao PDR Common Border





3.3 Coordination of the frequency notification with the International Telecommunication Union (ITU).

In 2022, the Office of the NBTC, as a governmental administrative agency for international communication service management in collaboration with the International Telecommunication Union (ITU), has coordinated the frequency notification ITU as follows:

1) Notifying the frequency use of the International Broadcasting Bureau (IBB) stations in Udon Thani, in a total of 36 stations, to the Radiocommunication Bureau, International Telecommunication Union (ITU), to acknowledge the frequency use and frequency interference with the stations by submitting the High Frequency Broadcasting (HFBC) Schedule for A22S3 Schedule for ITU Submission - Thailand via the ITU system.

2) Notifying the frequency use of the International Broadcasting Bureau (IBB) stations in Udon Thani, in a total of 66 stations, to the Radiocommunication Bureau, International Telecommunication Union (ITU) by submitting the HFBC Schedule for A22T1 Schedule for ITU Submission - Thailand via the ITU system.

3) Notifying the confirmation of frequency use of the governmental AM broadcasting stations, in a total of 56 stations.

4. Analyzing and resolving domestic frequency interference.

The Office of the NBTC has analyzed the causes of frequency interference with the Vessel Monitoring System (VMS) using the 1500 MHz and 700 MHz frequency bands of the International Mobile Telecommunications (IMT) system. Initially, the NBTC regional offices investigated the causes of interference along harbor areas in the eastern and southern regions, as reported. They found out that the interference occurred around seashore areas or river harbors with the 700 MHz base stations. The Office of

the NBTC held a meeting with related agencies including Department of Fisheries, VMS service providers, and IMT service providers, to analyze the possible causes of interference. After running the simulated test of the interference with the actual system by controlling related variables for 3 times, the results showed that the interference was caused by the VMS receiver malfunction. When receiving the signal from the 700 MHz IMT transmitter, the receiver was activated, and simultaneously created a new signal which was identical to the needed frequency of the satellite transmitter, leading to the interference. The meeting acknowledged the interference cause and suggested the VMS receiver modification to tolerate the interference or adjust the vessel monitoring schemes for appropriateness.

5. Establishing the National Spectrum Monitoring Center.

The National Spectrum Monitoring Center was established for monitoring, collecting, and analyzing data related to the nation's spectrum management to apply the analytical information for administration purpose, as well as functioning as a command center in emergency cases to facilitate the decision making of the management with promptness, accuracy, and immediacy, and to ensure the availability and usability of the communication system in emergency cases.

Lately, the NBTC has carried out the National Spectrum Monitoring Center Establishment Plan B.E. 2562 - 2565 (2019 - 2022) and has resulted in the progress of the implementation by studying and analyzing the model system provision for establishing the National Spectrum Monitoring Center to be a prototype for setting up the Operation Center and the Command and Control Center located in the new NBTC Head office. In this regard, the Office of the NBTC also sent the officers responsible for spectrum monitoring to attend the capacity development courses, based on the





human resources development plan on the spectrum monitoring field to ensure the steady functional operations in compliance with the current situation, and the NBTC's policy. On behalf of the Office of the NBTC, the NBTC regional offices held meetings for mutual understanding between the Regional Affairs Bureau, the Office of the NBTC region 1 - 4, as the regional spectrum monitoring centers, and the offices of the NBTC, to review the National Spectrum Monitoring Center Establishment

Plan B.E. 2562 – 2565 (2019 - 2022), prepare the spectrum monitoring plan, and review the monitoring equipment procurement. At present, the preparation of the spectrum monitoring equipment development and maintenance plan for the NBTC regional offices B.E. 2566 - 2568 (2023 - 2025) has been completed. Meanwhile, the National Spectrum Monitoring Center Establishment Plan B.E. 2565 – 2566 (2022 - 2023) is in the NBTC consideration process.





Satellite Service Management

The NBTC has arranged the Satellite Orbital Rights Management Plan B.E. 2563 (2020), in accordance with the Act on the Organization to Assign Radio Frequency and to Regulate the Broadcasting and Telecommunications Services B.E. 2553 (2010) and its amendment. In addition, the NBTC has prescribed the licensing criteria and procedures on satellite orbital access, and the licensing criteria on foreign satellite orbital slot to provide domestic services, as well as coordinating with both domestic and international agencies for the spectrum usage for satellite business, in compliance with the Radio Regulations of the International Telecommunication Union (ITU), to obtain and maintain the satellite orbital rights. The major performance and achievements in 2022 are as follows:

1. Satellite orbital access licensing.

1.1 The Notification of the NBTC on Criteria and Procedures for Satellite Orbital

License Package, dated October 31, 2022, was published in the Royal Gazette and valid from November 5, 2022. On December 27, 2022, the NBTC allowed the interested bidders to submit their bidding applications at the NBTC Head office. There were 3 applicants including Space Tech Innovation Company Limited, National Telecom Public Company Limited, and Prompt Technical Services Company Limited. The Office of the NBTC has verified the bidding qualifications and announced the eligible bidder list on January 10, 2023, and held the satellite orbital slot package auction on January 15, 2023. In this regard, the auction is considered as a mechanism for allocating the national resources for maximum benefit by taking public interest into account, bringing about free and fair competition, and preserving satellite orbital rights, which leads to the optimum benefits for the nation and the satellite business.



The application submitting for satellite orbital slot package auction



The satellite orbital slot package auction

According to the bidding results of the satellite orbital slot package auction on January 15, 2023, a total of 806.503 million baht (excluding VAT) was raised from the 2 winning bidders which were 1) Space Tech Innovation Company Limited for the second package at

the price of 380.018 million baht and the third package at the price of 417.409 million baht, and 2) National Telecom Public Company Limited for the fourth package at the price of 9.076 million baht.

The satellite Orbital Slot Package Auction Results					
Slot Package	1	2	3	4	5
Winner	No applicant	Space Tech Innovation	Space Tech Innovation	NT	No applicant
No. of round	-	2	1	1	-
Final Price	-	380,017,850	417,408,600	9,076,200	-
Total Price (Excluding Vat)	806,502,650 baht				

1.2 Granting the permission to the National Astronomical Research Institute of

Thailand (Public Organization) for satellite orbit primary access for the field of TSC-P (NGSO).





2. Granting licenses for foreign satellite orbital slots.

2.1 Granting licenses for foreign satellite orbital slot according to Clause 16 of the Notification of the NBTC on Criteria and Procedures to License Foreign Satellite to Provide Domestic Services.

1) Granting license to the National Telecom Public Company Limited to temporarily use AsiaSat5 transponder for live broadcasts of the GERMAN CUP (DFB Pokal) 2021/2022 football match and the Volleyball Nations League 2022.

2) Granting license to the Signal Department Royal Thai Army to temporarily use ABS-2A slot for supporting missions related to military security.

2.2 Granting license to the National Telecom Public Company Limited to use foreign satellite orbital slots for providing temporary domestic services with AsiaSat5 from July 18, 2022, until the NBTC officially appoints the winning bidders to use the satellite orbital slot packages or otherwise specified by the NBTC.

2.3 Granting license to TC Broadcasting Company Limited to use foreign satellite orbital slot for providing domestic services with Globalstar for a 5-year term, effective from November 15, 2022.

3. Studying the regulatory guidelines for providing satellite services in Thailand.

The Office of the NBTC conducted the study project on satellite services trends and regulatory guidelines for satellite service provision in Thailand by researching various topics including aerospace industry, satellite industry, technology, trends, types of present and future satellite services, case studies abroad related to satellite service regulations (People's Republic of China, Indonesia, United Arab Emirates, United States of America, United Kingdom, and Luxembourg), socio-economic impact and national security, overviews of aerospace and satellite policies and regulations, satellite service regulation development in Thailand, communication laws and satellite service regulation in Thailand, as well as significant policy recommendations, such as spectrum sharing between fixed service via satellite and international mobile telecommunications in the 3.5 GHz and 28 GHz frequency bands, satellite network filing, landing rights, promoting satellite and aerospace services, national satellite policies, satellite terminal licensing, appropriate licensing criteria and procedure to comply with changing ecosystem. In this regard, the Office of the NBTC distributed the final report of the project and regulatory guidelines for satellite service provision in Thailand to related agencies and published on the NBTC website.





Regulation on Broadcasting, Television, and Telecommunications Services



Broadcasting and Television Services Regulation

The NBTC and the Office of the NBTC have carried out key missions in regulating broadcasting and television services by developing rules and regulations in order to encourage free and fair competition in compliance with the dynamic environment and the business ecosystem, and to reduce the regulation gap between traditional broadcasting operators under the NBTC regimen and non-regulated service providers, as well as focusing on consumer protection, consumer network empowerment, media literacy, and consumer service enhancement with digital technologies for the utmost benefit for the country development. The major performances and achievements in 2022 are as follows:

1. Radio broadcasting service regulation.

1.1 Transition of the radio broadcasting to licensing system.

The NBTC has carried out the FM radio broadcasting and frequency licensing operational plan by organizing the FM frequency auction for audio broadcasting

service provision for business purposes on February 21, 2022 (referred as the frequency auction), in line with the expiration of frequency holding or use on April 3, 2022, of the audio broadcasting operators, according to Section 83 of the Act on the Organization to Assign Radio Frequency and to Regulate the Broadcasting and Telecommunications Services B.E. 2553 (2010) and its amendment. The operations aimed for smooth transition of the audio broadcasting service provision, without affecting broadcasting consumers and the industry. Also, the frequency auction offered the opportunities to new broadcasters to jump into the frequency licensing system, in a total of 74 frequency bands. There were applicants for frequency use for 71 frequency bands. At the end of the auction on February 21, 2022, a total of 68 frequency bands were successfully bid. According to the NBTC Special Meeting No. 2/2022 on March 31, 2022, the NBTC endorsed the winning bidders as the authorized licensees for audio broadcasting service provision for business purposes, in a total of 68 bands with 7-year license terms.



The FM frequency auction for audio broadcasting service provision for business purposes



1.2 Permission for FM radio broadcasting trials for public and community services.

In 2022, the radio stations licensees for audio broadcasting trials applied for “trial broadcasters”, based on the Notification of the NBTC on Criteria on FM Radio Broadcasting Trials, in a total of 4,102 stations, as of December 31, 2022, categorized into commercial business for 3,274 stations, public services for 644 stations, and community services for 184 stations.

1.3 Consideration of radio frequency licensing for low power FM broadcasting for public and community services.

According to the NBTC meeting No.21/2021 on November 10, 2021, the NBTC approved the principles of radio frequency licensing based on the FM Radio Frequency Plan, the AM Radio Frequency Plan, and the Low Power AM Radio Frequency Plan. In this matter, the Office of the NBTC has announced the invitation for the license application for low power FM broadcasting for public and community services, and submitted the analysis report on frequency use to the subcommittee on broadcasting business licensing for consideration, prior to submission to the NBTC for further consideration.

1.4 Criteria and technical standards and operations related to FM broadcasting.

The NBTC prescribed the criteria and technical standards to ensure effective FM broadcasting service provision and frequency use without interference, and specified the technical report submitting approaches for each type of FM radio station by imposing preventive measures against frequency interference to aeronautical radio service for efficiency and effectiveness. In addition, the outputs of the research and development joint project on inference measurement system, between the Office of the NBTC and Suranaree University of Technology, have been utilized by disseminating the results and organizing workshops for the equipment used to measure and monitor interference from spurious emission of radio stations, which cover the basic

specifications of the equipment, software, and the equipment installation.

1.5 Operations of DAB+ digital radio broadcasting.

The digital radio trial broadcasting aims to support the government policy implementation, and to comply with the Thailand's National Digital Economy and Society Development Plan and Policy, strategy 1: develop countrywide high-efficiency digital infrastructure, by executing digital radio broadcasting trials with a focus on exploring the technical standards to support the NBTC consideration in defining related criteria in order to offer more accessible information alternatives to people, and reduce the frequency interference. In 2022, the NBTC has conducted the digital radio trial broadcasting in Bangkok and vicinity, which was the trial in phase 2. The transmission power and antenna pattern were adjusted to cover the signal dead spots detected from the phase 1 trials.

1.6 Revision of the Second Broadcasting Master Plan B.E. 2563 - 2568 (2020 - 2025) and the notifications related to radio broadcasting business to comply with the current situation.

In 2022, the Office of the NBTC held 5 online and onsite public hearings on uplifting Thai broadcasting to move towards global standards, and to create sustainable economy and society, having Air Marshal Thanapant Raicharoen, NBTC commissioner, as the chairman of the conferences, along with the subcommittee on broadcasting business licensing, the NBTC officials from the head office and regional offices, to receive comments and suggestions from relating associations, confederations, network organizations, radio broadcasting operators, governmental radio broadcasting licensees, radio broadcasting licensees for business purposes, FM radio trial broadcasters, radio hosts, producers, and radio listeners, to prepare the roadmap and elevate Thai broadcasting industry as follows:





The 1st Public Hearing on June 16, 2022, at Sailom 5011 meeting room, the NBTC Head office.

The 2nd Public Hearing on June 22, 2022, at Sailom 5011 meeting room, the NBTC Head office.

The 3rd Public Hearing on July 8, 2022, at Pasakorn 1-2, Monthathip Convention Center, Udon Thani.

The 4th Public Hearing on August 18, 2022, at Nimman Convention Center, U Nimman Hotel, Chiang Mai.

The 5th Public Hearing on August 25, 2022, with the representatives from Siangdham for People Foundation under the Royal Patronage H.R.H Princess Maha Chakri Sirindhorn.

After these conferences, the subcommittee on broadcasting business licensing, as in the meeting No.3/2022 on July 17, 2022, assigned the Office of the NBTC to prepare the public hearing summary to the subcommittee meeting prior to the NBTC meeting for further consideration. Subsequently, according to the subcommittee on broadcasting business licensing meeting No.15/2022 on October 17, 2022, the subcommittee acknowledged the summary and approved the clarification approach to the radio broadcasting operators' comments and suggestions.

The NBTC had a meeting resolution from the NBTC meeting No.30/2022 on November 9, 2022, to revise the Second Broadcasting Master Plan B.E. 2563 - 2568 (2020 - 2025) with a focus on uplifting broadcasting and television services to move towards global standards, and to create sustainable economy and society through a transition of broadcasting and television industries to the sustainable digital communication ecosystem, as well as having regulations based on empirical data, considering effective use of broadcasting and television resources, and improving the licensing

system, content production, and quality of service to comply with the global standards. In addition, the NBTC emphasized on consumer protection, and civil liberty & rights promotion in information accessibility and utilization in the digital era, and assigned the Office of the NBTC to revise the notifications related to radio broadcasting business, in a total of 7 notifications, to comply with the current situation and more apprehensible, leading to more effective broadcasting regulation and less possible disputes. The revised notifications are as follows:

- 1) The Notification of the NBTC on Licensing Criteria and Procedures for Broadcasting Services.
- 2) The Notification of the NBTC on Criteria on FM Radio Broadcasting Trials.
- 3) The Notification of the NBTC on FM Radio Frequency Plan.
- 4) The Notification of the NBTC on Low Power FM Radio Frequency Plan .
- 5) The Notification of the NBTC on Technical Standards of Low Power FM Broadcast Transmitter.
- 6) The Notification of the NBTC on Technical Standard Test of Low Power FM Broadcast Transmitter.
- 7) The Notification of the NBTC on Preventive Criteria Against Frequency Interference of Radio Stations to Aeronautical Radio Service.

Subsequently, the Office of the NBTC, having Air Marshal Thanapant Raicharoen, NBTC commissioner, as the chairman of the meetings, along with the subcommittee on broadcasting business licensing, the NBTC officials from the Head office and regional offices, held the meeting for presenting the public hearing summary and clarifying the concerns of the stakeholders in the 5 previous public hearing events, with the aims to utilize the information to uplift Thai broadcasting business towards global





standards, and create sustainable economy and society. The 2 meetings were held both onsite and online system. The first meeting was held on November 10, 2022, at Avani Khon Kaen Hotel and Convention, Khon Kaen, and the second meeting on November 30, 2022, at Sailom 5011 meeting room, the NBTC Head office.

The clarification issues were categorized into 5 main topics, including (1) finance, (2) program content, (3) technical issue, (4) licensing, and (5) others such as digital radio ratings, support & promotion, with 2 groups of resolving approaches as follows:

- 1) Problems that can be resolved by the NBTC straightaway. At present, the NBTC has been partially carrying out, such as improving the complaint handling system and providing the training on broadcasting guidelines.

- 2) Problems that need laws amendment prior to resolution

Currently, the Office of the NBTC is in the process of operational plans preparation for radio broadcasting transition, including the operational plan to review the broadcasting and television master plan, and the notifications related to broadcasting business licensing.

1.7 Operations of digital broadcasting business licensing.

The NBTC recognized the importance of digital broadcasting as an alternative for service providers. Thus, the working group to prepare for driving the digital radio broadcasting, was set up, having Assistant Professor Phoomsith Mahavessiri, Deputy Secretary-General of Broadcasting Cluster as the chairman of the working group, and executive directors as members of the working group, with its responsibility to prepare information and readiness in each aspect to support the NBTC's decisions in prescribing strategies, policies or approaches to drive the digital radio broadcasting service of Thailand and promote licensing. In 2022, there are 4 working group meetings as follows:

The 1st meeting on June 23, 2022, at Sailom 5011, level 1, Auditorium Building, the NBTC Head office.

The 2nd meeting on June 30, 2022, at Sailom 5011, level 1, Auditorium Building, the NBTC Head office.

The 3rd meeting on August 8, 2022, at Sailom 5021, level 2, Auditorium Building, the NBTC Head office.

The 4th meeting on September 8, 2022, at Sailom 1031, level 3, Main Building, the NBTC Head office.

The meeting agendas for acknowledgement proposed were the case study of DAB in Europe, the summary of operational guidelines for digital broadcasting services, socio-economic impact assessment on digital radio broadcasting transmission, results of DAB+ digital radio broadcasting trials in Bangkok, phase 2. The agendas for consideration were guidelines on network design and radio frequency planning for digital radio broadcasting services, and cost estimation method of digital radio broadcasting network, etc. According to the latest meeting, the meeting approved the operational plan and draft terms of reference of the project to explore demand in broadcasting service provision, cost estimation and preparation for network investment and digital radio broadcasting service provision models of Thailand, and notified the related departments for further proceedings.

2. Television Broadcasting Service Regulation.

2.1 Spectrum licensing for digital terrestrial television provision.

New license

Granting a spectrum license to Thai Public Broadcasting Service (ALTV Channel 4) for digital television service provision, public service type 1, with the purpose of promoting knowledge and education of children and the youth. The license is effective from June 15, 2022, to December 31, 2030¹.

¹ The NBTC Meeting No.15/2022 on June 15, 2022





Renewing license

1) Granting a spectrum license to Thai Public Broadcasting Service (TPBS Channel 3) for high-definition digital terrestrial television service provision, public service type 1, with the purpose of promoting knowledge, education, religions, arts & cultures, sciences, technology & environment, agriculture, occupational support, health, hygiene, sports, or people's quality of life enhancement. The license is effective from June 1, 2022, to December 31, 2030².

2) Granting a spectrum license to the Royal Thai Army by the Royal Thai Army Radio and Television (TV5 Channel) for high-definition digital terrestrial television service provision, public service type 2, with the purpose of national security or public safety. The license is effective from June 1, 2022, to December 31, 2030³.

3) Granting a license to the Government Public Relations Department (National Broadcasting Services of Thailand Channel 2) for high-definition digital terrestrial television service provision, public service type 3, with the purpose of disseminating information to promote good understandings between the government and people, and between the parliament and people, to educate people regarding democratic regime of government with the King as Head of State under the Constitution, useful information for the disabled, the underprivileged or the public service volunteers, or other useful information to the public. The license is effective from July 6, 2022, to December 31, 2030⁴.

2.2 Spectrum permission for temporary test or trial (digital TV).

1) Granting permission to the Ministry of Education for temporary digital television trial broadcasting on DLTV1–DLTV12, with the purpose of facilitating students in every household to access distance learning through

12 digital television channels, from February 15, 2022, to August 14, 2022. (The digital television trial broadcasting has already ended.)

2) Granting permission to Thai Public Broadcasting Service for spectrum use in broadcasting and television operations for experimental or temporary testing as part of the digital terrestrial television broadcasting trial project using UHD 4K technology. The purpose of project is for research and development of broadcasting and television technology, and for the benefit of establishing criteria for applying for licenses to operate broadcasting or television businesses, with authorization to conduct television signal trials from October 1, 2022 – March 31, 2023.

2.3 The review of the digital terrestrial television network rental compensation rates based on service costs.

To ensure fairness and appropriateness to the network providers and users, according to Section 42 of the Broadcasting Business Act B.E. 2551 (2008), the Notification of the NBTC on Regulatory Guidelines on Broadcasting Tariffs, and the Notification of the NBTC on Calculation Standard on Compensation Rate of Digital Terrestrial Television Network Rental, the operations have been carried out as follows:

1) The digital terrestrial television network (MUX) providers officially submitted the proposals of MUX rental rates, costs, and other supplemental documents to the NBTC for consideration. In this regard, the NBTC approved the MUX temporary 3-month rental rates (June 1 – August 31, 2022)⁵ and extended the period to December 31, 2022⁶. The NBTC also assigned the subcommittee on pricing and competition to revise the calculation method of network rental compensation, and consider pricing with Long Run Average Incremental Cost (LRAIC) method or Marginal Cost method,

² The NBTC Meeting No.18/2022 on July 18, 2022

³ The NBTC Meeting No.20/2022 on August 3, 2022

⁴ The NBTC Meeting No.22/2022 on August 24, 2022

⁵ The NBTC Meeting No.17/2022 on July 6, 2022

⁶ The NBTC Meeting No.22/2022 on August 24, 2022





to prevent overpricing, which will lessen the operators' burdens in network rental payment. Also, the subcommittee was assigned to analyze advantages/disadvantages in economic and regulatory policy aspects within 3 months⁷.

2) On October 26, 2022, the NBTC approved the Long Run Average Incremental Cost (LRAIC) method, and guidelines for consideration of effective cost structure and MUX rental rate calculation hypothesis. However, the NBTC disapproved the proposals of MUX rental rates and cost structures submitted by the MUX providers and informed the MUX operators to revise the rental rates based on the cost structures with regards to public interest, transparency, and fairness to users, according to the Notification of the NBTC on Calculation Standard on Compensation Rate of Digital Terrestrial Television Network Rental⁸.

3) On December 21, 2022, the NBTC approved the proposals of MUX rental rates and cost structures submitted by the MUX providers, with fixed rates for 4 years from January 2023 - December 31, 2026⁹, as follows:

- Thai Public Broadcasting Service, with the rate of 3.43 million baht/month/channel for standard-definition (SD) channels, and 10.29 million baht/month/channel for high-definition (HD) channels (excluding VAT).
- Government Public Relations Department, with the rate of 3.43 million baht/month/channel for standard-definition (SD) channels, and 10.29 million baht/month/channel for high-definition (HD) channels (excluding VAT).
- Royal Thai Army Radio and Television, with the rate of 3.18 million baht/month/channel for standard-definition (SD) channels, and 9.54 million baht/month/channel for high-definition (HD) channels (excluding VAT).

In case of MCOT Public Company Limited, the NBTC reconfirmed the

resolution of the NBTC meeting No.29/2022, on October 26, 2022, that is, the NBTC disapproved the proposal of MUX rental rate submitted by MCOT Public Company Limited, and informed the company to revise the MUX rental rate with regards to public interest, transparency and fairness to users, according to the Notification of the NBTC on Calculation Standard on Compensation Rate of Digital Terrestrial Television Network Rental, within 15 days from the date of receiving the letter, with the purpose that the NBTC can support the actual costs to the MUX operators in a timely manner, which must not exceed the approved rates by the NBTC based on the National Council for Peace and Order (NCPO) Order 4/2019.

2.4 Annual licensing fee deduction and exemption.

To promote broadcasting and television services to provide informative programs or useful contents to the public, the Office of the NBTC carried out the duties based on the Notification of the NBTC on Broadcasting or Television Annual Licensing Fee Deduction and Exemption B.E. 2556 (2013), with the purpose that the broadcasting or television licensees can request for annual licensing fee deduction or exemption in each year according to the specified rates, criteria and procedures. In 2022, the NBTC considered the annual licensing fee deduction for 2 TV channels providing informative programs or useful contents to the public as specified in the criteria as follows:

1) Thai Government Public Relations Department, for the accounting period of 2020 and 2021, with the annual licensing fee deduction rate of 50 percent.

2) Thai Public Broadcasting Service, for the accounting period of 2020, with the annual licensing fee exemption.

⁷ The NBTC Meeting No.17/2022 on July 6, 2022

⁸ The NBTC Meeting No.29/2022 on October 26, 2022

⁹ The NBTC Meeting No.35/2022 on December 21, 2022





2.5 Digital terrestrial television broadcasting test with 4K technology.

1) The Office of the NBTC has conducted the feasibility study on Digital Terrestrial Television Broadcasting tests or trials with 4K technology or Ultra-High Definition (UHD), by studying related standards and technologies, case studies abroad on determining technical conditions, and survey results. The focus groups with stakeholders were organized to exchange knowledge and opinions relating to the feasibility of digital terrestrial television broadcasting, and address appropriate approaches to match the context of Thailand. The Office of the NBTC proposed the study report to the NBTC in 2021. The NBTC approved the technical guidelines for proposal assessment of digital terrestrial television broadcasting with the 4K technology test or trial project and assigned the Office of the NBTC to prepare related notifications. In this regard, in 2022, the Office of the NBTC prepared the Notification of the Office of the NBTC on Technical Guidelines for Proposal Assessment of Digital Terrestrial Television Broadcasting with 4K Technology Test or Trial Project and publicized on the NBTC website from January 21, 2022.

2) To ensure technical readiness for television broadcasting with 4K technology in compliance with the national strategy of competitiveness enhancement, about new technology infrastructure development, in terms of build-and-transfer basic technology and high technology innovation and transfer to fulfill the users' needs in both public and private sectors, and setting framework of sufficient spectrum resource allocation for quality service provision with the affordable price, the Office of the NBTC held the technical preparatory meeting with related agencies, and prepared the summary or primary guidelines, on March 22, 2022. There

was a proposal for digital terrestrial television trial broadcasting with 4K technology, submitted to the Office of the NBTC from Thai Public Broadcasting Service (Thai PBS), together with the details of necessary test equipment, both for the new system specifications and compatibility with the existing system, the test approach and plan, and other related details. Subsequently, the NBTC approved Thai PBS's licensing proposal for temporary digital terrestrial television trial broadcasting with 4K technology (UHD) and assigned the Office of the NBTC to publicize the trial project¹⁰. Currently, Thai PBS is in the process of digital terrestrial television trial broadcasting with 4K technology in restricted areas covering a range of 10 kilometers from the television transmitter located in Thai PBS Headquarters on Vibhavadi Road.

2.6 Improving the Regulation in compliance with the changing industry ecosystems.

The NBTC emphasizes on improving the regulation in compliance with changing industry ecosystems to drive the National Strategy on public sector rebalancing and development. The related laws should be clear and only to the extent required, up-to-date, effective, and universal, leading to inequality mitigation. The NBTC also focuses on laws amendment to keep up with the dynamic environment. The related operations in 2022 are as follows:

1) The subcommittee on communication service provision via digital platforms was appointed with the responsibilities to prepare the summary of current situation and future of the communication service provision via digital platforms on the internet network, including challenges, impact, and studies on related laws in force, as well as proposing the laws amendment to comply with

¹⁰ The NBTC Meeting No 28/2022 on October 19, 2022





the changing industry ecosystem, and offering recommendations on empowering and regulating communication service provision via digital platforms. In addition, the focus group meetings were held to exchange information and receive feedback from related sectors, on September 13, 2022 under the topic of “Sharing the future of Thai Televisions in the Transition to OTT Context”, and on December 19, 2022

under the topic of “Opportunities and Survival of Television Industry in the Emerging Media Ecosystem”, attended by the digital terrestrial television operators, non-frequency television operators, digital platforms operators, content producers, organizations & associations related to broadcasting services, academic experts in communication arts and mass communications, regulators and the NBTC officials.



*The focus group meeting for sharing information
and feedback from related sectors*

2) After improving the digital terrestrial television network, the NBTC considered the revision of technical standards of the digital terrestrial television receivers to match the current spectrum usage in Thailand, to build resilience to the industry after the spectrum refarming of the 700 MHz frequency band, according to the radio frequency plan for digital terrestrial television service. The NBTC also revised the Notification of the NBTC on Technical Standards of the Digital Terrestrial

Television Receivers with the purpose of upgrading the signal receivers of the digital terrestrial television for greater efficacy, to be suitable for the current spectrum use in Thailand, in line with the radio frequency plan for the digital terrestrial television service, as well as reducing burden while building resilience to the industry related to signal receiver production. The notification was published in the Royal Gazette on September 12, 2022.



3. Law Enforcement against broadcasting and television operators.

3.1 Regulation on violations or non-compliance with law.

The NBTC has regulated the broadcasting and television services with proactive practices in monitoring and examining the broadcasting and television services operations in compliance with the Broadcasting Business Act B.E. 2551 (2008), the Notification of the NBTC on Licensing Criteria and Procedure for Radio or Television Broadcasting Service B.E. 2555 (2012), the Notification of the NBTC on Criteria for FM Radio Broadcasting Trials, and the conditions set out in the annex. In case of violation or non-compliance with the related laws or the conditions set out in the annex, the NBTC shall prescribe an administrative notice to the

licensee to cease the violating action, or to conform to the laws strictly. In this regard, the NBTC prescribed strict regulatory measures, especially broadcasts or advertisement with the actions considered as broadcasting consumer exploitation such as advertising of food, drugs and health products, as the contents may lead consumers to consume deceiving products or services, or cause misconception of the products or services, or contain/refer to false or exaggerate information, which may be severe harmful to the people's health.

In 2022, the regulations on manners regarded as violations or non-compliance with the laws related to broadcasting and television businesses, notifications, rules, orders, or conditions set out in the annex were carried out as shown in Table 1.

Table 1 Regulations on manners regarded as violations or non-compliance with broadcasting and television services laws, notifications, rules, orders, or conditions in the annex

Violations or Non-Compliance with broadcasting and television services laws	Number of order
No broadcasting record	1
No station name announcement	25
Unauthorized service suspension or termination	1
Advertisement that violates licensing conditions	7
Improper use of broadcasting trial information	1
Advertising illegal health products	157

Source: Broadcasting Business Licensing Bureau, Office of the NBTC





4. Consumer protection in broadcasting and television services.

In 2022, the NBTC carried out operations for consumer protection in broadcasting and television services by regulating the actions considered as consumer exploitation, empowering consumers and upskilling the media literacy, promoting and protecting the rights of the disabled, the underprivileged in information accessibility and utilization through broadcasting and television services, and developing criteria for consumer protection in broadcasting and television services, with the process covering 3 dimensions including 1) regulating the actions considered as consumer exploitation with proactive monitoring procedures and complaint handling for effective consideration and regulation, 2) empowering consumers to take part in every regulatory process, and 3) promoting information accessibility of the disabled, the underprivileged. The details are as follows:

4.1 Regulation on actions considered as broadcasting consumer exploitation.

In 2022, the proactive operational process was carried out by monitoring the broadcasting and television business operations, and handling complaints, based on the Notification of the NBTC on the Actions Considered as Consumer Exploitation in Radio and Television Broadcasting Services B.E. 2555 (2012), for broadcasts or advertisement such as advertising of food, drugs and health products, as they may affect the people with misleading health information, money waste, and lack of opportunity for medical treatment, which may be severe harmful to the people's health. The regulation imposition included advertisements with over-limit time length

as they caused trouble and annoyance, and advertisements of superstitious products (talisman) which have no non-scientific proof. The process focused on proactive resolution by creating understanding to the broadcasting and television operators to avoid the actions considered as broadcasting consumer exploitation and prescribing administrative punishment. To ensure the effective operations, 3 mechanisms have been developed as follows:

1) Integrating with related agencies in conformity with the Memorandum of Understanding (MoU) on regulating against advertising of illegal food, drugs and health products or actions considered as consumer exploitation in broadcasting, television, and telecommunication services, with 5 regulators including the Office of the NBTC, Food and Drug Administration (FDA), Office of the Consumer Protection Board, Royal Thai Police, and Ministry of Digital Economy and Society. The discussion and operation review have been continuously conducted.

2) Creating work mechanisms for central and regional parts. The regional parts were cooperated by the NBTC regional offices and the Provincial Public Health Offices by linking information to the central part for consideration.

3) Developing technology as a tool to monitor broadcasting with a radio and television illegal content detection system, which has already detected 200 radio stations or television stations in Bangkok, Chonburi, Chiang Mai, Udon Thani, and Phuket.

The foregoing process allowed the NBTC to regulate the actions considered as consumer exploitation in illegal food, drugs and health products advertisement as shown in Table 2.



Table 2 Examination of illegal contents regarding illegal food, drugs, and health products

Operation	Digital Terrestrial Television	Non-Frequency Television	Broadcasting Services
Detecting the advertisements considered as consumer exploitation in broadcasting and television businesses	1 licensee 1 case	5 licensees 5 cases	121 licensees 185 cases
Licensees proven guilty by FDA/Provincial Public Health Office	1 licensee 1 case	5 licensees 5 cases	97 licensees 159 cases
Orders to cease any action considered as consumer exploitation in broadcasting and television services	4 orders	27 orders	418 orders
Imposing fines for the order infringement regarding consumer exploitation based on Section 31 of the Act on the Organization B.E. 2553 (2010) and its amendment	-	6 orders	36 orders
Imposing fines according to Section 37 of the Broadcasting Business Act B.E. 2551 (2008)	-	2 orders	6 orders

Remark : Data as of January 1, - December 31, 2022

Source : Broadcasting Consumer Protection Bureau, Office of the NBTC

The consideration process consists of proactive executions by monitoring the broadcasting and television service operations, and complaint handling. As the NBTC's administrative orders may affect the litigants, the subcommittee on consumer protection in broadcasting and television services, offered the licensees to acknowledge sufficient facts as well as offering chances for disputes and clarification based on the process, and clarifying them to build understandings to conform with the laws correctly, regarded as an effort to reduce offenses that affect consumers.



4.2 Consumer empowerment and media literacy upskill.

The NBTC emphasizes on empowering consumers and upskilling media literacy to protect their rights, in compliance with the national reform in the field of mass communications and information technology that enhances people with media literacy through various processes. The key operations in 2022 are as follows:

- 1) Building consumer networks in broadcasting and television services by creating awareness of consumer rights and protection in broadcasting and television services, to exchange a wide range of knowledge, and undertake decentralized operations in small groups and form into a network, leading to actual and sustainable empowerment. The public and private sectors, together with the consumer networks have driven the collaboration mechanism and promoted participation of consumers through various activities, such as the trainings in Petchaburi



during May 20 - 21, 2022, in Sukhothai during May 26 - 27, 2022, in Loei during June 10 - 11, 2022, and in Nakhon Si Thammarat during June 24 - 25, 2022, and the public hearing event to exchange views on media consumer protection especially children and the youth, women, the disabled, the elderly and the underprivileged, in creating awareness of consumer rights, to upskill their media literacy and form monitoring & complaint handling networks, in Bangkok on October 17, 2022.

Thus, building the consumer networks leads to the increase of knowledge, understanding and consumer rights awareness regarding broadcasting, television, and on-air services, enabling consumers to follow-up the work of media, and report clues or complaints to the NBTC and related agencies. The networks also help extend the knowledge further to the consumers' families, communities, and society.

2) Promoting media literacy to enhance consumers in broadcasting and television services, and people to access and utilize information cautiously, by the following operations.

(1) In-class learning: to enhance media literacy skills by developing curriculum in learning skill development for people regarding broadcasting and television services for cautious utilization in 4 levels including secondary education (junior high school/senior high school), undergraduate, the public, and promoting implementation in educational institutes/agencies, and organizations, as well as providing media teaching aids such as teaching tutorials in forms of documents and e-Book, videos, animations, or other suitable teaching materials, to support the organizations in education system and lifelong learning. The information on media literacy teaching can be found on <https://bcp3.nbt.go.th/melit>.

(2) Promoting media literacy activities by organizing community events for educational institutes joining the "Khon Tan Sue" project (<https://facebook.com/khontansue>). Many institutes have further integrated the project by setting up the Khon Tan Sue association to carry on the mission, and organize activities to promote media literacy for people, children and the youth, to build collaboration with domestic educational institutes in upskilling and promoting active and cautious media utilization, as well as disseminating the media literacy knowledge with the educational institute integration, at Bangkok during October 21 - 23, 2022.

(3) Building knowledge and public awareness of media literacy by supporting the programs related to media literacy skill development for people and the groups with specific needs, such as D-MeeDee program which contains sign language, closed caption, and audio description. Moreover, websites for promoting television and radio media literacy have been created, such as <http://bcp.nbt.go.th> and <https://www.facebook.com/con/rights>, aimed to enhance knowledge and understandings through a variety of media.

4.3 Promotion and protection of the rights of the disabled¹¹ and the underprivileged in accessibility and utilization of broadcasting and television services.

The disabled can access and utilize the information from every digital terrestrial television station through the following services. (1) Sign language that the disabled can access, at least 1,320 minutes/day, (2) closed caption that the disabled can access, at least 2,640 minutes/day, and (3) audio description that the disabled can access, at least 1,320 minutes/day. The key operations in 2022 to promote and protect the rights of the disabled and the underprivileged in equal accessibility and utilization of television services are as follows:

¹¹ The disabled include a visual-impaired person and a hearing-impaired person.



1) Regulating broadcasting and television services, according to the Notification of the NBTC on Promoting and Protecting the Rights of the Disabled in Accessibility and Utilization of Television Services, by monitoring the report on television service provision with sign language, closed caption, or audio description in 2021. In this regard, the NBTC prescribed a fine of 50,000 Baht to 1 licensee, and warnings to 3 licensees to instruct the licensees to conform to the Notification of the NBTC on Promoting and Protecting the Rights of the Disabled in Accessibility and Utilization of Television Services.

2) Promoting the rights of the disabled and the underprivileged in information accessibility by organizing the public hearing event on November 3, 2022, to afford opinions from organizations of each disability type, and related professional organizations, to notify the operators to provide suitable services based on basic measures and promotion measures to match the disabled's needs.

3) Building understanding of the disabled's rights to access and utilize information as follows:

(1) Collaborating with the National Association of the Deaf in Thailand to organize training on creating awareness of the disabled's communication rights (hearing) in accessibility and utilization of television services, at Samut Prakan during May 5 - 8, 2022, to prepare the members of disability organizations to aware and understand their rights in accessibility and utilization of television services.

(2) Organizing the training for television sign language interpreters for 72 hours

at Bangkok, divided into phase 1 during June 9 - 13, 2022, and phase 2 during June 18 - 21, 2022, with 32 interpreters joining the training. The purpose of the training was to develop effective interpretation skills for the maximum benefit to the disabled.

(3) Building understanding and awareness of the operators, the disabled, consumers, and the public, regarding the television service provision with sign language, closed caption, or audio description, by preparing press releases for disseminating in various channels including television channels and social media.

(4) Conducting the service quality evaluation with related agencies including (1) the Sign Language Interpreter Association of Thailand to evaluate the quality of sign language interpreter service on television, (2) the National Association of the Deaf in Thailand to evaluate the quality of closed caption service, and (3) Thailand Association of the Blind to evaluate the quality of audio description service, with the purpose of promoting continuous service improvement.

(5) Empowering the disabled to be aware of their rights to access and utilize information, with the aims to educate the people to understand and recognize the disabled's rights promotion and protection, and supporting the operations such as D-MeeDee program which encourages the disabled to recognize their rights and knowingly utilize information from television services, Puen Gun Khon Phan D program, which enhances the knowledge of the disabled and the people in promoting and protecting the disabled's rights in television service accessibility and utilization.





5. Broadcasting and television services support and development.

5.1 Broadcasting operator support.

1) The conference on “Fostering Thai Broadcasting service in the New Media Era” was held on July 26, 2022, to encourage the broadcasting operators and related parties in the industry to exchange information and opinions that lead to the broadcasting service development of Thailand and deployment with business planning and effective decision making in the dynamic industry ecosystem and competitive environment, as well as fostering the broadcasting operators to pursue their business sustainably.



The “Fostering Thai Broadcasting Service in the New Media Era” conference

2) The focus group meetings to receive feedback and suggestions from the radio broadcasting licensees, FM radio trial broadcasting licensees, associations, considerations, network organizations, hosts, producers, and listeners, were held to apply the feedback and suggestions with the broadcasting roadmap preparation for public interest and elevate the broadcasting industry of Thailand towards the global standards for socio-economic sustainability. The 1st meeting at the NBTC Head office, on June 16, 2022. The 2nd meeting at the NBTC Head office, on June 22, 2022. The 3rd meeting in Udon Thani, on July 8, 2022. The 4th meeting in Chiang Mai, on August 18, 2022. The 5th meeting in Udon Thani, on August 25, 2022. The NBTC assigned the Office of the NBTC to apply the results with the broadcasting and television master plan revision in accordance with the current situation, and revise the notifications related to radio broadcasting service, in a total of 7 notifications as follows: (1) The Notification of the NBTC on Licensing Criteria and Procedures for Broadcasting Services. (2) The Notification of the NBTC on Criteria on FM Radio Broadcasting Trial. (3) The Notification of the NBTC on FM Radio Frequency Plan. (4) The Notification of the NBTC on Low Power FM Radio Frequency Plan. (5) The Notification of the NBTC on Technical Standards of Low Power FM Broadcast Transmitter. (6) The Notification of the NBTC on Technical Standards Test of Low Power FM Broadcast Transmitter. (7) The Notification of the NBTC on Preventive Criteria against Frequency Interference of Radio Stations to Aeronautical Radio Service¹².

¹² The NBTC Meeting No.30/2022 on November 9, 2022

In addition, the Office of the NBTC held 2 meetings to clarify the operational approaches based on feedback and suggestions

of the radio broadcasting operators on November 11, 2022, in Khon Kaen, and on November 30, 2022, at the NBTC Head office.



The clarification on operational approaches based on feedback and suggestions of the radio broadcasting operators

5.2 Television operator support.

1) The focus group meeting on the request to use unoccupied sequences of general television services on non-frequency television networks was held on October 5, 2022 to receive feedback from related parties in the industry regarding the request to use unoccupied

sequences of general television services on non-frequency television networks, which would be in compliance with the national strategies on public sector rebalancing and development with sufficient and appropriate laws to suit the contexts.



The focus group meeting on the request to use unoccupied sequences of general television services on non-frequency television networks

2) The focus group meeting, attended by the representatives of financial institutes, the investment promotion agencies and the operators in the broadcasting and television service chain was held on February 2, 2022, to empower the operators in the industry

to adapt to the emerging new media competitively, by facilitating the correspondence with the representatives from the financial institutes and the investment promotion agencies about future collaboration in funding sources and/or tax privileges.



5.3 Broadcasters in broadcasting and television services promotion.

1) Organizing a meeting with the broadcaster training agencies that have signed in the MoU with the Office of the NBTC, in a total of 13 agencies, on October 12, 2022, with the purpose of facilitating the training agencies to carry out the training courses with standards for greater efficiency.

2) Promoting and upskilling the human resource in broadcasting and television services to be socially responsible and adhering to the public interest and supporting the performance standard development of workforce in broadcasting and television businesses. The certified broadcasters must pass the broadcaster training courses in basic level, intermediate level, advanced level, and the test to earn certificates. The broadcaster certification ceremony for the year 2022 was held on November 21, 2022.



The broadcaster certification ceremony for the year 2022

6. Human resource development and building knowledge in broadcasting and television services.

In 2022, the NBTC carried out the human resource development and building knowledge in broadcasting and television services as follows:

6.1 Human resource development in broadcasting and television services.

1) Organizing trainings to enhance knowledge and understanding of laws and regulations in broadcasting services for operators, government agencies and people, with the aims to disseminate the knowledge regarding laws and regulations in broadcasting services, to empower the public and private operators, and stakeholders from every sector to access to the broadcasting laws and regulations properly, for 4 times including (1) the training in Khon Kaen on September 9, 2022, (2) the training in Kamphaeng Phet on September 23, 2022, (3) the training in Krabi on September 30, 2022, (4) the training in Phra Nakhon Si Ayutthaya on October 7, 2022.

2) Organizing a training to build knowledge and understanding for regional trial broadcasting operators for the year 2022, with the aims to educate the operators with comprehensive knowledge, for 4 times including (1) the training in Sukhothai during June 22 - 24, 2022, (2) the training in Chonburi during June 29 - July 1, 2022, (3) the training in Khon Kaen during July 6 - 8, 2022, and (4) the training in Trang during July 20 - 22, 2022.

3) Organizing trainings to build knowledge on news reporting for broadcasters, news anchors, and hosts, with the aims to enhance knowledge on news reporting in various situations, and professionalize human resource performance in broadcasting and television businesses with neutrality, and conscience, for 4 times including (1) the training in Phra Nakhon Si Ayutthaya during October 20 - 21, 2022, (2) the training in Khon Kaen during November 3 - 4, 2022, (3) the training in Chiang Mai during November 10 - 11, 2022, and (4) the training in Phuket during November 24 - 25, 2022.



4) Organizing trainings on building the public networks (listeners and audiences) in broadcasting and television services for the year 2022, with the aims to encourage the public to participate and assist the officials in radio and television media monitoring, and notify the Office of the NBTC to take actions against the outlaws systematically, promptly and efficiently, for 4 times including (1) the training in Phra Nakhon Si Ayutthaya during October 21 - 22, 2022, (2) the training in Khon Kaen during November 4 - 5, 2022, (3) the training in Chiang Mai during November 11 - 12, 2022, and (4) the training in Phuket during November 25 - 26, 2022.

5) Organizing workshops on trends of radio broadcasting technology and creative program production in the digital era, with the aims to upskill the radio broadcasting operators in creating modern and useful contents with digital technology application, business model of content providers to compete in the emerging technology era, and content presentation with technical and practical methods, for 3 groups including the 1st group in Chiang Mai during April 4 - 6, 2022, the 2nd group in Khon Kaen during June 19 - 22, 2022, and the 3rd group in Chonburi during July 24 - 27, 2022.

6) Organizing trainings to provide knowledge on technical rules for radio broadcasting stations for the year 2022, with the aims to educate the participants, and to conform with the notifications on technical criteria for radio broadcasting stations, for 3

times including (1) a training in Bangkok on May 30, 2022, (2) a training in Khon Kaen on July 26, 2022, and (3) a training in Songkhla during September 27 - 28, 2022.

7) Organizing workshops on content creation for multimedia, with the aims to promote creative and quality content production with theoretical and practical trainings, for 2 groups including the 1st group in Nakhon Ratchasima during May 23 - 25, 2022, and the 2nd group in Chiang Rai during June 27 - 29, 2022.

8) Organizing a training on television broadcasting techniques via internet networks (IPTV/OTT), on July 27, 2022, to upskill the Office of the NBTC employees to apply the knowledge and technical skill effectively with the current situations.

9) Studying and developing the media workforce in the new media era and the social movement in Thailand, with the aims to study contents, characteristics, and intermediary of social networks with their movements in the new media era in Thailand, and organizing 3 focus group meetings to put the results into the training course on "New Social Media and the Social Movement in Thailand", including (1) the meeting in Chiang Mai on August 3, 2022, (2) the meeting in Khon Kaen on August 10, 2022, and (3) the meeting at Bangkok on August 18, 2022. In addition, the pilot training for the broadcasting and television operators and mass media professionals was held during September 28 - 29, 2022.





10) Organizing the workshop on “NBTC Competition Forum 2022 Digital Media: Game Changing Broadcast Distribution”, on October 27, 2022, to exchange business views in broadcasting, television, and related industries. The seminar in the workshop also encouraged the

participants to exchange views and knowledge on directions and growing trends of online platforms, ratings data collection which affected domestic advertising budget, and strategies & business plans for optimizing opportunities and competitive advantages in business operations.



*The NBTC Competition Forum 2022 Digital Media:
Game Changing Broadcast Distribution Workshop*

6.2 Building understanding in broadcasting and television services.

1) Organizing the meeting on September 16, 2022, to review and comprehend the implementation of the Notification of the NBTC on Licensing Criteria and Procedures for Broadcasting or Television Networks B.E. 2555 (2012) and conditions set out in the annex, for broadcasting or television networks provision for non-frequency services. The purposes of the meeting were to build understanding, exchange views on operational guidelines for regulating broadcasting and television services to address the rapidly changing business environment, in compliance with the national strategy in balancing and developing the government administration system with sufficient and appropriate laws to suit the contexts.

2) Organizing the meetings to build understanding in monitoring and regulating the broadcasting or television licensees with the purpose of clarifying the licensing approaches, based on the notifications related to the networks and conditions set out in the annex, exchanging

views, challenges and obstacles in the operation, and clarifying the guidelines on digital licensing by electronic means, according to Section 70 of the Broadcasting Business Act B.E. 2551 (2008), and e-BCS system for radiocommunications licensing in broadcasting and television services which complies with the 20-Year National Strategies, in balancing and developing the government administration system by encouraging the government agencies to adhere to the people centric scheme and respond to the people’s needs promptly and transparently. The meetings were held in Udon Thani during November 3 - 4, 2022, in Chiang Mai during November 10 - 11, 2022, and in Phuket during December 8 - 9, 2022.

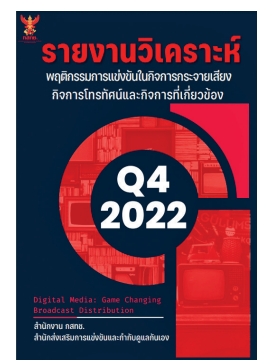
3) Organizing the meetings on May 23 and June 30, 2022, to build understanding about revenues from broadcasting and television services operations and license fee payment for the television operators to clarify the intent and objectives of collecting license fee, accounting & document preparation, and license payment process.





4) Organizing the meeting and seminar to publicize the study results of the consulting project on 5G readiness for broadcasting, television, and other services, on March 22, 2022. The meeting aimed to present the technological changes and competition landscape in broadcasting, television, and other related services, as well as applicable laws, policies, practices, and regulatory measures on 5G use cases abroad. Also, the meeting aimed to share the knowledge and experiences to the related parties about 5G technology deployment in the broadcasting, television and other related businesses, exchange views on business adjustment, directions of international regulations, and appropriate regulation for Thailand.

5) Publishing the analytical quarterly report on competitive behavior in broadcasting, television, and other related businesses by adopting economic theories to analyze the competition in the areas of contents, business administration, resilience, business domination, technological advance, and industry trends. These areas were presented through the viewpoint and experience of the Office of the NBTC, as a regulator, to the operators for optimizing the insights to adjust themselves and tackle the technological dynamic. The analytical report was published on <https://broadcast.nbt.go.th>, and presented at the Competition Forum 2022.



The analytical report on competitive behavior in broadcasting, television, and other related businesses





Telecommunications Service Regulation

The NBTC has carried out the mission of regulating telecommunication services for the benefits of people and enhancing fair competition in the market are the key missions that the NBTC and the Office of the NBTC have been carrying out constantly, especially in the era of the emerging technologies and the future innovation that shift people's behavior and disrupt the business operations in the telecommunications industry. Solving technology misused by scammers to deceive people and consumers is another priority task of the NBTC that requires urgent actions. The major performance and achievements in 2022 are as follows:

1. 5G technology deployment promotion and support.

The NBTC has continually been promoting and supporting 5G technology deployment by supporting the projects of the National 5G Committee and the operations through the Broadcasting and Telecommunications Research and Development Fund for Public Interest (BTFP), and granting spectrum licenses for innovation experiments in the regulatory sandbox to ensure the effectiveness of driving entire 5G adoption and integration among sectors to enhance the competitive advantage, and create attractive investing environment to Thailand, as well as developing 5G for socio-economic optimization, in compliance with the goals of the National Strategy Plan, and the National Digital Economy and Society Development Plan and Policy as follows:

1.1 Supporting the 5G utilization pilot projects of Thailand.¹³ The progress of the projects in 2022 is described as follows:

1) **The Smart Hospital Project with 5G Technology and Artificial Intelligence (AI) of Siriraj Hospital** was supported by the NBTC to be a smart hospital prototype which adopted 5G technology, Cloud, AI and Digital Disruption to apply in public service and the personnel work of the hospital, by utilizing 5G network and AI system with the smart emergency medical system, the smart emergency room, the pathological diagnosis system, the personal health assistance system for non-communicable diseases patients, the medical consumption prediction system for inventory management (medical and non-medical products), the medical record with blockchain technology, and the medical logistics with 5G unmanned vehicle. The project was completed in July 2022.



¹³ The Smart Hospital with 5G technology and Artificial Intelligence project was financially supported by the BTFP. The projects approved by the National 5G Committee were financially supported by other agencies such as the Ministry of Digital Economy and Society.





2) The 5G Digital Agriculture Pilot Project at Pha Mee Training Center, Chiang Rai, aimed to apply 5G technology with vanilla farm and temperature-controlled greenhouse with the Evaporative Cooling System (EVAP) by developing the watering system and installing the farming controllers with Internet of Things (IoT Controllers), the environment sensors (IoT Sensors) in the vanilla farm and the EVAP greenhouse, improving the device connections and communications with 5G technology and IoT, developing a software for cultivation management and activity record, and developing a Cloud GDCC system to support the connections of IoT Smart Farm and data storage with Big Data technologies for Thai agriculture industry. The project was completed in July 2022.

3) The Ban Chang 5G Smart City Project aimed to enhance the digital telecommunications infrastructure with 5G technology for people and public service, by developing the data collecting system from smart poles, the assistance system for telemedicine and for coordinating with the police, etc. Currently, it is in the process of installing the IoT and non-IoT connector program, the smart city data management system, data presentation system for websites, and data presentation system for applications, which are expected to complete by 2023.

4) The 5G Smart Station Pilot Project at Bang Sue Grand Station Bangkok aimed to be the first 5G smart station prototype of Thailand and Southeast Asia, by innovating the robotic technology and AI for AI security service for passengers in the terminals, and automation wheelchair for the disabled and the elderly. Currently, the project is in progress and expected to be completed by 2023.

5) The 5G Smart Campus Pilot Project aimed to uplift the Intelligent Hybrid Classroom prototype, and enhance security, environment, and energy saving, by empowering the students to participate in building innovations with robotics, IoT and AI technologies on the 5G platform. Currently, it is in the process of testing 5G innovations, and publicizing the online courses on e-Learning platform, the Dhurakij Pundit University Massive Open Online Course (DPU MOOC), and social media of the university. Currently, the project is in progress and expected to be completed by 2023.

6) The 5G District Pilot Project for Public Service in Chiang Mai, in the part of 5G Smart Health aimed to upgrade the telemedicine equipment in remote area with 5G technology and adopt digital health devices to facilitate the medical personnel in remote diagnosis by connecting the main hospital and the hospital in remote area with 5G technology. Currently, the project is in progress and expected to be completed by 2023.

7) The 5G Use Case in Screening and Alert System for Phuket Sandbox Project for Phuket Tourism Economy Preparation aimed to apply 5G technology in various dimensions from collecting data to form the database and using 5G smart gates with cameras installed at checkpoints to monitor air, land, and water immigration, for tourist's face detection analysis, utilizing Big Data for screening authentication purpose, and connecting data via Phuket Data Sandbox Platform. The project was completed. Currently, it is the process of document review by the National Digital Economy and Society Commission.





1.2 Supporting the project operation through the Broadcasting and Telecommunications Research and Development Fund for Public Interest (BTFP).

According to the BTFP Administration Committee Meeting No.10/2022 on October 27, 2022, the committee approved the operational budget for the projects of Khon Kaen University and Prince of Songkla University including (1) 5G Testbed and Use Cases Designing Project, and (2) Promoting 5G Ecosystem for the South of Thailand Project. Currently, it is in the process of submitting the budget proposal to the NBTC for consideration.

1.3 5G technology promotion through frequency permission for innovation experiment in Regulatory Sandbox.

The NBTC and the Office of the NBTC have allowed the applicants to develop

and test their innovation within a limited boundary or so-called “Regulatory Sandbox” according to the Notification of the NBTC on Criteria for Permitting Frequency Use for Innovation Development and Testing since 2019 to present, in a total of 11 agencies. In 2022, the NBTC has given permission to 3 agencies including (1) Burapha University to test 5G Private Network for developing and testing the Smart Factory, “Predictive Maintenance, and Smart Logistics innovations”, (2) Khon Kaen University to test the frequency for developing Smart Agriculture, Smart City, and Antenna Research, and (3) the Eastern Economic Corridor by PTT Public Company Limited to use frequency for drone testing for high altitudes monitoring patrol and maintenance, and fire extinction with drone swarm. The details are shown in Table 3.

Table 3 Regulatory Sandboxes authorized by the Office of the NBTC

No.	Regulatory Sandbox	License Period	Use Case
1	Chulalongkorn University	December 11, 2019 - December 10, 2024	The research project on public policy recommendation regarding spectrum management in case of spectrum sharing between International Mobile Telecommunications, 5G technology, and other business using the 3500 MHz and 28 GHz frequency bands with King Mongkut's University of Technology North Bangkok
2	Kasetsart University, SriRacha Campus	December 11, 2019 - December 10, 2024	To support TOT-Pattaya City-Huawei 5G Smart City
3	Prince of Songkla University	April 8, 2020 - April 7, 2025	<ul style="list-style-type: none"> - Innovating unmanned vehicle with Global Navigation Satellite System (GNSS) with the Geo-Informatics and Space Technology Development Agency - The digital agriculture pilot project for enhancing seabass and Gracilaria Fishery farming in Songkhla Lake, funded by the Office of the National Digital Economy and Society Commission
4	WHA Eastern Seaboard Industrial Estate (WHA EIE)	May 27, 2020 - May 26, 2025	<ul style="list-style-type: none"> - Smart MDB - Smart Environment
5	Eastern Seaboard Industrial Estate (Rayong) (ESIE)	May 27, 2020 - May 26, 2025	<ul style="list-style-type: none"> - Smart Energy - Smart Security (CCTV), Smart Pole - AR & VR



No.	Regulatory Sandbox	License Period	Use Case
6	WHA Eastern Seaboard Industrial Estate (WHA EIE1)	May 27, 2020 - May 26, 2025	<ul style="list-style-type: none"> - Smart City Solution - Smart Factory - Factory Asset Tracking - AI CCTV enhanced for time attendance and HR operation - Smart Energy Management - AR & VR
7	Digital Economy Promotion Agency (depa)	August 26, 2020 - August 25, 2023	<ul style="list-style-type: none"> - Equipment testing for developing proactive medical check-up - Unmanned vehicles testing
8	King Mongkut's University of Technology North Bangkok	May 12, 2021 - May 11, 2026	Spectrum Sharing Test between 5G International Mobile Telecommunications and other business using the 3500 MHz frequency band
9	Faculty of Engineering, Burapha University	May 10, 2022 - May 9, 2027	<ul style="list-style-type: none"> - Smart Factory & Smart Manufacturing - Predictive Maintenance - Smart Logistics
10	Khon Kaen University	June 29, 2022 - June 28, 2027	<ul style="list-style-type: none"> - Smart Agriculture - Smart City - Antenna Research
11	Eastern Economic Corridor by PTT Public Company Limited	August 31, 2022 - August 30, 2025	<ul style="list-style-type: none"> - Drone for high altitudes monitoring patrol and maintenance - Fire extinction with drone swarm

Remark : Data as of November 10, 2022

Source : Facilities-based Telecommunications Business Licensing Bureau, Office of the NBTC



The conference with Bangkok Governor on integration for communication lines organization

2. Organizing the communication lines and bringing communication lines underground.

The NBTC has collaborated with many sectors to implement the government policies to drive Thailand to be the ASEAN Metropolitan and resolve disordered communication lines to prevent danger for people, as well as supporting the switching overhead lines to underground lines for safety, landscapes improvement, and effective usage. The major performances of 2022 are as follows:

2.1 Organizing the communication lines. The NBTC prepared the integration plan for communication lines organization on electric poles in main routes of Bangkok and other provinces, and coordinated and supported the operational budget with the allocated fund from the BTFP, according to the Cabinet Resolution on November 23, 2021. In 2022, the Office of the NBTC collaborated with Metropolitan Electricity Authority (MEA), Provincial Electricity Authority



(PEA), the telecom operators, and related public sector, to accelerate the plan implementation to allow infrastructure sharing and minimize the number of the communication lines on electric poles in priority areas, as well as enhancing Single Last Mile. In this regard, on April 12, 2022, the Secretary-General of the NBTC approved the Communication Line Organization Plan B.E. 2565 (2022) which specified the designated areas of the Metropolitan Electricity Authority and the Provincial Electricity Authority as follows:

1) Organizing overhead communication lines of the Metropolitan

Electricity Authority for 247 routes, in a total of 760.08 kilometers, divided into 3 group including the priority group, the non-priority group, and the Single Last Mile network rollout trial.

2) Organizing overhead communication lines of the Provincial Electricity Authority for 857 routes, in a total of 1,510.12 kilometers, divided into 4 phases as follows: Phase 1: Kick off the plan for 2 routes, Phase 2: Organizing the lines for 284 routes, Phase 3: Organizing the lines for 288 routes, Phase 4: Organizing the lines for 283 routes, in a total of 857 routes. The results of line organizing in 2022 are described in Table 4.

Table 4 Plan - outcomes of organizing overhead communication line of 2020

No.	Details	Communication Line Organizing Plan		Communication Line Organizing Outcome		
		Number (Routes)	Distance (Km)	Number (Routes)	Distance (Km)	Percentage
1	Organizing overhead communication lines on electric poles of the Metropolitan Electricity Authority					
1.1	The priority group	208	411.29	26	70.95	17.25
1.2	The non-priority group	38	346.59	23	172.1	49.63
1.3	The Single Last Mile network rollout trial	1	2.2	1	2.2	In progress
Total		247	760.08	50	245.25	32
2	Organizing overhead communication lines on electric poles of the Provincial Electricity Authority					
2.1	Phase 1 Kick off	2	4.07	2	4.07	100
2.2	Phase 2 Organizing plan	284	472.21	17	32.43	6.87
2.3	Phase 3 Organizing plan	288	517.71	7	14.14	2.73
2.4	Phase 4 Organizing plan	283	516.13	3	7.21	1.4
Total		857	1,510.12	29	57.85	3.83

Remark : Data as of September 10, 2022

Source : Telecommunications Policy and Resources Management Bureau, Office of the NBTC

2.2 Bringing communication lines underground.

In 2020, the NBTC and the Office of the NBTC has supported and coordinated with the telecommunication operators to bring the communication lines underground for 19

routes, in a total of 34.821kilometers, divided into the underground operation in the Metropolitan Electricity Authority areas for 6 routes, 8.3 kilometers, and the underground operation in the Provincial Electricity Authority areas for 13 routes, 26.521 kilometers, as described in Table 5.



Table 5 Results of bringing communication lines underground in the Metropolitan Electricity Authority and the Provincial Electricity Authority areas

No.	Province	Route	Distance (Km.)
Results of bringing communication line underground in the Metropolitan Electricity Authority areas			
Non Si Project			
1	Bangkok	Soi Anuman Ratchathon (Naradhiwas Rajanagarindra Road to Decho Road)	0.3
2	Bangkok	Soi Anuman Ratchathon (2) (Surawong Road to Soi Naradhiwas Rajanagarindra 2)	0.2
3	Bangkok	Ratchadapisek Road (Nang Linchi Road to Sathu Pradit Road)	1.7
4	Bangkok	Naradhiwas Rajanagarindra Road (Rama 3 Road to Surawong Road)	4.3
5	Bangkok	Surawong Road (San Nae Deul Restaurant to Somboon Seafood Restaurant)	0.8
Bangkok Landscape Improvement Project			
6	Bangkok	Rama 1 Road (Pathumwan Intersection to Ratchaprasong Intersection)	1
Total			8.3
Results of bringing communication line underground in the Provincial Electricity Authority areas			
Major Cities Power System Development Project			
1	Nakhon Ratchasima	(lot2) Suranaree Road, Burin Road, Phibun La Eiad Road/Chom Surangyat Road (partial) and Pho Klang Road (partial)	2.58
2	Nakhon Ratchasima	(lot3) Chom Surangyat Road, Bua Rong Road, Pho Klang Road, and Yotha Road	3.1
3	Nakhon Ratchasima	(lot4) Ratchadamnoen Road, Ratchanikun Road, Chainarong Road/ Phon Saen Road, Yommarat Road, Atsadang Road, Chom Phon Road/ Mahatthai Road and Sappasit Road	4.8
4	Nakhon Ratchasima	(lot5) Phon Saen Road, Yommarat Road, Atsadang Road, Chom Phon Road, Mahatthai Road, Sappasit Road, and Kam Hang Songkhram Road	2.63
5	Chonburi	(lot2) Central Pattaya	2.2
6	Chonburi	(lot3) Sukhumvit Road	1.8
Tasks supported by local government organization			
7	Chiang Rai	Phaholyothin Road (Thailand-Myanmar Frontier, Soonvijai Intersection and the Oil and Oil Plant Development Research Center Intersection)	3
8	Nong Khai	Prachak Silapakhom Road (Vietnam Memorial Junction to Pho Chai Intersection)	1.7
The One Province One Chaloem Prakiat Road Workplan			
9	Tak	Pa Mamuang Highway Junction (Km. 0+000 to Km. 0+861)	0.861
10	Sing Buri	Wilajit Road (the southern side of the old city hall, the northern side of the old city hall)	1
11	Sa Kaeo	Suwannasorn Road (from 249 + 380 to 250 + 550)	1
12	Phitsanulok	National Highway 12 and Khon Rak Sukkaphab Road to Cham Karn Boon Road, around the City Pillar Shrine	0.85
13	Uttaradit	Pracha Nimit Road (Uttaradit Municipal Office, Uttaradit Highway District)	1
Total			26.521

Source : Telecommunications Policy and Resources Management Bureau, Office of the NBTC



NBTC

Results of bringing communication line underground in the Metropolitan Electricity Authority areas and the Provincial Electricity Authority areas

In 2022

Results of bringing communication line underground in the Metropolitan Electricity Authority (MEA) areas

Total
8.3
kilometers

Non si Project (Bangkok)

1. Soi Anuman Ratchathon (Naradhiwas Rajanagarindra Road to Decho Road)	0.3 km.
2. Soi Anuman Ratchathon (2) (Surawong Road to Soi Naradhiwas Rajanagarindra 2)	0.2 km.
3. Ratchadapisek Road (Nang Linchi Road to Sathu Pradit Road)	1.7 km.
4. Naradhiwas Rajanagarindra Road (Rama 3 Road to Surawong Road)	4.3 km.
5. Surawong Road (San Nae Deul Restaurant to Somboon Seafood Restaurant)	0.8 km.

Bangkok Landscape Improvement Project

6. Rama 1 Road (Pathumwan Intersection to Ratchaprasong Intersection)	1 km.
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Results of bringing communication line underground in the Provincial Electricity Authority (PEA) areas

Total
26.521
kilometers

Major Cities Power System Development Project

Nakhon Ratchasima

1. (lot2) Suranaree Road, Burin Road, Phibun La Eiad Road/Chom Surangyat Road (partial) and Pho Klang Road (partial)	2.58 km.
2. (lot3) Chom Surangyat Road, Bua Rong Road, Pho Klang Road, and Yotha Road	3.1 km.
3. (lot4) Ratchadamnoen Road, Ratchanikun Road, Chainarong Road/Phon Saen Road, Yommarat Road, Atsadang Road, Chom Phon Road/Mahatthai Road and Sappasit Road	4.8 km.
4. (lot5) Phon Saen Road, Yommarat Road, Atsadang Road, Chom Phon Road, Mahatthai Road, Sappasit Road, and Kam Hang Songkhram Road	2.63 km.

Chonburi

5. (lot2) Central Pattaya	2.2 km.
6. (lot3) Sukhumvit Road	1.8 km.

Tasks supported by local government organization

7. Chiang Rai Phaholyothin Road (Thailand-Myanmar Frontier, Soonvijai Intersection and the Oil and Oil Plant Development Research Center Intersection)	3 km.
8. Nong Khai Prachak Silapakhom Road (Vietnam Memorial Junction to Pho Chai Intersection)	1.7 km.

The One Province One Chaloem Prakit Road Workplan

9. Tak Pa Mamuang Highway Junction (Km. 0+000 to Km. 0+861)	0.861 km.
10. Sing Buri Wilajit Road (the southern side of the old city hall, the northern side of the old city hall)	1 km.
11. Sa Kaeo Suwannasorn Road (from 249 + 380 to 250 + 550)	1 km.
12. Phitsanulok National Highway 12 and Khon Rak Sukkaphab Road to Cham Karn Boon Road, around the City Pillar Shrine	0.85 km.
13. Uttaradit Pracha Nimit Road (Uttaradit Municipal Office, Uttaradit Highway District)	1 km.



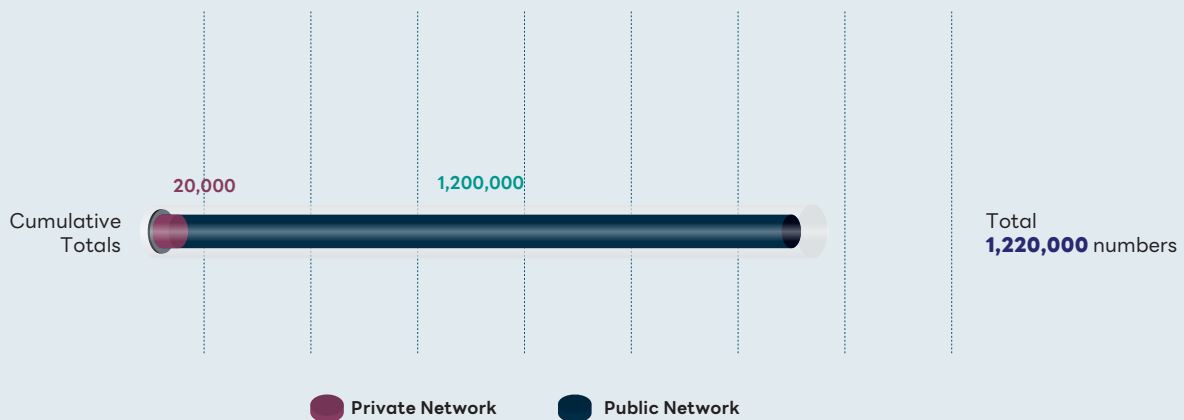
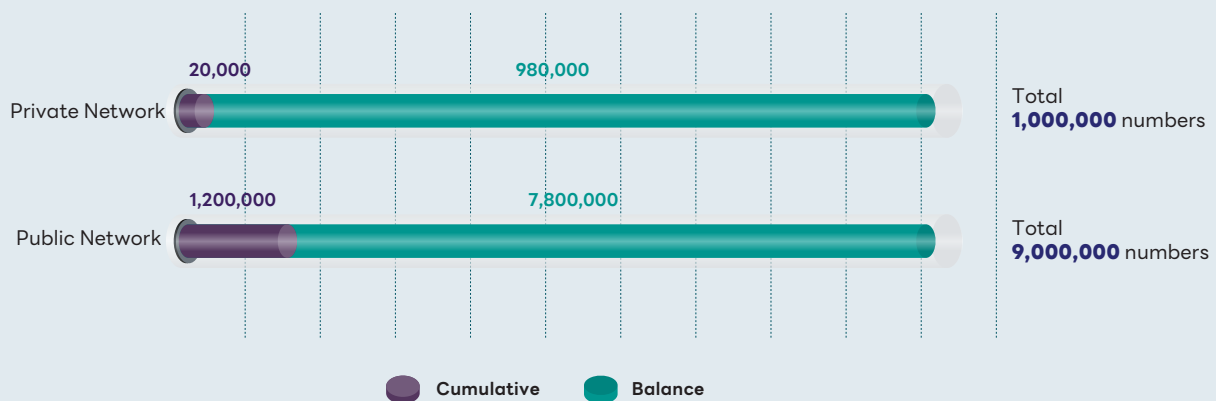


3. Telecommunications Numbering Management for Internet of Things (IoT) Services.

The NBTC has considered telecommunication numbering allocation for Internet of Things (IoT) services, according to the Notification of the NBTC on Criteria for Telecommunications Numbering Allocation and

Management, and Criteria and Procedures for Telecommunications Numbering Management and Data Collection of IoTs service usage, for a cumulative number of 1,220,000,¹⁴ divided into Private Network for 20,000 numbers, and Public Network for 1,200,000 numbers. The details are shown in Chart 2.

Chart 2 Telecommunication numbering allocation for Internet of Things (IoT) services



Remark : The numbering allocation for Private Network is 10,000 numbers per each group, 10-digit, and can be extended up to 14-digit. Thus, the numbers allocated can be extended up to 100,000,000 numbers. Data as of October 2022.

Source : Numbering Management Bureau, Office of the NBTC

¹⁴ Data as of October 2022

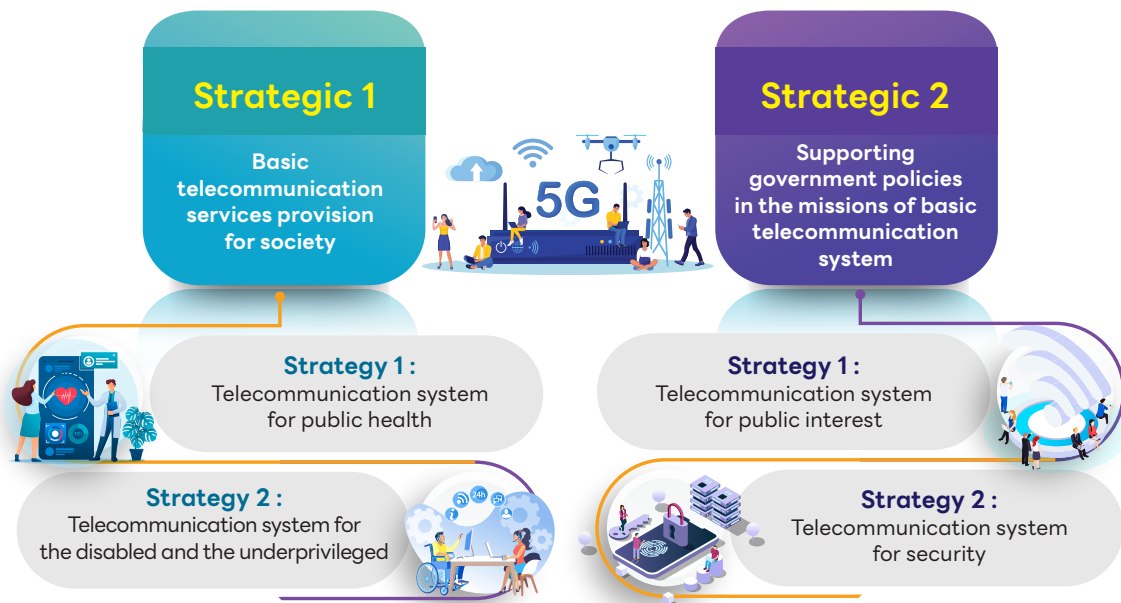


4. Universal basic telecommunication and social services (Universal Service Obligations (USO)).

4.1 Preparation of the Universal Basic Telecommunications and Social Service Plan No. 3 (B.E. 2565) (2022).

Currently, the NBTC is implementing the Notification of the NBTC on the Universal Basic Telecommunications and Social Service Plan No.3 B.E. 2565 (2022) with 1-year operational period, aiming to develop, expand, and distribute the basic telecommunication service to cover areas and the USO target groups nationwide. The plan

also contributes to promote, support, and apply the basic telecommunication services to enhance the operational efficiency of various sectors including, education, public health, public service, and the public, as well as creating opportunities and upskill the people, especially in remote areas, low-income earners, the disabled, children, the elderly, and the underprivileged to access basic telecommunication services. The Universal Basic Telecommunications and Social Service Plan No.3 B.E. 2565 (2022) comprises 2 strategics and 4 strategies as follows:



The Universal Basic Telecommunications and Social Service Plan No.3 B.E. 2565 (2022) is due on May 26, 2023. Thus, to ensure the USO mission continuity, the NBTC is carrying out the preparation of the Universal Basic Telecommunications and Social Service Plan No.4 B.E. 2566 - 2570 (2023 - 2027).

4.2 Ensuring the availability of the Project on the provision of broadband internet service and mobile phone signal in border areas (Zone C+), in a total of 3,920 villages, and the project on the provision of broadband internet service in remote areas (Zone C), in a total of 15,735 villages.

The NBTC has carried out the project on the provision of broadband internet service and mobile phone signal in border areas and remote areas continuity to bridge the digital divides, and promote equal and fair accessibility in the geographical and social dimensions, in the effort to improve the quality of life of people, teachers, students, elders, patients, and the target groups in remote areas. At present, the project was completed by providing free-of-charge services for 19,655 villages (29,748 service points) for 5 years (2022 – 2026) as follows:



1) The project on the provision of broadband internet service and mobile phone signal in border areas (Zone C+) is divided into 3 phases which are (1) Phase 1 for equipment procurement, installation, and readiness test prior to service provision, (2) Phase 2 for providing services for 5 years, and (3) Phase 3 for delivery of equipment after service. Currently,

the mobile phone signal is now available for service at 4,697 service points, and broadband internet service at 4,883 service points, including the provision of village Wi-Fi, public internet centers (USO Net), public internet rooms (USO Wrap), school Wi-Fi, and sub-district health promoting hospital Wi-Fi, for 5 years as specified in the plan. The details are shown in Table 6.

Table 6 The mobile phone signal and broadband internet service provision in border areas (Zone C+) project

Type of Service	Target	In Service	Percentage
Village Wi-Fi	3,135	3,135	100
Public Internet Center (USO Net) ¹⁵	486	486	100
Public Internet Room (USO Wrap) ¹⁶	3	3	100
School Wi-Fi	1,158	1,158	100
Sub-district Health Promoting Hospital Wi-Fi	101	101	100
Total	4,883	4,883	100

Source: Universal Services Bureau, Office of the NBTC

2) The broadband internet service provision in remote areas (Zone C) for 15,732 villages project is divided into 3 phases which are (1) Phase 1 for equipment procurement, installation, and readiness test prior to service provision, (2) Phase 2 for providing services for 5 years, and (3) Phase 3 for delivery of equipment

after service. Currently, the broadband internet service is now available at 20,168 service points, including the provision of village Wi-Fi, public internet centers (USO Net), public internet rooms (USO Wrap), school Wi-Fi, and sub-district health promoting hospital Wi-Fi, for 5 years as specified in the plan. The details are shown in Table 7.

Table 7 The broadband internet service provision in remote areas (Zone C)

Type of Service	Target	In Service	Percentage
Village Wi-Fi	15,423	15,423	100
Public Internet Center (USO Net)	177	177	100
Public Internet Room (USO Wrap)	1,521	1,521	100
School Wi-Fi	2,968	2,968	100
Sub-district Health Promoting Hospital Wi-Fi	79	79	100
Total	20,168	20,168	100

Source: Universal Services Bureau, Office of the NBTC

¹⁵ USO Net includes a provision of a newly built building, computers with Wi-Fi and an ICT administrator for 5 years.

¹⁶ USO Wrap includes a provision of a renovated classroom, computers with Wi-Fi and an ICT administrator for 5 years.





The Committee on Communications, Telecommunications and Digital for Economy and Society, House of Representatives, followed up the mobile phone signal and broadband internet service provision in border and remote areas project



The NBTC followed up the mobile phone signal and broadband internet service provision in border and remote areas project





5. Consumer protection in Telecommunications Service.

The NBTC has emphasized on the operations to protect consumers in telecommunications service, as today we live in the era that communication technologies are crucial for our daily life, such as education, business, trading, transport, and telemedicine. All these services need technologies to apply. Even the scammers also take advantage of the technologies to deceive people. Thus, creating technological awareness and understanding for people is also one of the missions that the NBTC focuses on closely by collaborating with the related agencies to develop a public network mechanism together with activities organizing to build knowledge and understanding to people nationwide, as well as solving phone scams and electronic media threats that spread widely and affect the social security and safety. Thus, the NBTC has prescribed measures and approaches for solving such problems, to clearly specify the responsibilities of the licensees related to the cases to safeguard the people against the problems in a timely manner. The major performances in 2022 are as follows:

5.1 Solving phishing call scam (call center scam) and Short Message Service (SMS) fraud.

1) Appointing the multilateral working group to solve call center scam and SMS fraud.

To facilitate the prompt and effective collaboration of the related agencies, leading to the concrete practices, the NBTC assigned the Office of the NBTC to appoint

the multilateral working group for solving call center scam and SMS fraud to study measures and laws relating to the problems, create a complaint handling channel to cooperate with other agencies, and design a scam handling and protection process to ensure efficient integration between corresponding agencies, including the Ministry of Digital Economy and Society, the Personal Data Protection Committee, Bank of Thailand, the Technology Crime Suppression Division, the High-Tech Crime Division, the Telecommunications Association of Thailand under the Royal Patronage, Thailand Consumers Council, and mobile operators.

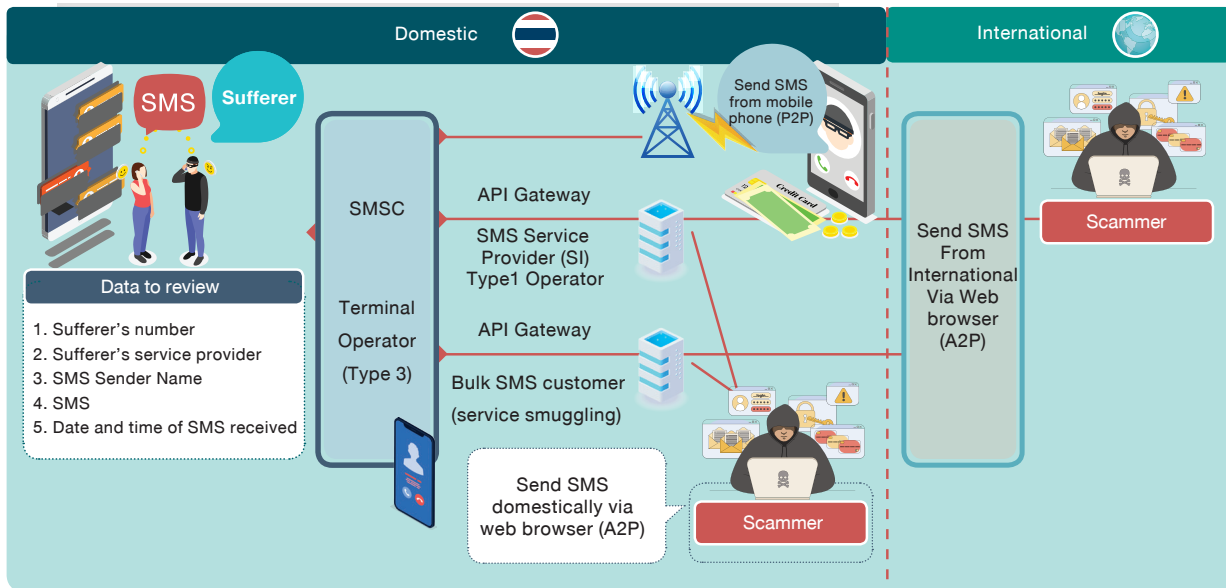
2) Solving SMS fraud from scammers.

Nowadays, scammers send SMS to deceive people in various ways such as e-banking notifications, financial transaction notifications, or invitation links to gambling or pornographic sites. In case that unaware mobile users unintentionally click the attached links, or fill in the personal data including username and password, it may lead to leakage or misuse of personal data, financial transaction data, or other important information such as identification number, and One Time Password (OTP). In this regard, the Office of the NBTC has resolved the problem by creating the sender's name database for the mobile operators to review sender name duplication, and for the Office of the NBTC to use as a regulatory guideline, and to prepare regulatory practices in SMS service to be apply with the telecom licensees. The details are shown in Figure 1.





Figure 1 Illustration of SMS fraud from scammers



1) Solving phishing call that impersonates a trustworthy person through phone call or electronic media (call center scam).

Initially, scammers may directly call victims from overseas through the Voice over Internet Protocol (VoIP) technology with fake numbers showing up as landline number, 4-digit phone number of government agencies, such as the police, court, or even the Office of the NBTC, to threaten and convince the people to transfer them the money, or to impersonate legitimate private companies such as a logistics company to ask the victims to pay for their parcels, or as a bank to deceive the victims with overdue credit card balance. The common phishing calls can be categorized into 2 types as follows:

(1) International phone call.

An international call through the Voice over Internet Protocol (VoIP) is regarded as the incoming call from overseas with non-calling line identification. However, for an international call through the operator's network (International Direct Dialing: IDD), the country code will be added as a prefix by the call origination operator, regarded as the calling line identification. The operator in Thailand will not

convert the number before forwarding to the recipient number.

The NBTC has solved the phone scams by (1) blocking the overseas calling traffic to the recipient number in Thailand with the calling ID appearing as "landline number", "short dial number", and "4-digit phone number" of Thailand, (2) blocking the overseas calling to the recipient number in Thailand with the country code that is not specified by ITU, (3) in case there is an incoming call from overseas with Non-Calling Line Identification (non-CLI) through VoIP, a "+697" prefix must be added to identify incoming call from an unknown source overseas, (4) requiring the international call operators, the call termination operators, and the mobile operators to add a "+698" prefix to a roaming call from overseas with Calling Line Identification (CLI) (an incoming call from a country using the country code specified by ITU will show "+" prefix of that country.), and (5) preparing the Unstructured Supplementary Services Data (USSD) with the number "*138" to provide options for the recipients to reject overseas calls. The system also allows the users to cancel the service anytime.



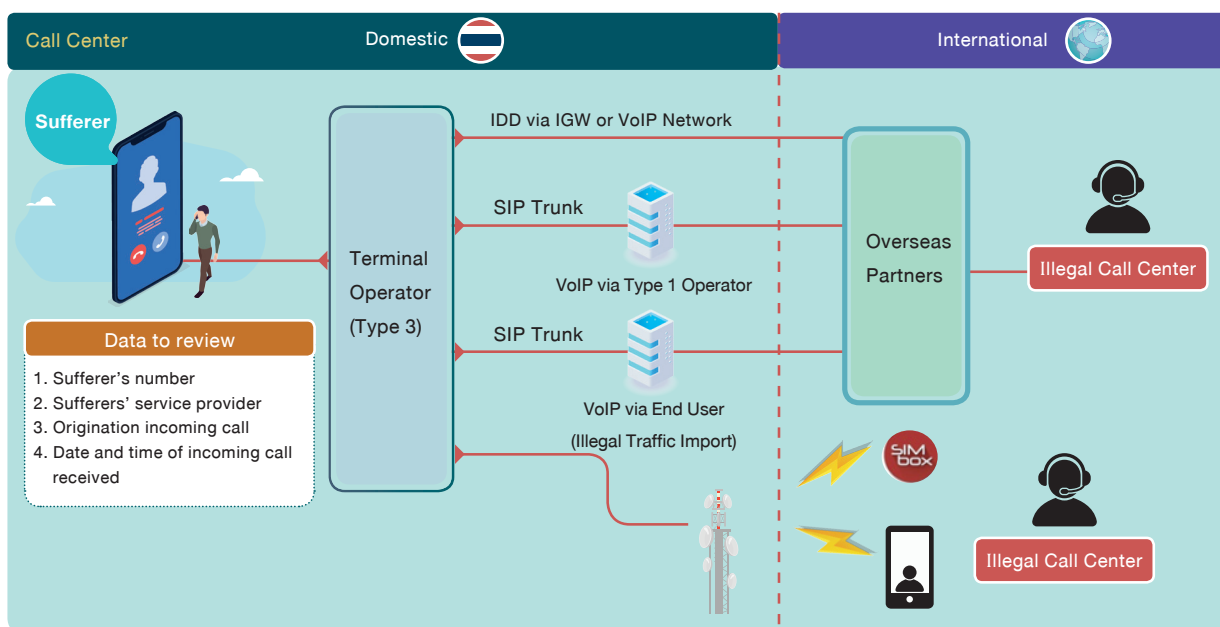


(2) Domestic phone call.

Typically, scammers may buy loads of sim cards to make phishing calls to deceive people. Thus, the NBTC prescribed measures to resolve and manage sim card registration by (1) requiring every mobile operator to control the number of sim card registration of their customers, in case of an individual, no more than 5 registered numbers per customer. If the customer intends

to register more than 5 numbers, he/she must contact the operator's service center for registration, (2) preparing the proactive measure by monitoring the call traffic from overseas with unusual usage behavior or deemed illegal. As soon as the operator can identify the location of committing the offense, it shall notify the Royal Thai Police for further legal proceedings. The details are shown in Figure 2

Figure 2 Illustration of phishing call by impersonating other person through phone call or electronic media



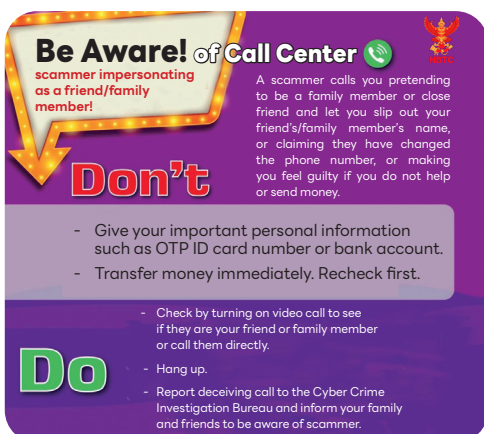


5.2 Creating people's awareness constantly.

Today, the technology is changing rapidly, and likewise the scam tactics. The best way to prevent these scams is to build immunity for people by reinforcing them with the updated information about types of scams to develop literacy effectively. The Office of the NBTC has built the scam awareness to the people by preparing the "SCAM Alert" database for collecting patterns of fraud via mobile phones and electronic media, problem-solving guidance, and contacts of help centers for assistance or complaint handlings. The NBTC has also necessarily publicized the database for building knowledge to people to tackle the scammer's tactics, including (1) "5 Do 5 Don't", as a guide list of what to do and not to do when receiving calls from scammers, (2) common scammer's tactics, to educate people such as claims of being a

financial or governmental institution, (3) whistle-blowing channels, to promote the channels for filing complaints or whistleblowing, (4) guidance to deal with phishing calls or SMS fraud, and (5) warning: call scams and SMS scams.

Furthermore, the Office of the NBTC has integrated the whistle-blowing channels with every mobile operator, and collaborated with the Online Fraud and Complaint Center (1212 ETDA) of the Ministry of Digital Economy and Society, to interconnect complaint information on scams via mobile phones and electronic media, as well as improving public relations means for more effective and comprehensible, such as infographics, images and motion pictures on telecommunications consumer's right, measures against call center scams, cautions on fake calls impersonating as known persons, and filing complaints through 1200 Call Center.

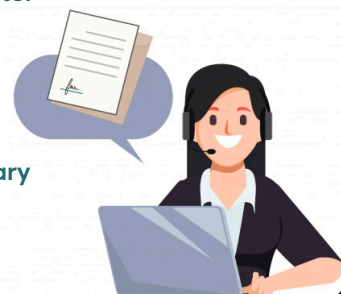


Filing a complaint via Call Center 1200



A complainant must provide facts about the problem and enclosed related documents for consideration based on Section 8 of the Notification of the NBTC on Complaint/Handling Process and Consideration in the Telecommunication Business B.E. 2559 (2016) starting that the complainant who wish to file a complaint must submit document with the following details.

1. First name – Last name of the Complainant
2. ID card number/a copy of passport/a copy of any other identity card issued by a government agency
(In case of granting authorizations, the Attorney' 13-digit ID card number, a copy of Grantor's ID card with certified true copy shall be endorsed with the Power of Attorney.)
3. Postal Address
4. The phone number to be complained
5. Telephone number for contact
6. The mobile operator to be complained
7. Facts about the problem
8. Desired outcome
9. Other documentary evidence (if any)



5.3 Collaboration with related agencies.

The NBTC has collaborated with Cyber Crime Investigation Bureau (CCIB), and the telecommunications licensees in following-up, monitoring, whistleblowing, and submitting the complaint information from people. In case of the action deemed fraud or illegal either in the form of SMS scam or phone scam, the legal proceedings shall be executed. On July 6, 2022, the Office of the NBTC together with Cyber Crime Investigation Bureau (CCIB) and Advanced Info Service Public Company Limited raided

8 areas in Bangkok as specified by the search warrant, and arrested the offenders and another 3 suspects, as well as seizing the exhibits including 43 IP PBX telephone extensions, 30 wireless routers, and others, such as account books and mobile phones, deemed illegality according to the Radio Communications Act B.E. 2498(1955). Such operations are considered as the integrated collaboration of agencies for proactive work in legal enforcement to suppress the offenders actively, to tackle the phone scams, alleviate suffering, and leverage justice to people.



The Office of the NBTC together with CCIB and related agencies raided and seized the scammers in 8 areas around Bangkok

5.4 The public network development in telecommunications consumer's rights protection.

The NBTC has empowered the public networks to extend the knowledge on consumer's rights to communities nationwide, and organized activities to enhance knowledge on consumer protection in telecommunications service to the public networks covering 77 provinces nationwide as follows:

1) Organizing the workshops to enhance knowledge, follow up and evaluate the public network leaders in consumer protection in telecommunications service at

the provincial level in any region, and conduct comprehensive evaluation of the participants by taking assessment questionnaires. From the past events, the assessment results show that the participants' understandings of consumer's rights in telecommunications service are at the excellence level.

2) Organizing the conferences with related parties to foster understanding on complaint handling in 4 regions, and visiting the sites to monitor the implementation of the Notification of the NBTC on Complaint Handling Process and Consideration in the Telecommunication Business B.E. 2559 (2016).



5.5 The criteria and measures development on consumer protection.

The key operations in developing the criteria and measures on consumer protection are as follows:

1) Repealing the NBTC regulation on Dispute Mediation between Telecommunications Licensee and Complainant B.E. 2555 (2012).

The regulation was repealed to shorten the solving period and process without affecting the rights of the complainant who suffered from the telecommunication services. Currently, it is in the process of publishing in the Royal Gazette for further implementation. In addition, the NBTC has amended the Notification of the NBTC on Complaint Handling Process and Consideration in the Telecommunication Business B.E. 2559 (2016) to comply with the current situation, by considering the technology convergence, licensing, and telecommunication business regulation, to ensure clearer and more effective practices, in accordance with the repeal of the NBTC regulation on Dispute Mediation between Telecommunications Licensee and Complainant B.E. 2555 (2012). Currently, the repeal is in progress.

2) Revising the licensing criteria and conditions related to consumer protection concerning personal data, privacy, and communication freedom in telecommunication service.

In 2022, the NBTC prepared the draft Notification of the NBTC on Measures on Telecommunication Consumers Rights Protection of Personal Data, Privacy, and Communication Freedom in Telecommunication Service, to ensure the consumer rights protection, together with the utilization of user's personal data for telecommunication service or other purposes, are updated and effective in order to support the technology development and the convergence of digital business in public service, in compliance with the Personal Data Protection Act B.E. 2562 (2019), which effective from

June 1, 2022. According to the NBTC Meeting No.29/2022 on October 26, 2022, the NBTC approved the draft Notification of the NBTC on Measures on Telecommunication Consumers Rights Protection of Personal Data, Privacy, and Communication Freedom in Telecommunication Service, and brought to the public hearing event on November 28, 2022. The summary of the public hearing was prepared by the Office of the NBTC. It is in the process of the summary submission to the subcommittee on consumer protection in telecommunication business, to the NBTC for further consideration.

6. Studying the impact of Over-the-Top (OTT) services on mobile service tariff.

As the ASEAN Initiative for Facilitating Sustainable Over-the-Top (OTT) Ecosystem proposed by Thailand (Office of the NBTC) to the ASEAN Summit was approved in the ASEAN Digital Ministers Meeting, and became effective from January 21, 2021, it stipulates the ASEAN member states to share and exchange information on OTT businesses and services in the ATRC meeting and related events in economic and social aspects. Regarding the information exchange in the meetings, it shows that the free OTT services have a higher rate of substitution for telecommunication services, resulting in the impact on tariff regulation in the future. Thus, the Office of the NBTC has studied the impact of OTT services on mobile service tariff, and studied global situations and regulations, to gain in-depth knowledge and understanding to prepare for the effective tariff regulation in the future, as well as to benefit consumers to have alternatives, and benefit Thai telecommunication industry in competition promotion. At present, the Office of the NBTC has 6 international cases with analytic studies of the main areas such as current situations, OTT transition and essential tools in regulating OTT services in telecommunication service of those countries.

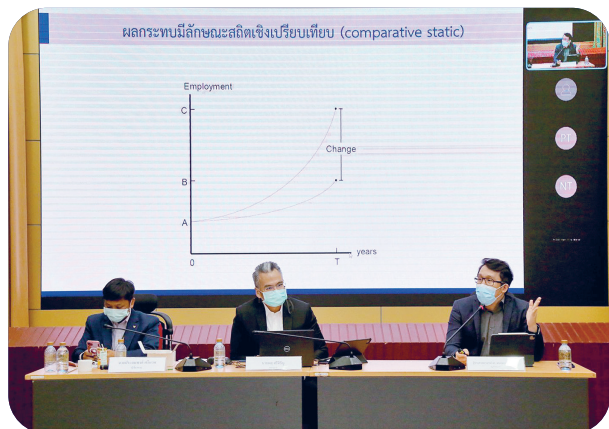


7. Regulating merger in telecommunication service.

In 2022, there was a telecom merger between True Corporation Public Company Limited (True Corp) and Total Access Communication Public Company Limited (dtac). On January 25, 2022, True Corp and dtac submitted the letters to notify the corporate merger together with the merger report to the NBTC. To sum up, under the provisions of Section 146 of the Public Company Limited Act B.E. 2535 (1992) (the PLC Act), the result of amalgamation of True Corp and dtac would form a new public limited company (NewCo) which would assume all assets, liabilities, rights, duties, and responsibilities of the two companies, and the subsidiaries of True Corp and dtac would remain.

In addition, the investment benefit proportion in other legal entities of True Corp and dtac would remain the investment under NewCo.

The NBTC appointed 4 subcommittees to study and analyze the amalgamation of True Corporation Public Company Limited and Total Access Communication Public Company Limited, including the subcommittee on law, the subcommittee on consumer protection and civil rights, the subcommittee on technology and the subcommittee on economics, to consider the corporate merger prudently, comprehensively, and efficiently. Furthermore, the NBTC held focus group meetings to gain feedback for consideration from the operators in the industry, the people, and all related sectors.



The Focus Group meeting on the amalgamation of the telecom companies



In compliance with the Notification of the NBTC on Regulatory Measure on Merger in Telecommunication Service Section 12 (the Merger Notification), the Office of the NBTC submitted the merger report of True Corp and dtac to the NBTC in the NBTC meeting No.11/2022 on May 10, 2022. The NBTC assigned the Office of the NBTC to collect the comments of the subcommittees to study and analyze the amalgamation of True Corporation Public Company Limited and Total Access Communication Public Company Limited, to further analyze and propose to the NBTC meeting. Subsequently, according to the NBTC Special Meeting No.5/2022 on October 20, 2022, the majority agreed that the merger was not deemed holding the same type of business as stated in Section 8 of the Notification of the NTC on Prevention Measures against Monopoly or Actions Leading to Unfair Competition in Telecommunication Service B.E. 2549 (2006), and the implicit result of Section 9 of the Merger Notification, as well as considering operation by the Merger Notification, and noting the merger and prescribing the specific conditions/measures based on Section 12 of the Merger Notification.

8. Developing regulations and licensing schemes in telecommunications and radio communications services.

8.1 The legislation of the Royal Decree based on Section 30 of the Act on the Organization to Assign Radio Frequency and to Regulate the Broadcasting and Telecommunications Services (No.3) B.E. 2562 (2019), to support convergence and effective spectrum use, is a key policy of the Office of the NBTC which needs to be carried out promptly for concrete outcomes to benefit the communication industry in the technological convergence era. Earlier in 2021, the NBTC released 4 notifications to support the provision, which have already been published in the Royal Gazette. In 2022, working group to analyze the impact of the implementation

of the notifications related to Section 30 of the Act on the Organization to Assign Radio Frequency and to Regulate the Broadcasting and Telecommunications Services (No.3) B.E. 2562 (2019) was appointed by the NBTC to study and specify the outlines of the analysis report and guidelines on impact assessment of related laws. In addition, the working group has conducted the analysis report on the impact of the implementation of the notifications related to Section 30 of the Act on the Organization to Assign Radio Frequency and to Regulate the Broadcasting and Telecommunications Services (No.3) B.E. 2562 (2019).

8.2 Revision of criteria related to telecommunications service to fit the industrial ecosystem

One of the key policies to be driven by defining short-term and long-term plans is to revise the criteria. In 2022, the NBTC collected information related to telecommunications and radio communications services such as applicable notifications, rules, and orders, and completed the action plan for revising the criteria related to telecommunications and radio communications services for the year 2022 (short-term) and the 3-years roadmap (long-term). At present, the action plan for revising the criteria related to telecommunications and radio communications services for the year 2022 has been entirely implemented, and the follow-up and evaluation processes have already been completed.





International Affairs

As a governmental administrative agency for international communication service management with the International Telecommunications Union, or with other international organizations, governments and overseas agencies, the NBTC has carried out the missions in international affairs by hosting many significant conferences, participating and sending delegates to the international meetings for collaborating with international regulators which will be beneficial to the broadcasting, television, telecommunications, and radio communications regulations of Thailand. The major performances and achievements of the year 2022 are as follows:

1. Operations as an ITU Council member.

1.1 The NBTC attended the International Telecommunication Union meeting of the 2022 Session of the Council (ITU Council 2022) and hosted the afternoon reception as well as hosting the dinner reception for the

delegates from the member states during March 21 - 31, 2022, at Geneva, Switzerland. The meeting agenda was on plan and policy, budget, progress, and achievements of other ITU meetings, etc. In this regard, Mr. Trairat Viriyasirikul, Acting Secretary-General of the NBTC, was the Head of Thailand delegation to join the meeting. As a Councilor of Thailand, it enabled the delegates to acknowledge the considerable information of the ITU, and to express opinions and recommendations for the nation's benefits. The meeting was regarded as an international arena that offered Thailand to show performances and achievements in telecommunications regulation, and to discuss with other member states, as well as gathering votes for Thailand as in the Asia and Australasia Region, in the ITU Council Member Election (for a term of office from 2023 – 2026), which would be held in the Plenipotentiary Conference 2022 (PP-22) during September 26 – October 14, 2022, at Bucharest, Romania.



ITU Council 2022



1.2 The NBTC attended the Plenipotentiary Conference 2022 (PP-22) during September 26 – October 14, 2022, at Bucharest, Romania, to actively campaign for gathering votes for Thailand in the ITU Council Member Election. In this regard, Clinical Professor Sarana Boonbaichaiyapruk, Chairman of the NBTC, as the Head of Thailand delegation, Mr. Torpong Selanon, NBTC commissioner, as a counselor of Thailand delegation, and Mr. Trairat Viriyasirikul, Acting Secretary-General of the NBTC, as the Deputy Head of Thailand Delegation, together with the representatives from the Office of the NBTC, have joined the

campaign for gathering votes for Thailand during the event. Subsequently, on October 3, 2022, the Chairman of the NBTC, the NBTC commissioner and the Acting Secretary-General of the NBTC attended the Plenary Meeting, held during the Plenipotentiary Conference 2022 (PP-22), to vote for the ITU Council. **Accordingly, Thailand was elected as ITU Council member states for a term of office from 2023 – 2026, with the 4th rank from 16 member states in Asia and Australasia Region, and the 16th rank from 193 member states worldwide, regarded as the highest rank that we have ever had from the previous elections.**



The Plenipotentiary Conference 2022



On this occasion, the Chairman of the NBTC addressed the Policy Statement of Thailand focusing on the ITU'S Connect 2030 Agenda for global telecommunication/ ICT development such as fostering access & increasing the use of telecommunications infrastructure, and the Village Broadband Internet Project (Net Pracharat) to bridge the digital divide. The statement also emphasized on empowering people with digital skills, promoting healthcare with telemedicine, and enhancing 5G utilization in Siriraj Hospital as a "Smart Hospital". Furthermore, on behalf of the Thailand delegation, the Office of the NBTC would willingly support the relocation of the International Telecommunication Union (ITU) Regional Office for Asia and the Pacific.



The Chairman of the NBTC addressed the policy statement focusing on the Connect 2030 Agenda

2. Conferences under the ITU framework.

In 2022, the NBTC and the Office of the NBTC have joined the significant conferences under the International Telecommunication Union (ITU) framework as follows:

2.1 The Global Standards Symposium (GSS-20) on February 28, 2022, the World Telecommunication Standardization Assembly 2022 (WTSA-20), and the Global Standard Symposium (GSS-20) during March 1 - 9, 2022, at Geneva, Switzerland, were attended by Mr. Trairat Viriyasirikul, Acting Secretary-General of the NBTC, as the Head of Thailand Delegation. The agendas for consideration were to adopt the new resolutions, revise some resolutions, repeal the resolutions on telecommunication standards of the ITU Telecommunication Standardization Sector (ITU-T), and prepare the study framework for the study groups in a 4-year period, which deemed benefit protection of the nation in determining a position with the ITU member states. Furthermore, the agenda aimed for suggesting the resolution amendment, and addressing the position for wording adjustment in the Resolution 88 regarding the international mobile service (international roaming) and pushing forward to the Study Group 3 (SG3) meeting and other related meetings. After becoming effective, the draft document will be beneficial to missions and operations related to the international roaming service.

2.2 The Girls in ICT Day Thailand 2022 celebration was co-hosted by the International Telecommunication Union (ITU) and the Office of the NBTC on April 28, 2022, led by Professor Pirongrong Ramasoota, the NBTC commissioner, as the Chairman of the conference, with the participants from various agencies including the Asia-Pacific Telecommunity, the United Nations Resident Coordinator Office Thailand (UNRCO), the United Nations Educational, Scientific and Cultural Organization (UNESCO), the United Nations Economic and Social Commission for Asia





and the Pacific (UNESCAP), the United Nations Entity for Gender Equality and the Empowerment of Women (UN Women), the United Nations International Children's Emergency Fund (UNICEF), the Ministry of Digital Economy and Society (MDES), the Ministry of Education,

Chulalongkorn University, Thammasat University, and CISCO (Thailand) Company Limited, to support the capacity of girls and young women around the world to utilize ICT knowledge with their education and technological career in the future.



The Girls in ICT Day Thailand 2022

2.3 The World Telecommunication Development Conference 2021 (WTDC-21) and other related meetings were held during June 2 - 16, 2022, at Kigali, Rwanda. On this occasion, Mr. Torpong Selanon, NBTC commissioner, addressed the vision statement in the Partner2Connect Digital Development Roundtables (P2C) together with ministers and leaders of telecommunications and ICT regulators from 193 member state, and shared the pledge in Thailand's policy promoting a digital inclusion which gained greatly recognition and appreciation from the international leaders and ITU, as Thailand has highly valued a digital inclusion, particularly the vulnerable groups, and leaving no one behind (Digital Inclusion without accessibility is impossible). In addition, the WTDC-21 meeting included the agenda to discuss on directions and framework of ITU Telecommunication Development Sector (ITU-D) for the year 2022 - 2025, consisting of the ITU Strategic Plan 2024 - 2027, the Action Plan, structure, work methods, new topic proposal of the study group, resolution, and recommendation. The meeting also allowed the representatives of the youth around the world to

participate in promoting innovation development and sustainable digital convergence, which have created new skills in the digital world, and would affect the consideration and policy making in information technology development, as practical guidelines in the future.



The World Telecommunication Development Conference 2021





3. International trade negotiations in service trade and operations under international economic collaboration.

The NBTC and the Office of the NBTC designated the representatives to participate in the trade negotiation meetings to discuss and share opinions, as well as preparing the proposals in related areas as follows:

3.1 Participating in the meetings and negotiations under the framework of the World Trade Organization (WTO) for 4 times via teleconference for considering and determining a position in the e-Commerce code of conduct preparation, under the Article of Telecommunications and other related articles under the framework of WTO.

3.2 Discussing with the US delegates in the revision of Thailand's schedule of agreement on telecommunications at the Uruguay Round under WTO framework, on January 19, 2022, via teleconference. The United States has formerly made an official opposition to the revision of the Article. In this regard, the Office of the NBTC together with the Department of Trade Negotiations and the Ministry of Digital Economy and Society (MDES) have additionally clarified the issue. As a result, the United States officially withdrew the opposition, and the revised Thailand's schedule of agreement on telecommunications was in force from March 9, 2022.

3.3 Participating in the negotiations under the ASEAN-Australia-New Zealand Free Trade Agreement (AANZFTA) for 5 times via teleconference for preparing the annex of telecommunications under the AANZFTA framework and determining a position of Thailand in text proposal of the member states, particularly in the topic of RCEP Plus Elements to improve the telecommunications regulation of the member states to comply with the rapidly changing technology. The NBTC representatives, together with the Department of Trade Negotiations, the Ministry of Commerce

and the Ministry of Digital Economy and Society (MDES), also participated in the negotiation on the Article of e-Commerce in the meeting of Committee on Electronic Commerce (CEC) for 3 times via teleconference, and the meeting of Committee on Trade in Services (CTS) for 3 times via teleconference to consider the issues related to the missions of the NBTC.

3.4 Participating in the negotiations under the European Free Trade Agreement (EFTA) to prepare the mutual free trade agreement in the annex of telecommunications, and participating in the negotiation on the Article of e-Commerce, and the Article of Service Trade, which the mutual parties aim to achieve the negotiation outcomes within 2 years (June 2024).

3.5 Participating in the negotiations under the ASEAN-Canada Free Trade Agreement (ACAFTA) to prepare the Article of Telecommunications under the ACAFTA framework. As Thailand and Canada have never had a mutual trade agreement, such agreement preparation would expand the market and mutually develop trade criteria, as well as improving the telecommunication regulatory standards. Besides, the Office of the NBTC cooperated with the Department of Trade Negotiations, Ministry of Commerce, to support the preparation of the Article of e-Commerce on the issues relevant to the NBTC's missions.

4. Bilateral Cooperation.

In 2022, the Office of the NBTC hosted the bilateral coordination meetings, attended the bilateral meetings between organizations, and sent representatives to participate in the meetings on the relevant issues, with the aims for promoting collaboration in communications regulation of the nation, and preparing the memorandum of understanding between agencies, which would elevate the regulatory capacity of both agencies, such as:





4.1 The virtual meeting of “U.S.-Thailand 6 GHz Standards Workshop” during February 17 - 18, 2022 was co-hosted by the Office of the NBTC, the United States Trade and Development Agency (USTDA), and the Office of the National Digital Economy and Society Commission. On this occasion, the Office of the NBTC presented the progress of the 6 GHz licensing and regulation of Thailand.

4.2 The Bilateral Meeting and the Signing Ceremony of the Memorandum of Cooperation (MOC), with the Ministry of Internal Affairs and Communications (MIC), Japan, was held on May 10, 2022, in Tokyo, Japan. This MOC would encourage collaboration and strengthen the relationship of both organizations for conducting activities, under the revised collaboration framework to comply with the current situations, by considering coordination guidelines in telecommunications, broadcasting, television, and radio frequency management for the future, as well as supporting each other in the international arenas.



The Bilateral Meeting and the Signing Ceremony of the MOC with the Ministry of Internal Affairs and Communications, Japan

4.3 The bilateral virtual meeting with the Independent Communications Authority of South Africa (ICASA), South Africa, was held on July 5, 2022, led by Clinical Professor Sarana Boonbaichaiyapruk, Chairman of the NBTC, as the Chairman of the meeting. The meeting aimed to exchange knowledge and experiences on regulation, as well as encouraging future collaboration of both parties.



The bilateral meeting with ICASA, South Africa

4.4 The bilateral virtual meeting with Agence Nationale de Reglementation des Telecommunications (ANRT), Morocco, was held on July 21, 2022, led by Clinical Professor Sarana Boonbaichaiyapruk, Chairman of the NBTC, as the Chairman of the meeting. The meeting aimed to exchange knowledge and experiences on regulation of both parties.



The bilateral meeting with ANRT, Morocco

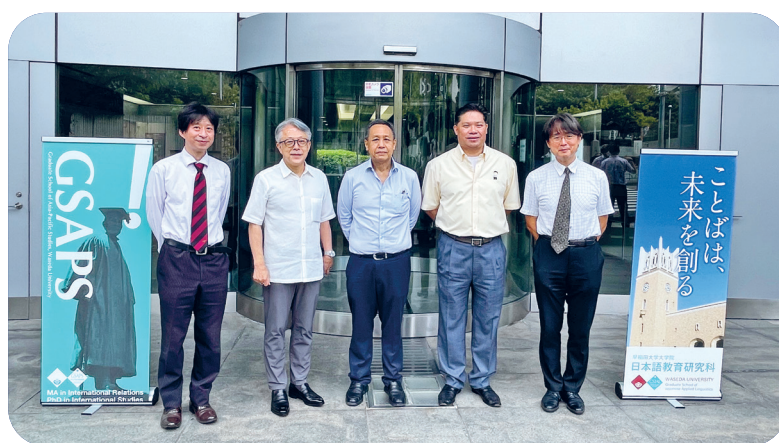




4.5 The meeting with the delegates of the United States Embassy was held on July 22, 2022, at the NBTC Head office to acknowledge the progress of the issues concerning the products related to the spread of Weapons of Mass Destruction (WMD), and the development of two-way communications equipment export controlling system, as well as encouraging future collaboration of both parties.

4.6 The meeting with Waseda University, Japan was held on August 23, 2022.

On this occasion, Associate Professor Suphat Suphachalasai, the NBTC commissioner, and Mr. Trairat Viriyasirikul, Acting Secretary-General of the NBTC, joined the discussion on technical collaboration of both organizations, scholarship for master's degree and doctoral degree, internship program, and strategic database development project, as well as collaboration with the International Telecommunications Society (ITS) for co-hosting the 16th ITS Asia-Pacific Conference in 2023.



The meeting between the Office of the NBTC and Waseda University, Japan

4.7 The meeting with the Parliamentary Vice-Minister, Ministry of Internal Affairs and Communications, Japan, was held on August 24, 2022. On this occasion, Associate Professor Suphat Suphachalasai, the NBTC commissioner, and Mr. Trairat Viriyasirikul, Acting Secretary-General of the NBTC, joined the discussion on

the strategic database to exchange knowledge on information management for analyzing the information technology industry, and prescribing related policies. Currently, the Office of the NBTC is studying the strategic database for developing the technical strategies of the organization.



The meeting between the Office of the NBTC and the Ministry of Internal Affairs and Communications, Japan



4.8 The bilateral meeting with the Korea Communications Commission (KCC), Republic of Korea, was held on August 29, 2022, to strengthen the relationship and pursue collaboration under the MOU framework. On this occasion, Professor Pirongrong Ramasoota, the NBTC commissioner, joined the discussion on Thailand - South Korea collaboration in

co-production, OTT regulation in the nation, and policy for supporting the terrestrial television operators to adjust and improve their competitive performance to comply with the social context and consumer behavior in the digital era, as well as guidelines on quality content production to elevate the television industry of Thailand.



The bilateral meeting between the Office of the NBTC and KCC, Republic of Korea

4.9 The bilateral meeting with the Korea Communications Standards Commission (KCSC), Republic of Korea, was held on August 29, 2022, to pursue collaboration under the MOU framework. On this occasion, to promote a good practice in communications and create an environment for accurate information

utilization, Professor Pirongrong Ramasoota, the NBTC commissioner, shared knowledge and experiences on broadcasting content regulation with KCSC, the authority to review broadcasts and internet content in the broadcasting and television services.



The bilateral meeting between the Office of the NBTC and KCSC, Republic of Korea



4.10 The bilateral meeting with the President of the Office of Electronic Communications (UKE) was held during September 10 - 15, 2022 at Warsaw, Republic of Poland. On this occasion, Air Marshal Thanapant Raicharoen, the NBTC Commissioner, as the Head of Thailand Delegation, joined the meeting to maintain the relationship and collaboration, and shared information on spectrum management,

5G deployment promotion, policy for promoting competition in telecommunications, policy for telecommunications Quality-of-Service (QoS) standards, and policy for public protection and disaster relief (PPDR), as well as supporting each party in the international arenas with a focus on ITU collaboration framework, and discussing on the next bilateral meeting in 2023 which will be hosted by the Office of the NBTC.



The bilateral meeting with the President of the Office of Electronic Communications (UKE)

4.11 The meeting with the United States Department of Commerce was held on September 12, 2022, at the NBTC Head office, to discuss on telecommunication economy, radio frequency allocation, the S-Curve industries, which would encourage the economic and telecommunication collaboration between the United States and Thailand, and reinforce the US investment in Thailand, particularly, in the area of digital economy to recover the economy after the COVID-19 pandemic, as well as promoting the telecommunication services of Thailand.

was held from September 27 - October 1, 2022, in the Republic of Korea. On this occasion, Professor Pirongrong Ramasoota, the NBTC commissioner, gave a speech on “Challenges of International Broadcasting Co-Production Strategies,” and Thailand’s television market situation after the emerging of OTT services (Over-the-Top), as well as the advantages of Thailand in the global market, and challenges of the operators in Thailand in international broadcasting co-production. In this regard, Thailand was invited and honored to be the Country of Honor for this annual event.

4.12 The International Broadcasting Co-Production Conference 2022 (IBCC 2022)



The International Broadcasting Co-Production Conference 2022 (IBCC 2022)



The Operations to Support the Government Policies Implementation

The NBTC and the Office of the NBTC have carried out the missions to continually support the implementation of government policy for improving the communications infrastructure of Thailand to meet the global standards and facilitating the development of the healthcare system for the benefit of the nation and people. The major performances in 2022 are as follows:

1. Measures to assist people and the licensees, and support the protection and treatment from the Coronavirus disease 2019 (COVID-19) pandemic.

The NBTC and the Office of the NBTC have continually supported the government policy and measures on protecting, controlling, and mitigating the impact of COVID-19 pandemic by prescribing the measure to assist people and the licensees, and support the COVID-19 protection and treatment, measure on broadband internet provision for online education, and measure to assist the telecommunications licensees affected by the COVID-19 pandemic. The NBTC also supported the healthcare administration of the government agencies and extended the assistance measures to 2022. The qualified telecommunications licensees were able to deduct the equipment and service expenses, which occurred from the measure support, from the revenue to submit to the Broadcasting and Telecommunications Research and Development Fund for Public Interest (BTFRP) which used for basic telecommunications service provision, according to the Notification of the NBTC on Criteria and Procedure for Deducting Expense

for Telecommunication Obligations for Public Interest, under the operational budget of 200 million baht.

In 2022, the Office of the NBTC and the participating telecommunications licensees supported the internet system, computers, laptop computers, mobile phones, CCTV cameras, mobile phone service charges, and SMS charges of the government agencies. Accordingly, in the 3rd quarter of 2022, as the overall situation of the COVID-19 pandemic has improved, particularly in Thailand, the Center for COVID-19 Situation the Administration (CCSA) repealed the Declaration of the Emergency Situation in all areas of the Kingdom of Thailand, effective from October 1, 2022, resulting in the end of the measure support.

2. Local digital investment promotion.

Granting the mobile network operator licensing without its own networks for Data Center and Cloud Service of Thailand is not limited to a legal entity with at least 51 percent of the Thai ownership proportion. A foreign owned company may also apply for a service license under the telecommunications license type 1. Such regime aims to support the economic recovery of the country after the COVID-19 situation resolved, and facilitate the foreign owned companies to do the telecommunications services in Thailand, in accordance with the government's measure for digital investment promotion, and the Board of Investment of Thailand's policies to promote investment, which



attract more foreign operators to invest in Data Center and Cloud Service in Thailand, as well as supporting the government's policy in digital investment promotion.

In 2022, the Office of the NBTC granted the telecommunications licenses for Data Center and Cloud Service to 7 operators including Internet Thailand Public Company Limited, Supernap (Thailand) Company Limited, AIMS Data Centre (Thailand) Company Limited, STT GDC (Thailand) Company Limited, ABPO Company Limited, Netmarks (Thailand) Company Limited, and Alibaba Cloud (Thailand) Company Limited. This could bring about investment and operation in related businesses, maximize the competitive performance of the nation, and increase revenue to the nation from related services more than 2,300 million baht during 2018–2020.

3. Integration with related agencies for the National Reform Plan implementation in healthcare.

During August 3 - 5, 2022, the Office of the NBTC together with corresponding

organizations including Ministry of Higher Education, Science, Research and Innovation, Ministry of Digital Economy and Society (MDES), Department of Disease Control, Ministry of Public Health, and Bangkok Metropolitan Administration, organized a conference in the topic of “Big Rock 1: Health Security, the Next Step of the National Healthcare Reform” to support the national reform in healthcare in terms of strengthening the health information system, enhancing the digital healthcare system innovations, and reforming the primary service system in Bangkok for sustainable outcomes. In this regard, the NBTC and the Office of the NBTC contributed policy and budgetary support for sustainable furtherance, such as developing communications infrastructure for better primary service efficacy in Bangkok with Telemedicine System, budget allocation, and supporting the Ministry of Public Health and Ministry of Digital Economy and Society (MDES) in providing the cloud system for health districts to improve the health information connection of the nation.



Big Rock 1: Health Security conference with related organizations



Strategy and Organization Management

The NBTC mandates the management, officers, and employees of the Office of the NBTC to carry out their duties with integrity, morality, and transparency as well as maintaining the operational standards adhering to the good governance principles. In addition, the NBTC emphasizes on applying technology to increase productivity, in compliance with the policy to

transform the Office of the NBTC to be the fully digitalized organization, to facilitate people and upskill the officials in technical expertise to keep up with the digital era, and become a key driver for communications regulation of the nation. The major performances and achievements in 2022 are as follows:



Management of the Office of the NBTC

1. Maintaining the operational standards and focus on developing the organization according to the Integrity and Transparency Policy to elevate the organization with integrity and transparency sustainability.

1.1 The Office of the NBTC joined the Integrity and Transparency Assessment (ITA) for the year 2022. As evaluated result by the Office of the National Anti-Corruption Commission (NACC), the Office of the NBTC won the Integrity and Transparency Assessment (ITA) Awards 2022 with the score of 99.58 (AA level), and ranked the 1st of the government agency category, regarded as the third consecutive year of the organization for the AA level. In addition to the Award, the Office of the NBTC was awarded the plaque of honor and the certificate of commendation from the Prime Minister and the Chairman of the NACC as the Office of the NBTC has defined a major policy for the year 2022 to maintain the integrity and transparency operational standards for the AA level and sustainable development. The awards received were the encouragement of the Office of the NBTC to focus and put effort in the effective development to be a sustainable organization with integrity and transparency, and take the assessment result to improve the operation for the maximum benefit to people.





1.2 The Office of the NBTC prepared good governance promotion plan for a 6-year term (2022 - 2027) and organized several activities for promoting the organization to be a sustainable organization with good governance as follows:

1) Preparing the Office of the NBTC's good governance promotion plan in compliance with the 4 principles of basic governance including sufficiency, discipline, morality, and volunteering. In 2022, the Notification of the Office of the NBTC on Intention to be a Moral Organization has been circulated to the management and officials of the Office of the NBTC to sign the declaration of intent. In addition, the Anti-Corruption Action Plan has been prepared to be a guideline for driving operation in the areas of anti-corruption and transparency within the organization in line with the good governance principles.

2) Organizing the activities continually to promote good governance, ethics, and anti-corruption of the Office of the NBTC, such as organized the training to enhance knowledge and participation in promoting integrity and transparency of the Office of the NBTC, to improve the understanding of the officials in the assessment criteria, to build engagement with officer to develop their work process effectively, organized the stakeholder meeting, including organized the Best of NBTC 2020 ceremony was also held to award the plaques of honor and certificates to the nominated officers. At present, the draft Notification of the NBTC on the Code of Ethics of the Office of the NBTC is in preparation for applying as a guideline for the management and officials to comply with the ethical standards.

2. Elevating the Office of the NBTC to be a model of Digital Organization

2.1 In compliance with the national plans and policy in uplifting governmental service to digital government, the Office of

the NBTC has prepared the Strategy Plan of the Office of the NBTC Digital Development B.E.2565-2570 (2022 - 2027) to drive the NBTC strategic plan for reaching a fully digitalized organization (NBTC Digitalization) and a data-driven organization, to enhance the digital infrastructure and administration to be up-to-date and comprehensive, in accordance with Thai and international law and regulation, as well as integrating data and workflow with digital technology to support the operation of every sector.

The roadmap also focuses on Open Government Data with transparency, and digital technology development for more effective public service to people and service recipients, leading to a prompt service provision in compliance with the work policies in the digital era, which have been prioritized since 2018, as well as integrating data sharing with other agencies, such as the Single Point Data Searching System, the application of Artificial Intelligence (AI) and Robotic Process Automation (RPA) to data analysis and data connections, the application of Automation system to reduce the data arrangement with automatic e-Document searching system to enable efficient workflow.

In particular, the NBTC Service Portal was developed as an information portal for people and service recipients in every sector according to the Digitalization of Government Service Plan, phase 2, covering 6 missions and One-Stop-Service provision. **Consequently, the Office of the NBTC won the Digital Government Award 2022 (DG Awards 2022) held by the Digital Government Development Agency (Public Organization) (DGA), with the 1st rank from 1,935 participating agencies,** and won the Quality Organization Award 2022 in Digital workforce category which is award given to government agencies that committed to develop their organization towards digital government of Thailand.





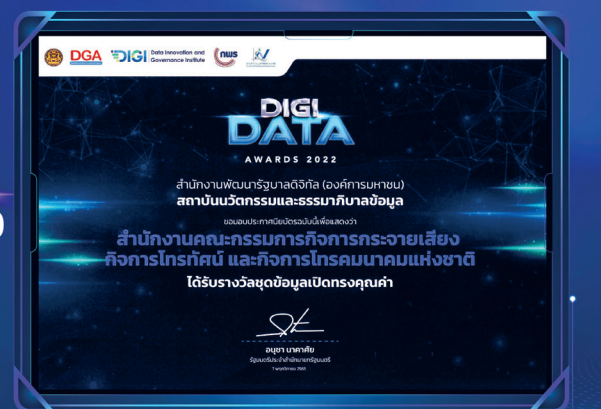
The DIGI Data Awards 2022 Ceremony

2.2 The Office of the NBTC carried out data disclosure with transparency and offered the related sectors to utilize the data. In 2022, the Office of the NBTC was one of the DIGI Valuable Data Catalog Award Winners in the DIGI Data Awards 2022 Ceremony held by the Data Innovation and Governance Institute, the Digital Government Development Agency

(Public Organization) to grant the awards to stimulate driving for digital government under the concept of Data Driven Organization. Receiving this award represented the determination to transform the organization to become the digital government with data governance and Open Government Data disclosure through Open Government Data Portal.



The Office of the NBTC won the **"Valuable Open Data Award"** in the DIGI DATA AWARDS 2022 Project By the Digital Government Development Agency (Public Organization)



NBTC DATA CATALOG

<https://datacatalog.nbt.go.th>





2.3 The Office of the NBTC has developed the e-Licensing system (e-BCS) as a means of adding a license application channel for broadcasting and television operators. The system accommodates the operators as they can apply for licenses without traveling to the NBTC Headquarters to submit the documents. Applying the system is regarded as utilizing technology to improve work and service of the Office of the NBTC to meet the customer's needs promptly and effectively.

In 2022, the access rate to the e-BCS system of operators accounted for 100 percent. Additional mobile applications were also developed to facilitate users and support the operation including (1) e-BCS Mobile Application for operators, with 1,132 downloads

(894 downloads on Android and 238 downloads on iOS), as of December 31, 2022, (2) BCS Mobile App for officials. **Subsequently, despite joining the contest for the first time, the Office of the NBTC won the Public Sector Excellence Awards (PSEA) 2022 in the public service category with a good level in the service development sub-category, held by Office of the Public Sector Development Commission (OPDC).** Typically, the Public Sector Excellence Awards (PSEA) are offered to the government agencies providing convenient, prompt, transparent, fair, and satisfying service to people. Receiving this award represented the determination and contribution of the Office of the NBTC in digital development to step towards the digital organization to reform the country to truly Digital Thailand.



The Public Sector Excellence Awards Ceremony 2022 :
The Public Service Award in Service Development with e-BCS System



2.4 The Office of the NBTC has developed a communication channel and publicize information to the public through LINE official account “@NBTC” as a channel to disseminate information and press releases of the Office of the NBTC and other government agencies to broadcasting, television, and telecommunications operators, as well as the people. The channel makes mutual communications updated and fasted for various urgent situations, in accordance with the government policy to increase communication channels between the government agencies and people with promptness and convenience, in line with the National Digital Economy and Society Development Plan and Policy. As of December 31, 2022, the @NBTC Line group had around 7 million members.

3. Preparation for policy and guideline on information security

The Office of the NBTC focuses heavily on information security in communication industry governance, by driving the policy to

promote enforcement of the Personal Data Protection Act (PDPA) under the concept of “secure, fast, transparent and verifiable,” based on the standard of the Data Protection Office (DPO). The Office of the NBTC also upskills the officials in the area of cybersecurity, and further developed the e-BCS Mobile application to enable operators to apply for licenses and check the operational status via mobile phones, as well as organizing the “Personal Data Protection Act: PDPA Compliance” workshop of the NBTC officials to impart knowledge on personal data protection and data owner’s rights protection, based on the Personal Data Protection Act B.E. 2562 (2019), and the personal data protection policy of the Office of the NBTC. Consequently, in 2022, **the Office of the NBTC won the Cybersecurity Excellence** from the National Cyber Security Agency (NCSA) in “Thailand Cybersecurity Excellence Award 2022” ceremony. On this occasion, 21 agencies, out of 133 participating agencies, were granted trophies in many categories.



The Excellence Organization Award for cybersecurity adhering according to international standards in information technology and telecommunications field.



4. Budget Management in 2022.

In 2022, the Office of the NBTC prepared a budget surplus, with the accrued revenue of 8,540.354 million baht, and set an expenditure budget for the year 2022 for 6,765.781 million baht. The result of the expenditure budget of the operation of the Office of the NBTC of 6,059.264 million baht, and was remitted to Digital Economy and Social Development Fund, according to Section 24 (4) of the Digital Development for Economic and Society Act B.E. 2560 (2017) on Cash Basis for 1,276.982 million baht. It is expected to submit additional revenue as the state income for 1,204.107 million baht.

5. Promoting and Supporting Broadcasting, Television, and Telecommunications Research and Development for Public Interest.

The Office of the NBTC approved fund allocation, in accordance with the objectives of the Broadcasting and Telecommunications Research and Development Fund for Public Interest (BTFP), proposed by the BTFP fund Management Committee as follow:

Category 2 - the projects that aimed to achieve the policy goals of the BTFP Fund Management Committee, in a total of 31 projects for 560.02 million baht, and 1 ongoing project for 12.59 million baht.

Category 3 - the projects or operations assigned by the NBTC to achieve the objectives of the BTFP, in a total of 2 projects for 1,300 million baht, including 1) organizing the communications lines according to the Cabinet resolution on November 23, 2021, and the resolution of the NBTC meeting No.2/2022 on January 21, 2022, for 700.00 million baht, and 2) supporting a budget to the Ministry of Tourism and Sports for the FIFA World Cup Final 2022 broadcasting, according to the resolution of the NBTC meeting No.30/2022 on November 9, 2022 for 600.00 million baht

Category 4 - Supporting operations

by the Thai Media Fund law under the budget amount of 500.00 million baht. Currently, it is in consideration of the Fund Management Committee and the NBTC.

However, there was no fund allocation to projects in Category 1 in 2022 as it is in the evaluation process of the 4-year action plan implementation. The evaluation outcomes will be brought to revise the action plan and set directions for fund granting in the future for the maximum benefit.

6. Risk management and internal control of the Office of the NBTC.

The Office of the NBTC has operated the internal control and risk management based on the Ministry of Finance's criteria for Internal Control Standards for Government Agency B.E. 2561 (2018) and the Risk Management Standards for Government Agency B.E. 2562 (2019), regarded as a framework for prescribing, evaluating, and improving the internal control system of the organization.

The Office of the NBTC set up the Internal Audit Committee, the Internal Control Assessment Committee, and the Risk Management Committee to prescribe an internal control evaluation guideline, and prepare the internal control plan and the fraud risk management plan for the year 2022, with a monitoring process every 6 months. Furthermore, the committee has developed the internal control and risk management systems for follow-up and evaluation, and has given recommendations for implementing the internal control and risk management plan of the Office of the NBTC of the year 2020 - 2022, as well as organizing a training on guideline on fraud risk assessment, with the lecturer from the Office of the National Anti-Corruption Commission (NACC), to impart knowledge on fraud risk assessment to the



NBTC officials and encourage them to realize the importance of risk management. Currently, it is in the preparatory process of the internal control and risk management plan of the Office of the NBTC for the year 2022 – 2027 as a framework for further operations.

7. Human Resource development and knowledge sharing to the employees.

7.1 Supporting and promoting knowledge and capability improvement continually for the NBTC officials to drive the digital organization by upskilling operational expertise, technological skills, and other related skills to create high performance under good governance framework, and providing certified courses, as well as organizing activities to upskill workforce and prepare to be a model of digital organization.

7.2 Conducting internal trainings and sending the officials for external trainings based on the annual human resource development plan of the Office of the NBTC, in various topics such as digital transformation upskill, legal knowledge development, personal data protection, regulation in broadcasting, television, telecommunications, and satellite and orbit management, as well as foreign languages, etc. The internal and external experts were invited to educate the NBTC officials and discussed in the academic seminars in related topics, to encourage the officials to apply the knowledge to their work productively, and enhance the regulatory capacity for broadcasting, television, telecommunications, and satellite services among the rapidly changing industry ecosystems.



The workshop on regulatory capacity improvement

7.3 Organizing the annual academic seminar to enable knowledge sharing and collaboration with other sectors related to broadcasting, television, telecommunications, and satellite businesses, as well as collaboration with academics and experts. On this occasion, Clinical Professor Sarana Boonbaichaiyapruk,

Chairman of the NBTC, presided at the seminar and give the opening remarks, as well as sharing knowledge and experience, together with the NBTC commissioners, Air Marshal Thanapant Raicharoen and Police General Nathathorn Prousoontorn.





The seminar to share knowledge to the NBTC officials

8. Conducting activities to create value for society and environment

The Office of the NBTC have supported activities and projects for social contribution, collaborated with other agencies to create value for people, society, and environment, supported operation of related agencies, and regulated the operators in emergency and disaster preparedness as follows:

1) Collaborating with the mobile operators including AIS, True Corp and dtac to mitigate the impact of flood affected by Typhoon Noru by requiring them not to cut off the mobile signal in the affected areas, extending the billing cycle for postpaid customers for 1 month, and extending usage period for prepaid customers. The Office of the NBTC also instructed every

mobile operator to ensure the availability and preparedness of mobile signal, base stations, and maintenance teams to handle the situation. For example, in April 2022, the mobile operators were instructed to be prepared for tropical storms at Nakhon Nayok, Prachin Buri, Sa Kaeo, Chachoengsao, Chonburi, Rayong, Chanthaburi, and Trat, to prevent possible damage to their base stations and fix the signal or network failure timely. By this, the people in such areas could use the service continuously and effectively.

2) Following up and coordinating with radio stations nationwide to prepare for news and warning broadcasts in case of emergency or disaster, to keep the people updated to the situation and cooperate with the government and government agencies as required.





Due to heavy rain in many areas in Thailand, a close observation for flash floods, strong winds and natural disasters is needed, as these disasters may cause damage to health, life, properties, and public health system. Thus, the Office of the NBTC instructed every broadcasting and television operator to strictly follow the Notification of the NBTC on Criteria and Operational Procedures for Emergency or Disaster B.E. 2555 (2012).

3) Supporting a volunteer activity to donate necessary supplies (“Mee Laew Bangpan”) to Rajvithi Home for Girls, and a

volunteer activity to develop the community around the Manangkhasila Mansion on the occasion of the Birthday Anniversary of His Majesty, on July 28, 2022.

4) Supporting the Thai Red Cross Society for a project to upgrade the geographic information system (GIS) to assist the sufferers.

5) Supporting the “Crown Prince Hospitals for People” medical project to commemorate the kindness of His Majesty.

6) Encouraging the NBTC officials to share and donate supplies and protect the environment.



The activities to create value for society and environment for the year 2022



Organizational Restructure by Adding the Academic Cluster

Nowadays, competition authorities in many countries have been stepping towards the evidence-based regulators by prescribing regulatory policy, measure, or decision-making based on evidence generated through academic studies and research, as well as disclosure to the public to achieve transparency, and to show that the prescribed policy/measure has been through a thoughtful process, which making those regulators internationally recognized, and academic reference offered. Their regulations could also be the practice models for other regulators around the world.

The Office of the NBTC, as a regulator for broadcasting, television, and telecommunication services of Thailand, must move forward to be the evidence-based regulatory body. That is, it shall study and analyze aspects of broadcasting, television, and telecommunications services concretely and accurately with respect to objectivity in decision making, that is based on impersonal facts. In addition, it shall include policy impact analysis and evaluation in the process. To achieve this, the Office of the NBTC must be the organization with high-level technical proficiency to support work in related fields. Furthermore, the Office of the NBTC, as a main regulator of the nation, should formulate regulatory practices for broadcasting, television, and telecommunications services that meet the international standards. It should also take part in academic contribution and international engagement with international organizations or through agreements, as well as encouraging academic cooperation networks with international regulators and leading

academic institutes with expertise in these fields.

To achieve these goals and to comply with the Act on the Organization to Assign Radio Frequency and to Regulate the Broadcasting and Telecommunications Services (No.4) B.E. 2564 (2021) as well as the current situation, the NBTC has conducted an organizational restructure by adding the Academic Cluster to support the missions effectively, and drive the organization to achieve the aim to be the regulator with international standard and high-level technical capabilities that leads forward to an internationally-recognized organization with contribution in the international arena. The academic cluster comprises 4 bureaus and 1 Hub as follows:

1) The Policy Analysis Bureau

is responsible for studying, analyzing, supporting, monitoring, and offering technical recommendations on markets and competition in broadcasting, television, and telecommunications services, by adopting academic and economic principles in qualitative analysis, assessment of possible social impact of regulatory policy, policy analysis of technological development and dynamic competition, and legal framework related to competition and policy analysis, as well as performing other tasks as assigned.

2) The Policy Assessment Bureau

is responsible for studying and performing quantitative and numerical analysis of spectrum valuation, demand forecasting, economic impact of the NBTC policy, and regulatory impact of the Office of the NBTC policy prior to implementation, as well as performing other tasks as assigned.





3) The Digital Economy Data Analytics

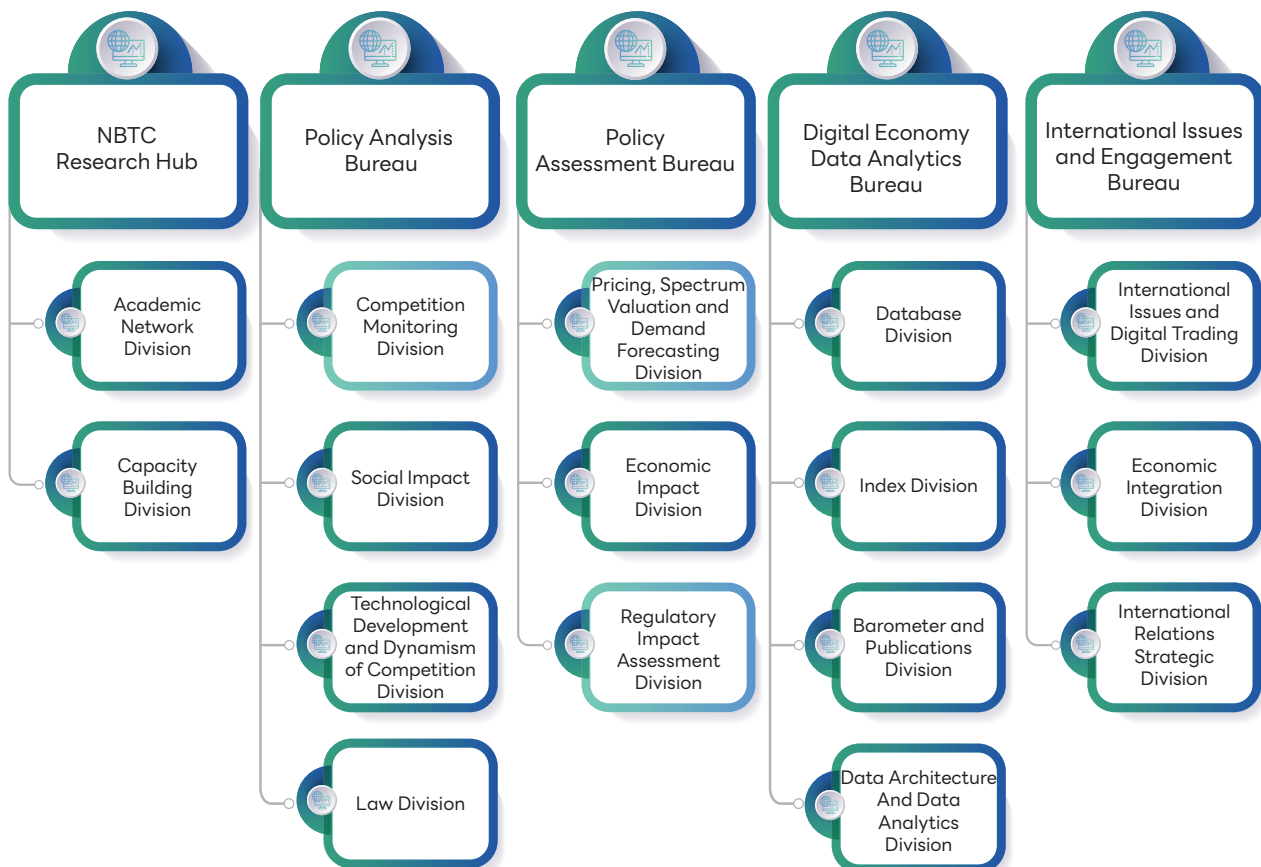
Bureau is responsible for collecting and preparing a significant economic strategy database for supporting the policy preparation of the Academic Cluster and the Office of the NBTC. The bureau is also responsible for studying and preparing the broadcasting, television, and telecommunications index, and academic research publications, monitoring significant economic situations, and conducting data architecture and data analytics of the Office of the NBTC to support the regulatory policy making, as well as performing other tasks as assigned.

4) The International Issues and Engagement Bureau is responsible for studying and performing academic tasks on future

strategic issues related to international relations, international agreements related to digital technology, and economic integration related to the missions of the NBTC or the Office of the NBTC, as well as performing other tasks as assigned.

5) The NBTC Research Hub is responsible for offering opportunities to external academics in the nation and abroad to concrete academic works with the NBTC officials and being a hub for sharing and imparting regulatory knowledge for broadcasting, television, and telecommunication services. It is also responsible for creating academic networks, and conducting academic activities with internal and international academics, as well as performing other tasks as assigned.

Structure and Internal Divisions Academic Cluster





The Follow-Up and Monitoring the Spectrum Use in Broadcasting, Television, and Telecommunications Services

The Office of the NBTC has been monitoring and examining the use of spectrum in broadcasting, television, and telecommunications services, and collaborating with organizations in the public and private sectors, and the people for public interest, to ensure the spectrum regulation compliance with the Radiowave Propagation Standard of the International Telecommunication Union (ITU), and related notifications and criteria. In this regard, the Office of the NBTC has resolved the frequency interference, monitoring the unauthorized use of frequencies, searched, arrested, and taken legal actions on offenders, according to the Radio Communications Acts B.E. 2498 (1955), the Broadcasting Business Act B.E. 2551 (2008), and the Telecommunications Business Act B.E. 2544 (2001), as well as regulating the services for safety of human health from using the radiocommunications equipment and electromagnetic fields (EMF) testing. The major performances and achievements of 2022 are as follows:

1. Monitoring radio frequency possession.

The Office of the NBTC has examined the radio frequency possession to regulate the frequency use according to the licensing criteria and conditions, and to prepare an updated radio frequency possession database for effective

frequency allocation, in the case of new frequency allocation, sharing frequency allocation, and unused frequency band refarming. The database would also be a primary information in unlicensed frequency band monitoring for analyzing, further examining the radio frequency possession, and restraining the offenders from the frequency use. In this regard, the NBTC regional offices and sub-region offices have monitored the frequency possession in 2022 as follows:

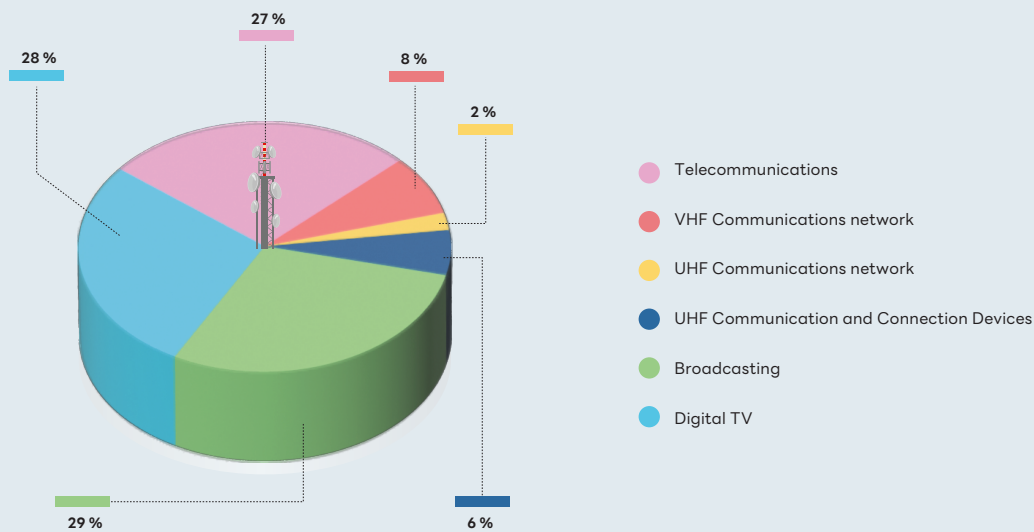
1.1 Measuring frequency usage from 30 MHz to 3000 MHz, categorized into 11 frequency band occupancy (FBO) programs, 24 hours per each. The result shows that some frequency bands have high occupancy rates. The largest proportion of occupancy belongs to the broadcasting service for 29 percent, followed by 28 percent for digital TV service, 27 percent for telecommunications service, 8 percent for VHF communications, 6 percent for devices and other connections, and 2 percent for UHF communications, respectively. As the frequency application in telecommunications, broadcasting, and television services is active all the time and used widely nationwide, resulting in high occupancy rates in some bands. However, some frequency bands are occasionally used for communications, and only in some areas, or with low transmit power, leading to low occupancy rates. The details are shown in Chart 3.





Chart 3

Frequency usage from 30 MHz to 3000 MHz, categorized by types of service



Remark: data as of December 31, 2022

Source: Regional Affairs Bureau, Office of the NBTC

The frequency usage in broadcasting, television, and telecommunications services can be categorized into 3 groups as follows:

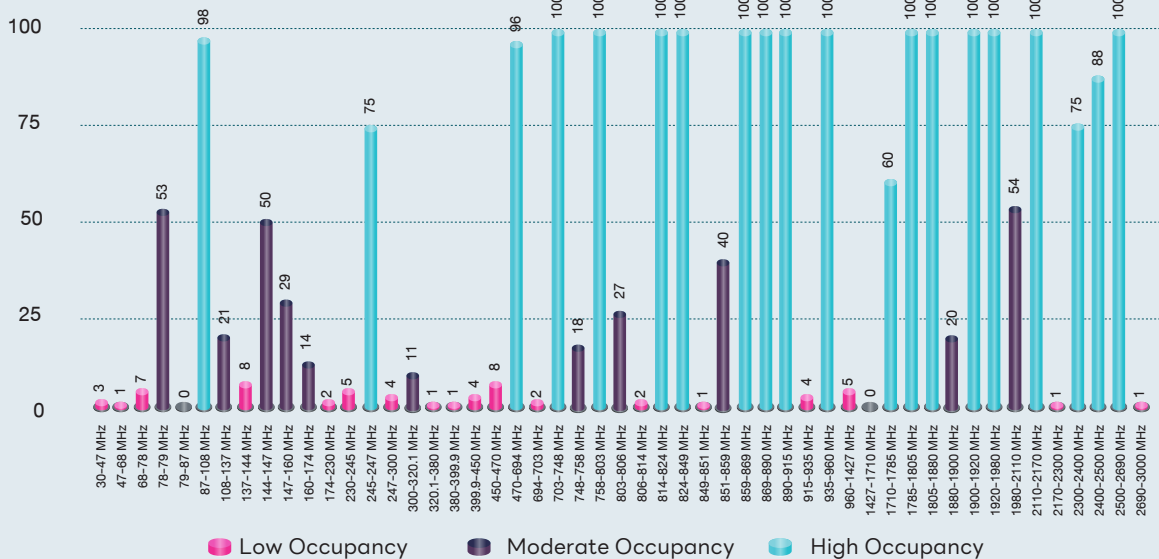
(1) High occupancy range group (occupancy 60 - 100%), regarded as a primary communication network that active all the time with nationwide service networks including radio broadcasting, digital TV, mobile phone, citizen band radio, amateur radio.

(2) Moderate occupancy range group (occupancy 10 - 60%), regarded as a secondary communication network that occasionally used for necessary communications and for substitution network by public and private agencies.

(3) Low occupancy range group (occupancy 0 - 10%), used for low power radio communication in some specific areas. The details are shown in Chart 4 and Figure 3.

Chart 4

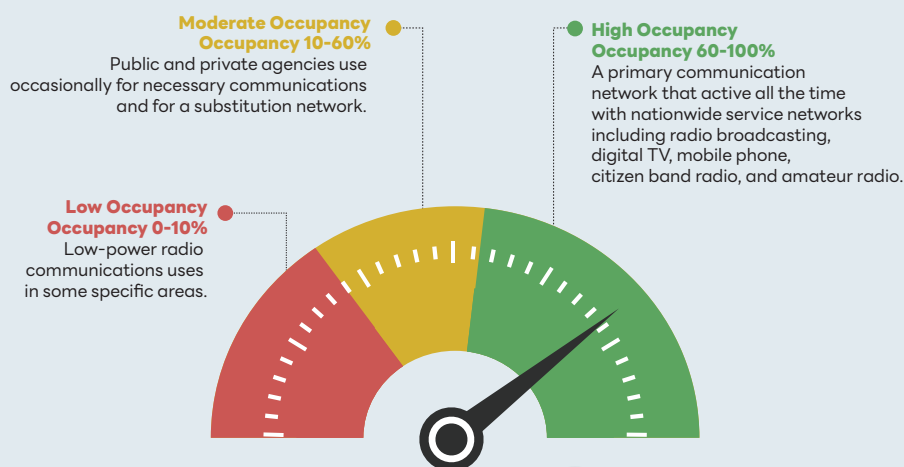
Frequency usage from 30 MHz to 3000 MHz, categorized by occupancy rate



Remark: data as of December 31, 2022

Source: Regional Affairs Bureau, Office of the NBTC



**Figure 3** Frequency usage from 30 MHz to 3000 MHz in 2022

Remark: data as of December 31, 2022

Source: Regional Affairs Bureau, Office of the NBTC

1.2 Verifying frequency possession is conducted after frequency usage measurement process is completed. The frequency possession and licensing information will be verified only for the active frequency bands or as needed, to identify the occupying organizations, and to update the user database with actual usage details, for effective frequency allocation, in the case of new frequency allocation, sharing frequency allocation, and unused frequency band refarming, as well as preventing illegal use.

2. Monitoring frequency propagation standards.

The Office of the NBTC has regulated and controlled radio wave propagation of radio

broadcasting stations, radio broadcasting stations for trial, digital television stations, and mobile base stations, to comply with the standards and conditions specified in the licenses of the Office of the NBTC. It has also provided technical measurement of radio wave propagation as requested or required by internal and international agencies, in accordance with criteria and regulations of the Office of the NBTC, and ITU recommendations, to prevent possible interference from technical defects by configuring the parameter for frequency propagation standard monitoring. The details are shown in Table 8.



**Table 8** Parameters for frequency propagation standard monitoring

Type of Station	Parameter to Examine
1. Radio Broadcasting Main Station 2. Radio Broadcasting Station for Trial	- Frequency Deviation Limits - Unwanted Emission
3. Digital Television Station	- Frequency Deviation Limits - Power (Channel Power) - Bandwidth - MER (Modulation Error Ratio) - CBER (BER Before LDPC) - LBER (BER After LDPC) - C/N (Carrier-to-noise Ratio) - Constellation Diagram
4. Mobile Base Station	- Bandwidth - Unwanted Emission (Harmonic)

According to the frequency monitoring action plan, the Office of the NBTC monitored the frequency propagation standards in a total of 5,150 stations, classified into 4 categories including 1) radio broadcasting stations for trial, 2) radio broadcasting main stations, 3) digital television stations (DTV), and 4) mobile base stations. In 2022, the Office of the NBTC monitored the frequency propagation standards for 5,323 times (5,150 stations). The results showed that there was frequency propagation of the stations that complied with the standards

for 5,184 times, and those not complied with the standards for 139 times, which were monitored repeatedly for 139 times as their propagation failed to meet the standards. The primary cause of non-standardized propagation is the frequency deviation limits that exceed the standards, and the spurious emission that brings about frequency interference. In this regard, the Office of the NBTC notified the operators to solve and adjust their equipment and transmitters to meet the standards. The details are shown in Table 9.

Table 9 Result of Frequency propagation standard monitoring in 2022

Unit: Times

Regional Offices of the NBTC	Quantity (Times)	Type of Station				Monitoring Results		
		Radio Broadcasting Station for Trial	Radio Broadcasting Main Station	Digital Television Station (DTV)	Mobile Base Station	Meet the Standard	Fail to Meet the Standard	Total
Region 1	1,443	1,029	73	170	171	1,343	100	1,443
Region 2	1,335	842	68	186	239	1,335	-	1,335
Region 3	1,350	1,033	79	185	53	1,334	16	1,350
Region 4	1,195	560	109	264	262	1,172	23	1,195
Total	5,323	3,464	329	805	725	5,184	139	5,323

Remark: Data as of December 31, 2022

Source: Regional Affairs Bureau, Office of the NBTC





3. Monitoring and resolving radio frequency interference.

Radio frequency interference has been monitored to analyze the causes of frequency interference within the country and along borders, as informed by related agencies and the people, or identified by the Office of the NBTC itself, as well as solving the interference problems, especially the interference with aeronautical radio service (AEROTHAI), which may affect the aviation safety. The frequency propagation or the equipment usage causing the interference may be restrained, to allow the operators to solve and find a solution to prevent such frequency interference.

In 2022, the NBTC regional offices and sub-region offices have been notified the frequency interference (complaints) and

solved such problems, in a total of 456 cases, categorized into the interference with mobile base stations (telecommunications) for 301 cases, accounted for 66.01 percent, the interference with aeronautical radio service (aviation communications) for 98 cases, accounted for 21.49 percent, the interference with radio communications for 32 cases, accounted for 7.02 percent, the interference with broadcasting service for 14 cases, accounted for 3.07 percent, the interference with communications via satellite for 10 cases, accounted for 2.19 percent, and the interference with digital TV and cable TV for 1 case, accounted for 0.22 percent respectively. In this regard, the Office of the NBTC has resolved and ceased the interference cases completely, accounting for 100 percent. The details are shown in Table 10 and Chart 5.

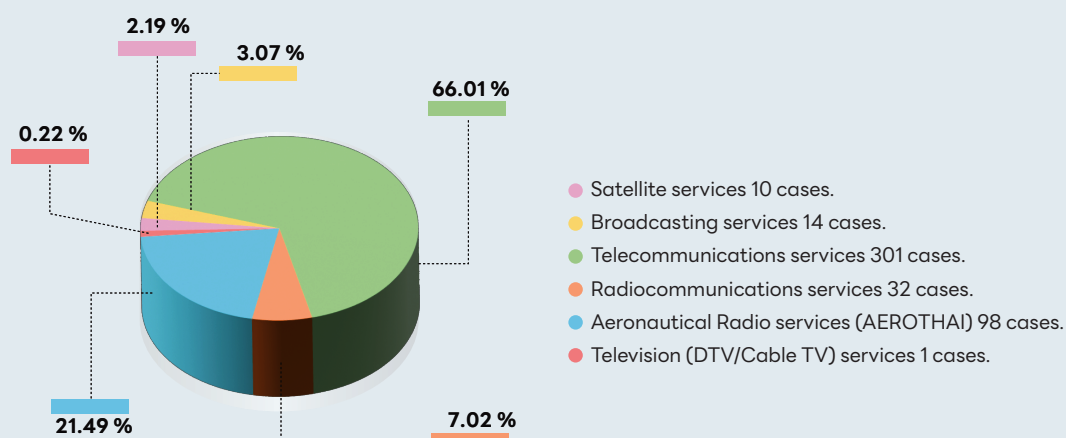
Table 10 Statistics of the number of complainants in radio frequency services in 2022

Organization Service	Regional Offices of the NBTC				Total (Cases)	Interference Ceased (Cases)	Percentage of Success
	Region 1	Region 2	Region 3	Region 4			
Broadcasting	7	3	1	3	14	14	100
Telecommunications	238	10	23	30	301	301	100
Radiocommunications	18	10	2	2	32	32	100
Aeronautical Radio	63	15	8	12	98	98	100
Television (DTV/Cable TV)	1	-	-	-	1	1	100
Satellite	7	-	-	3	10	10	100
Total	334	38	34	50	456	456	100

Remark : Data as of December 31, 2022

Source : Regional Affairs Bureau, Office of the NBTC




Chart 5 Radio frequency interference proportion classified by service types in 2022


Remark : Data as of December 31, 2022

Source : Regional Affairs Bureau, Office of the NBTC

4. Monitoring unauthorized frequency.

According to the provisions of the international radio regulations, the Radio Communications Act B.E. 2498 (1955) and related notifications, the unauthorized frequency has been monitored to prevent illegal usage by examining the established radio stations that use the unauthorized frequency, and acquiring information to verify, as well as taking legal actions further. In 2022, the Office of the NBTC monitored the unauthorized frequency use, and received complaints from people, public

and private sectors, in a total of 27 cases, which are the infractions for 24 cases, and the non-infractions for 3 cases. In this respect, the 22 cases of infraction found are caused by unauthorized use of frequency, while the 2 cases are the frequency used by the radio stations for trial which were temporarily restrained due to non-renewal licenses. These cases were submitted to the internal departments of the Office of the NBTC to pursue legal proceedings. The details are shown in Table 11 and Chart 6.

Table 11 Results of unauthorized frequency monitoring in 2022

Regulator	Number of Complaints (Cases)	Monitoring Results		Number of Offense, classified by Type of Service	
		Offense Found	No Offense Found	Broadcasting/ Television	Telecom/ Radio Communications
Office of the NBTC, Region 1	11	9	2	-	9
Office of the NBTC, Region 2	2	1	1	1	-
Office of the NBTC, Region 3	10	10	-	1	9
Office of the NBTC, Region 4	4	4	-	-	4
Total (Cases)	27	24	3	2	22

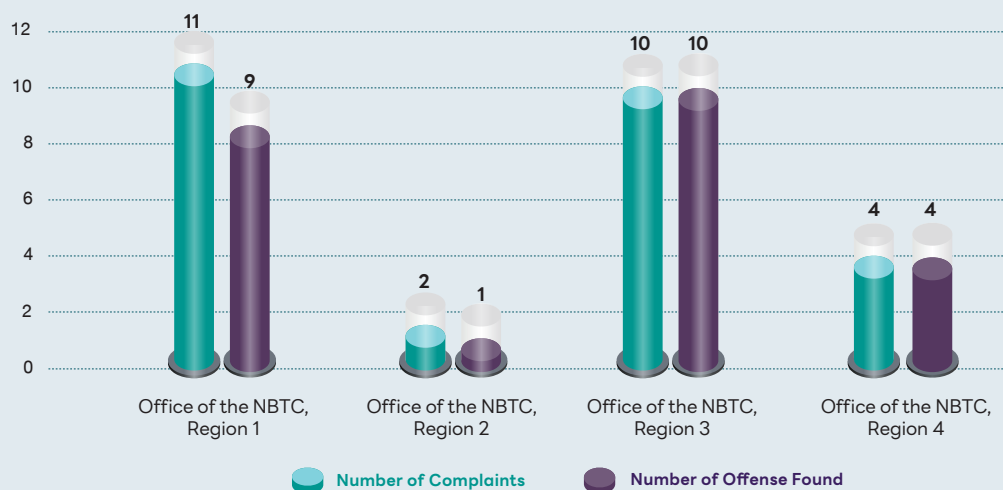
Remark : Data as of December 31, 2022

Source : Regional Affairs Bureau, Office of the NBTC



**Chart 6** Results of unauthorized frequency monitoring in 2022

Unit : Case



Source : Regional Affairs Bureau, Office of the NBTC

5. Legal search and arrest.

The Office of the NBTC has taken legal actions against offenders according to the Radio Communications Act B.E. 2498 (1955), the Broadcasting Business Act B.E. 2551 (2008), and the Telecommunications Business Act B.E. 2544 (2001), by cooperating with the police and military officers in searching and arresting the offenders

for investigation and legal proceedings. In 2022, there were a total of 24 cases, categorized into the radio communications service for 12 cases, telecommunications and internet services for 10 cases, and broadcasting and television services for 2 cases, as well as exhibits found in a total of 223 items. The details are shown in Table 12.

Table 12 Statistics of searching and arresting offenders in 2022

Regulator	Number of Total Cases	Type of Service			Number of Exhibit (Items)
		Broadcasting/ Television	Radio Communications	Telecom/ Internet	
Office of the NBTC, Region 1	7	1	3	3	26
Office of the NBTC, Region 2	2	1	1	-	6
Office of the NBTC, Region 3	10	-	3	7	145
Office of the NBTC, Region 4	5	-	5	-	46
Total	24	2	12	10	223

Remark : Data as of December 31, 2022

Source : Regional Affairs Bureau, Office of the NBTC





6. Health and safety regulation regarding the use of radiocommunications equipment and measurement on electromagnetic field (EMF) emission of the radiocommunications station.

To comply with the Notification of the NTC on the Safety Standard for the Use of Radiocommunication Equipment on Human Health (NTC. TS. 5001-2550), the Office of the NBTC conducted the measurement on the EMF emission. The results would be compared to the maximum EMF absorption level of human when

exposed to a radiocommunications device that emits EMF when placed close to human's head or less than 20 centimeters from human's body in the normal position of use. The specific absorption rate (SAR)¹⁷ of the electromagnetic fields between 100 kHz - 10 GHz, for the people who are exposed to specific electromagnetic fields from work and the people who are exposed to general electromagnetic fields, must not exceed the limits specified in the NTC. TS. 5001-2550 standards. The details are shown in Table 13.

Table 13 The NTC. TS. 5001-2550 standards

1	SAR Limit for Occupational Exposure Group	SAR Limit (W/Kg)
	Average SAR for Whole-Body	0.4
	SAR for only the Head & Trunk	10
	SAR for only the Limbs	20
2	SAR Limit for General Exposure Group	SAR Limit (W/Kg)
	Average SAR for Whole-Body	0.08
	SAR for only the Head & Trunk	2
	SAR for only the Limbs	4

In 2022, the Office of the NBTC has continually conducted the technical standard measurement on radio frequency emission of the telecommunication operators' mobile base stations, by defining the operational plan to measure the level of emission to safeguard the people health and safety effectively against

EMF harm from radiocommunications devices after establishing the radiocommunications stations, in compliance with the the Safety Standard for the Use of Radiocommunication Equipment on Human Health, and related NBTC notifications. The details are shown in Table 14.

¹⁷ 1) The overall specific absorption rate (SAR) levels are the average rate in any 6-minute period.

2) The average SAR for the whole body derives from a quotient of the total power absorbed into the body and the total mass.

3) The SAR for partial body is the average rate per 10 grams (g) of the same cuboid-shaped tissue.



**Table 14** Plan-Result of electromagnetic field (EMF) emission measurement of the radiocommunications stations in 2022

Month	Regulator								Total	
	Office of the NBTC, Region 1		Office of the NBTC, Region 2		Office of the NBTC, Region 3		Office of the NBTC, Region 4			
	Plan	Result	Plan	Result	Plan	Result	Plan	Result	Plan	Result
JAN	100	111	55	47	64	105	53	102	272	365
FEB	96	104	70	112	64	85	53	55	283	356
MAR	96	95	70	126	64	90	53	84	283	395
APR	96	99	55	116	64	92	53	88	268	395
MAY	92	82	60	77	64	79	53	75	269	313
JUN	92	79	60	102	64	103	53	74	269	358
JUL	6	21	5	31	5	35	5	20	21	107
AUG	6	87	5	28	5	18	5	48	21	181
SEP	6	23	5	22	5	25	5	32	21	102
OCT	6	22	5	14	5	24	5	32	21	92
NOV	6	27	5	33	5	46	5	50	21	156
DEC	6	4	5	6	5	7	5	18	21	35
Total	608	754	400	714	414	709	348	678	1,770	2,855

Remark : Data as of December 31, 2022

Source : Regional Affairs Bureau, Office of the NBTC

Nevertheless, the Office of the NBTC prescribed that the telecommunications operators with base stations must label their radiocommunications devices clearly based on the maximum EMF absorption limit from a device when its emitting component is placed close to human's head or less than 20 centimeters from human's body in the normal position of use, as well as labeling their fixed radiocommunications equipment that emits electromagnetic field in wide-range areas based on the NTC. TS. 5001-2550 standards.

In 2022, according to the operational plan, the Office of the NBTC has conducted the electromagnetic field (EMF) strength test of the

4 telecom operators' base stations nationwide, in a total of 1,770 cases, and received complaints from people, in addition to the plan, for 1,085 cases. From the total test result of 2,855 cases, it shows that the overall EMF emission of the radiocommunications stations follows the standards, that is, the aggregate of the EMF density compared to the EMF strength limits, based on the NTC. TS. 5001-2550 standards account for 0.0200 percent. Also, the EMF strength test results of the 4 telecom operators' base stations follow the standards, including (1) Advanced Wireless Network Company Limited (AWN) for 687 stations with the comparative EMF density of 0.0259 percent, (2) Total Access



Communication Public Company Limited (dtac) for 586 stations with the comparative EMF density of 0.0226 percent, (3) True Corporation Public Company Limited (True Corp) for 578 stations with the comparative EMF density of

0.0273 percent, and (4) National Telecom Public Company Limited (NT) for 1,004 stations with the comparative EMF density of 0.0102 percent. The details are shown in Table 15.

Table 15 Results of electromagnetic field (EMF) emission measurement of the radiocommunications stations in 2022, categorized by operators

Unit : Station

Regulator	EMF Emission Monitoring Plan in 2022	Number of EMF Emission Monitoring classified by operators (Stations)				Results
		AWN	dtac	True Corp	NT	
Office of the NBTC, Region 1	608	181	160	171	242	754
Office of the NBTC, Region 2	400	175	158	144	237	714
Office of the NBTC, Region 3	414	162	136	134	277	709
Office of the NBTC, Region 4	348	169	132	129	248	678
Total	1,770	687	586	578	1,004	2,855
EMF Density Compared to the Standard (Percentage)		0.0259	0.0226	0.0273	0.0102	0.0200

Remark : Data as of December 31, 2022

Source : Regional Affairs Bureau, Office of the NBTC

In addition to the mission in regulating and monitoring the frequency emission of base stations regularly for public safety, the Office of the NBTC realizes and highly emphasizes on the importance of building knowledge and understanding to people on the issue constantly by organizing workshops and preparing materials to publicize through various channels.

7. Regulating frequency use in broadcasting service.

The Office of the NBTC completed the preparation of the Notification of the NBTC on Technical Standard Testing of Low Power FM Transmitter, and the Notification of the Office of the NBTC on Spurious Emission Testing of

FM Radio Station, which were published in the Royal Gazette on March 30, 2022. Accordingly, the Office of the NBTC has monitored the test results of the technical standard and spurious emission, conducted, and submitted to the Office of the NBTC by the test agencies. Every FM broadcast radio station must perform the test by December 31, 2022. Meanwhile, the Office of the NBTC also regulated the frequency use by conducting a random spurious emission test of the tested radio stations in Nakhon Ratchasima, Khon Kaen, and Loei provinces. The results show that the tested radio stations, by the registered test agencies, follow the broadcast standards without over-limit spurious emission.





8. Monitoring frequency use in broadcasting and television services and resolving frequency interference.

In 2022, the Office of the NBTC has imposed law on the broadcasting and television operators, for both authorized operators and unauthorized operators, by admonishing,

informing the police, or searching and arresting, with the aims to regulate radio frequency use, prevent the frequency interference, and to ensure the businesses comply with related notifications. The outcome of proceedings on operators are described in Table 16 - 17.

Table 16 Result of proceedings on offenders in broadcasting and television businesses

Service	Operation	Quantity	
		Case	Station/place
Broadcasting Service			
Authorized Operator	Petition/ Incrimination	2	2
Unauthorized Operator	Petition/ Incrimination	4	5
	Inspection/Arrest	8	14
Television Service			
Set-Top Box Distributor	Inspection/Arrest	6	12

Source : Broadcasting Enforcement Bureau, Office of the NBTC

Table 17 Results of monitoring and resolving interference in broadcasting and television services, and the prosecution follow-up in broadcasting and television services

Type of Service	Monitoring and Solving Interference in Broadcasting and Television Services		Prosecution Follow-Up in Broadcasting and Television Services	
	In-Progress (Station/place)	Completed (Station/place)	Pending (Cases)	Case Result Notified (Cases)
Broadcasting	8	8	29	30
Television	1	11	15	17

Remarks : 1. Data as of January 1 - December 31, 2022

2. The prosecution follow-up in broadcasting and television services aims to acknowledge the progress of the proceedings, and accelerate the legal process, as well as developing/improving the evidence search and collect process for further proceedings.

Source : Broadcasting Enforcement Bureau, Office of the NBTC

9. Measuring technical parameter of digital terrestrial television transmitter and monitoring digital terrestrial television signal.

In 2022, the Office of the NBTC has cooperated with the digital terrestrial television network and facility providers (licensees) to examine the technical attributes and digital terrestrial television signals at the transmission stations and along the border of single frequency network (SFN) for 5 times,

to ensure the broadcasts comply with the technical specifications, including 1) Bangkok station on May 2, 2022, 2) Samut Songkhram station, and field signal test at the SFN border, on May 12, 2022, 3) Ubon Ratchathani station, during June 13 - 14, 2022, 4) Songkhla station, during July 25 - 26, 2022, and 5) Khao Chalak station and Pattaya station, and field signal test at the SFN border, during July 15 - 17, 2022.





Efficiency and Effectiveness of Considering Consumers' Complaint in Broadcasting, Television, and Telecommunications Services.

The NBTC and the Office of the NBTC have continually carried out the mission to protect consumers in broadcasting, television, and telecommunication businesses, by improving the process and procedures, and developing the inclusive consumer protection criteria and measures to correspond to the current situation with respect to public interest. For example, the NBTC Call Center 1200 service has been enhanced by improving and increasing additional complaint filing channels for convenience and efficiency, creating the complaint filing channels for the visually impaired or the hearing impaired to access the service easily, and improving the complaint handling system for more effectiveness, as well as building cooperative networks with related agencies for collaboration and information integration. In addition, the telecommunications licensing database integration has been conducted by sharing the juristic number through the NBTC Data Center with the Office of the Consumer Protection Board (OCPB), to enhance consumer protection in broadcasting, television, and telecommunications services.

The major performances and achievements in 2022 are as follows:

1. Receiving complaints.

The Office of the NBTC has developed and improved the NBTC Call Center 1200 service to receive complaints effectively, as a communications channel for people, and increased more channels for people to ask for advices & inquiries, and/or to file complaints through fast, accessible and convenient channels including NBTC Call Center 1200 (toll-free), email (1200@nbt.go.th), serviceportal.nbt.go.th website, social media such as Facebook: NBTC1200, Line application: @NBTC1200, Drop Call service which can receive voicemail for 24 hours, and by postal service. Due to the additional channels developed, the Office of the NBTC has provided information services, and received complaints from people in 2022, in a total of 67,843 cases, increasing from the last year for 1,444 cases. The details are shown in Table 18.

Table 18 Information service provision and complaint receipt via NBTC Call Center 1200 in 2022

No.	Type of Service	Number of Cases		Increase/ (Decrease)
		2021	2022	
1	Telecommunications Service, e.g., problems regarding mobile service, internet, fixed line, other services, Call Center, and scams	37,243	40,136	2,893
2	Broadcasting and Television Service, e.g., problems regarding inappropriate contents, digital TV viewing data, and satellite TV	2,821	2,127	(694)
3	Information Service Relating to the Office of the NBTC, e.g., inquiries on complaint solving progress, contact officers, and information inquiries about the Office of the NBTC	19,314	15,427	(3,887)
4	Receiving Complaints about Disorganized Communication Lines	7,021	10,153	3,132
Total		66,399	67,843	1,444

Remark : Data as of December 2022

Source : Data Operation Center Bureau, Office of the NBTC





A total of 67,843 cases of information service provision and complaint receipt via NBTC Call Center 1200 service can be categorized into the following groups. 1) Inquiry about telecommunications service for 40,136 cases, and 15,910 cases among these are inquiries, complaints, consulting, and whistleblowing to the Office of the NBTC regarding scam call center and SMS fraud, 2) Inquiry about broadcasting and television services for 2,127 cases, 3) Others information service relating to the office of the NBTC, such as complaint follow-up, contact officers, inquiry about the organization, and contact channels of government agencies, for 15,427 cases. The details are as follows:

- To ask, consult, and seek advice in preventing phone scams from scam call center, accounted for 71.22 percent. In this regard, the Office of the NBTC provides information and preventive guidelines, and operational approach, as well as recommending related agencies to contact and pursue legal actions to

the offender such as cyber police, and officials of the Department of Special Investigation (DSI). In most cases, people do not wish to provide information, or cannot submit sufficient information (not having the scammer's number).

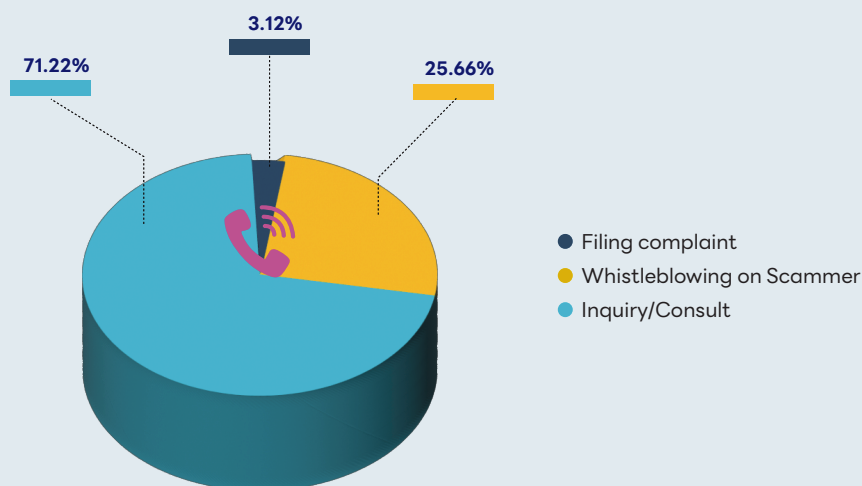
- To whistleblowing about scammers, accounted for 25.66 percent. In this regard, the Office of the NBTC requests additional details to collect and submit to related agencies for further proceedings, such as incident date & time, phone numbers of the whistleblower and the presumed scammer, and details of deception stories, etc.

- To file complaints for restraining incoming calls and blocking numbers and messages, accounted for 3.12 percent. In case complainants submit sufficient evidence according to the notification on complaint process, the Office of the NBTC shall proceed such complaints to the handling process and pursue further proceedings promptly.

The details are shown in Chart 7.

Chart 7

Statistics of complaint, inquiry, and whistleblowing on Scam Call Center via NBTC Call Center 1200 in 2022



Remark : Data as of December 31, 2022

Source : Broadcasting Consumer Protection Bureau, Office of the NBTC



2. Operational effectiveness and efficiency of consumer's complaint in broadcasting, television, and telecommunications services.

2.1 Solving complaints in broadcasting and television services.

1) The Office of the NBTC has performed the task in accordance with the Notification of the NBTC on Procedures and Timeframe for Consideration of Requests or Complaints Relating to the Broadcasting Business, and the fact-finding process based on the Notification of the NBTC on Criteria and Procedure for Fact Finding of Offense with Administrative Penalty in Broadcasting and Television Services B.E. 2556 (2013). The Office also prepared the analysis and proposal to the NBTC for consideration based on the Notification of the NBTC on Actions Considered as Consumer Exploitation in Broadcasting and Television Services B.E. 2555 (2012). Overall, the Office of the NBTC's complaints consideration were on schedule or ahead of schedule. The process and procedures are summarized as follows:

- Receive complaints from various and accessible channels and assign the responsible agent for effective operation.
- Notify the complainants, and gather facts from licensees, service providers, and other sources, as well as cooperating with government agencies and other related agencies such as the Food and Drug Administration (FDA) and the Office of the Consumer Protection (OCPB).

Consider the complaints based on the procedure. That is, the subcommittee on consumer protection in broadcasting and television businesses, appointed by virtue of the Act on the Organization to Assign Radio Frequency and to Regulate the Broadcasting and Telecommunications Services B.E. 2553 (2010) and its amendment, consisting of experts in consumer protection and other related fields, conducts the proposal to the NBTC for consideration.

Carry out the NBTC resolution such as prescribing an administrative act on licensees who take advantage of consumers, repealing the complaints, or coordinating with related agencies.

Notify the complainants of the results of consideration, the procedures and consumer rights.

Define conditions for digital terrestrial television operators to prepare specific complaint handling systems and report to the NBTC every 6 months.

The complainants and people can follow up the complaint handling process and results through the website and other channels of the Office of the NBTC.

A total of 72 cases of complaints can be divided into the settled/completed cases for 51 cases accounted for 70.83 percent, and in-progress cases for 21 cases, accounted for 29.17 percent. The details are shown in Table 19.

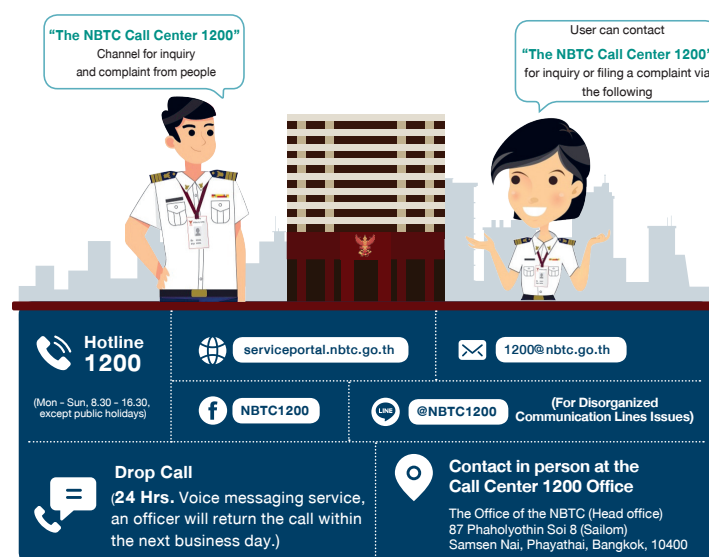




Table 19 Statistics of complaints regarding to actions considered as consumer exploitation in broadcasting and television services, classified by types of business

Type of service	Quantity	Settled/Completed Cases		In-Progress Cases	
		No. of Cases	Percentage	No. of Cases	Percentage
Television service					
1. Digital Terrestrial Television 1.1 Channels	8	1	12.50	7	87.50
2. Subscription Television 2.1 Network					
2.1.1 Satellite TV	57	47	82.46	10	17.54
2.1.2 Cable TV	-	-	-	-	-
2.2 Channels	5	1	20.00	4	80.00
Total	70	49	70.00	21	30.00
Broadcasting Service					
1. Main Radio Station (Existing)	-	-	-	-	-
2. Broadcasting Trial Licensee 2.1 Public	-	-	-	-	-
2.2 Community	-	-	-	-	-
2.3 Business	2	2	100.00	-	-
Total	2	2	100.00	-	-
Grand Total	72	51	70.83	21	29.17

Remarks: 1. Operations data as of December 31, 2022

2. Complaints during October 1, 2021 - September 30, 2022, as the overall process of considering and handling complaints in broadcasting and television services based on the Notification of the NBTC on Procedures and Timeframe for Consideration of Requests or Complaints Relating to Broadcasting Business takes at least 90 - 120 days.

Source: Broadcasting Consumer Protection Bureau, Office of the NBTC

Nevertheless, as an administrative act of the NBTC, the complaint handling process may affect the rights of the litigant. Thus, the subcommittee on consumer protection in broadcasting and television businesses, as assigned by the NBTC, offers opportunities to the licensees for acknowledging sufficient facts, disputing, and presenting their evidence

according to the process. In addition, the subcommittee may clarify the process or offer recommendations to the licensees to improve their service for content and advertising broadcasts, considering consumer protection, as an effort to mitigate offense which may affect consumers.



From the total complaints of 72 cases, there are complaints in the issues that are presumed to be offenses according to the Notification of the NBTC on Standards of Subscription Television Service Contract B.E.

2556 (2013), for 57 cases, which have been completed for 46 cases, accounted for 80.70 percent, solved by the operators, or repealed as the complainant wish. The details are shown in Table 20.

Table 20 Statistics of complaints regarding presumed offense against standards of subscription television service contract

Standards of Subscription Television Service Contract	Quantity	Settled/Completed	In-Progress
TV Program Broadcasting Adjustment	21	18	3
Service Fee Refund	3	2	1
Device Insurance Fee Refund	3	3	-
Billing inaccuracy Review	2	1	1
Advertising TV Program Monitoring	1	-	1
Changing in Terms of Service	1	-	1
Service Termination	10	8	2
Service Fee Exemption	8	8	-
Service Fee Exemption after Contract Termination	8	6	2
Total	57	46	11

Remark : Data as of December 31, 2022

Source : Broadcasting Consumer Protection Bureau, Office of the NBTC

The operation of complaint handling process is based on provisions of the Notification of the NBTC on Procedures and Timeframe for Consideration of Requests or Complaints Relating to Broadcasting Business, and set as an indicator in the Second Broadcasting Master Plan B.E. 2563 - 2568 (2020 - 2025), Strategy 3: Content regulation, consumer protection and promotion of civil rights and liberty (problem solving and complaint handling in a timely manner), with the aim to shorten consideration period for optimum benefit of the complainant. By calculating the processing time for the incoming complaints,

during October 1, 2021, to September 30, 2022, it shows that the average processing time for handling a complaint is 78 days, less than the period of 120 days imposed in the NBTC notification.

The cases in progress are the cases under operation of the operators to clarify the facts, or under consideration of related agencies, such as the Food and Drug Administration (FDA). However, some cases are complicated, in which fact finding, proofs or item records are needed to analyze and prepare proposals. And many cases rely on internal departments of the Office of the NBTC and external agencies.





2) The Office of the NBTC has tackled the complaints regarding program schedule and content in broadcasting and television services within a 120-day timeframe¹⁸, according to the Notification of the NBTC on Procedures and Timeframe for Consideration of Requests or Complaints Relating to Broadcasting Businesses, and the fact-finding process based on the Notification of the NBTC on Criteria and Procedure for Fact Finding of Offense with Administrative Penalty in Broadcasting and Television Services B.E. 2556 (2013). In addition, the subcommittee on content, self-regulation promotion, and professional organizations development in broadcasting and television services was set up to consider such complaints prior to submission to the NBTC board meeting for consideration.

The Office of the NBTC offers a variety of accessible channels to receive complaints about the program schedules, such as email (1200@nbt.go.th), by phone (Hotline 1200 toll-free), email application, website (<https://1200.nbt.go.th/contact/>), Facebook (NBTC1200), LINE application (@NBTC1200), and mobile application, with the system to notify the receipt of complaints and results to the complainants, so that they can follow up the progress. Furthermore, the Office of the NBTC Head office, the NBTC regional offices and the monitoring center for illegal radio and television content, are responsible for monitoring and coordinating with external agencies for content regulation, such as Ministry of Social Development and Human Security, Ministry of

Foreign Affairs, Ministry of Culture, Center for Morality Promotion (Public Organization), and the Siam Society under Royal Patronage. These three cases¹⁹ will be brought into the complaint examination and consideration process. The processing time standard indicator is set to accelerate the process to complete ahead of the period imposed in the Notification of the NBTC on Procedures and Timeframe for Consideration of Requests or Complaints Relating to Broadcasting Businesses, which is classified into 5 levels as follows:

Level 1: The average period with 1 percent faster than the period imposed in the notification.

Level 2: The average period with 2 percent faster than the period imposed in the notification.

Level 3: The average period with 3 percent faster than the period imposed in the notification.

Level 4: The average period with 4 percent faster than the period imposed in the notification.

Level 5: The average period with 5 percent faster than the period imposed in the notification.

In addition, the completion period varies on complication²⁰ of the complaint. The problem-solving period is defined by the complication level as follows: 1) less complicated case: should not exceed 45 days, 2) moderately complicated case: should not exceed 90 days, and 3) extremely complicated case: should not exceed 120 days.

¹⁸ must not exceed 157 days in case of extension.

¹⁹ The 3 cases consist of 1) receiving complaints through each channel, 2) examining by the content monitoring center and the Office of the NBTC Head office and the NBTC regional offices, and 3) coordinating with external agencies for content regulation.

²⁰ 1) less complicated case means a complaint with full evidence and requires no comments from external agencies or experts.
2) moderately complicated case means a complaint with difficulty in gathering evidence or requires comments from an external agency or an expert.
3) extremely complicated case means a complaint with considerable difficulty in gathering evidence, or requires comments from many external agencies or experts, or may need additional operation to solve the problem and promote regulation on program schedule and contents in broadcasting and television services effectively.



To regulate the quality of program schedule and contents in broadcasting and television businesses, the Office of the NBTC adheres to the related laws and regulations including 1) the Broadcasting Business Act B.E. 2551 (2008), 2) the Notification of the NBTC on Licensing Criteria and Procedure for Radio or Television Broadcasting Service B.E. 2555 (2012), 3) the Notification of the NBTC on Criteria on Program Schedule Preparation for Broadcasting and Television Services B.E. 2556 (2013) and its amendment, and 4) the Notification of the Office of the NBTC on Guidelines for Content Rating of Television Program, based on the Notification of the NBTC on Criteria on Program Schedule Preparation for Broadcasting and Television Services B.E. 2556 (2013).

The guidelines for considering program content in broadcasting and television businesses consist of 6 cases with the operational measures as follows:

1) In case the program containing banned contents according to Section 37 of the Broadcasting Business Act B.E. 2551 (2008) shall be punishable by the administrative fine, from 50,000 - 500,000 baht.

2) In case the content rating of TV program (P, C, G, 13+, 18+, M) inconsistent with the Notification of the Office of the NBTC on Guidelines for Content Rating of Television Program, based on the Notification of the NBTC on Criteria on Program Schedule Preparation for Broadcasting and Television Services B.E. 2556 (2013), the subcommittee and the NBTC shall consider the contents and prescribe measures for the licensee to adjust the content rating to comply with the criteria, to protect children and young viewers from inappropriate contents for their age and development.

3) In case the program contains contents that violate the licensing extent and

conditions for broadcasting and television businesses, according to the Notification of the NBTC on Licensing Criteria and Procedure for Radio or Television Broadcasting Service B.E. 2555 (2012), the NBTC shall prescribe a hierarchical administrative measure, beginning with prescribing an administrative warning for the licensee to correct, as the licensee must be responsible for selecting, providing, regulating contents of any program to meet the professional standards and media ethics. If the violation still occurs or does not follow the administrative warning, the NBTC shall prescribe a strict measure to suspend and repeal the license, respectively.

4) In case the program does not contain illegal contents or violate any licensing conditions, but such content is inappropriate, the subcommittee and the NBTC may ask for cooperation from the licensee to present the content cautiously, by virtue of Section 27 (6) and (16) of the Act on the Organization to Assign Radio Frequency and to Regulate the Broadcasting and Telecommunications Services B.E. 2553 (2010).

5) In case of promoting integrated network & preparation of professional ethical standards and self-regulations based on Section 39 of the Broadcasting Business Act B.E. 2551 (2008), the subcommittee and the NBTC may forward the complaint and results of consideration to the professional organization of the licensee to acknowledge which will be beneficial to the promotion of integrated network and ethical standards preparation.

6) In case people have regulatory recommendations for the Office of the NBTC, the subcommittee and the NBTC may adopt the recommendations for more effective regulation of the broadcasting and television services.





In 2022, the complaints regarding program schedule and contents in broadcasting and television services in the complaint receiving process have been completed, in a total of 86 cases, accounting for 100 percent of the total complaints. They can be categorized by types of service into 1) digital terrestrial television service for 72 cases, 2) non-frequency television (satellite and cable TV) for 4 cases, and 3) broadcasting service for 10 cases (existing radio service for 4 cases, and radio broadcasting trial for 6 cases).

In this regard, a total of 86 cases can be divided by source into 1) complaints filed by people to the Office of the NBTC for 47 cases (digital terrestrial television service for 42 cases, non-frequency television (satellite and cable TV) for 1 case, and existing radio service for 4 cases), and 2) problems detected by the Office of the NBTC for 39 cases (digital terrestrial

television service for 30 cases, non-frequency television (satellite and cable TV) for 3 cases, and radio broadcasting trial for 6 cases). However, there are no complaints submitted from other agencies.

The processing period for complaint handling is based on the timeframe specified in the Notification of the NBTC on Procedures and Timeframe for Consideration of Requests or Complaints Relating to Broadcasting Businesses, and in line with the indicators. The average processing period is at Level 5 (the average period with 5 percent faster than the period imposed in the notification), taking 114 days, classified into the less complicated cases for 18 cases, the moderately complicated cases for 23 cases, and the extremely complicated cases for 45 cases. The details are shown in Table 21.

Table 21 Complaints regarding program schedule and contents in broadcasting and television services

Source	Quantity (Total)	Type of Service				Completed	
		Digital Terrestrial TV	Satellite & Cable TV	Existing Radio Station	Radio Broadcasting Trial	Number of Cases	Percentage
Complaint filed by people	47	42	1	4	-	47	100
Problem detected by the Office of the NBTC	39	30	3	-	6	39	100
Total	86	72	4	4	6	86	100

Remarks: 1. Data as of December 31, 2022

2. Data of complaints in the process during October 1, 2021 - October 31, 2022

3. No complaints submitted from other agencies during such a period.

Source: Content Regulation and Announcer Development Bureau, Office of the NBTC



The complaints regarding program schedule and contents in broadcasting and television services, in a total of 86 cases,

can be categorized by complaint issue as shown in Table 22.

Table 22 Complaint issues regarding program schedule and contents

Complaint Issue	Number of Cases	Percentage
Violent contents or scenes	39	45.35
Inappropriate words or language	12	13.95
Content rating of TV program	8	9.30
Distorted information	6	6.98
Others, e.g., guest selection/inappropriate outfits worn on TV	6	6.98
Inconsistency with professional ethics and civil rights violations	4	4.65
Advertising considered as licensing conditions infringement of broadcasting trial for public service and community service	4	4.65
No face mask worn, and not keep social distancing on TV broadcasts to prevent the spread of COVID-19	4	4.65
Presentation of contents regarding lottery hints, superstition, or beliefs	2	2.33
International relations	1	1.16
Total	86	100.00

Source : Content Regulation and Announcer Development Bureau, Office of the NBTC

By considering the complaints, the most common complaint issue is violent contents or scenes. For example, the mass shooting news report of a criminal attacking people and preschool children with a gun and knife at Uthai Sawan Subdistrict Administrative Organization and a child development center, Nong Bua Lamphu province, and the news report of a violent incident in a school in Nonthaburi province. The digital terrestrial television operators often demonstrate violence scenes and sequences through media with immersive graphics, accounting for 45.35 percent. Secondly, the issue of inappropriate words and language in broadcasts such as impolite words, swear words, and hate speech, as well as Thai grammatically incorrect sentences, account for 13.95 percent, followed by the issue of content rating of TV programs, accounting for 9.30 percent, and the issue of distorted information reporting which

may lead to misunderstanding, accounting for 6.98 percent, and other issues such as guest selection/inappropriate outfits worn on TV, accounting for 6.98 percent.

The complaint issue also includes inconsistency with professional ethics and civil rights violations, such as children's rights, women's rights and rights of vulnerable groups, accounting for 4.65 percent, which is equal to the issue of advertising considered as licensing conditions infringement of broadcasting trial for public service and community service, and the issue of no face mask worn and not keep social distancing on TV broadcasts to prevent the spread of COVID-19. In addition, the issue of content presentation regarding lottery hints, superstition, or beliefs, accounts for 2.33 percent, followed by the international relations issue which accounts for 1.16 percent.





From the above complaints, it was found that most complaints in 2022 are relevant to violence news that shocks viewers. Thus, the Office of the NBTC invited mental health experts from the Department of Mental Health, Ministry of Public Health, to share knowledge and thoughts about impact of such violent content on the persons at the incident and the audience, leading to a mechanism for proactive problem solving by collaborating with agencies related to situation control or critical situations that have an effect on people, as well as television licensees and self-regulation organizations. In addition, the Office of the NBTC conducted the integrated contingency plan and guideline for regulating contents and information effectively and efficiently, by taking public interest, civil rights protection, and consumer protection, into account.

2.2 Solving complaints in tele-communications service.

1) The Office of the NBTC has performed the task in accordance with the Notification of the NBTC on the Complaint Process and Consideration to the Complaint of Telecommunications Service B.E. 2559 (2016). Overall, the Office of the NBTC's complaint consideration were on schedule or ahead of schedule. The process and procedures are summarized as follows:

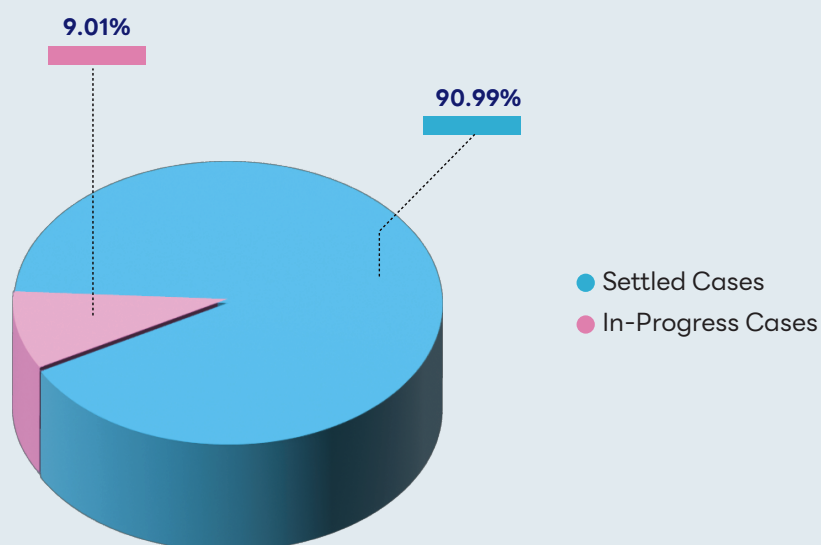
- Receive complaints from various and accessible channels and examine the documents and related evidence.
- Notify the litigated licensee to acknowledge the complaint and carry out fact finding from the licensee by clarification and evidence submission.

- Notify the complainants of the consideration results. In case the complainant is satisfied with the licensee's clarification, the case will be repealed. On the contrary, in case the complainant is not satisfied with the clarification, the Office of the NBTC shall forward the case into the consideration process. That is, a non-complicated case will be submitted to the Secretary-General of the NBTC to consider based on the diagnostic approach, while a complicated case will be submitted to the meeting of the subcommittee on consumer protection in telecommunication service, appointed by virtue of the Act on the Organization B.E. 2553 (2010) and its amendment, consisting of experts in consumer protection and related fields, to prepare the proposal to the NBTC for consideration.

- Inform the complainants and the service providers to acknowledge the results of consideration.

In 2022, the Office of the NBTC has solved complaints in the telecommunication service or for consumers affected by the telecommunication service, such as short message service (SMS) problem, technical & quality of service problem, billing inaccuracy, add-on service cancellation, and service validity problem. There were complaints filed in the complaint handling process, in a total of 3,431 cases. From the total cases, 3,122 cases were solved and settled, accounting for 90.99 percent, and 309 cases were in progress, accounting for 9.01 percent. The details are shown in Chart 8.




Chart 8 Status of complaint handling in telecommunications service in 2022


Remark : Data as of December 31, 2022

Source : Telecommunications Consumer Protection Bureau, Office of the NBTC

The complaints can be categorized by type of service into 1) mobile phone service for 2,564 cases, accounted for 74.73 percent, 2) internet service for 789 cases, accounted for 22.99 percent, 3) radiocommunications

stations/cell towers for 38 cases, accounted for 1.11 percent, and 4) fixed line service for 40 cases, accounted for 1.17 percent. The details are shown in Table 23 and Chart 9.

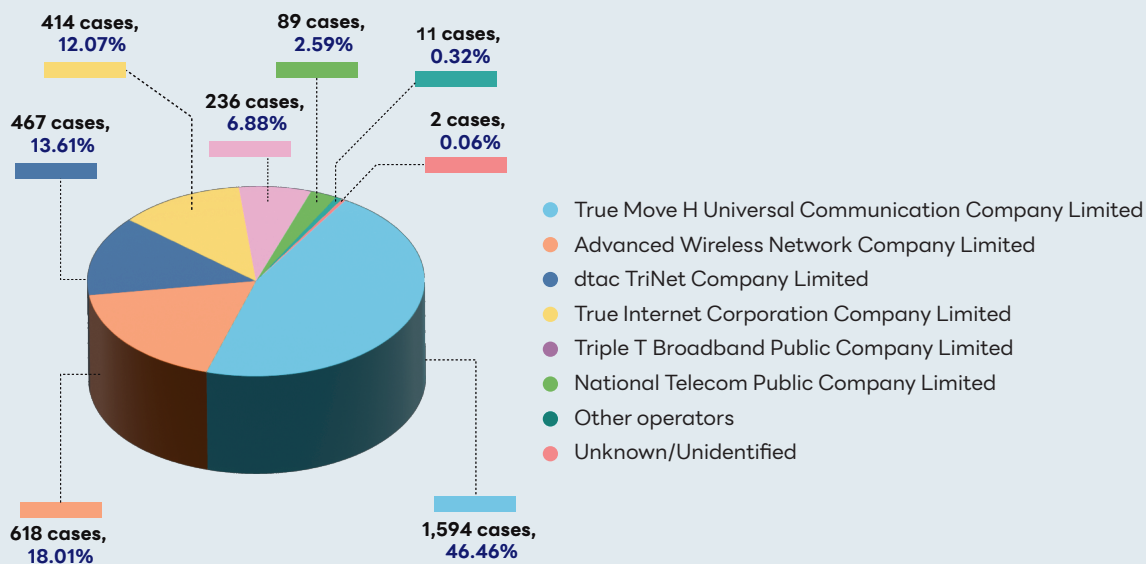
Table 23 Number of complaints, categorized by type of service in 2022

No.	Type of Service	Total Cases	
		Number of Cases	Percentage
1	Mobile phone service	2,564	74.73
2	Internet service	789	22.99
3	Radiocommunications stations/cell towers	38	1.11
4	Fixed line service	40	1.17
Total		3,431	100.00

Remark : Data as of December 31, 2022

Source : Telecommunications Consumer Protection Bureau, Office of the NBTC



**Chart 9** Number of Complaint, Categorized by operators in 2022

Remark : Data as of December 31, 2022

Source : Telecommunications Consumer Protection Bureau, Office of the NBTC

By considering the complaints, it shows that the 5 most common complaint issues are 1) Spam SMS for 1,036 cases, accounted for 30.20 percent, 2) service termination for 706 cases, accounted for 20.58 percent, 3) service standards for 631 cases, accounted

for 18.39 percent, 4) billing inaccuracy for 499 cases, accounted for 14.54 percent, and 5) privacy rights and personal data for 241 cases, accounted for 7.03 percent, respectively. The details are shown in Table 24.

Table 24 Results of complaint handling, categorized by complaint issue in 2022

Complaint Issue	Number of Cases	Percentage	Status	
			Settled	In-Progress
Spam SMS	1,036	30.20	1,012	24
Service Termination	706	20.58	674	32
Service Standards	631	18.39	556	75
Billing inaccuracy	499	14.54	442	57
Privacy Rights and Personal Data	241	7.03	169	72
Quality of Service	219	6.38	213	6
Service Validity	53	1.54	36	17
Radiocommunications stations/cell towers	38	1.11	12	26
Incorrect/Insufficient Information	8	0.23	8	0
Total	3,431	100.00	3,122	309

Remark : Data as of December 31, 2022

Source : Telecommunications Consumer Protection Bureau, Office of the NBTC



Regarding the most common complaint issue of SMS spam/fraud, the Office of the NBTC has cooperated with related agencies including the Ministry of Digital Economy and Society, the Royal Thai Police, the Cyber Crime Investigation Bureau (CCIB), and telecommunications operators, to strengthen the measures against SMS fraud, and enforce the administrative penalty strictly against the content providers that spread the deceiving SMS to people, by taking legal actions against

offenders according to the Computer-Related Crime Act, to solve the problems more effectively. By considering the efficiency of complaint handling categorized by complaint issue, it shows that, from a total of 3,431 cases in 2022, 3,122 cases were solved and settled, accounting for 90.99 percent. In this regard, the Office of the NBTC aims to pursue complaint handling for consumers with prompt and effectiveness. The details are shown in Table 25.

Table 25 Efficiency of complaint handling during 2021 - 2022

No.	Complaint Issue	2021			2022		
		Total Cases	Settled	In-Progress	Total Cases	Settled	In-Progress
1	Spam SMS	600	496	104	1,036	1,012	24
2	Service Termination	484	363	121	706	674	32
3	Service Standards	418	279	139	631	556	75
4	Billing inaccuracy	537	357	180	499	442	57
5	Privacy Rights and Personal Data	58	26	32	241	169	72
6	Quality of Service	61	36	25	219	213	6
7	Service Validity	99	56	43	53	36	17
8	Radiocommunications Stations /Cell Towers	-	-	-	38	12	26
9	Incorrect/Insufficient Information	6	4	2	8	8	0
10	Add-on Services	-	-	-	-	-	-
11	Service Accessibility	2	1	1	-	-	-
12	Other Complaints	1	1	-	-	-	-
13	Prepaid Service Top-up	1	1	-	-	-	-
Total		2,267	1,620	647	3,431	3,122	309

Source: Telecommunications Consumer Protection Bureau, Office of the NBTC



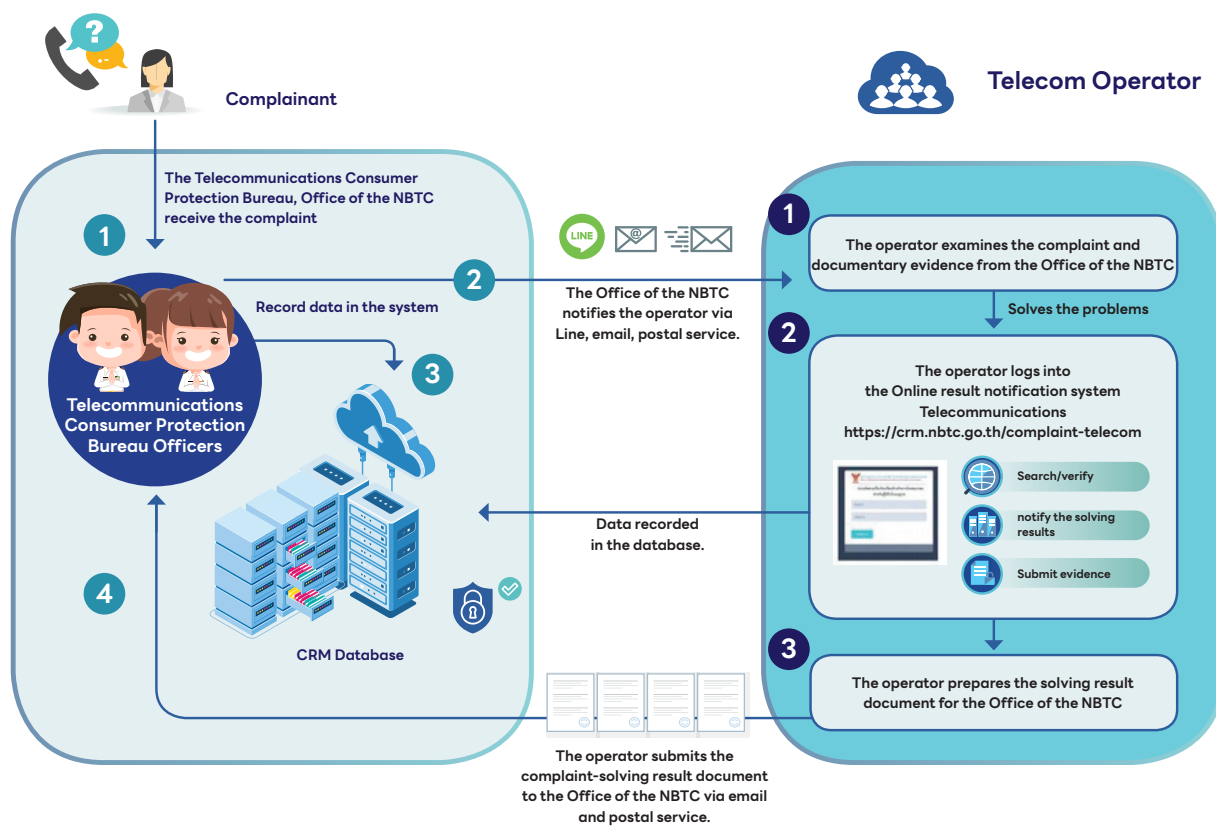
2) The Office of the NBTC has carried out mediation in telecommunications business as requested by complainants for entering the mediation process, during January 1 - October 31, 2022, for 188 cases²¹, according to the NBTC Regulation regarding Dispute Resolution between Telecommunications Operators and Complainants B.E. 2555 (2012). Those were the cases that the litigated party did not wish to conciliate and could not settle the dispute prior to mediation, or prior to entering the handling process based on the Notification of the NBTC on the Complaint Process and Consideration to

the Complaint of Telecommunications Services B.E. 2559 (2016).

In addition, there was 1 case that entered the mediation process. Thus, the Office of the NBTC held a mediation meeting, and the litigated party agreed to settle the dispute.

3) The complaint receiving and handling system (CRM system) has been developed by improving the complaint handling process, and enhancing the document delivery channels to complainants and operators via electronic means with the Robotics Process Automation system (RPA).

Figure 4 Channels for operators to resolve complaints



4) The website for consumer protection in telecommunications services has been developed and updated to comply with the international standards. At present, it is in the process of carrying out the website development project to safeguard consumers against cyber-attack with cutting-edge technology and platforms, in accordance with the technological

dynamic. In addition, the site structure has been enhanced in user interface and system administrator sections to be modern, convenient, and user-friendly, making it easier for the system administrator to manage information, as well as responding to consumers' usage promptly and effectively.

²¹ Data as of November 1, 2022



Management of the Broadcasting and Telecommunications Research and Development Fund for the Public Interest

In 2022, the Broadcasting and Telecommunications Research and Development Fund for the Public Interest (BTFP), under the operations of the Fund Management Committee, has performed significant tasks and achievements as follows:

1. The major performances.

1.1 Strategic plan implementation.

The BTFP has conducted a mid-term plan review of the 4-Year Action Plan of the Broadcasting and Telecommunications Research and Development fund for the Public Interest B.E. 2563 - 2566 (2020 - 2023) to comply with the changing ecosystem, the National Strategy, the Master Plan under the National Strategy, the National Digital Economy and Society Development Plan and Policy, and related master plans, including the Action Plan for Promoting the Adoption of 5G Technology in Thailand Phase 1 B.E. 2564 - 2565 (2021 - 2022) and Phase 2 B.E. 2566 - 2570 (2023 - 2027), the 6-Year Action Plan of the Thailand National AI Strategy B.E. 2565 - 2570 (2022 - 2027), the Second Broadcasting Master Plan B.E. 2563 - 2568 (2020 - 2025), and the Universal Basic Telecommunications and Social Service Plan No.3 B.E. 2565 - 2569 (2022 - 2026). The purpose of the mid-term plan review is to manage the operations according to the plan appropriately and effectively, having the representatives from the Office of the National Economic and Social Development Council (NESDC), the Comptroller General's Department, the Budget Bureau, and the Office of the Prime Minister, to be the counselors to consider and offer recommendations for revising the action plan.

1.2 Fund allocation.

The BTFP has allocated the budget according to the objectives of the fund for public interest to support and promote the projects under the framework as follows:

Category 1 - No fund allocation²²

Category 2 - Classified into 3 types which are (1) projects that aim to achieve the Fund Management Committee's policy, by defining the terms of reference for 31 projects, in a total of 560.02 million baht²³, (2) approved ongoing project for 1 project which is the project on development for communications system integration, positioning system and simulation system for cave mapping and exploration, by Suranaree University of Technology in a total of 12.59 million baht, and (3) funding under the agreement with government agencies in 2022, within the budget limit of 200.00 million baht.²⁴

Category 3 - Projects or operations announced assigned by the NBTC to achieve the objectives of the fund for 2 projects, in a total of 1,300 million baht, including (1) organizing communication lines according to the Cabinet Resolution on November 23, 2021 and the resolution of the NBTC meeting No.2/2022 on January 21, 2022, in a total of 700.00 million baht, and (2) Supporting a budget for FIFA World Cup Final 2022 live broadcast by the Ministry of Tourism and Sports according to the resolution of the NBTC meeting No.30/2022 on November 9, 2022, in a total of 600.00 million baht.

Category 4 - Supporting laws enforcement of the Thai Media Fund, in a total of 500.00 million baht.

²² There was no fund allocation in 2022 as the performance evaluation according to the 4-year action plan, was conducted at the end of the year 2021 and 2022. The evaluation outcomes would be brought to revise the 4-year action plan, and to set directions for maximum benefit of the fund allocation for the next year.

²³ It is in the process of submitting to the NBTC board meeting for considering the Term of Reference.

²⁴ According to resolution of the NBTC meeting No.28/2022 on October 19, 2022, the NBTC approved the policy review of the fund allocation for the year 2022 and required the BTFP to transfer the budget of 200.00 million baht from the total budget allocation for Category 2, in case of funding under the agreement with government agencies for the year 2022, to combine with the fund allocation for Category 3 for the year 2022.





1.3 Financial Management.

The total revenue of the BTFP is 8,403.09 million baht.

1) Budget allocation from the Office of the NBTC, in a total of 1,000.00 million baht

2) Contributions from the licensees in broadcasting, television, and telecommunications services, in a total of 5,791.50 million baht

3) Profits of the BTFP, in a total of 352.49 million baht.

4) Income from the Administrative Fines, in a total of 64.32 million baht

5) Others, in a total of 1,194.78 million baht consisting of the surplus of the project funds remitted by the grantees and VAT refunds.

The total expenditure of the BTFP is 15,866.84 million baht.

1) Budget allocation to the projects under the objectives of the fund, in a total of 9,705.70 million baht.

2) Refund to USO telecommunications operators according to the judgment, in a total of 4,488.17 million baht.

3) Remittance to the Ministry of Finance as the surplus from the Transition to Digital Terrestrial Television Project, in a total of 1,211.04 million baht.

4) Repay the deposit of the digital TV coupon project, in a total of 6.03 million baht.

5) VAT remittance and others, in a total of 455.90 million baht.

The BTFP has deposited the money with commercial banks and domestic specialized financial institutions, according to the regulations of the Fund Management Committee on capital preservation, Disbursement, Accounting and Accounting System B.E. 2555 (2012) and its amendment, with the average annual return at 0.65 percent as of December 31, 2022.

1.4 Monitoring and evaluation.

The guidelines on the fund monitoring and evaluation have been prescribed as follows:

1) Appoint the Subcommittee on the BTFP Project Follow-Up and Evaluation to monitor and evaluate the disbursement in compliance with the objectives of the BTFP, and invite the grantees to report the project progress continually to the Subcommittee's meeting.

2) Assign the grantees to submit the project progress reports and the expense reports based on the specified terms in the funding contracts.

3) Appoint the Committee on Research Audit by selecting the experts in the related fields to consider the operations based on the funding contracts to ensure effectiveness and accomplishment of the projects, as well as approving the project grantees' outputs.

1.5 Image Enhancement of the BTFP.

The BTFP has publicized information and enhanced the organization image for the year 2022 by disseminating informations, policies, duties, and missions of the BTFP, as well as promoting project funding and operations of the BTFP via various media channels such as television, newspaper, and online media, to reach people immensely and promptly, suiting the reception of information of the people today. The BTFP has produced news clipping, infographics, VDO clips, exclusive interviews, and press releases of the grantees' projects, to publicize via television, newspapers, print media, and online media such as Facebook, YouTube, Instagram, and Line Today, as well as promotion through well-known influencers in social media, and through publicity by related government agencies regarding projects that promote useful content production and broadcasting as follows:





1) Organizing an event to promote the duties and missions of the Broadcasting and Telecommunications Research and Development Fund for Public Interest, and presenting the outcomes of the projects funded by the BTFP, on “BTFP Showcase by NBTC: Facilitating the Research Results to National Development”, by showcasing the outputs and outcomes of 17 projects.

2) Publicizing the projects that promote useful contents production and broadcasting through related government agencies, in a total of 12 projects categorized into (1) projects to promote useful content production and broadcasting for public interest, for 2 sub-projects, (2) projects to promote content production and broadcasting of digital television programs for children, the youth, and families, for 9 sub-projects, and (3) projects on television program production to promote the disabled’s rights and sawy-utilization of television services, for 1 project.

3) Field surveys to monitor the operations of the funded projects including the project to prepare for COVID-19 pandemic at Sakon Nakhon Hospital, Sakon Nakhon on January 20, 2022, and the project to develop the elderly classification assessment system for facility design, and the Smart EMS system at the Social Welfare Development Center for Older Persons, Nakhon Phanom, on January 21, 2022.

4) Organizing the volunteer activity for social contribution by donating the budget for scholarship and facility provision for students in the Cha-am School for the Blind

with Multiple Disabilities, Cha-am, Phetchaburi, together with the contribution from the management, and officers of the BTFP.

2. Efficiency and effectiveness evaluation.

2.1 Efficiency evaluation.

The BTFP estimated the cash flow based on the revenue plan and the expenditure plan of the BTFP for necessary obligations in the savings account. The remaining budget was invested in fixed deposit accounts of commercial banks and domestic specialized financial institutions, according to the investment criteria set by the Fund management committee by considering the credit risk and liquidity risk of each bank and institution, for the maximum return with the minimum risk. In 2022, the BTFP gained the annual average return at 0.65 percent, equivalent to the average return of the 5 large commercial banks offering 0.65 percent average return. The disbursement plan of the BTFP for project support was set for 10,994.88 million baht, and the actual disbursement was 9,969.44 million baht, accounting for 90.67 percent, nearly as identified in the plan, as the operation of the high-value projects in Category 3 (the project on the provision of broadband internet service and mobile phone signal in border areas (Zone C+) and the project on the provision of broadband internet service in remote areas (Zone C) complied with the revised plan, resulting from the contract revision. The details are shown in Table 26.



**Table 26** The disbursement of the fund compared to the target

Unit : Million baht

Type	Details	Target	Actual Disbursement	Percentage
1	Projects in which eligible persons apply for funding and financial support from the BTFP that are in compliance with the objectives set forth in Section 52 (1), (2), (3), and (4) of the Act on the Organization to Assign Radio Frequency and to Regulate the Broadcasting and Telecommunications Services B.E. 2553 (2010) and its amendment	261.82	171.08	65.34
2	Projects that fulfill the objectives specified by BTFP Fund Management Committee under Section 52 (1), (2), (3), and (4) of the Act on the Organization to Assign Radio Frequency and to Regulate the Broadcasting and Telecommunications Services B.E. 2553 (2010) and its amendment, and support the operations to comply with the government policies, the Spectrum Management Master Plan, the Telecommunications Master Plan, the Broadcasting Master Plan, and the Universal Basic Telecommunications and Social Service Plan	635.82	502.70	79.06
3	Projects or operations according to the NBTC policies	9,597.24	8,795.66	91.65
	3.1 The USO projects	8,595.47	7,900.84	91.92
	3.2 Other projects	1,001.77	894.82	89.32
4	Projects to support the Thai Media Fund	500.00	500.00	100.00
Total		10,994.88	9,969.44	90.67

Remark : Data as of December 31, 2022**Source :** The Research and Development Fund Bureau, Office of the NBTC

2.2 Effectiveness evaluation.

2.2.1 According to the operation in 2022, the revenue of the BTFP was 14,313.31 million baht, increasing from the previous year for 4,014.52 million baht. The expenditure of the BTFP was 5,927.16 million baht, increasing from the previous year for 2,831.81 million baht. Regarding the financial status in 2022, the BTFP had assets in a total of 98,918.60 million baht, decreasing from the previous year for 10,326.53 million baht, the total liability was 44,968.26

million baht, decreasing from the previous year for 18,629.11 million baht, deemed the stable fund by having the current ratio as 22.89 times, increasing from the previous year for 18 times and better than the accounting standard criteria that should not lower than 1.5 times, while the debt ratio as 0.45 times, decreasing from the previous year for 0.13 times, better than the accounting standard criteria that should not higher than 1.5 times. The details are shown in Table 27.

**Table 27** The BTFP financial report by comparing 2022 and 2021

Unit : Million baht

	2022*	2021	Increase (Decrease)	Percentage
1. Performance				
Revenues	14,313.31	10,298.79	4,014.52	38.98
Revenue from contribution	13,842.56	9,608.62	4,233.94	44.06
Income from deposit interests	286.68	326.17	(39.49)	(12.11)
Other revenue	184.07	364.00	(179.93)	(49.43)
Expenses	5,927.16	3,095.35	2,831.81	91.49
Financial support expenses	2,445.41	1,360.30	1,085.11	79.77
Depreciation and amortization	2,270.71	1,593.25	677.46	42.52
Other expenses	1,211.04	141.80	1,069.24	754.05
Revenues above (below) than expenses	8,386.15	7,203.44	1,182.71	16.42
2. Financial Position				
Assets	98,918.60	109,245.14	(10,326.54)	(9.45)
Cash and cash equivalents	14,412.17	22,681.78	(8,269.61)	(36.46)
Short-term investment	42,500.91	41,695.05	805.86	1.93
Accrued revenue from contribution	5,754.77	5,755.30	(0.53)	(0.01)
Other current assets	507.64	1,630.46	(1,122.82)	(68.87)
Accrued revenue from spectrum refarming (Section 53 (8/1))	27,174.01	27,174.01	0.00	0.00
Fixed assets and infrastructure assets - net	8,569.10	10,308.54	(1,739.44)	(16.87)
Liabilities	44,968.26	63,597.37	(18,629.11)	(29.29)
Current liabilities	2,760.52	14,655.48	(11,894.96)	(81.16)
Non-current liabilities	42,207.74	48,941.89	(6,734.15)	(13.76)
Net Assets	53,950.34	45,647.77	8,302.57	18.19
3. Cash Flow				
Earnings	8,403.09	15,166.15	(6,763.06)	(44.59)
Cash received from contribution	6,791.50	8,487.14	(1,695.64)	(19.98)
Cash received from deposit interests	352.49	410.64	(58.15)	(14.16)
Others	1,259.10	6,268.37	(5,009.27)	(79.91)
Disbursements	15,866.84	5,665.67	10,201.17	180.05
Financial support	9,706.72	4,169.05	5,537.67	132.83
Others	6,160.12	1,496.62	4,663.50	311.60
Earnings above (below) than disbursements	(7,463.75)	9,500.48	(16,964.23)	(178.56)
4. Financial Ratio				
Current Ratio (times)	22.89	4.90	17.99	367.14
Debt Ratio (times)	0.45	0.58	(0.13)	(22.41)

Remark : *The financial statement for the year 2022 shown in the table above has not been proved and approved by the State Audit Office of the Kingdom of Thailand (SAO).

Source : Research and Development Fund Bureau, Office of the NBTC





2.2.2 The performance of the BTFP achieved the objectives productively as the funded projects have created benefits comprehensively to the radio, television, and telecommunications businesses in the aspects of research and development, innovation and facility, learning and quality-of-life improvement of the people, and human resource development in radio and television businesses widely. According to the overall efficiency and effectiveness evaluation of the funded projects, the projects that were funded and completed in 2022 had a relatively high efficiency level with the score 4.09 out of 5, divided into 5 aspects including 1) research and development, 2) service provision, learning promotion and people's quality of life improvement, 3) training and skill development, 4) media production, and 5) prescribing policies and work plans in broadcasting, television, and telecommunications services.

1) Overall efficiency and effectiveness evaluation results of the funded projects

- The projects that were funded and completed in 2022 had a high efficiency level with the score 4.36 out of 5, divided into the aspects of service provision, learning promotion, and people's quality of life improvement, and prescribing policies and work plans in broadcasting, television, and telecommunications services, that had a high effectiveness level with the full score of 5, followed by the aspect of media production, having a high efficiency level with the score 4.25 out of 5. The aspects that had a relatively high efficiency level were research and development with the score 3.88 out of 5, followed by training and skill development with the score 3.67 out of 5.

- The projects that were funded and completed in 2022 had a high effectiveness level with the score 4.62 out of 5,

divided into the aspects of service provision, learning promotion, and people's quality of life improvement, and prescribing policies and work plans in broadcasting, television, and telecommunications services, with the full score of 5, followed by the aspects of media production, having a high efficiency level with the score 4.50 out of 5. The aspects of training and skill development with the score 4.33 out of 5, followed by research and development with the score 4.25 out of 5.

- The projects that were funded and completed in 2022 had a relatively high impact level with the score 3.74 out of 5, divided into the aspects of service provision, learning promotion, and people's quality of life improvement, and prescribing policies and work plans in broadcasting, television, and telecommunications services, with the score 4.00 out of 5, followed by the aspects of research and development with the score 3.88 out of 5, and media production, with the score 3.50 out of 5. The aspects that had a moderate impact level was training and upskill with the score 3.33 out of 5.

- The projects that were funded and completed in 2022 had a relatively high sustainability level with the score 3.64 out of 5, divided into the aspects of service provision, learning promotion, and people's quality of life improvement, and prescribing policies and work plans in broadcasting, television, and telecommunications services, with the score 4.00 out of 5, followed by the aspects of research and development with the score 3.63 out of 5. The aspects that had a moderate impact level were training and skill development with the score 3.33 out of 5, and media production, with the score 3.25 out of 5 respectively. The details are shown in Table 28.



Table 28 The overall efficiency and effectiveness assessment results, categorized by project Type in 2022

Aspect	Average Score				
	Efficiency	Effectiveness	Impact	Sustainability	Final Rating
1. Research and development	3.88 (Relatively High)	4.25 (High)	3.88 (Relatively High)	3.63 (Relatively High)	3.91 (Relatively High)
2. Service provision, learning promotion and quality of life improvement	5.00 (High)	5.00 (High)	4.00 (Relatively High)	4.00 (Relatively High)	4.50 (High)
3. Training and skill development	3.67 (Relatively High)	4.33 (High)	3.33 (Moderate)	3.33 (Moderate)	3.67 (Relatively High)
4. Media production	4.25 (High)	4.50 (High)	3.50 (Relatively High)	3.25 (Moderate)	3.88 (Relatively High)
5. Prescribing policies and work plans in broadcasting, television and telecommunications services	5.00 (High)	5.00 (High)	4.00 (Relatively High)	4.00 (Relatively High)	4.50 (High)
Total Average Score	4.36 (High)	4.62 (High)	3.74 (Relatively High)	3.64 (Relatively High)	4.09 (Relatively High)

Remarks: (1) Total score range between 1.00 - 1.80 is regarded as a low level.

(2) Range between 1.81 - 2.60 is regarded as a relatively low level.

(3) Range between 2.61 - 3.40 is regarded as a moderate level.

(4) Range between 3.41 - 4.20 is regarded as a relatively high level.

(5) Range between 4.21 - 5.00 is regarded as a high level.

2) The completed projects in 2022 have been evaluated for overall efficiency and effectiveness. The overall outputs summary and outputs effectiveness and efficiency analysis are as follows:

- **The aspect of research and development** comprises the projects that available for knowledge sharing to people, including (1) emergency telemedicine data center system connecting database of 423 clinics, (2) “Chu Jai”, the mental health nurturing robotics for elderly care centers in Thailand, (3) the individual holistic healthcare platform, (4) the motion & activity monitoring device for elderly care at home, as to create a new market for smart home devices, (5) the RFID device for communication line detection, and equipment that can be installed on a communication line to organize and lessen the number of communication lines, (6) the

radar system to scan and detect objects under railroads, (7) the digital technology learning center that can cooperate with the university’s internet network, and (8) the digital system of the elementary school of Chulalongkorn University Demonstration School (SMART CUD) for learning administration, operation and internal school security. The overall performance has a relatively high efficiency and effectiveness level.

- **The aspect of service provision, learning promotion, and people’s quality of life improvement**, to empower the target group by establishing 2 community internet centers for the underprivileged in the highlands that lack access to electricity, and disseminating knowledge to people in the community for 200 people. The overall performance has a high efficiency and effectiveness level.





- **The aspect of training and skill development** to promote media literacy and human resource development for entering the radio and television services, comprises (1) the capability assessment system for development and capability training for 560 new-generation mass communications students, (2) the VR Startup Center on 7th floor, Multipurpose Building, King's Mongkut University of Technology North Bangkok, to pass on know-hows and be a model center, and (3) media literacy, accessibility and creativity development for children, young adults, the underprivileged, the elderly, the community leaders, and religious teachers, for 119 persons. The overall performance has a relatively high efficiency and effectiveness level.

- **The aspect of media production** consists of funded projects for promoting media production to cover all target groups, focusing on the special target groups including the children and the youth, the disabled, the ethnic groups, and the underprivileged. The projects include (1) the documentary program project for education of Thai youth and family, (2) the “Wheel Share” program production project, (3) the “Stronger” program production project, and (4) the TV program for promoting

healthcare for the elderly groups through tourism in Thailand. The overall performance has a relatively high efficiency and effectiveness level.

- **The aspect of prescribing policies and work plans in broadcasting, television, and telecommunications services** consists of the projects to study impact analysis and guidelines for developing digital terrestrial television of Thailand after the transition, by studying consumer behavior of the sample groups of every region, and impact on digital terrestrial television operators from technological dynamic and media ecosystem, as well as submitting recommendation reports for developing types and contents of digital terrestrial television programs in the category of commercial service and public service, to the Office of the NBTC and related agencies. The overall performance has a high effectiveness and efficiency level.

3) The completed projects in 2022 have been followed up and evaluated by the BTFP in a total of 17 projects. The details of efficiency and effectiveness evaluation are shown in Table 29.





Table 29 Details of effectiveness and efficiency evaluation (by project) of 2022

Evaluation Aspect	Weighting (Percentage)	Rating	Description
The project on technological prototype development for enhancing emergency telemedicine in suburbs through networks			
Efficiency	25	5 (High)	<ul style="list-style-type: none"> - Hospitals are selected to join the project to develop the information technology system to address the actual health requirements - The developed technology covers a wide range of users and is suitable for medical and public health operations, for people, volunteers, medical personnel in primary, secondary infirmaries and specialized fields. - The counseling system on smartphones via the application "NU Med" is available on Android and iOS systems which is easy to install. - The survey result shows that the users' satisfaction level for the technology is higher than the target. The satisfaction rate assessed by medical personnel is 100 percent, and the satisfaction rate assessed by the volunteers is 97 percent.
Effectiveness	25	5 (High)	<ul style="list-style-type: none"> - The operations conformed to the plan. - According to the data center system usage through the application, it shows that the project achieved the overall outcome higher than the targets based on the specified performance indicators including (1) having 423 infirmaries connected to the database, (2) having doctors and nurses for consultation via the application "NU Med" for 33,868 persons, (3) having the application users for 16,581 persons, and (4) the officials of community health promoting hospitals and doctors and nurses' families utilize the application for 1,427 persons as well as the village health volunteers utilize the application for 15,449 persons in Phitsanulok.
Impact	25	4 (Relatively High)	<ul style="list-style-type: none"> - The coordination and counseling service for patient treatment are served timely, and can solve the problems of a shortage of specialized doctors or inexperienced doctors, such as the counseling system with VR technology via tablets used for newborn abnormalities treatment with ultrasound. The doctors and nurses from Uttaradit Hospital can consult with specialized doctors from Naresuan University immediately, and the people can access personal medical information, receive healthcare news, and contact for emergencies through Hotline 1669.
Sustainability	25	4 (Relatively High)	<ul style="list-style-type: none"> - The guidelines for academic cooperation are prepared for the project to develop a technological model for telemedicine improvement via digital high-speed network between Naresuan University and Phitsanulok Provincial Public Health Office. - The digital technology innovation is applied in medical treatment and health promotion for people, to meet the Thailand 4.0 policy according to the 20-Years National Strategy and the Phitsanulok Smart City policy. - The project is beneficial to medical treatment development and health promotion for people.
Final Rating		4.50 (High)	



Evaluation Aspect	Weighting (Percentage)	Rating	Description
“Chu Jai” : the mental health nurturing robotics for elderly care centers project			
Efficiency	25	4 (Relatively High)	<ul style="list-style-type: none">- The project is completed on time and conforms to the terms of reference.- The significant outcomes derive from the project including 1) medical robotics for elderly care centers that are able to assess the negative emotional state of the elderly, and nurture/assist/heal the mind of the elderly by interacting and offering telepsychotherapy, and 2) an application for data management of the elderly care centers. However, such development has limitations of stability, accuracy, and content variety.
Effectiveness	25	4 (Relatively High)	<ul style="list-style-type: none">- Overall, the project can achieve the objectives/target indicators.- According to the satisfactory survey of “Chu Jai” robotics usage by the elderly and caregivers, and the qualitative data from interview and observation, the strengths of Chu Jai are the mental health application and benefit to users. The chit-chat chatbot program installed is an interactive conversation with the emotional expressions that are consistent with the topics, together with cute appearance with various facial expressions enabling the elderly to feel connected. The robots can also detect the negative emotions such as depression or anxiety from the conversation, meanwhile, the chit-chat chatbot would react to heal the emotions. Moreover, the music therapy application is installed in the robots for integrated treatment.- The trainings are conducted to impart technology for development for the elderly and officials in the care centers to upskill the knowledge and the elderly’s quality of life in Thailand, for 3 times, including 1) the 1st training on “Psychology & Technology” having 39 participants, and most of them have a very high satisfactory level, 2) the 2nd training on “Mental Health and Treatment for the Elderly”, having 35 participants, and most of them are very satisfied with the event, 3) the 3rd training on “The Elderly Data and Resource Management System” having 31 participants, and most of them are satisfied and realize the benefit of Chu Jai for chit-chatting, that lighten the workload of the caregivers, especially when the caregivers are mentally and emotionally unstable. The reactions at such moments can create negative feelings for the elderly, resulting in the relationship between the elderly and the caregivers. However, such development has limitations of stability, accuracy, and content variety.
Impact	25	3 (Moderate)	<ul style="list-style-type: none">- The future plan includes the improvement of Chu Jai based on the recommendations gained constantly from the interview with the elderly and the caregivers as follows : The robot body structure - as having a proper and functional tested robot model, the medical device standard test must be conducted, by improving the material and internal structure to be lightweighted but durable. The function system must be improved for higher stability, and the music therapy application must be improved to be more user-friendly and offer a more variety of music genres. The chit-chat chatbot must be improved in the areas of accuracy and chit-chatting contents. Besides, the sensor system may be installed in the robots to interact with users’ movements to create interaction with users, creating features and friendliness, rather than a screen touching solely. However, though Chu Jai is designed concisely, there are some limitations and obstacles as follows: The robot body structure - the robotic molding process is detailed and requires knowledge in 3D, modeling, mechanics, and liberal arts. The molding process for each piece requires polishing and coloring, and the assembling process needs expert capacity, making the overall molding process time-consuming, leading to the project delay. Also, in the manufacturing process, the material weight control is quite challenging, resulting in a heavy weight robot. Besides, as the function system of Chu Jai requires internet connection for data computing, the data collection process has problems with application stability. And in case of noise surroundings while using the chit-chatting function, the reaction of the robot may be delayed or distorted.
Sustainability	25	3 (Moderate)	
Final Rating		3.50 (Relatively High)	



Evaluation Aspect	Weighting (Percentage)	Rating	Description
Elderly Care Project			
Efficiency	25	3 (Moderate)	<ul style="list-style-type: none"> - The significant outcome of the project is the IoT device prototype that can monitor motions and activities of the elderly living at home. The design is improved based on the recommendations from the comprehensive device tests under the actual utilization circumstances, creating the primary prototype that can be developed further for commercial products, and decreasing reliance on foreign software. However, there is no empirical evidence on producing Master's Degree or Doctoral Degree students, filing for patent registration or Thai Petty Patent prior to project completion, or publishing articles in the international academic conferences as stated in the project outputs.
Effectiveness	25	3 (Moderate)	<ul style="list-style-type: none"> - The progress of the project conforms to the plan in 5 activities out of 7 activities. The device prototype is created for video monitoring with IoT to take care of the elderly. The module for summarizing the activity information is developed as a web application to display the results of data detection, monitoring, and distinguishing, such as falling, and unstable movement/falling forecast with the alert system linked to the caregivers. However, there is no empirical evidence on producing Master's Degree or Doctoral Degree students, filing for patent registration or Thai Petty Patent prior to project completion, or publishing articles in the international academic conferences as stated in the project outputs.
Impact	25	4 (Relatively High)	<ul style="list-style-type: none"> - The system usage presentation to users and family members at the Volunteer Home, is conducted to instruct users to use the system and gain recommendations and comments from the actual users, as well as presenting the system to the people or companies that are interested in the elderly care technology, the experienced public health officers, medical teams, or officials from Mahidol University's team, for taking the recommendations to improve the system.
Sustainability	25	3 (Moderate)	<ul style="list-style-type: none"> - The available software is developed for a higher frame rate computing on Nvidia Jetson TX2, by applying the deep learning model that has fewer layers, and developing the available tracing algorithm to minimize resource consumption in the calculation process.
3.25 (Moderate)			
The Platform Development for Individual Holistic Healthcare Project			
Efficiency	25	4 (Relatively High)	<ul style="list-style-type: none"> - The project is completed within the specified timeframe with social media utilization to impart medical knowledge such as the structural balance and high blood pressure/immunity enhancement/the causes of hypertension/the causes of diabetes. - The project is the first innovation that integrates conventional medicine and balanced therapy medicine in the same platform, in compliance with the Thailand 4.0 policy and the national strategic plan in public health and innovation for national development to leverage the quality of life. The project identifies the connection between variables that cause diseases or risk conditions to create the forecast analysis equation of non-communicable diseases precisely and comprehensively. According to the study on the relationship of related issues and facial asymmetry, it shows that facial asymmetry is related to non-communicable diseases, however, the data available is not sufficient for creating the equation to forecast risks of disease.



Evaluation Aspect	Weighting (Percentage)	Rating	Description
Effectiveness	25	4 (Relatively High)	<ul style="list-style-type: none"> - The significant output is a medical platform prototype for individual holistic treatment with balanced therapy. The project adopts a Deep Technology in medical computing by storing health data and health assessment through the application. The application has been downloaded by users more than 7,700 times. The project team has conducted the usage demonstration for the hospitals, the private companies, and the Social Security Offices, as well as joining the National Health General Assembly of 2019. - The public relations are conducted in various channels based on the objectives, including 1) through offline channels by field visits to disseminate the application guidebooks at hospitals/universities in the target areas, and extending the public relations at the lecture venues and conducting a medical lecture in Bangkok, and 2) through online platforms such as Facebook Page, Instagram, Twitter, and YouTube, by presenting the medical contents that are beneficial to the followers. - According to the satisfactory survey of the sample groups using the application for 342 persons, it shows that 1) users are very satisfied with the contents of the health platform, 2) users are very satisfied with the application as it suits Thai society today had the highest average, followed by recommending the application to others.
Impact	25	4 (Relatively High)	<ul style="list-style-type: none"> - According to public relations activities through social media, it shows that the Facebook users have accessed Page Heal for 2,064,741 times, from May 2019 to December 2020.
Sustainability	25	4 (Relatively High)	<ul style="list-style-type: none"> - The presented contents are useful for the users and people who access Facebook : Page Heal, in the area of medical facts such as varicose veins, Alzheimer's disease, cholesterol fact, and osteoporosis prevention by sun exposure. The 86 sets of infographic media and 52 video clips are prepared to be spread through online channels which are regarded as a persistent digital footprint that can be searched for on the social media platforms. However, the public relations activities through some online channels have not been operated continuously after the project completion. - The patent registration has been co-filed by the Balanced Therapy Foundation for Health and Age under the Patronage of Her Royal Highness Princess Bejaratana and the BTFP on January 12, 2021.
Final Rating			4.00 (Relatively High)
The Research and Development Project for Communication Line Detection Device			
Efficiency	25	3 (Moderate)	<ul style="list-style-type: none"> - The key achievement of the project is a communication line detection device prototype that can read the communication line parameters approved by the NBTC. Moreover, after the project is completed, the grantee (the King's Mongkut Institute of Technology Ladkrabang) detects some problems; that is, some devices are damaged by having the pipe ends left open due to the small hooks, and the pipes bent when exposed against strong winds or harsh temperature.
Effectiveness	25	4 (Relatively High)	<ul style="list-style-type: none"> - The activities are conducted within the timeframe, producing a significant output which is the RFID device prototype for communication line detection. The advantages of RFID include simultaneous data readings and recording, which enables the data alteration or tag recording as needed, and ready-to-use even while an object is moving. For example, in case a product is on a conveyor, and the data reader can communicate through a wide range of mediums such as water, plastic, glass, or other opaque material, while the barcode is unable to do so. However, the developed communication line database of the NBTC (Cable Identification System : CIS) has some limitations as it works independently without connection with the existing systems of the Metropolitan Electricity Authority (GIS system) and the Provincial Electricity Authority (TAM system).



Evaluation Aspect	Weighting (Percentage)	Rating	Description
Impact	25	4 (Relatively High)	- The measures are prescribed to the operators to organize and reduce the number of communication lines to meet the specified cable diameter, and to prevent unauthorized overhead communication lines.
Sustainability	25	3 (Moderate)	- It creates an organized and beautiful scenery, and enhances public safety. - The materials used are damaged, leading to unsustainability. However, the data collection through a Cloud system, and the Linux system usage with the MariaDB database results in updated data. The first and second databases are VPS and the third database is a device separated from VPS, used for backup. In case a database is damaged, the rest can continue working. As soon as the damaged database can run normally, the system will download the recent database to work, making the data updated and stable.
Final Rating			3.50 (Relatively High)
The Explosive Detection Radar System for Railroad in the Southern Provinces Project			
Efficiency	25	3 (Moderate)	- The frequency is able to transmit through the ground to the objects or underground holes. The signal computing is designed for automatic readings, and the developed radar system can detect the objects underground automatically without the interpretation by the experts. - By embedding an object 20-centimeters deep down, and installing an antenna 30-centimeters above the railway level, it shows that the system can detect the object and display the parabolic signals clearly. Besides, the system can transfer the images and identify the GPS location via 3G/4G networks.
Effectiveness	25	4 (Relatively High)	- The project can achieve the objectives/target indicators. However, the explosive detection radar system for the railroad still needs further development. The system has not been used in the actual circumstances as it is just in the trial process for explosive detection (using a gas tank for testing) in which other factors may affect the results such as the differences of soil surfaces.
Impact	25	4 (Relatively High)	- The state agencies includes the officers working in the 3 southern border provinces who detect and observe explosives embedded along railroads. - The people in the 3 southern border provinces can use transportation service safely due to the explosive detection device utilization by the officers.
Sustainability	25	4 (Relatively High)	- The availability of the detection system or alarm system for abnormalities found under the railroads plays an important role in mitigating risks of loss of life and property, as well as economy and social psychology. However, there have been no tests in the actual circumstances. It is only the explosive detection radar test (using a gas tank).
Final Rating			3.75 (Relatively High)



Evaluation Aspect	Weighting (Percentage)	Rating	Description
The digital technology learning center development project			
Efficiency	25	5 (High)	<ul style="list-style-type: none"> - The progress of the project conforms to the operational plan and is completed within the specified timeframe. The significant achievement is a learning center establishment for knowledge management with digital technology. The work of students and instructors derived from knowledge utilization are applied within the university. The internal departments of the university set up a cooperative research network. The people can adopt the data science and IoT knowledge to create innovations and research work to solve problems of the community. - The cooperative activities with other universities and the Digital Government Development Agency (DGA) are conducted by signing the Memorandum of Understanding (MoU) with the Faculty of Science, Srinakharinwirot University, for providing trainings and consultation on data governance to the government organizations.
Effectiveness	25	5 (High)	<ul style="list-style-type: none"> - The project can achieve the objectives/target indicators, having a learning center for knowledge management with digital technology of the students, lecturers, and officers for learning by practicing in labs and self-learning systems. - The university integrates the work of students and lecturers to apply to the operation of the university. The public and private organizations have contacted the university to organize the training on data science and IoT, leading to further cooperation. In this regard, the "Tok Tak", a robotic facilitator from the projects in the contest of Faculty of Science, Srinakharinwirot University, is awarded the first prize and granted the NIA scholarship to develop further for practical implementation in hospitals. - The internal departments within the university have a strong cooperative research network, consisting of 3 main faculties including the Faculty of Science, the Faculty of Engineering, and the Social Communication Innovation College. - The project outputs are applied to assist teaching classes in the Bachelor of Science Program in Computer Science, and the Master of Science in Data Science.
Impact	25	4 (Relatively High)	<ul style="list-style-type: none"> - The cooperative activities with other universities such as Thailand Cyber University (TCU), Thai-Nichi Institute of Technology, King Mongkut's University of Technology Thonburi, and other organizations, are conducted for a common utilization of resources in data science and IoT.
Sustainability	25	4 (Relatively High)	<ul style="list-style-type: none"> - The activities to support and exchange ideas in adopting data science and IoT technologies between universities are conducted by inviting students and officials of King Mongkut's University of Technology Thonburi and Thai-Nichi Institute of Technology to join the project contest. - Hitachi Elevator Company Limited has invited lecturers from the Faculty of Science, Srinakharinwirot University to give advice on the IoT application to improve the elevator system in the company buildings. The cooperation has been pursued by organizing the training in data analytics for the official to develop a data analytic system for factory use, and the MoU with the Faculty of Science, Srinakharinwirot University will be signed for developing a training center for data analytics in automation systems. - The government organization includes the Digital Government Development Agency (DGA) which will sign the MoU with the Faculty of Science, Srinakharinwirot University, for providing training and counseling on data governance preparation to the state agencies.
Final Rating		4.50 (High)	



Evaluation Aspect	Weighting (Percentage)	Rating	Description
The digital system project of Chulalongkorn University Demonstration Elementary School (SMART CUD) for the year 2018			
Efficiency	25	4 (Relatively High)	<ul style="list-style-type: none">- The project is completed within the specified timeframe, and achieves the objectives/target indicators of the project, by creating a platform for capability development of the youth and educational efficiency enhancement for schools nationwide, connecting with the USO Net system via the platform developed by the Chulalongkorn University Demonstration School.- The system is tested with the USO Net pilot schools and the schools participating in the project, by selecting 14 USO Net schools supported by the NBTC and other 3 participating schools. However, the results implementation in other additional schools may require more time.
Effectiveness	25	5 (High)	<ul style="list-style-type: none">- The USO Net alliance schools are interested in the educational administration system via the platform, especially in the part of the student lists in each class, score record & grading, and teaching material resource.- The schools in other networks that interested in the Smart School system trial have primarily applied the online learning management system to solve the problem of unavailability of onsite classes in the beginning of 2021 due to the COVID-19 pandemic. Overall, most teachers, lecturers and students are interested and highly satisfied with the project.- According to the satisfactory survey on the CUD Smart School system conducted by a total of 500 users, 80.6 percent of the users find the system very useful and meet the user's needs.
Impact	25	4 (Relatively High)	<ul style="list-style-type: none">- The Chulalongkorn University Demonstration Elementary School selects and contacts the USO Net schools, under Chachoengsao Primary Education Service Area Office 2, for 7 schools and the schools under Kanchanaburi Primary Education Service Area Office 4 for 7 schools.
Sustainability	25	4 (Relatively High)	<ul style="list-style-type: none">- There are 3 schools that are interested in joining the project, including Chulalongkorn University Demonstration Secondary School, Don Bosco Vitthaya School, Udon Thani, and Hua Hin Vitthayalai School, Prachuab Khiri Khan. However, the results implementation in other additional schools may require more time.- The counseling meeting to introduce the Smart School system is conducted for the USO Net schools, the management and teachers.
Final Rating		4.25 (Relatively High)	
The Information Service Development Project for the Underprivileged in the Highlands (Pilot Project)			
Efficiency	25	5 (High)	<ul style="list-style-type: none">- The 60 trainees who passed the "Leaders for Change" course are aware of mindset inspiration for performing the "should-do" tasks rather than just undertake duties, to develop communities in the highlands to be the "community business". 80 percent of the community leaders have guidelines, inspirations and understandings for performing "duties" which are "activities" and "projects", specified by the government organization, and performing the "should-do" tasks within the legal framework, to bring the highlands communities forward to be the self-dependent communities by utilizing sustainable local resources.- The 18 trainees who passed the "Community Leaders : The People Type®" course can utilize the 'Innovation Square Meter' and believe that they can move forward to be self-dependent by utilizing local biological resources and information technology, at a 30 percent increase rate annually.- The 50 trainees/areas who passed the "Information Technology Utilization Trial and Internet for the Highlands Community" gain knowledge and can utilize internet service for communications, education, research, and coordination with outside areas. The highlands communities utilize the local wisdom in biological diversity to enhance capabilities in the areas of self-dependent, food, herbal medicine, and energy, by developing towards the local economy system via information service system in marketing, tourism, and commerce.

Evaluation Aspect	Weighting (Percentage)	Rating	Description
Effectiveness	25	5 (High)	<ul style="list-style-type: none"> - The 100 trainees/areas who passed the "Learning Development and Information Communication Dissemination" gain knowledge on internet utilization for communication, education, research, and coordination, to drive the project to achieve the targets, and to realize the opportunity to utilize the information technology, computer, and communication devices for developing knowledge, professional skills, and impartial living. - The project can achieve the specified objectives. - The capacity development trainings for information service for the underprivileged in the highlands have been organized for 4 courses including (1) "Leaders for Change", a course for developing knowledge and understandings about social, environmental and information technological changes in the digital era in the economic, social, environmental, civil liberties, and legal aspects regarding highland-based administration, and offering opportunities for the people and trainees to share opinions, (2) "Community Leaders: the People Type" (vocational education), a course for developing knowledge, understanding, production process, usage, maintenance, information technology for communications, internet, energy, and the highlands internet center administration, (3) "Information Technology Utilization Trial and Internet for the Highlands Community", a public review on the project progress, guidelines for resolving inequality, upskill the officers in the highlands, information technology & computer installation, information technology utilization for communications, and communication literacy in the digital era, as well as community leader development, and the Type R people for the internet centers, and (4) "Development Learning and disseminate information media for society in the highlands", a course for imparting understanding for information technology utilization in marketing and commerce of the highlands communities to officially increase the economic, social and environmental values.
Impact	25	4 (Relatively High)	<ul style="list-style-type: none"> - The post-training assessment in internet usage for highlands agricultural development is conducted at Ban Doi Kaew USO Net Center Chiang Mai, and Ban Huay Makok USO Net Center Mae Hong Son. The results show that the trainees give high marks on the utilization in agricultural development for a better living. The internet usage also enables the trainees to use social media such as Facebook, YouTube, and Instagram, and enhance knowledge for themselves efficiently to be able to advertise their local products and tourism through the internet to stimulate expansion marketing goals and publish or transmit to other people.
Sustainability	25	4 (Relatively High)	<ul style="list-style-type: none"> - According to the survey at Ban Doi Kaew, Moo 5, Tambon Mued Ka, Doi Tai, Chiang Mai, and Ban Huay Makok, Moo 4, Tambon Santi Khir, Mae La Noi, Mae Hong Son, the results show that the people highly engage in local development in economic, occupational, and social development in forms of social welfare by granting the allowances for the elderly and the disabled, environmental management and community health administrative cooperation with the Sub-District Administration Offices and the District Administration Offices. The people are interested in utilizing the knowledge gained from the project for the benefits of themselves and the community. - The training on online marketing improves the efficiency of marketing that suits the lifestyle of the people in the highland communities at Ban Doi Kaew, and supports the local product development for trading or enhancing the local economy to move towards the sustainable self-dependent community in the future.



Evaluation Aspect	Weighting (Percentage)	Rating	Description
			<ul style="list-style-type: none"> - The children and the youth are the target group that are willing to learn new things and utilize energy technology for telecommunications, internet, digital service system for communications, and marketing to extend the operations in forest development & income generation of the elderly living in the highlands to create added values to local knowledge and biological diversity.
Final Rating			4.50 (High)
The Competency Research and Development Project and Capacity Assessment for New-Gen Journalists			
Efficiency	25	3 (Moderate)	<ul style="list-style-type: none"> - According to the project, 51.2 percent of the trainees understand the competency model and think that the training course is practical. However, the journalists, the stakeholders and related agencies have less understanding in the human resource development with competency-based principles, and cannot apply the principles to internal human resources management and development. In particular, as the competency model and competency lists are developed for the specific professions of which the professional ethics have been specified, it is difficult for the people in professional groups to differentiate between ethics and competency.
Effectiveness	25	5 (High)	<ul style="list-style-type: none"> - The project is completed and achieves every targeted activity and specified work plan. - Comparing the pretest and post-test scores of the post-training assessment, the results show that 226 out of 467 trainees gain more understanding, accounting for 80 percent of the total respondents.
Impact	25	3 (Moderate)	<ul style="list-style-type: none"> - The project enhances the trainees' knowledge and understanding of the competency, enabling them to improve their competency and capabilities, as well as applying the knowledge to plan their career advancement, which are beneficial to the trainees, mostly university students, prior to entering the labor market productively. - The operations under the project affect the industry ecosystem and Thai society which are moving forwards to a knowledge-based economy.
Sustainability	25	3 (Moderate)	<ul style="list-style-type: none"> - The project is in consistency with other projects and activities of related agencies such as academic seminars on the new - gen journalists' ethics or the activity for student development in the fields of radio, television, telecommunications. Besides, there are many organizations and sectors interested in the research project and results, requesting for the publication of results for further research and utilization. - The project complies with the National Economic and Social Development Plan, and the public policy in the 20-Year National Strategy, in the Strategy for Human Capital Development and Strengthening.
Final Rating			3.50 (Moderate)





Evaluation Aspect	Weighting (Percentage)	Rating	Description
The Learning Center Development Pilot Project and the Virtual Reality (VR) Creation Program for Students			
Efficiency	25	4 (Relatively High)	<ul style="list-style-type: none">- The project is completed within the timeframe and achieves the specified targets.- The trainees of the program gain knowledge and create work, representing the effectiveness of the training program of which the knowledge can be applied to their careers.- The long-term curriculum of King Mongkut's University of Technology North Bangkok, that integrates the existing curriculums, has been promoted by adding to the permanent program of the faculty.- According to the final report, though the operations of each activity are completed, most activities are delayed and not complied with the plan.
Effectiveness	25	5 (High)	<ul style="list-style-type: none">- The project achieves the objectives in output indicator, that is, the number of trainees must not less than 200 persons. The number of actual trainees is 210 persons. The significant outputs are the learning center model, the draft curriculum, and the training program.- Comparing the pretest and post-test scores of the training assessment, the results show that the average score after training is higher than the average pretest score, and the satisfactory level of the trainees is in a highest level in the areas of the project results and program (4.47 points), lecturers (4.67 points), facilities (4.68 points), service quality (4.60 points), and the overall training (4.62 points).
Impact	25	4 (Relatively High)	<ul style="list-style-type: none">- There is a study and data collection of domestic vocational schools and undergraduate study to be a database for publicizing the Virtual Reality (VR) creation program, in a total of 948 schools.
Sustainability	25	4 (Relatively High)	<ul style="list-style-type: none">- The long-term curriculums of King Mongkut's University of Technology North Bangkok integrate with the existing curriculums, for 28 classes per semester.
Final Rating		4.25 (High)	
The project on Media Literacy Upskill for the Underprivileged and the Elderly of the Hmong			
Efficiency	25	4 (Relatively High)	<ul style="list-style-type: none">- The project is completed within the timeframe, having the participating target groups including children, the youth, the underprivileged & the elderly, leaders and teachers who have communications skills and keep track of uncreative media, by having media literacy and media consumption to pass on useful and creative media, and communications skills through media, as well as forming a network for monitoring uncreative media, and communicating to the community. However, the achievement of a network or monitoring uncreative media and communicating to the community has no sufficient empirical evidence.
Effectiveness	25	3 (Moderate)	<ul style="list-style-type: none">- The project achieves the objectives/target indicators completely. According to the post-training assessment, the average satisfactory level of the trainees to the training ranges from high to very high. The overall project operation complies with the objectives, accounting for 60 - 100 percent.



Evaluation Aspect	Weighting (Percentage)	Rating	Description
Impact	25	3 (Moderate)	- The video clips, the PowerPoint presentation, radio scripts, articles, mottos, press releases about the project have been spread through various channels such as the foundation's website and the Thai Catholic Media website, making the people in the community appreciate the work and cherish their community. However, the achievement of a network or monitoring uncreative media and communicating to the community has no sufficient empirical evidence.
Sustainability	25	3 (Moderate)	
Final Rating			3.25 (Moderate)
The Project on Documentary Program for Thai Children, the Youth and Family Education			
Efficiency	25	4 (Relatively High)	- The “Mong Thai Chak Khob Fah” is a documentary program for quality learning and comprehensively developing knowledge for the children, the youth and family, broadcasting through Digital TV and a satellite TV channel under Next Step Company Limited. However, the outcome of taking the project to be a model for documentary program production has no sufficient empirical evidence.
Effectiveness	25	4 (Relatively High)	- The project achieves the objectives/target indicators completely. The significant output is the “Mong Thai Chak Khob Fah” program broadcasted for 40 episodes, 25 minutes each, through the New 18 channel, and the “Khong Dee Thailand HD” channel. However, the outcome of taking the project to be a model for documentary program production has no sufficient empirical evidence.
Impact	25	3 (Moderate)	The impact and sustainability on people : The documentary program is interesting and offers the opportunity to broadcast a quality documentary program in the fields of arts and culture that is suitable for Thai children, the youth, and family, and to expand the number of learning media. However, the outcome of taking the project to be a model for documentary program production has no sufficient empirical evidence.
Sustainability	25	3 (Moderate)	
Final Rating			3.50 (Relatively High)
The “Wheel Share” Program Production Project			
Efficiency	25	3 (Moderate)	- The project is completed within the timeframe. However, the significant outcome is a better understanding about the disabled and creative attitudes towards the disabled, and disabilities in the society. However, the people do not quite realize the capabilities of the disabled, or have a new positive attitude towards the disabled who have competency to drive the society, due to a small audience.
Effectiveness	25	4 (Relatively High)	- Overall, the project achieves the objectives/target indicators completely, having the “Wheel Share” program in a total of 50 episodes, broadcasted through TV 5 HD channel during 09:35 - 10:00 am. - According to the satisfactory survey of the 2 groups including the disabled and general people watching the “Wheel Share” program, 86 percent of the respondents are satisfied with the overall program. Besides, the respondents have comments and recommendations about the program for 43 comments. Most comments and recommendations are positive such as useful and comprehensive contents which can be utilized for a practical use in a daily life.



Evaluation Aspect	Weighting (Percentage)	Rating	Description
Impact	25	3 (Moderate)	- The “Wheel Share” program emphasizes on the capabilities of the disabled, and changes their image to be the capable persons that can drive the society, as well as creating a channel for the disabled to access the right jobs. However, the program still has a small number of audiences.
Sustainability	25	3 (Moderate)	
Final Rating		3.25 (Moderate)	
“The Stronger” Program Project			
Efficiency	25	5 (High)	- The project is completed within the timeframe. - According to the survey on “The Stronger” program broadcasted through every media channel, the number of views is 1,155,438 times, achieving the target indicator that specifies the number of views at least 300,000 times. - The number of respondents to evaluate the program through activities on social media is 500 persons which achieves the target indicator.
Effectiveness	25	5 (High)	- The project achieves the objectives/target indicators completely. - “The Stronger” program is produced in a total of 30 episodes broadcasted through the digital TV channel on Bright TV, Smart SME, True Vision 49, and through online media such as Facebook Fan page, YouTube, and websites. - According to the survey on the program awareness and assessment for 500 samples, most respondents have seen the program for 16 – 20 episodes, accounting for 33 percent, followed by 11 – 15 episodes, accounting for 25 percent. Most of them viewed the program via online media, including Facebook, YouTube, and websites, accounting for 60 percent.
Impact	25	4 (Relatively High)	- “The Stronger” has been broadcasted through various channels, making the program accessible for the people, by publicizing the achievements and operations of enhancing the disabled’s quality of life to get rights and social welfare. The program also shows that if the disabled are supported appropriately by the government, they can be a key force to drive organizations, society, and the nation, and can live in the society with honor, dignity and happiness.
Sustainability	25	4 (Relatively High)	
Final Rating		4.50 (High)	
The TV program for promoting healthcare for the elderly groups through tourism in Thailand Project			
Efficiency	25	5 (High)	- The “Roon Yai Pha Za” is a TV program hosted by Mr. Benchapon Chueyaroorn together with an experienced physician, taking a guest of the show who is a well-known senior celebrity on tour to many places. So far it has been produced for 20 episodes with celebrities joining the show. The contents have been disseminated through various channels within the timeframe specified in the contract.



Evaluation Aspect	Weighting (Percentage)	Rating	Description
Effectiveness	25	5 (High)	<ul style="list-style-type: none"> - In the production process, the contents have been revised many times prior to broadcasting. As the program contents are about healthcare, the specialized physicians are invited to join. Also, the survey on the TV program for promoting healthcare for the elderly groups through tourism in Thailand Project has been conducted by 60 respondents. The results show the feedback of the respondents as follows : (1) The program is useful at the highest level for 36.7 percent, at a high level for 38.3 percent, at a moderate level for 21.7 percent, at a low level for 1.7 percent, and at the lowest level for 1.7 percent. (2) The audience gain knowledge about diseases from the program at the highest level for 28.3 percent, at a high level for 43.3 percent, at a moderate level for 25 percent, at a low level for 1.7 percent, and at the lowest level for 1.7 percent. (3) The audience enjoys the show at the highest level for 26.7 percent, at a high level for 30 percent, at a moderate level for 36.7 percent, at a low level for 5 percent, and at the lowest level for 1.7 percent. - The content published on YouTube Channel of the Rama Channel (full program) has a total view of 23,724 views. The content published on YouTube Channel of the Rama Channel (short clips) has a total view of 1,152,023 views. The content published on Facebook of the Rama Channel for 4 times has a total view of 47,960 views. The content published on YouTube Channel of TV5 for 4 times has a total view of 1,332 views.
Impact	25	4 (Relatively High)	<ul style="list-style-type: none"> - The digital TV and online media are the effective options to impart health knowledge on prevention and treatment to the public in a form of health tourism through the "Rama Channel", which is a channel of the Faculty of Medicine, Ramathibodi Hospital, Mahidol University, to disseminate knowledge for self-reliant health promotion and disease prevention to the public, without reliance on hospitals unnecessarily, "as a healthy person does not need to go to hospital." It is a sustainable health resolution for Thai society, and also promotes health tourism in Thailand, as well as saving the budget in public health spending. - The producer selects the talented and entertaining host who can make the show enjoyable and reliable, and invites the specialized physicians in each expertise to join and provide health facts and information. Moreover, to make the show more interesting, the senior celebrities are invited to join the show and attract viewers, leading to tourism trends in taking senior members of the family to travel, creating unity among the family, and stimulating the tourism economy simultaneously. - The audience can access the program through various online channels. However, due to small feedback on the pros and cons of the program, the project team cannot conduct a comprehensive quality assessment.
Sustainability	25	3 (Moderate)	<ul style="list-style-type: none"> - A health tourism means the tourism with the aims for health promotion, and/or treatment & rehabilitation, or the tourism that integrated treatment and physical & mental health revival with conscience on preserving tourism resources and environment in natural and cultural tourist attractions. In this regard, providing knowledge to prevent diseases and promote good health to people to be self-reliant rather than unnecessary hospital-reliant is a sustainable health resolution for Thai society, that promotes health tourism in Thailand, as well as saving the budget in public health spending. The program is broadcasted through free TV channels in the digital TV system such as TV5 HD, satellite television Rama Channel, the National Broadcasting Services of Thailand (NBT), and via online channels such as YouTube and Facebook, making the program spread in a wide range, and offering various viewing options for audiences. - The "Roon Yai Pha Za" old episodes are rerun on online channels, causing a decrease in the number of viewers as there is no new content. The content dissemination by viewers also decreases (sharing video clips or word of mouth). Besides, the target audience which is the elderly may not have online media literacy, leading to difficulty to follow the program.
Final Rating			4.25 (High)





Evaluation Aspect	Weighting (Percentage)	Rating	Description
The project on Impact Analysis and Guidelines for Thailand Digital Terrestrial Television Development after the Transition			
Efficiency	25	5 (High)	- The project achieves the objectives, and offers the people to access quality TV programs with the contents that suit the audience's needs.
Effectiveness	25	5 (High)	- The project achieves the objectives/targets, having the significant outcome, that is, the Office of the NBTC and related agencies can utilize the information to improve contents in the digital terrestrial television service for the maximum benefit. The operators can utilize the information in management, and the people have an opportunity to watch quality TV programs with the contents that suit the audience's needs.
Impact	25	4 (Relatively High)	- The research creates a significant outcome, that is, the Office of the NBTC and related agencies can utilize the information to improve contents in the digital terrestrial television service for the maximum benefit. The operators can utilize the information in management, and the people have an opportunity to watch quality TV programs with the contents that suit the audience's needs.
Sustainability	25	4 (Relatively High)	
Final Rating			4.50 (High)

Source: The Research and Development Fund Bureau, Office of the NBTC



4) The projects funded by the BTFP allocation for the year 2022 have achieved the objectives of the Section 55 of the Act on the Organization B.E. 2553 (2010) and its amendment, by driving the broadcasting, television, and telecommunications businesses, and spurring the country development in many aspects including economy, society, human resources, and security.

- **Economic Development Dimensions.**

The BTFP allocated the fund for research and development in broadcasting, television, and telecommunications businesses that focus on creating applicable innovations for 5G and digital technologies adoption, by disseminating the fund support to the economy in every level, such as the 5G Testbed and Use Case Development Project of Khon Kaen University. The operation of the project was divided into 6 sub-projects including the Smart Dairy Farm, the Real-Time Image Transfer System, the 5G Drone for Plant Health Monitoring, the Agricultural Machinery Control with 5G Technology, the Application Development of Mobile Device for Medicine Image Recognition for Cardiovascular Diseases Outpatient with Deep Learning Technology, and the 5G Surface Reflector Antenna and Measurement. Such support encourages long-term sustainability, decreases the technological dependence from abroad, and stimulates investment in the broadcasting, television, and telecommunications industries as well as related industries.

- **Social Development Dimensions.**

The BTFP focuses on research and development projects for quality of life enhancement for children, the youth, the elderly, and the underprivileged,

such as the documentary series production for creating awareness of health product types, the program production for the disabled on information utilization through broadcasting, television, and telecommunications services, the audio description production to facilitate the information access of the disabled, the campaign through broadcasting, television, and telecommunications services to enhance understanding of the society to the disabled and the underprivileged, the program production for enhancing learning process of consumers through experiences.

- **Human Resources Development Dimensions.**

The BTFP focuses on the projects that develop and elevate the capacity of human resources in broadcasting, television, telecommunications, and information technology businesses, by conducting the project on the 5-Years Human Resources Development Master Plan for Broadcasting, Television, Telecommunications, and Information Technology Businesses, with the aim to set direction for funding the human resources development in 4 areas, especially in the fields that the labor is scarce, or in-demand. The BTFP also emphasizes on human resources upskill with specialized expertise to keep up with the technological dynamics.

- **Security Dimensions.**

The BTFP focuses on the digital technology adoption to enhance security of life and property, by supporting the projects such as the 5G Ecosystem Enhancement for the South of Thailand Project of Prince of Songkhla University, the Security and Tourism Capacity Enhancement with 5G Technology, and the Artificial Intelligence Innovation for Cybersecurity Skill Development.





3. The operational guidelines for the year 2023.

3.1 Policy and strategy implementation goals.

The Fund Management Committee set the goals for operation of policy and strategy implementation for 2023 as follows:

- 1) Improve and implement the Broadcasting and Telecommunications Research and Development Fund for Public Interest Action Plan for 4-Year Term B.E. 2563 - 2566 (2020 - 2023) to achieve the specified goals, and prepare the draft Broadcasting and Telecommunications Research and Development Fund for Public Interest Action Plan for 5-Year Term B.E. 2567 - 2571 (2024 - 2028).
- 2) Prepare the budget allocation and timeframe for the year 2024 by conducting a cooperation guideline with related agencies for driving the fund allocation to grassroots target groups, performing a proactive operation in

create understandings about fund allocation to the target groups fairly and comprehensively, reviewing and improving the fund allocation process such as regulations, notification, and contracts, to comply with the proactive policies of the Fund Management Committee, and create the encompassing communication channels to respond to questions on fund granting and utilize the research outputs in a sustainable national development.

3.2 Fund allocation goals

According to the Fund Management Committee meeting resolution, the committee approved the budget limit for allocation for the year 2023, in a total of 1,000 million baht. Currently, it is under the NBTC consideration to approve the budget limit and fund allocation guidelines for the year 2023, as proposed by the Committee on Fund Administration. The details are shown in Table 30.

Table 30 Budget limit and fund allocation guidelines for the year 2023²⁵

No.	Fund Allocation for the Year 2023	Amount (Million baht)
1	Category 1 : Project or activities proposed by an eligible grantee for a fund support based on the objectives of the BTFP according to Section 52 (1) (2) (3) and (4) of the Act on the Organization B.E. 2553 (2010) and its amendment	300.00
2	Category 2 : Project specified by the Fund Management Committee	700.00
	2.1 Strategic grant project ²⁶	600.00
	2.2 Ongoing project (agreement with the granted agency)	100.00
	2.3 Fund for collaboration with public sector ²⁷	-
3	Category 3 : Project or operation specified by the NBTC for achieving the BTFP objectives	-
4	Category 4 : Fund for supporting the Thai Media Fund according to Section 52 (5) of the Act on Organization B.E. 2553 (2010) and its amendment	under consideration ²⁸
Total		1,000.00

Source : Research and Development Fund Bureau, Office of the NBTC

²⁵ under consideration of the NBTC to approve the budget limit and fund allocation guidelines.

²⁶ The budget limit for strategic grant projects of the Fund Management Committee only. The grant projects of the clusters as assigned by the NBTC are classified in Category 3.

²⁷ The allocation for the Fund for Collaboration with public sector for the year 2022 are under consideration, and expected to complete with contract signing in 2023, and the NBTC resolution stipulated the BTFP to review the fund allocation for the project by the agreement with state agencies. As a result, the BTFP proposed the NBTC to refrain from the budget allocation for the Fund for Collaboration with public sector in 2023.

²⁸ assign the Secretariat to collect information for budget allocation analysis and propose to the Committee on Fund Administration meeting and the NBTC board meeting for consideration.



3.3 The fund spending monitoring and efficiency evaluation goals.

The BTFP will continually develop the management system for effectiveness and stability, by facilitating the fund management and maintenance to prosper and stable, as well as improving related laws, regulations, and criteria, to be updated in compliance with related strategic plans. The system should be comprehensive for all work processes, transparent, and verifiable by adopting information technology to facilitate the operation of the Research and Development Fund Bureau, and the grantees for greater efficiency. The BTFP granting guidelines will be prepared for distribution through the BTFP

website, and published as a guidebook to provide information on the granting process and procedure to grantees and stakeholders. Moreover, the human resources capacity of the BTFP will be developed to support and achieve the BTFP plans and policies, including skills and experiences in plan & policy analysis, project analysis & evaluation, finance and accounting, research and intellectual property management, and foreign languages, as well as promoting the public relations of the BTFP performances, outputs from the projects supported by the BTFP, and useful information for the society and the BTFP to the public.





3

Report on Market Situation and Competition in Broadcasting, Television, and Telecommunications Services in 2022



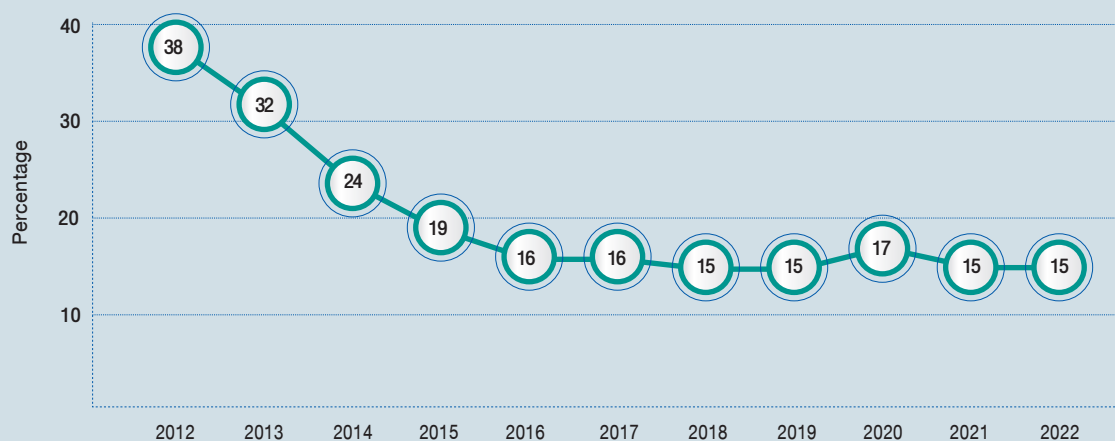
Market Situation and Competition in Broadcasting and Television Services

1. Broadcasting Service Market Situation in 2022.

1.1 Radio Service access rate from every channel in 2022. According to the survey on Thai population aged 12 years old and above who listen to 40 FM main radio stations (87.5 - 107.0 MHz) from every channel

(e.g., radio receiver, mobile phone, and computer) in Bangkok and its vicinity, it shows that the radio service access rate in 2022 accounts for 15 percent of the total population, which is equivalent to the previous year. The details are shown in Chart 10.

Chart 10 Radio service access rate from every channel during 2012 - 2022



Source: AGB Nielsen Media Research

1.2 Advertising value in broadcasting service in 2022. The advertising value via 34 FM main radio stations in Bangkok and its vicinity (88.0 - 91.5 MHz, 93.0 - 98.0 MHz, 99.0 MHz, 100.0 - 103.5 MHz, and 104.5 - 107.0 MHz) in 2022 is in a total of 3,457.64 million baht. Compared to

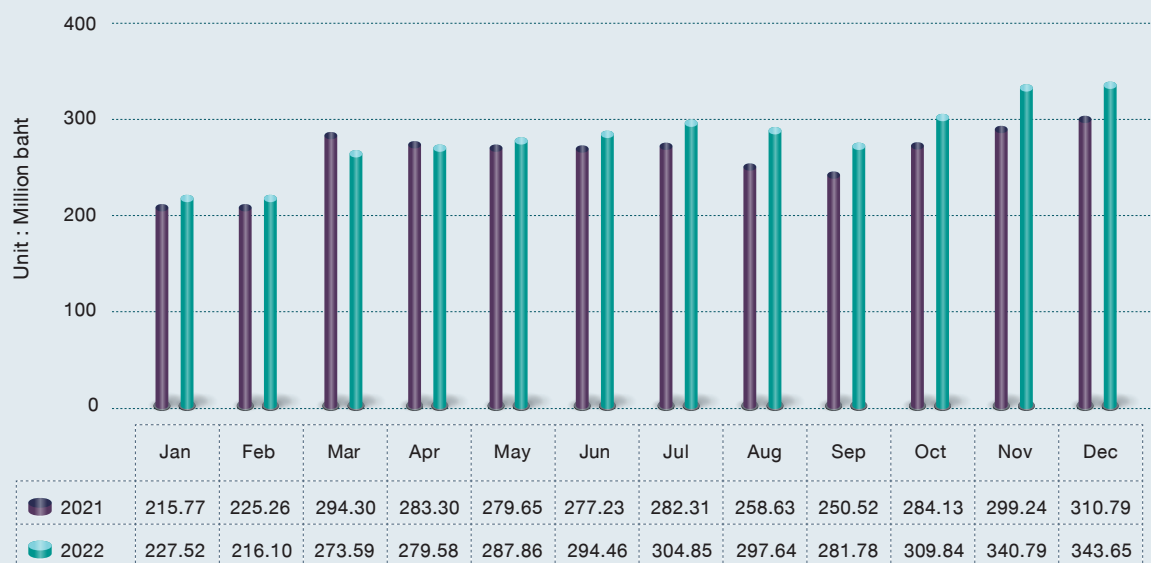
the advertising value of 2022 and 2021, it shows that the advertising value of 2021²⁹ is 3,261.13 million baht, and the value of 2022 is higher than the value of 2021 for 196.51 million baht, accounting for 6.03 percent. The details are shown in Chart 11.

²⁹ In 2021, the advertising value via 35 FM main radio stations (88.0 - 91.5, 93.0 - 99.0, 100 - 103.5 and 104.5 - 107.0 MHz)





Chart 11 Advertising value via FM main radio stations in Bangkok and its vicinity during 2021 - 2022

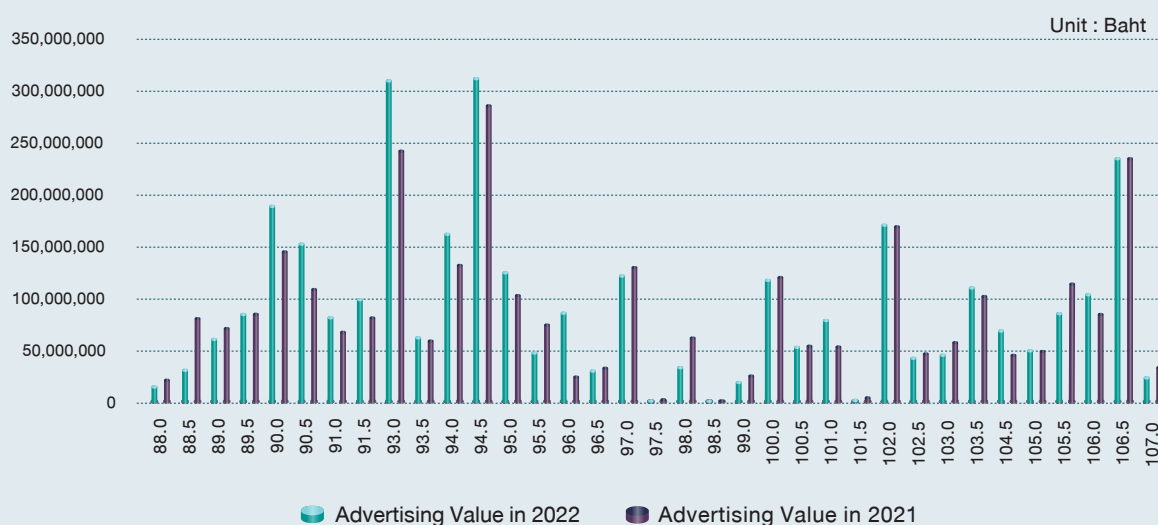


Source : AGB Nielsen Media Research

To consider the advertising value by station, the top 10 radio stations with the highest revenue from advertising in 2022 are 94.5 MHz station (Thai country music program), 93.0 MHz station (Easy listening program), 106.5 MHz (Easy listening program), 90.0 MHz (Thai country music program), 102.0 MHz

(News and documentary program), 94.0 MHz (Easy listening program), 90.5 MHz (News and documentary program), 95.0 MHz (Thai country music program), 97.0 MHz (News and documentary program), and 100.0 MHz (Traffic report program) respectively. The details are shown in Chart 12.

Chart 12 Advertising value via 35 FM main radio stations in Bangkok and its vicinity (by station) during 2021 - 2022



Source : AGB Nielsen Media Research

Remark : No data collection of the 98.5 MHz station in 2022

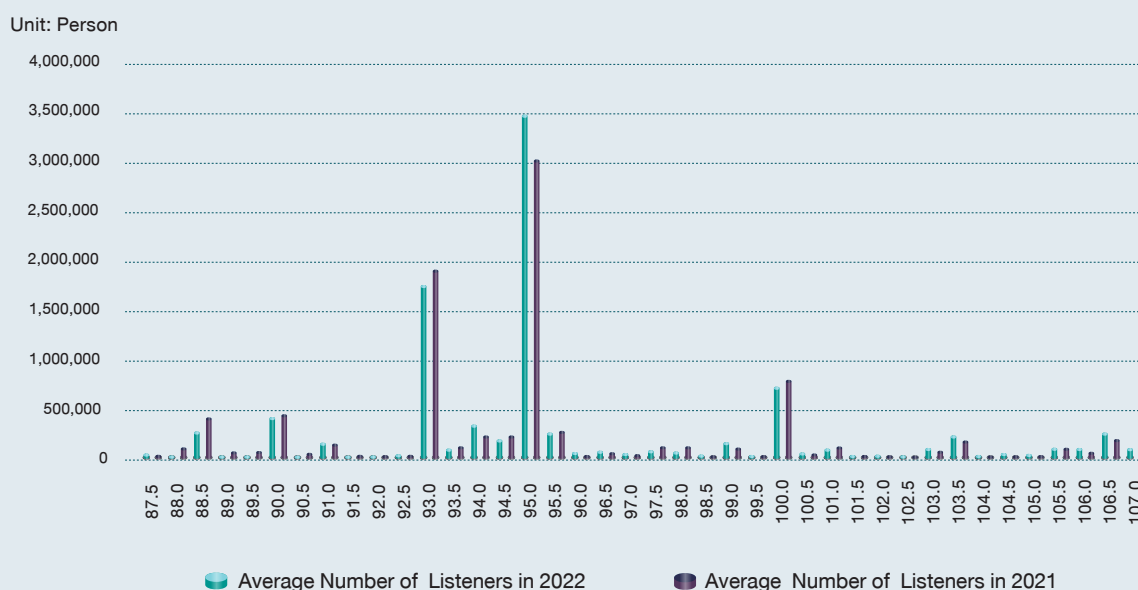




1.3 The number of radio listeners in 2022. According to the survey on Thai population aged 12 years old and above who listen to 40 FM main radio stations (87.5 – 107.0 MHz) from every channel (e.g., radio receiver, mobile phone, and

computer) in Bangkok and its vicinity, it shows that the monthly average number of listeners in 2022 is 10,123,583 persons per month, decreasing from 2021 for 149,500 persons, or accounting for 1.46 percent. The details are shown in Chart 13.

Chart 13 The number of 40 FM main radio stations listeners in Bangkok and its vicinity (classified by station) during 2021 - 2022



Source : AGB Nielsen Media Research

To consider by each station, the top 10 radio stations with the highest number of listeners in 2022 are 95.0 MHz station (Thai country music program), followed by 93.0 MHz station (Easy listening program), 100.0 MHz station (Traffic report program), 90.0 MHz station (Thai country music program), 94.0 MHz station (Easy listening program), 88.5 MHz station (Easy listening program), 95.5 MHz station (Easy listening program), 106.5 MHz station (Easy listening program), 103.5 MHz station (Easy listening program), and 94.5 MHz station (Thai country music program) respectively.

1.4 Market Competition analysis of broadcasting service by advertising value and listener portion. From the analysis of advertising value together with listener portion in broadcasting service market, it shows that most radio stations with high number of listeners tend to earn high advertising value. The stations that are very popular and competitive in the market are Thai country music stations such as 95.0 MHz station, 94.5 MHz station, and 90.0 MHz station.





Moreover, easy listening program stations³⁰ and traffic report program stations gain popularity among listeners and can compete well in the market. These stations are well-known and familiar to listeners, the

easy listening program stations such as 93.0 MHz station, 94.0 MHz station, and 106.5 MHz station. Also, the traffic report program station is the 100.0 MHz station. The details are shown in Table 31.

Table 31 Top 10 stations with the highest number of listeners and stations with the highest advertising revenue during 2021 - 2022

Rank	Stations with the highest number of listeners		Stations with the highest advertising revenue	
	2022	2021	2022	2021
1	95.0 MHz (Thai country music program)	95.0 MHz (Thai country music program)	94.5 MHz (Thai country music program)	94.5 MHz (Thai country music program)
2	93.0 MHz (Easy listening program)	93.0 MHz (Easy listening program)	93.0 MHz (Easy listening program)	93.0 MHz (Easy listening program)
3	100.0 MHz (Traffic report program)	100.0 MHz (Traffic report program)	106.5 MHz (Easy listening program)	106.5 MHz (Easy listening program)
4	90.0 MHz (Thai country music program)	90.0 MHz (Thai country music program)	90.0 MHz (Thai country music program)	102.0 MHz (News and documentary program)
5	94.0 MHz (Easy listening program)	88.5 MHz (Easy listening program)	102.0 MHz (News and documentary program)	90.0 MHz (Thai country music program)
6	88.5 MHz (Easy listening program)	95.5 MHz (Easy listening program)	94.0 MHz (Easy listening program)	94.0 MHz (Easy listening program)
7	95.5 MHz (Easy listening program)	94.0 MHz (Easy listening program)	90.5 MHz (News and documentary program)	97.0 MHz (News and documentary program)
8	106.5 MHz (Easy listening program)	94.5 MHz (Thai country music program)	95.0 MHz (Thai country music program)	100.0 MHz (Traffic report program)
9	103.5 MHz (Easy listening program)	106.5 MHz (Easy listening program)	97.0 MHz (News and documentary program)	105.5 MHz (Easy listening program)
10	94.5 MHz (Thai country music program)	91.0 MHz (Traffic report program)	100.0 MHz (Traffic report program)	103.5 MHz (Easy listening program)

Source: AGB Nielsen Media Research

It is noteworthy that the Thai country music 95.0 MHz station, which has the highest number of listeners, is not on the top 5 list of the highest revenue stations. Besides, the news and documentary stations even not in the top 10 list of the stations with the highest number of listeners, but are the top in earning

high advertising revenue, such as the 102.0 MHz station, the 90.5 MHz station, and the 97.0 MHz station. However, such trend derives from the advertising value in the broadcasting industry, which is forced by the number of listeners, and advertising budget providing that relied on advertising agencies connection.

³⁰ The radio station with contents of international music, modern Thai music or a variety talks.





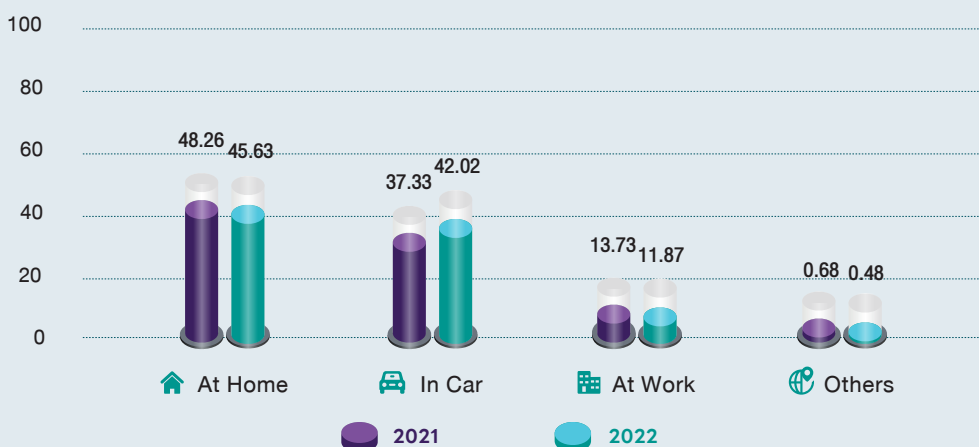
1.5 Radio listening behavior in 2022.

According to the survey on Thai population aged 12 years old and above who listen to 40 FM radio stations (87.5 - 107.0 MHz) from every channel (e.g., radio receiver, mobile phone, and computer) in Bangkok and its vicinity, it shows that most listeners listen to the radio at homes, accounting for 45.63 percent, in cars for 42.02 percent, at works for 11.87 percent, and others for 0.48 percent respectively.

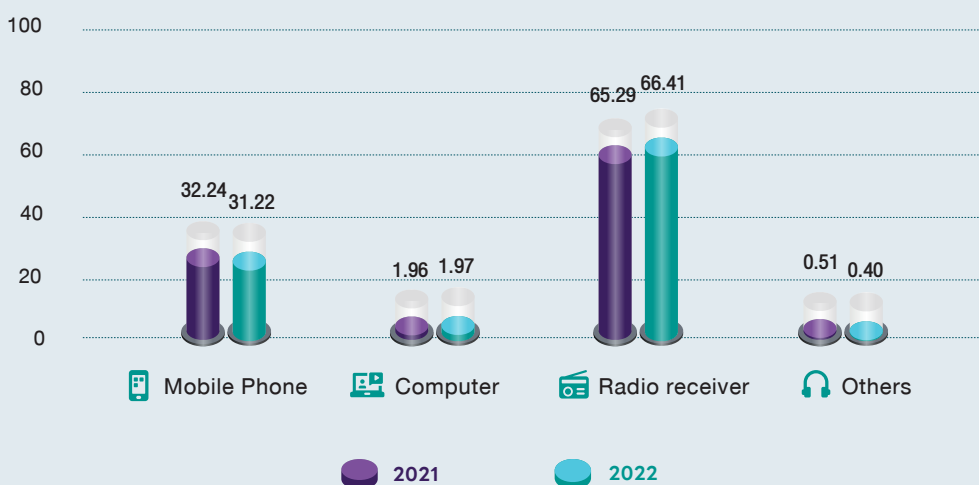
Furthermore, most people listened to the radio through radio receivers, accounting for 66.41 percent, mobile phones for 31.22 percent, computers for 1.97 percent, and others for 0.40 percent respectively. However, when compared the radio listening behavior between 2022 and the previous year, the survey shows that there are increasing trend of radio listening in cars, as well as through radio receivers and computers. The details are shown in Chart 14.

Chart 14 Radio listening behavior (classified by location and device) during 2021 - 2022

Unit : Percentage



Unit : Percentage



Source : AGB Nielsen Media Research

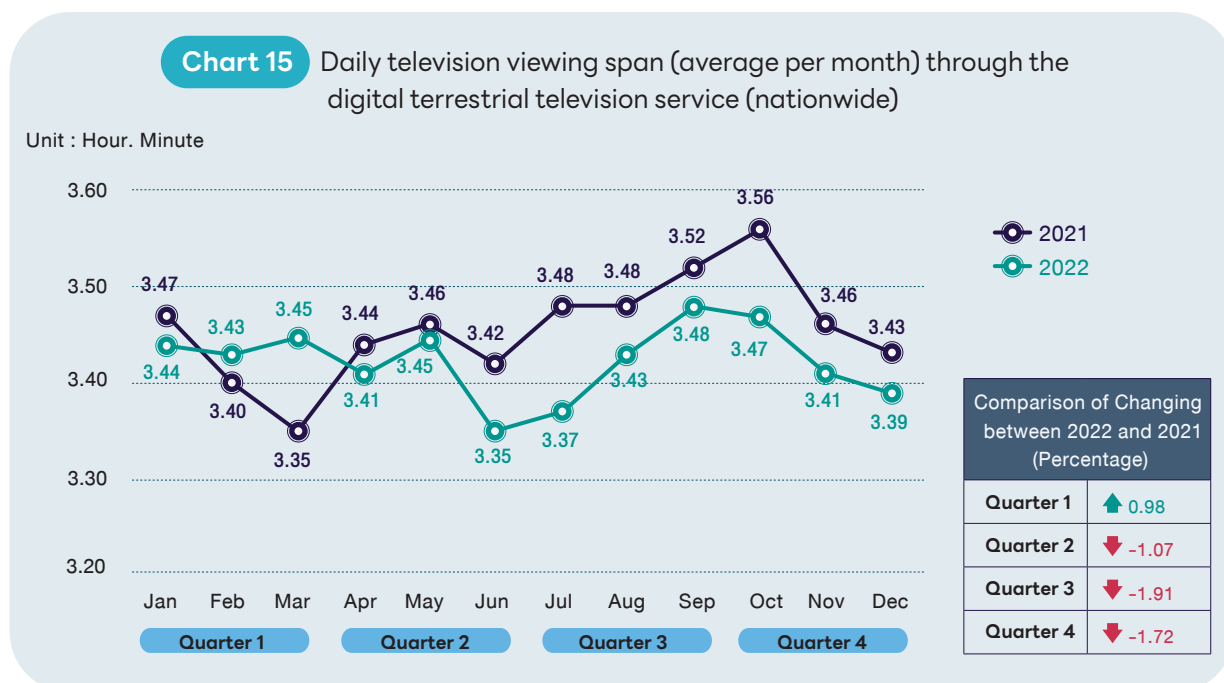


2. Television Service Market Situation in 2022.

2.1 Television viewing behavior in 2022.

According to the daily television viewing data (average per month) of the digital terrestrial television service in 2022 compared to 2021, it shows that the viewing span increasing in

Quarter 1 for 0.98 percent, while decreasing in Quarter 2 for - 1.07 percent, Quarter 3 for - 1.91 percent, and Quarter 4 for - 1.72 percent. Moreover, according to the monthly data, it shows that, in 2022, the digital terrestrial television viewers spend the longest viewing span in September, at an average of 3 hours 48 minutes. The details are shown in Chart 15.



Source : AGB Nielsen Media Research

From the above data, the television viewing span in Quarter 3 of 2022, has been gradually increased, though it was shorter than the viewing span in 2021. However, in Quarter 4, the viewers tended to have a shorter viewing span due to the COVID-19 situation recovery, leading to a low television viewing rate.

2.2 Market competition analysis of digital terrestrial television service with revenue and cost.

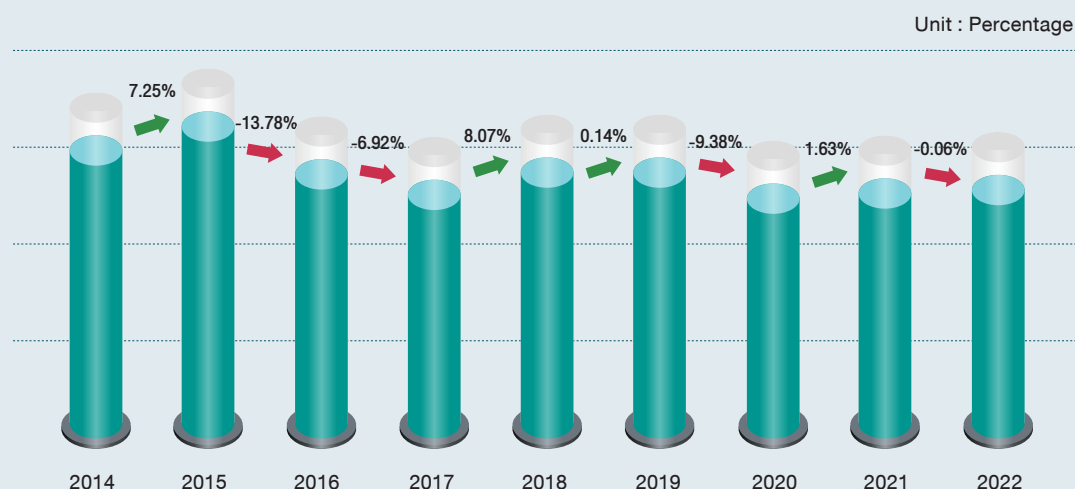
To consider the advertising revenue of the digital terrestrial television

market, it shows that the advertising value in 2022 slightly decreased, accounting for 0.06 percent compared to the advertising value in 2021. Overall, from the past 9 years, the total advertising revenue of the digital terrestrial television service providers has decreased during 2016 - 2017, while increased in 2018 - 2019, and tended to be up and down during 2020 - 2022. However, the total advertising value of the digital terrestrial television service is likely to decrease notably when compared with the year 2015. The details are shown in Chart 16.





Chart 16 Percentage of change in advertising value of the digital terrestrial television service during 2014 - 2022³¹



Source : AGB Nielsen Media Research

Due to the fierce competition after the digital terrestrial television transition, the economic slowdown, and the behavior changing of television viewers that shift to watch contents through online platforms, all these factors have made the digital terrestrial television industry facing challenges. To understand the business operational trend which will be advantageous to business sectors and for policy making in the future, the productivity³² analysis and comparison of the digital terrestrial television operators during 2018 - 2021³³ has been conducted by analyzing data of the operators' revenue³⁴ and cost³⁵ to assess the competitive situation of the digital terrestrial

television service providers. In brief, the results show that, the key success factor of business survival is the ability to make revenues higher than costs.

The analysis shows that some digital terrestrial television service providers for commercial purposes are competitive service providers, while some are facing high business challenges.

1) A service provider with productivity rating more than 1 means a service provider that earns service revenues more than service costs, regarded as a competitive service provider. The details are shown in Chart 17.

³¹ Calculated by the rate card of a TV station.

³² Productivity means the proportion of outputs to inputs. Data from financial statements is used in this analysis by considering aggregate revenue in a particular year, occurred from television business operation, to reflect the aggregate output value, and considering aggregate expenditure or television business operation cost to reflect the aggregate input value.

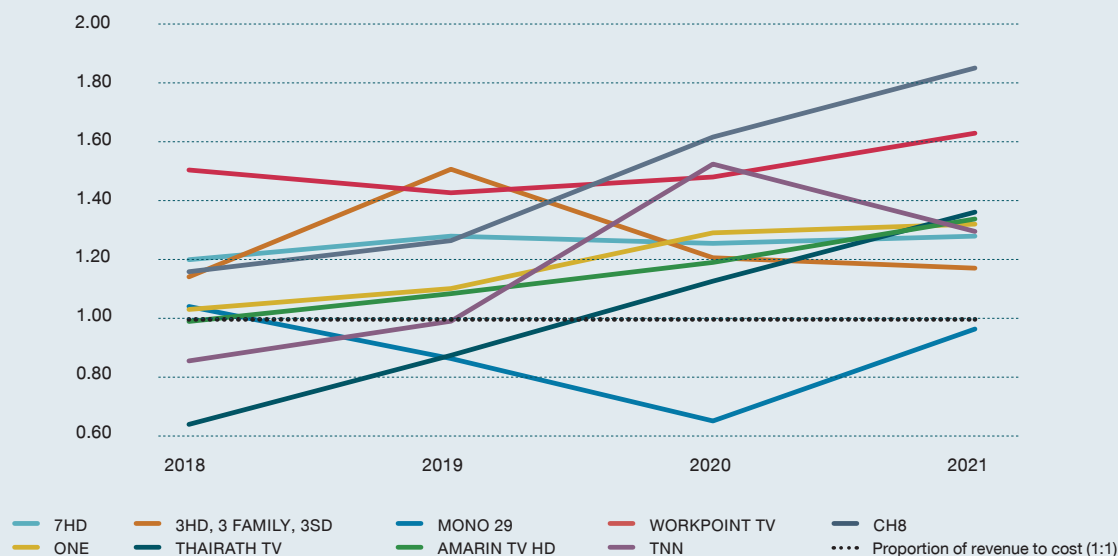
³³ The updated information at the study period.

³⁴ Revenue of a digital terrestrial television operator includes revenue from service provision, airtime rental fee, advertising revenue, venue rental fee, and equipment rental fee, etc.

³⁵ Cost of a digital terrestrial television operator includes service cost, selling expense/service expense, administrative expense, wage expense, raw material cost, and capital expenditure such as copyright cost, equipment depreciation, etc.



Chart 17 Proportion of revenue to cost of the service providers with productivity rating more than 1 (during 2018 - 2021)



Remark : Channel 3 FAMILY and Channel 3SD ceased all their broadcasts since October 1, 2019.

Source : Revenue and cost data from the annual remittance system to the BTFP and DBD DataWarehouse+

• **In 2018**, only 7HD, Channel 3 Group, Mono 29, Workpoint TV, Channel 8, and One had productivity rating more than 1 or had revenue from service provision high enough to cover service cost. Though Spring News Channel had productivity rating much more than 1, the rating and revenue were still very low. Eventually, Spring News returned its license in 2019.

• **In 2019**, the service providers that had productivity rating more than 1 were almost the same group as in 2018, which were 7HD, Channel 3 Group, Workpoint TV, Channel 8, One, and Amarin TV HD. However, Mono 29 had service cost and administrative cost higher than revenue from service provision, leading to the productivity rating less than 1 since 2019.

• **In 2020 and 2021**, the service providers that had productivity rating more than 1 were 8 channels, including 7HD, Channel 3 HD, Workpoint TV, Channel 8, One, Amarin TV HD, Thairath TV, and TNN. The additional service providers for this year were Thairath TV and TNN. That is, Thairath TV gained higher revenue from service provision and lower service cost. Though the high administrative expenses of TNN increased, the revenue from TV program sponsor also increased higher than its service cost and administrative expenses.

According to the past four years data, service providers with productivity rating more than 1 grew their service revenue portions. Some service providers had other more revenues apart from service revenue based on licenses. For example, 7HD and Channel 3 Group earned revenues from advertising and online services, technical services and other digital services, as well as rental fee and other services. Workpoint TV earned revenue from event organizing, and One earned revenue from copyright cost. However, the overall service cost and administrative cost of almost every channel had decreased.

The highlights of most service providers that had productivity rating more than 1 are Thai dramas (7HD, Channel 3 Group, Channel 8, and One), international TV series (Mono29, and Channel 8), variety shows and game shows (Workpoint TV). Besides, the number of news channels that had productivity rating more than 1 have been increasing since 2020. These include Amarin TV HD, Thairath TV, and TNN, offering news broadcasts which have lots of followers such as Tub Toh Kao, and Thairath News Show.

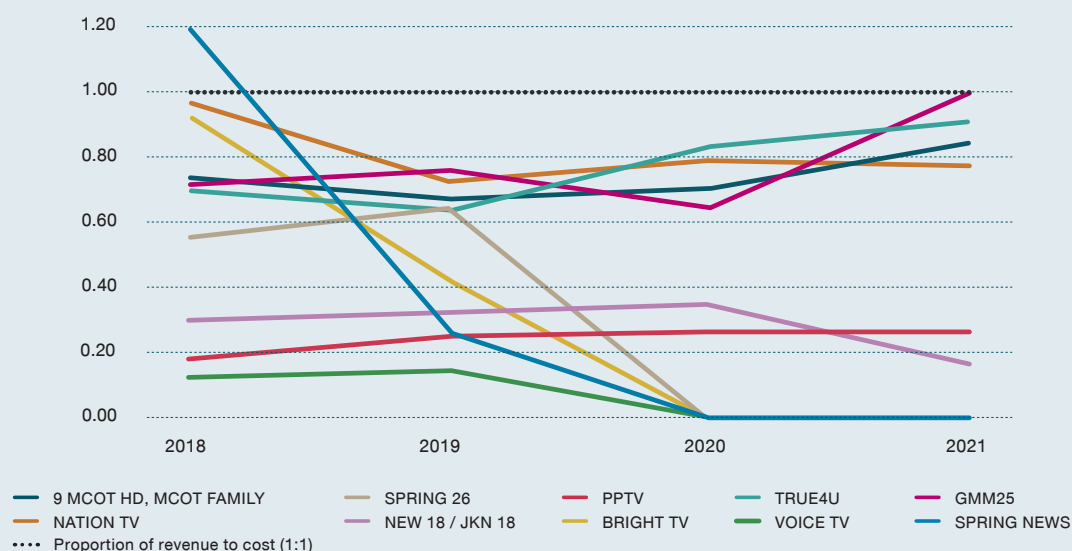




2) A service provider with productivity rating less than 1 means a service provider that revenue earned is lower than service cost, deemed the service provider is facing business operational challenges. Most service providers tend to have not increase revenue, especially the service provision revenue and PR & advertising revenue, while

the operational cost, administrative cost and service cost tend to increase. However, during 2018 - 2021, there were 10 service providers that had productivity rating less than 1. Out of these, 5 service providers had ceased their broadcasts, including Spring 26, Bright TV, Voice TV, Spring News, and MCOT Family. The details are shown in Chart 18.

Chart 18 Proportion of revenue to cost of the service providers with productivity rating less than 1 (during 2018 - 2021)



Source : Revenue and cost data from the annual remittance system to the BTFP and DBD DataWarehouse+

The service providers that ceased broadcasts and the service providers that had productivity rating less than 1 were in a category of news and documentary channels, and news report channels which were not as popular as news talks channels, such as Thairath TV and Amarin TV HD, as these channels had news hosts and newscasters with tons of followers, that can lead popularity to the programs. For New 18, it primarily focused on news report, but after rebranding to JKN 18, the content strategy completely focuses on international series broadcasts instead. However, after rebranding, the channel productivity rating still does not break even. Besides, other service providers with productivity rating less than 1 like, PPTV focused on live sports broadcasts, GMM25 focused on TV dramas/series, and TRUE4U primarily focused on TV series and movies.

In the television market competition, some operators can survive, and some are facing competition restriction challenges. According to revenue data, the revenues from online services and other digital services of some operators have been increasing, reflecting the strategic adaptation of the operators in a disruptive technology environment. The NBTC, as a regulatory organization, not only offered financial support to every television operator to survive, but also support capability upskill in various forms, including offering guidelines to fix the structural problems to strengthen the operators to survive in their businesses, such as law amendment in compliance with dynamic situations.



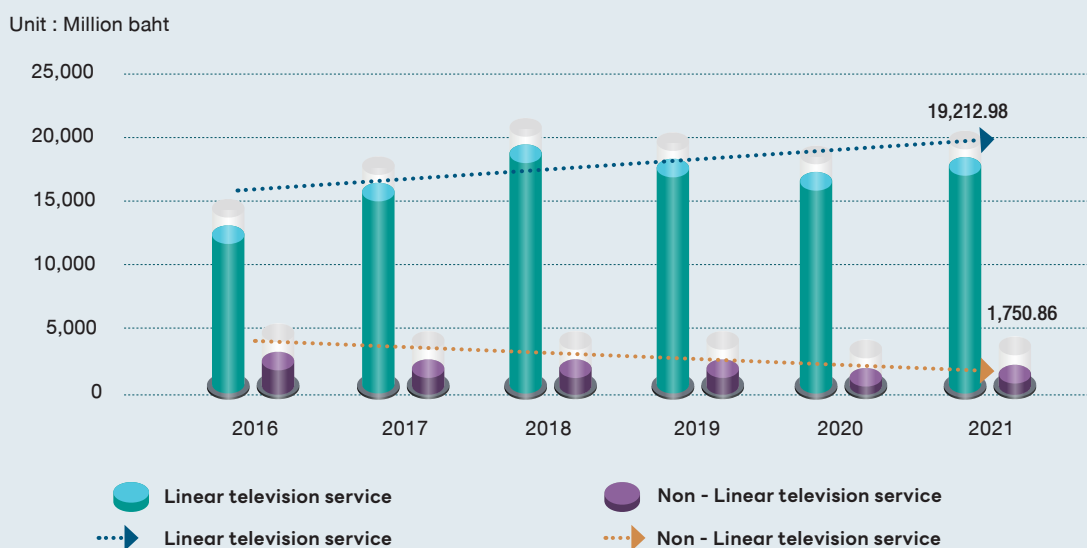
2.3 Competition of service providers.

1) Business value.

Market value of linear television service or digital terrestrial television service is calculated by revenue of operators, declared to the Office of the NBTC in 2022 which was the most recent year that the operators file income statements for license fees payment. In the accounting period of 2021, the total revenue was 19,212.98 million baht. Considering trends of the total market value of each year from 2016 to 2021, the overall market revenue was

likely to increase before declining in 2019. One of the reasons was the COVID-19 pandemic that caused product and service companies to minimize their TV advertising expenses, affecting the digital terrestrial television operators' revenues. However, as the economic situation has gradually eased in 2021, the companies spent more advertising expenses on TV commercials, leading to the increase in market value of linear television service compared to the market value of 2020. The details are shown in Chart 19.

Chart 19 Revenues of linear and non-linear television service providers during 2016 - 2021



Remark : Data as of June 30, 2022

Source : Broadcasting Tariffs Bureau, Office of the NBTC

Market value of non-linear television service or cable TV, satellite TV, and IPTV, is calculated by revenue of operators, declared to the Office of the NBTC in 2022 which was the most recent year that the operators file income statements for license payment. In 2021, the total revenue of non-linear television service licensees of every platform was 1,750.86 million baht, or 3.55 percent decrease compared to 2020, and were likely to continually decrease due to consumer behavior changing and a rapid growth of video streaming providers during COVID-19 pandemic.

2) Network providers. Market value of network providers is calculated by revenue of operators filed for license fee payment each year during 2016 to 2021. In the accounting

period of 2021, which was the most recent year that the operators filed the income statements to the Office of the NBTC, the total revenue of linear and non-linear television licensees was 1,691.24 million baht and 10,062.36 million baht respectively. Since 2017, the revenue trend has been decreasing due to competition in the OTT platform market, as more major international OTT players have penetrated the Thai market. The competitive market conduct of OTT platforms has changed consumer's viewing behavior of linear television network (Traditional TV) to non-linear television to on-demand viewing by attracting them with the original contents of each provider. The details are shown in Chart 20.



**Chart 20** Revenue of linear and non-linear television networks during 2016 - 2021

Remark : Data as of June 30, 2022

Source : Broadcasting Tariffs Bureau, Office of the NBTC

2.4 Competition of broadcasting and television services.

In broadcasting and television services competition regulation, in case there is any complaint on anti-competition practices of a licensee, such as pricing discrimination, unfair service conditions to other operators, or any practices that may affect competition in

broadcasting and television markets, the NBTC shall prescribe order, or measure for, or against such practices to resolve the impact, according to the Notification of the NBTC on Criteria and Measures to Prevent Monopolistic and Unfair Competition Practices in Broadcasting and Television Businesses B.E. 2557 (2014), and related notifications.



Market Situation and Competition in Telecommunications Services

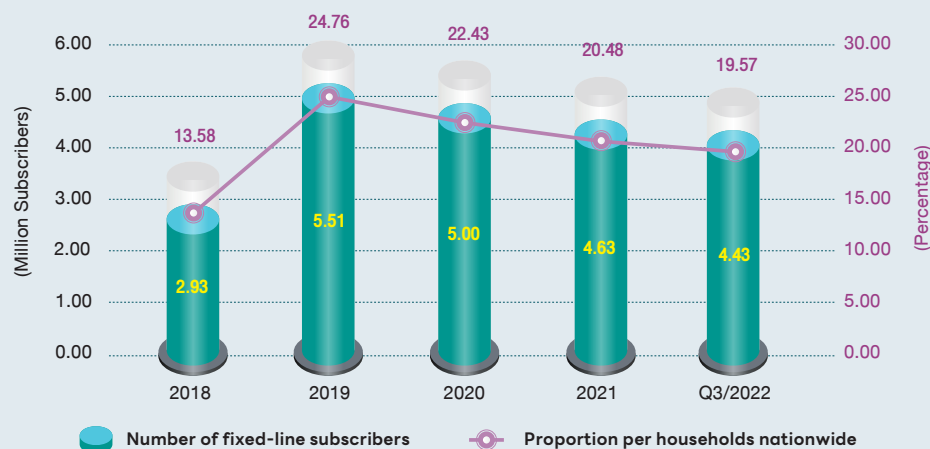
Telecommunications market is classified into 3 categories including fixed-line service, mobile service, and internet service as follows:

1. Fixed-line service market.

There were 4.43 million fixed-line subscribers in Thailand, accounting for 4.32 percent decrease compared to 2021. The proportion of fixed-line subscribers to the number of households was 19.57 percent, as

shown in Chart 21. Considering the market share of fixed-line service, National Telecom Public Company Limited (NT) had the largest market share at 66.31 percent, followed by True Internet Corporation Company Limited (TICC) at 28.59 percent, and Advanced Wireless Network Company Limited (AWN) at 2.71 percent respectively. The details are shown in Chart 22.

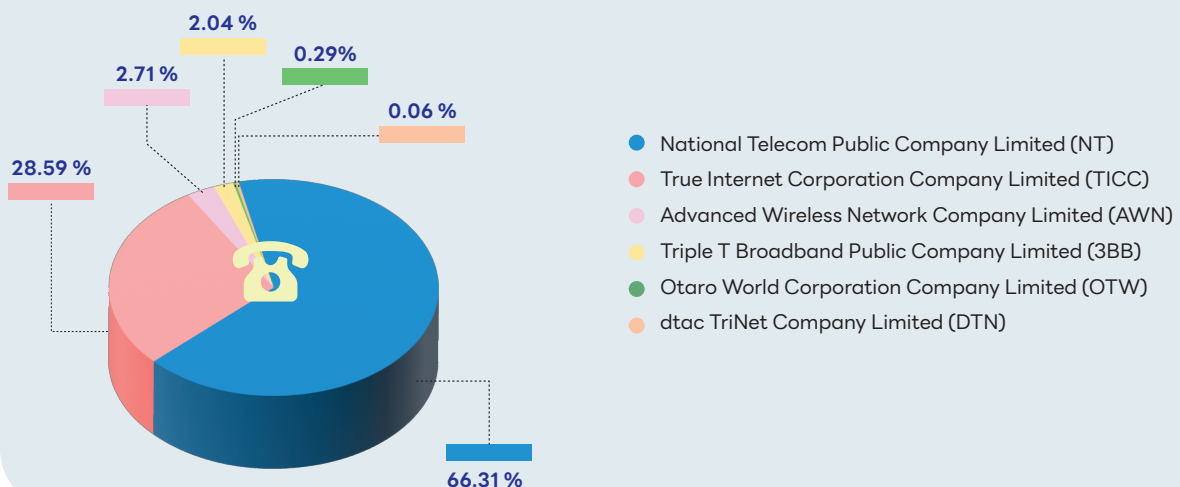
Chart 21 Number of fixed-line subscribers from 2018 to Quarter 3/2022



Remark : Data as of Q3/2022

Source : Telecommunications Policy and Resources Management Bureau, Office of the NBTC

Chart 22 Market share of fixed-line operators



Remark : Data as of Q3/2022

Source : Telecommunications Policy and Resources Management Bureau, Office of the NBTC



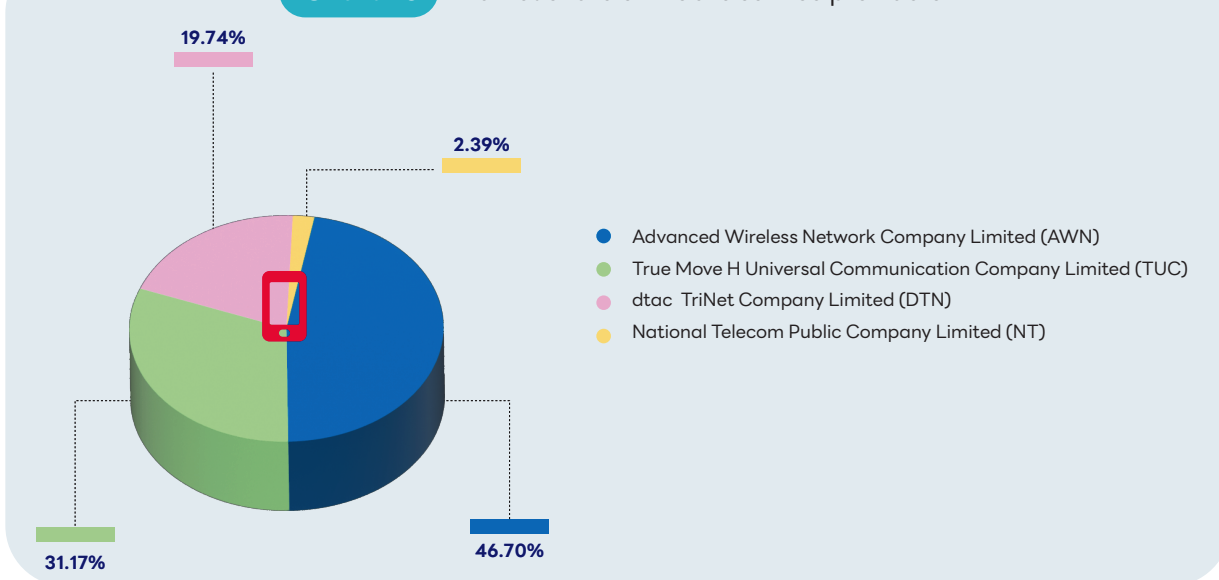


2. Mobile service market.

There were 129 million mobile subscribers in Thailand, accounting for 6.75 percent increase compared to 2021. The proportion of mobile subscribers per 100 population was 188.76 percent. Considering the market share of the mobile service market, AWN had the largest market share at 46.70 percent, followed by True Move H Universal

Communication Company Limited (TUC) at 31.17 percent, dtac TriNet Company Limited (DTN) at 19.74 percent, and National Telecom Public Company Limited (NT) at 2.39 percent respectively. The details are shown in Chart 23. The Herfindahl-Hirschman Index (HHI) of the mobile service market in 2021 was 3,612 and decreased to 3,548 in Quarter 3/2022.

Chart 23 Market share of mobile service providers



Remark : Data as of Q3/2022

Source : Telecommunications Policy and Resources Management Bureau, Office of the NBTC

3. Internet service market.

Nowadays, the internet service in Thailand can be utilized through various means. Most people use mobile broadband internet and fixed broadband internet services as follows:

3.1 Fixed broadband.

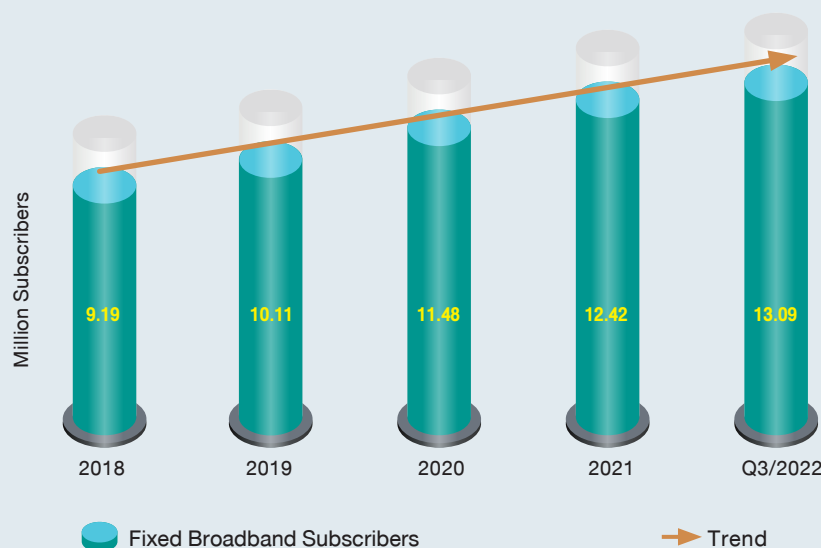
Today, broadband internet service can be connected through various technologies, developing from an xDSL technology (Digital Subscriber Line) to FTTP technology (Fiber to the Premises) or fiber optics networks from origin locations to users' homes and small enterprise's offices destinations. In Quarter 3/2022, the number of fixed broadband subscribers increased to 13.09 million subscribers, accounting for 5.36

percent increase compared to 2021. The details are shown in Chart 24. Considering the access rate, the proportion of 19.15 fixed broadband subscribers per 100 population, or 57.85 percent of family registered for fixed broadband service per a number of 100 households nationwide. Considering the market share in Quarter 3/2022, True Corporation Public Company Limited (True Corp) had the largest market share at 37.47 percent, followed by Triple T Broadband Company Limited (3BB) at 28.50 percent. The details are shown in Chart 25. The HHI of fixed broadband internet decreased from 2,723 in 2021 to 2,716 in 2022.





Chart 24 Number of fixed broadband subscribers from 2018 to Quarter 3/2022

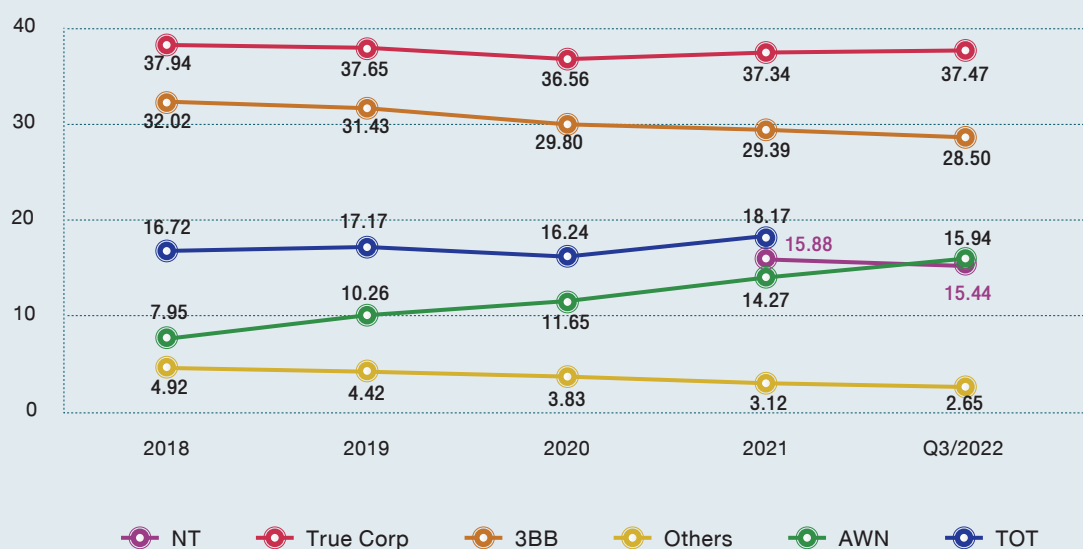


Remark : Data as of Q3/2022

Source : Telecommunications Policy and Resources Management Bureau, Office of the NBTC

Chart 25 Market share of fixed broadband service from 2018 to Quarter 3/2022

Unit : Percentage



Remark : TOT Public Company Limited merged with CAT Telecom Public Company Limited into the National Telecom Public Company Limited (NT)

Source : Telecommunications Policy and Resources Management Bureau, Office of the NBTC

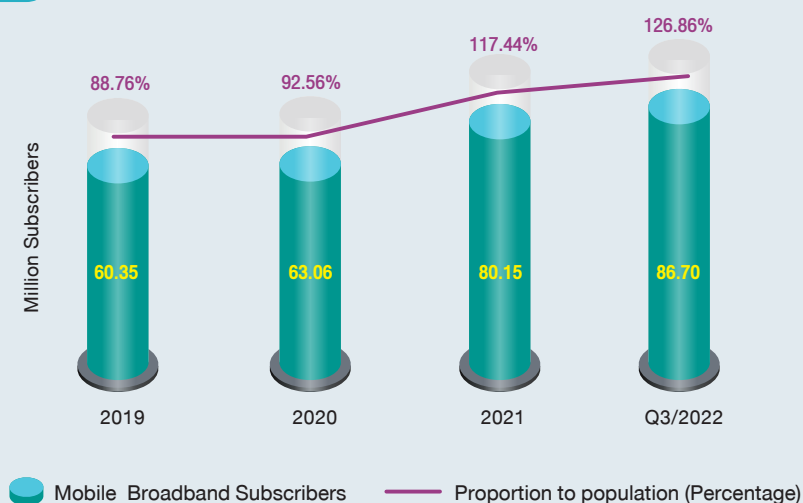


3.2 Mobile broadband.

As of Quarter 3/2022, there were 86.70 million mobile broadband subscribers, or 8.17 percent increase compared to 2021. The details are shown in Chart 26. The number of subscribers in 2022 increased, caused by high demand of the internet access due to COVID-19 pandemic that affected people's daily routine, such as Work from Home & Study at Home schemes, teleconference, or applications usage for entertainment, shopping, or food delivery.

The mobile broadband access rate was 126.86 percent. Considering the market share, True Move H Universal Communication Company Limited (TUC) had the largest market share at 38.70 percent, followed by Advanced Wireless Network Company Limited (AWN) at 38.11 percent, and dtac Trinet Company Limited (DTN) at 18.66 percent. The details are shown in Chart 27. The HHI of mobile broadband market decreased from 3,480 in 2021 to 3,318 in 2022.

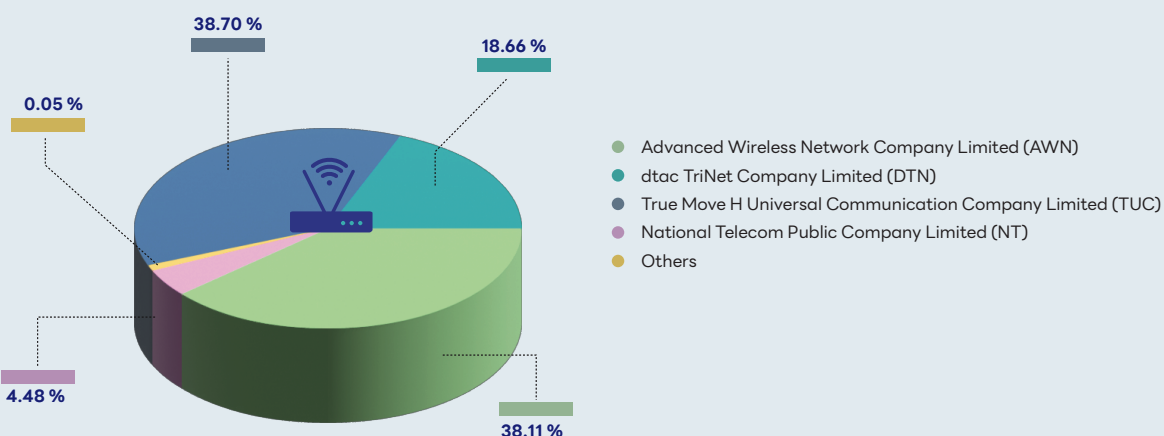
Chart 26 Number of mobile broadband subscribers from 2019 to Quarter 3/2022



Remark : Data as of Q3/2022

Source : Telecommunications Policy and Resources Management Bureau, Office of the NBTC

Chart 27 Market share calculated by number of subscribers of mobile broadband internet service in Quarter 3/2022



Remark : True Move H Universal Communication Company Limited (TUC) has updated the data since 2021.

Source : Telecommunications Policy and Resources Management Bureau, Office of the NBTC



Trends of Broadcasting, Television, and Telecommunications Industries in 2023

1. Trends of broadcasting and television industries in 2023.

It has commonly been assumed that the broadcasting and television operators would have to face business challenges in 2023 as a result of economic situations and behavioral changes in content viewing/listening to access more through online media platforms.

According to 'Thailand Digital Stat 2022' by We Are Social for the year 2022, Thai people surf internet about 9 hours 6 minutes per day (22 minutes longer, or 4.2 percent increase year on year), 20 percent more time spent on listening to the radio, music, podcasts, and playing online games, especially music video contents as the most popular contents, accounting for 60.9 percent from 94.2 percent of the total video viewed weekly by Thai internet users. It represents the content viewing/listening behaviors of Thai consumers that engage more on online media platforms. Thus, it is challenging for the broadcasting and television operators to offer contents that can respond to each generation of target group that has different viewing behaviors. Moreover, the data of 2022 shows that the total revenue and the number of video streaming subscribers in Thailand has continually been growing. In 2022, the revenue of domestic video streaming providers was in a total of 411.23 million USD, while the number of subscribers were more than 11 million accounts. Considering the growth of video streaming providers, the content provided in format of audiovisual media, which is similar to traditional linear television, and service platform variety, these factors make video streaming service as one of the major challenges to traditional television operators, especially in revenue competition which is the key factor that nurtures the businesses to grow.

However, the traditional broadcasting and television services still remain as the significant media for Thailand, particularly for disseminating news and information to the public, as they can penetrate in wide range to people. Thus, the Office of the NBTC, as a regulatory organization, has to support the operators to continue their businesses with quality, either by financial support, educational support, and performance development for content providers to be competitive with online media platforms, as well as business integrated support such as synergy supporting between traditional broadcasting and television operators and online media platform providers, or online media platforms creating of the traditional operators to expand their broadcast channels to penetrate wider range of people. Besides, deregulation is also the other option to reduce the operators' burden.

2. Trends of telecommunications industry in 2023.

In Quarter 2/2022, the COVID-19 pandemic situation has steadily improved, the government decided to ease controls and measures, leading to economic recovery, even though the private sector still could not recover their businesses with full capacity, and the public sector had continued their expense controls. In Quarter 3 - 4, the government announced the termination of the nationwide COVID-19 Emergency Decree, as the kingdom reclassified the COVID-19 from 'a dangerous communicable disease' to 'a communicable disease under surveillance', and prescribed measures to accelerate domestic economy, such as Co-Payment Scheme, We Travel Together Scheme, etc., that led to continuing recovery of businesses and enterprises in many industries, as well as the





telecommunications industry. In 2023, after the COVID-19 relief, the overall internet consumption rate tends to rise, due to content consuming behavior shifting with response to their thoughts, demands and daily life basis convenience via smartphones, Internet of Things (IoT) devices, and smart devices for smart homes to manage home-energy consumption, comfortable living environment creating, as well as security and elderly care enhancing. The business sector and organizations will adopt digital technology to improve their operation model for greater efficiency to address the changing consumer behavior, and comply with the consumer's various needs.

The overall investment in telecommunications industry tends to rise, due to digital economy driven investment of the government supporting policy, the investment preparedness for 5G network efficiency development and coverage expansion in the Eastern Economic Corridor (EEC), to enhance new business growth in many industries and to create a digital ecosystem by creating IoTs platform, Cloud systems, data security center, and data centers to serve the smart electronic industries, such as smart factory, smart electric vehicles, and eco-friendly green industry.

Business investment in 2023 will align with social development, balanced & sustainable environment protection based on the BCG model (Bio-Circular-Green Economy), as well as development in bioeconomy, circular economy and green economy. A technological investment will focus on efficiency improvement to enable 3G, 4G, and 5G networks co-operability to save

energy, to promote alternative energy usage, and to increase proportion the circular energy usage according to the sustainable development approaches. Nowadays, technology plays as major role in our lives. Though in 2022, we have not seen a concrete application of Metaverse technology in Thailand, soon Metaverse will become really a part of our lives, like avatar creating to interact with others in the virtual world, or robot developing that resembles human appearances with nearly human's skills and abilities, that probably to be used in physical world. Furthermore, after the decline of COVID-19 pandemic, consumers have been engaging with mobile applications increasingly to respond to their needs. Thus, the application creators tend to develop their applications to cover comprehensive services, or so-called 'SuperApps', with various transaction feature on applications such as online shopping, food delivery, messaging service, and payment. Moreover, the Adaptive AI technology will be adopted for behavioral learning and self-improvement based on new reference data to more address the reality world situations in real time. IoTs devices and smart devices that interoperate with other devices on Wi-Fi or 5G network will also be widely used in an intelligent & connected world era. In addition, many sectors will emphasize on sustainable technology adoption to build solutions for energy efficiency, or IT services for promoting environment sustainability, such as climate changing management technologies, and pollution reduction, etc.





The Observations on the Action in the Nature of Dominance in Broadcasting, Television, and Telecommunications Services which has Impacted the Benefits of the State and People

1. The Observations on the action in the nature of dominance in broadcasting and television services which has impacted the benefits of the state and people.

The Office of the NBTC has revised and repealed the Notification of the NBTC on Determination of Characteristics and Regulatory Measures for Mergers, Cross-Shareholding, and Dominance in Broadcasting service, with the aim to ease regulation and reduce procedures in undertaking the notification. The Office of the NBTC also released the Notification of the NBTC on Regulatory Measure on Mergers in Broadcasting services, published in the Royal Gazette on August 20, 2018. The dominance of broadcasting and television businesses is specified in Chapter 2 Dominance by stakeholders, defining that in case there is either direct or indirect dominating, by stakeholders with common benefits that may lead to monopolistic market conditions or anticompetition, the NBTC shall prescribe a specific measure to prevent such action that caused unfair competition.

In 2022, there was evidence showing that, the Nation Multimedia Group Public Company Limited had altered the common stock trading of the Nation Broadcasting Corporation Public Company Limited (the Controlling Person of the licensee). By investigating and analyzing the stock trading, the buyer had no relationship to other licensees. Thus, it was concluded that there was no effect on dominance or competition in broadcasting and television businesses.

2. The Observations on the action in the nature of dominance in telecommunications service which has impacted the benefits of the state and people.

In 2022, there was a merger case between True Corporation Public Company Limited (True Corp) and Total Access Communication Public Company Limited (dtac), on January 25, 2022. The two companies submitted the merger notification letters together with the merger report to the Secretary-General of the NBTC. In brief, the amalgamation of True Corp and dtac complied according to Section 146 of the Public Limited Companies Act B.E. 2535 (1992), and would result in a creation of the new company (NewCo). The NewCo would assume all assets, liabilities, rights, and obligations of True Corp and dtac by operation of law. The subsidiaries of True Corp and dtac would remain, and the proportion of investment benefits in other legal entities by True Corp and dtac would remain the investment of the NewCo.

The Office of the NBTC reported the merger notification between True Corp and dtac to the NBTC, according to Article 12 of the Notification of the NBTC on Telecommunications Regulatory Measure and Business Mergers. In the NBTC meeting No.11/2022 on May 10, 2022, the NBTC had the resolution to assigned the Office of the NBTC to collect the feedback reports of the subcommittee on merger analysis between True Corporation Public Company Limited and Total Access Communication Public Company



Limited, and conduct an additional analysis to submit to the NBTC meeting (Special meeting) No.5/2022 on October 20, 2022. The majority commissioners considered that, this merger was not regarded as the ownership of the same business type according to Article 8 of the Notification of NTC on Measures for the Prevention of Monopoly or Unfair Competition in Telecommunications Business B.E. 2549 (2006)

by the implication of Article 9 of the Notification of the NBTC on Telecommunications Regulatory Measure and Business Mergers. As a result, the NBTC acknowledged the merger and prescribed the conditions/specific measures based on Article 12 of the Notification of the NBTC on Telecommunications Regulatory Measure and Business Mergers.





Quality of Service and Telecommunications Service Rates that are Important to People

The NBTC has carried out regulations in telecommunications services, prescribed telecommunications quality of service criteria and standards, and regulated telecommunications service rates, with the aim to deliver consumers with standardized service and quality service at a fair price. The key performances and achievements in 2022 are as follows:

1. Quality of service regulations.

The Office of the NBTC has revised the Notification of the NBTC on Quality of Service Standards for Telecommunications Services, to deliver the consumers with the standardized and proper quality services, and to support nation's technological development, covering the IMT-2020 technology. In this regard, the Office of the NBTC organized the public hearing to get public opinions of stakeholders and the public, to the draft Notification of the NBTC on Quality of Service Standards for Telecommunications Services during August 10 to October 10, 2022. Moreover, the service quality indicators for the Round-Trip Time (RTT), HTTP, and streaming service have been differentiated the indicators between 4G and 5G (SA) technologies. Currently, it is on process of proposing the draft notification to the NBTC meeting to consider in order to be publicized in the Royal Gazette.

In 2022, the Office of the NBTC has continually monitored and examined the telecommunications service quality, according to the Notification of the NBTC on Quality of Service Standards for Telecommunications Services,

specifying the licensees to provide telecommunications services, that comply with the quality of service standards, indicated in the appendix of the notification³⁶, which requires the licensees to examine the service quality indicators and submit the reports to the Office of the NBTC quarterly. In addition, the Office of the NBTC has re-examined the service quality yearly, in case the service provision did not comply with the standards, investigated the cases when received complaints from consumers, and cooperated with the operators to review the complained issues. The summary of service quality monitoring based on the quality of service standards is as follows:

1.1 Quality of telecommunications service monitoring referenced by the telecommunications operators' quality of service monitoring report.

1) Quality of fixed telecommunication network services.

The fixed telecommunication network services include fixed-line telephone service and public payphone service. According to the quality of service reports submitted by 44 fixed line service licensees to the Office of the NBTC, the service provisions of all operators met the targets specified in the NBTC notifications. The results indicate the efficiency of telecommunications service provision, in terms of telecommunications network, services, and maintenance & repair, as well as communication accuracy, speed, and convenience. The details are shown in Table 32.

³⁶ The service quality indicators as appeared in the appendix of the Notification of the NBTC on Quality of Service Standards for Telecommunications Services, was published in the Royal Gazette on October 25, 2019, Volume 136 Special Part 265 Ngor, consisting of

- 1) Fixed telecommunications services mean the service provision through fixed telecommunications network such as copper wire network, fiber optic network, or both. The services include fixed-line telephone service, public payphone service, and data services. The service quality indicators include (1) Quality of general service indicators, (2) Quality of voice service indicators, and (3) Quality of data service indicators.
- 2) Mobile services mean the service provision through mobile telecommunications network for Land Mobile Service. The service quality indicators include (1) Quality of general service indicators, (2) Quality of voice service indicators, and (3) Quality of data service indicators.



Table 32 Quality of service performance of the fixed-lined service licensees in 2022

Clause ³⁷	Quality of service indicators	Target	Quality of service indicators		
			Minimum	Average	Maximum
Quality of General Service Indicators					
1.1.1	Supply time for initial connection	No longer than 10 working days	1 day	2.71 days	10 days
1.1.2	Percentage of service installation completed on or before the date confirmed	Not less than 90 percent	90	93.91	100
1.1.3	Number of reported faults per 100 subscribers	Not more than 5 times per 100 users	0	1.67	5
1.1.4	Fault repair time	No longer than 24 hrs.	1 hr.	7.42 hrs.	24 hrs.
1.1.5	Billing inaccuracy	Not more than 0.3 percent	0	0.04	0.27
1.1.6	Response time for accessing customer-service call center	No longer than 60 seconds	3 seconds	35.53 seconds	60 seconds
1.1.7	Payphone Service Availability	Not less than 90 percent in Bangkok and its vicinity	99.84	99.92	99.96
		Not less than 85 percent in other provinces	99.89	99.95	99.98
Quality of Voice Service Indicators					
1.2.1	Successful Call Ratio (within network)	Not less than 90 percent	91.07	96.48	99
1.2.2	Successful Call Ratio (across different network)	Not less than 85 percent	88.3	95.57	99
Quality of Data Service Indicators					
1.3.1	Network Unavailability: Cumulative Last Mile Node outage time in a month ratio	Not more than 1 percent	0	0.24	1

Remark : Data as of Quarter 3/2022

Source : Telecommunications Technology and Standard Bureau, Office of the NBTC

2) Quality of mobile network services. According to the quality of service reports submitted to the Office of the NBTC by 7 mobile service operators³⁸, consisting of the Mobile Network Operators (MNOs) and

Mobile Virtual Network Operators (MVNOs), the overall service provisions of the operators during Quarter 1/2022 - 3/2022 met the quality of service targets, specified in the NBTC notifications, as shown in Table 33 and 34.

³⁷ Clause hereby means the clause of indicators specified in the Notification of the NBTC on Quality of Service Standards for Telecommunications Services.

³⁸ 1) The 4 mobile network operators (MNOs) include (1) National Telecom Public Company Limited (NT), (2) Advanced Wireless Network Company Limited (AWN), (3) True Move H Universal Communication Company Limited (TUC), and (4) dtac TriNet Company Limited (DTN).
2) The 3 Mobile Virtual Network Operators (MVNOs) include (1) Loxley Public Company Limited, (2) Loxley Mobile Company Limited, and (3) The White Space Company Limited.



Table 33 Quality of service performance of the mobile service operators in 2022

Clause	Quality of service indicators	Target		Quality of service indicators		
				Minimum	Average	Maximum
Quality of General Service Indicators						
2.1.1	Service activation time	Prepaid: No longer than 3 hrs. for 90 percent of service activation time		99.81	99.94	100
		Post-paid: No longer than 5 hrs. for 90 percent of service activation time		97.02	99.23	100
2.1.2	Billing inaccuracy	Not more than 0.3 percent		0	0.03	0.21
2.1.3	Response time for accessing customer-service call center	Not longer than 60 seconds		21 sec.	41.66 sec.	60 sec.
2.1.4	Network unavailability: number of cell outages continuously over 4 hours in a month	Not more than 10 times per 100 cells/month		4.32 times	6.91 times	9.36 times
2.1.5	Network unavailability: number of cell outages continuously over 24 hours in a month	Not more than 3 percent		0.63	0.94	1.26
2.1.6	Network unavailability: Cumulative cell outage time in a month	Not more than 1 percent		0.09	0.19	0.28
Quality of Voice Service Indicators						
2.2.1	Successful Call Ratio (within network)	Not less than 90 percent during 10.00 – 13.00 hrs. quarterly		93.96	96.38	98.34
		Not less than 90 percent during 16.00 – 19.00 hrs. quarterly		94.11	96.47	98.13
2.2.2	Successful Call Ratio (across different network)	Not less than 90 percent during 10.00 – 13.00 hrs. quarterly		94.65	96.40	97.73
		Not less than 90 percent during 16.00 – 19.00 hrs. quarterly		95.32	97.11	98.20
2.2.3	Drop Call Rate	Not more than 2 percent during 10.00 – 13.00 hrs. quarterly		0.06	0.14	0.23
		Not more than 2 percent during 16.00 – 19.00 hrs. quarterly		0.06	0.15	0.26
2.2.4	Mean Opinion Score (MOS)	Not less than 2.5 (90 percent of measured score must not less than this score)	North	98.58	99.63	100
			South	97.58	99.29	100
			Central	99.79	99.94	100
			Northeast	99.28	99.82	100

Remark : Data as of Quarter 3/2022

Source : Telecommunications Technology and Standard Bureau, Office of the NBTC





Table 34 Quality of service performance in data service of the mobile service operators in 2022

Clause	Quality of service indicators	Target	Area	Measurement Location	Quality of service indicators		
					Minimum	Average	Maximum
Quality of Data Service Indicators							
2.3.1	Round-Trip Time (RTT)	3G: Not more than 500 ms, target indicator not less than 80 percent	Regional (South)	Major routes and minor routes	98.52	98.84	99.30
				Community areas	96.80	98.67	100
			Bangkok and its vicinity	Major routes and minor routes	97.58	98.65	100
				Surveillance areas	95.89	97.71	99.62
		4G: Not more than 150 ms, target indicator not less than 80 percent	Regional (South)	Major routes and minor routes	98.84	99.36	99.70
				Community areas	95.90	98.84	100
			Bangkok and its vicinity	Major routes and minor routes	99.09	99.68	100
				Surveillance areas	99.37	99.76	100
2.3.2	FTP success ratio	3G Download: Not less than 80 percent	Regional (South)	Major routes and minor routes	97.46	98.24	99.55
				Community areas	96.33	98.13	99.11
			Bangkok and its vicinity	Major routes and minor routes	98.73	99.65	100
				Surveillance areas	96.23	98.72	100
		4G Download: Not less than 80 percent	Regional (South)	Major routes and minor routes	96.67	98.18	99.41
				Community areas	97.34	98.59	99.40
			Bangkok and its vicinity	Major routes and minor routes	98.67	98.98	99.25
				Surveillance areas	97.87	99.13	100
		3G Upload: Not less than 70 percent	Regional (South)	Major routes and minor routes	99.41	99.66	100
				Community areas	98.16	98.98	99.64
			Bangkok and its vicinity	Major routes and minor routes	99.16	99.72	100
				Surveillance areas	97.71	99.27	100
		4G Upload: Not less than 70 percent	Regional (South)	Major routes and minor routes	97.45	99.11	100
				Community areas	97.59	99.14	100
			Bangkok and its vicinity	Major routes and minor routes	99.34	99.60	100
				Surveillance areas	98.32	99.24	100
2.3.3	FTP Ratio subjected to specified data rate	3G Download: Not less than 750 Kbps for 75 percent of Timeout FTP transmission	Regional (South)	Major routes and minor routes	95.84	98.15	100
				Community areas	98.28	98.85	99.15
			Bangkok and its vicinity	Major routes and minor routes	98.73	99.65	100
				Surveillance areas	96.05	98.85	100
		4G Download: Not less than 2.5 Mbps for 75 percent of Timeout FTP transmission	Regional (South)	Major routes and minor routes	97.30	98.67	100
				Community areas	98.33	98.98	99.79
			Bangkok and its vicinity	Major routes and minor routes	98.87	99.22	99.41
				Surveillance areas	93.50	98.04	100



Clause	Quality of service indicators	Target	Area	Measurement Location	Quality of service indicators		
					Minimum	Average	Maximum
		3G Upload: Not less than 300 Kbps for 75 percent of Timeout FTP transmission	Regional (South)	Major routes and minor routes	98.65	98.90	99.12
				Community areas	97.80	98.42	99.02
			Bangkok and its vicinity	Major routes and minor routes	99.16	99.69	100
				Surveillance areas	96.59	98.55	99.62
		4G Upload: Not less than 500 Kbps for 75 percent of Timeout FTP transmission	Regional (South)	Major routes and minor routes	95.53	98.18	99.69
				Community areas	97.57	99.11	100
			Bangkok and its vicinity	Major routes and minor routes	99.40	99.79	100
				Surveillance areas	98.32	99.24	100
2.3.4	HTTP success ratio	3G: Not less than 90 percent, less than 3 minutes timeout	Regional (South)	Major routes and minor routes	98.37	99.29	100
				Community areas	98.09	99.29	100
			Bangkok and its vicinity	Major routes and minor routes	99.15	99.79	100
				Surveillance areas	98.51	99.63	100
		4G: Not less than 90 percent, less than 1 minute timeout	Regional (South)	Major routes and minor routes	96.62	98.67	100
				Community areas	97.06	99.13	100
			Bangkok and its vicinity	Major routes and minor routes	98.66	99.57	100
				Surveillance areas	96.21	98.77	100
2.3.5	Streaming service accessibility	3G (Not defined)	Regional (South)	Major routes and minor routes	-	-	-
				Community areas	75.48	92.00	99.82
			Bangkok and its vicinity	Major routes and minor routes	-	-	-
				Surveillance areas	100	100	100
		4G and above (Not defined)	Regional (South)	Major routes and minor routes	-	-	-
				Community areas	95.26	97.02	99.27
			Bangkok and its vicinity	Major routes and minor routes	-	-	-
				Surveillance areas	100	100	100
2.3.6	Streaming reproduction success ratio	3G (Not defined)	Regional (South)	Major routes and minor routes	-	-	-
				Community areas	78.46	89.81	98.29
			Bangkok and its vicinity	Major routes and minor routes	-	-	-
				Surveillance areas	95.00	95.00	95.00
		4G and above (Not defined)	Regional (South)	Major routes and minor routes	-	-	-
				Community areas	89.42	93.71	99.88
			Bangkok and its vicinity	Major routes and minor routes	-	-	-
				Surveillance areas	95.00	95.00	95.00

Remark : Data as of Quarter 3/2022

Source : Telecommunications Technology and Standard Bureau, Office of the NBTC



In Quarter 3/2022, the Office of the NBTC identified the surveillance areas for mobile network services to be monitored the quality of data services (RTT, FTP and HTTP) by the operators, based on the Notification of the NBTC on Quality of Service Standards for Telecommunications Services, and the

Notification of the Office of the NBTC on Guidelines for Quality of Service Indicators Measurement and Surveillance Areas, which defines the report outline & result dissemination, service quality indicators and levels for service provision via fixed-line and mobile networks. The details are described in Table 35

Table 35 Surveillance areas for mobile network services in 2022

Area	Measurement Location (As of Q1/2022)	Measurement Location (As of Q2/2022)	Measurement Location (As of Q3/2022)
Regional surveillance areas	Measure in the Northeastern region - Major routes and minor routes in regional areas - Routes in community areas (within the same district)	Measure in the Southern region - Major routes and minor routes in regional areas - Routes in community areas (within the same district)	Measure in the Central and Eastern regions - Major routes and minor routes in regional areas - Routes in community areas (within the same district)
Surveillance areas in Bangkok and its vicinity	Major routes in Bangkok and its vicinity	Major routes in Bangkok and its vicinity	Major routes in Bangkok and its vicinity
	Special routes in Bangkok and its vicinity - Si Rat Expressway - Chalerm Maha Nakhon Expressway	Surveillance areas 1. Suvarnabhumi Airport 2. Don Mueang Airport 3. Bangkok Bus Terminal (Chatuchak) 4. Bangkok Bus Terminal (Borommaratchachonnani) 5. Bangkok Bus Terminal (Ekkamai) 6. Bangkok Railway Station (Hua Lamphong)	Community areas 1. Burapha University, Chonburi 2. University of Phayao, Phayao 3. Khon Kaen University, Khon Kaen 4. Mahachulalongkornrajavidyalaya University, Ayutthaya 5. Bang Poo Industrial Estate

Source : Telecommunication Enforcement Bureau, Office of the NBTC

1.2 Quality of service monitoring by the Office of the NBTC based on the standard regulations.

1) Stationary Test. The Office of the NBTC installed the quality of service testers for the telecommunication services at the NBTC regional offices and sub-region offices. The monthly test has been carried out to monitor the mobile service network in order to perform service in compliance with the quality of service standards as prescribed by the NBTC in the notification, which can be summarized as follows:

(1) According to the voice service quality monitoring by considering Successful Call Ratio and Drop Call Rate of same network operator, the voice service provision of all operators in Quarter 3/2022 met the standards. The Successful Call Ratio accounted for 99.91 percent, higher than the target (not less than 90 percent), and the Drop Call Rate accounted for 0.00 percent, better than the target (not more than 2 percent). The details are shown in Table 36.



Table 36 Test results of voice service within the same network operator in 2022

Quality of Service Indicators	Target	Test Results of Voice Service within the Same Network Operator		
		Quarter 1	Quarter 2	Quarter 3
Successful Call Ratio	Not less than 90 percent	99.98	99.96	99.91
Drop Call Rate	Not more than 2 percent	0.00	0.02	0.00

Remark : The tests were conducted in 26 areas, including the Office of the NBTC Head office (Sailom), the Offices of the NBTC region 1 - 4, the NBTC sub-region offices 11 - 16, the NBTC sub-region offices 21 - 25, the NBTC sub-region offices 31 - 35, and the NBTC sub-region offices 41 - 45.

Source : Telecommunication Enforcement Bureau, Office of the NBTC

(2) According to the voice service quality monitoring by considering Successful Call Ratio and Drop Call Rate in the different network operators, the voice service provision of all operators in Quarter 3/2022 met the standards.

The Successful Call Ratio accounted for 99.83 percent, higher than the target (not less than 90 percent), and the Drop Call Rate was 0.00 percent, better than the target (not more than 2 percent). The details are shown in Table 37.

Table 37 Test results of voice service in the different network operator in 2022

Quality of Service Indicators	Target	Test Results of Voice Service in the Different Network Operator		
		Quarter 1	Quarter 2	Quarter 3
Successful Call Ratio	Not less than 90 percent	99.94	99.67	99.83
Drop Call Rate	Not more than 2 percent	0.02	0.04	0.00

Remark : The tests were conducted in 26 areas, including the Office of the NBTC Head office (Sailom), the Offices of the NBTC region 1 - 4, the NBTC sub-region offices 11 - 16, the NBTC sub-region offices 21 - 25, the NBTC sub-region offices 31 - 35, and the NBTC sub-region offices 41 - 45.

Source : Telecommunication Enforcement Bureau, Office of the NBTC





(3) According to the data service quality monitoring by considering FTP Average Throughput download/upload rate, FTP

Success Ratio, and HTTP Success Ratio, the data service provision of all operators in Quarter 3/2022 met the standards, as shown in Table 38 and 39.

Table 38 Test results of data services quality on 3G Technology in 2022

Quality of Service Indicators		Target	Test Results on 3G Technology service		
			Quarter 1	Quarter 2	Quarter 3
FTP Download	FTP Average Throughput download rate	Not less than 0.750 Mbps	7.85	8.02	7.50
	FTP Success Ratio	Not less than 80 percent	96.77	95.49	95.70
FTP Upload	FTP Average Throughput upload rate	Not less than 0.300 Mbps	3.33	2.98	3.26
	FTP Success Ratio	Not less than 70 percent	97.61	95.16	93.97
HTTP	HTTP Success Ratio	Not less than 80 percent	98.35	97.00	97.17

Remark: The tests were conducted in 26 areas, including the Office of the NBTC Head office (Sailom), the Offices of the NBTC region 1 - 4, the NBTC sub-region offices 11 - 16, the NBTC sub-region offices 21 - 25, the NBTC sub-region offices 31 - 35, and the NBTC sub-region offices 41 - 45.

Source: Telecommunication Enforcement Bureau, Office of the NBTC

Table 39 Test results of data services quality on 4G Technology in 2022

Quality of Service Indicator		Target	Test Results on 4G Technology service		
			Quarter 1	Quarter 2	Quarter 3
FTP Download	FTP Average Throughput download rate	Not less than 2.5 Mbps	25.72	28.62	30.31
	FTP Success Ratio	Not less than 80 percent	98.43	97.43	96.53
FTP Upload	FTP Average Throughput upload rate	Not less than 0.5 Mbps	10.05	8.91	8.64
	FTP Success Ratio	Not less than 70 percent	98.41	96.73	95.99
HTTP	HTTP Success Ratio	Not less than 80 percent	98.79	97.88	97.05

Remark: The tests were conducted in 26 areas, including the Office of the NBTC Head office (Sailom), the Offices of the NBTC region 1 - 4, the NBTC sub-region offices 11 - 16, the NBTC sub-region offices 21 - 25, the NBTC sub-region offices 31 - 35, and the NBTC sub-region offices 41 - 45.

Source: Telecommunication Enforcement Bureau, Office of the NBTC



2) Mobility Test. The Office of the NBTC imposed the quarterly test by usage and defined the test areas in 4 categories including (1) major and minor highways (1-digit, 2-digit, and 3-digit routes), (2) major routes in Bangkok and its vicinity, (3) special routes in Bangkok and its vicinity, and (4) routes in community areas by random selecting some areas only for mobile service quality test to comply with the standards.

(1) According to the voice service quality monitoring by considering Successful Call Ratio and Drop Call Rate of an operator within the same network, the voice service provision of all operators in Quarter 3/2022 met the standards. The Successful Call Ratio was higher than the target (not less than 90 percent), and the Drop Call Rate was better than the target (not more than 2 percent). The details are shown in Table 40.

Table 40 Test results of voice service within the same network operator by the mobility test in 2022

Quality of Service Indicators	Target	Test Area	Test Results of Voice Service in Same Network Operator		
			Quarter 1	Quarter 2	Quarter 3
Successful Call Ratio	Not less than 90 percent	A	100.00	99.71	100.00
		B	99.98	99.97	100.00
		C	100.00	99.96	99.95
		D	99.97	99.73	99.98
Drop Call Rate	Not more than 2 percent	A	0.00	0.08	0.05
		B	0.02	0.15	0.07
		C	0.00	0.12	0.20
		D	0.01	0.04	0.13

Remark : Test Area A includes major and minor highways. Test Area B includes major routes in Bangkok and its vicinity. Test Area C includes special routes in Bangkok and its vicinity/surveillance areas. And Test Area D includes routes in community areas.

Source : Telecommunication Enforcement Bureau, Office of the NBTC

(2) According to the data service quality monitoring by considering FTP Average Throughput download/upload rate, FTP Success Ratio, and HTTP Success Ratio by

the mobility test, the data service provision of all operators in Quarter 3/2022 met the standards, as shown in Table 41.

**Table 41** Test results of data services quality on 3G and 4G Technology by the mobility test in 2022

Quality of Service Indicators		Target (3G)	Target (4G)	Test Area	Test Results on 3G technology service	Test Results on 4G technology service
FTP Download	FTP Average Throughput download rate	Not less than 0.750 Mbps or 75 percent	Not less than 2.5 Mbps or 75 percent	A	7.60	38.20
				B	8.02	31.72
				C	8.65	35.07
				D	7.71	39.76
	FTP Success Ratio	Not less than 80 percent	Not less than 80 percent	A	98.68	98.91
				B	98.60	98.22
				C	99.36	99.12
				D	98.98	99.31
FTP Upload	FTP Average Throughput upload rate	Not less than 0.300 Mbps or 75 percent	Not less than 0.5 Mbps or 75 percent	A	3.61	12.26
				B	5.36	11.90
				C	4.69	11.29
				D	4.40	10.82
	FTP Success Ratio	Not less than 70 percent	Not less than 70 percent	A	99.34	99.78
				B	99.59	98.41
				C	99.73	99.12
				D	99.87	99.34
HTTP	HTTP Success Ratio	Not less than 90 percent	Not less than 90 percent	A	99.21	99.34
				B	99.59	98.13
				C	100.00	99.78
				D	99.72	99.45

Remarks : 1. Data as of Quarter 3/2022

2. Test Area A includes major and minor highways. Test Area B includes main routes in Bangkok and its vicinity. Test Area C includes special routes in Bangkok and its vicinity/surveillance areas. And Test Area D includes routes in community areas.

Source : Telecommunication Enforcement Bureau, Office of the NBTC

In addition, to acquire information of the service network capacity for the mobile service standards consideration, the Office of the NBTC has performed the mobile service quality tests by usage for 313 clusters in 43 provinces, as well as performing the tests

to support the complaint handling work of the Office of the NBTC regarding mobile service quality for 95 items. The test reports of mobile service quality by usage on LTE-Advanced technology or higher for 313 items.





2. Telecommunications service rates regulations. The Office of the NBTC has regulated the telecommunications service rates to ensure consumers can access quality service at a fair price, receive quality service at a lower price, and promote fairness to consumers and operators with regards to public interest.

2.1 Fixed-line service rate regulation.

Currently, There are 7 fixed-line service providers including National Telecom Public Company Limited (NT), True Internet Corporation Company Limited (TICC), Advanced Wireless Network Company Limited (AWN), Triple T Broadband Public Company Limited (3BB), dtac TriNet Company Limited (DTN), Otaro World Corporation Company Limited (OTW),

and Amnex Company Limited (AMX). In Quarter 3/2022, there were a total of 17,436,000 fixed-line numbers allocated. Out of the total, 4,427,421 numbers were active fixed-line subscribers, or accounting for 1.55 percent decrease from the previous quarter. As of Quarter 3/2022, NT had the largest market share at 66.31 percent, as shown in Table 42. However, the fixed-line subscribers have been steadily decreasing due to changing consumer behavior. Today, the number of smartphone users has been increasing constantly. Thus, they tend to terminate their fixed-line subscription. The existing fixed-line users maintain their subscription only for business purposes, or as backup phones in their residences, or for emergency cases.

Table 42 Number of active fixed-line subscribers

Operators	Accumulated Allocated numbers
National Telecom Public Company Limited (NT)	14,900,000
True Internet Corporation Company Limited (TICC)	1,965,000
Advanced Wireless Network Company Limited (AWN)	321,000
Triple T Broadband Company Limited (3BB)	188,000
dtac TriNet Company Limited (DTN)	22,000
Otaro World Corporation Company Limited (OTW)	20,000
Amnex Company Limited (AMX)	20,000
Total	17,436,000

Remark : Data as of Quarter 3/2022

Source : Numbering Management Bureau, Office of the NBTC

The average revenue per user of fixed-line service in Quarter 3/2022 was 150.57 baht, and the average revenue per user of public payphone service was 20.51 baht. By considering the weighted average of fixed-line service and public payphone service, the average revenue per user was 147.63 baht.

2.2 Mobile phone service rate regulation. Today, the mobile phone service providers in Thailand are categorized into the mobile network operators (MNOs) who have their own infrastructures, The 4 MNOs including Advanced Wireless Network Company Limited (AWN), dtac TriNet Company Limited (DTN), True Move H Universal





Communication Company Limited (TUC), and National Telecom Public Company Limited (NT). Also, the mobile virtual network operators (MVNOs) who are service providers that have no spectrum use licenses and do not own infrastructure and/or requisite network for mobile phone service provision. The 4 MVNOs including The White Space Company Limited, Loxley Public Company Limited, Feels Telecom Corporation Company Limited, and redONE Network (Thailand) Company Limited. In addition, there were sub-brands under AWN and DTN, which were GOMO by AIS, and FINN Mobile. As of Quarter 3/2022, the average voice

service rate was 0.50 baht per minute. The average service rates of non-voice service including SMS was at 0.78 baht per message, MMS at 1.73 baht per message, and mobile internet at 0.10 baht per Megabyte. By comparing the average service rate of all services to the previous quarter, the average service rate of all services had slightly changed, and were below the regulating rates based on the Notification of the NBTC on Criteria and Regulation on Domestic Mobile Phone Service Pricing. The details are shown in Table 43.

Table 43 Average mobile phone service rates in Quarter 3/2022

Service Rate ³⁹	Voice (Baht/Minute)	SMS (Baht/Message)	MMS (Baht/Message)	Internet (Baht/MB)
Reference rate according to the Notification of the NBTC on Criteria and Regulation on Domestic Mobile Phone Service Pricing	0.60	0.89	2.33	0.16
Average Service Rate 2021 ⁴⁰	0.49	0.74	1.80	0.12
Average Service Rate 2022 ⁴¹	0.50	0.78	1.73	0.10

Source : Telecommunications Tariffs Bureau, Office of the NBTC

³⁹ To calculate the average service rate, the method is to average all promotional packages offered or provided in the quarter, derived from the average service rate per unit of each promotional package, by weighting main promotional packages in a proportion of 80 percent or 0.8, with the add-on promotional packages in a proportion of 20 percent or 0.2, based on Article 9 of the Notification of the NBTC on Criteria and Regulation on Domestic Mobile Phone Service Pricing.

⁴⁰ Weighted average service rates based on the number of promotional packages of the operators as of Q3/2021

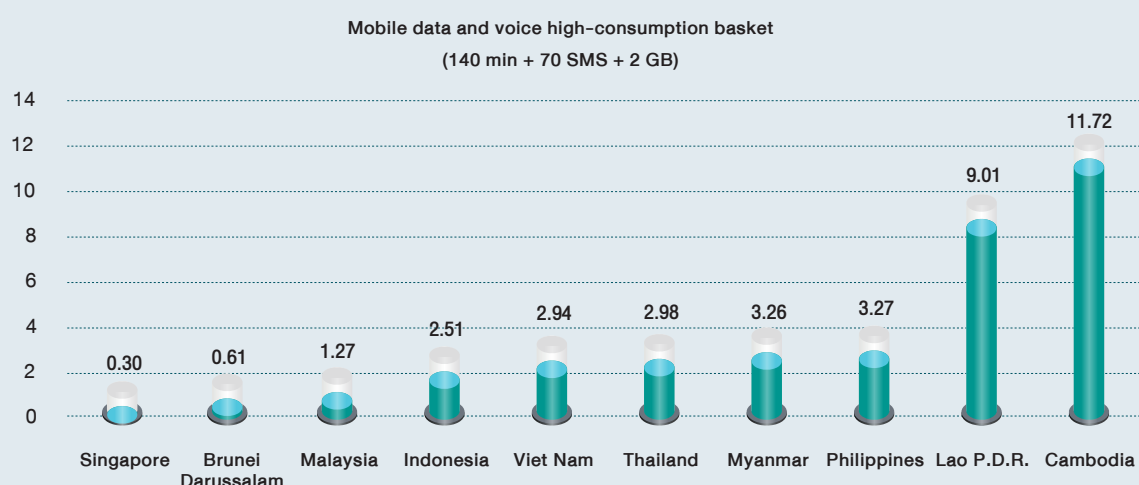
⁴¹ Weighted average service rates based on the number of promotional packages of the operators as of Q3/2022



2.3 Mobile phone service rates of Thailand and ASEAN countries. To compare the mobile phone service rates by considering Price/GNI per capita of 2021, which reflects the affordability, with this service rate, Thai people have a moderate affordability level compared to ASEAN countries. In this regard, the service packages taken into consideration are the

packages available based on the International Telecommunication Union (ITU) ICT Price Basket specified at 2 GB and 500 MB only. Most packages available in Thailand are unlimited data packages, or offer more than such data usage volume. The details are shown in Chart 28 and 29.

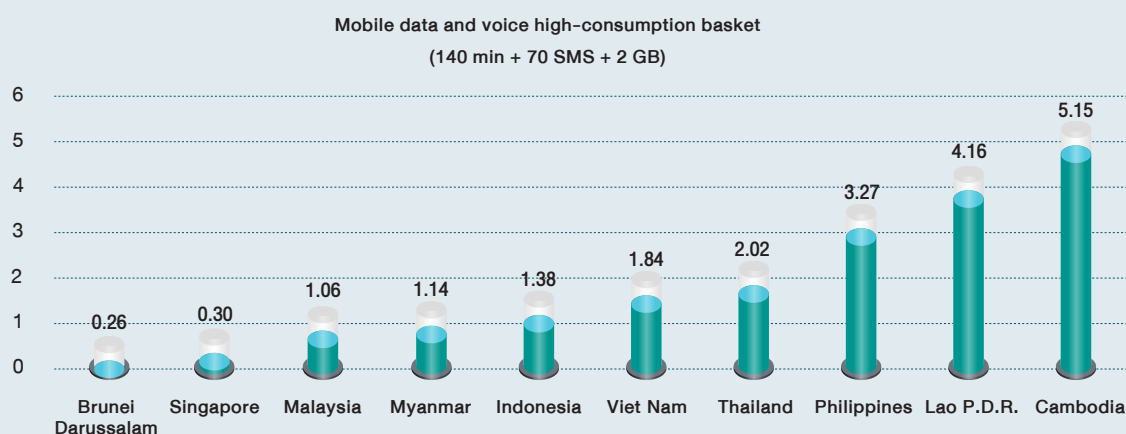
Chart 28 Proportion of mobile phone service rate to GNI per capita (high-consumption)



Remark : Data as of 2021

Source : <https://www.itu.int/en/ITU-D/Statistics/>

Chart 29 Proportion of mobile phone service rate to GNI per capita (low-consumption)



Remark : Data as of 2021

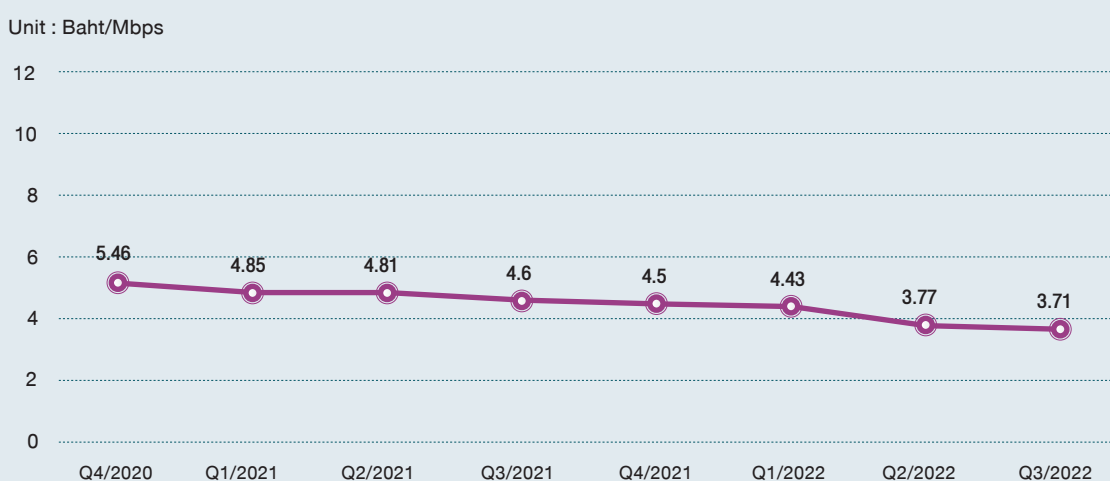
Source : <https://www.itu.int/en/ITU-D/Statistics/>



2.4 Fixed broadband internet service rate regulation. As of Quarter 3/2022, the fixed broadband internet service average rate of FTTx connection was 3.71 baht/Mbps, accounting for 1.61 percent decrease from the previous quarter, and 19.40 percent decrease from Quarter 3/2021. The pricing decrease resulted from high competition in the fixed broadband

internet market and leveraged technological readiness, pushing the service providers to lower their service rates to attract customers, or enhance the quality and add more privileges to promote their packages. However, the FTTx fixed broadband internet service rate has been constantly decreasing for the past several years. The details are shown in Chart 30.

Chart 30 Average FTTx fixed broadband internet service rate during Quarter 4/2020 to Quarter 3/2022



Remark: The historical data was updated as the service providers submitted the historical data of promotional fixed broadband internet packages.

Source: Telecommunications Tariffs Bureau, Office of the NBTC

2.5 International telephone service rate regulation. Nowadays, the fixed line telephone operators and mobile operators have been operating international telephone services. There are 2 types of international telephone service, including (1) International Direct Dialing (IDD), which allows caller to make a long-distance call abroad directly via mobile phone or fixed-line telephone, and (2) International Direct Dialing at Economical Rate, which allows caller to make a long-distance call abroad at affordable rate. In the international telephone service market in 2022, there were 6 major service providers including

National Telecom Public Company Limited (NT), dtac TriNet Company Limited (DTN), Advanced Wireless Network Company Limited (AWN), AIN GlobalComm Company Limited (AIN), TrueMoveH Universal Communication Company Limited (TUC), and Otaro World Corporation Company Limited (OTARO). These service providers have offered international telephone services by dialing access codes to make international calls in the IDD system, for 9 numbers. Besides, DTN and AWN have offered additional international telephone services by pressing a prefix '+' followed by the phone number to make a long-distance call abroad in





the IDD system. NT has offered the Voice over Internet Protocol (VoIP) for international calling under the brand 'Link' which allows a caller to make a call via the mobile phone application.

OTARO has offered the international telephone service through 2 packages including OTARO Standard and OTARO Premium. The details are shown in Table 44.

Table 44 International telephone service operators in 2022

No.	Operators	Active Number	
		IDD	Economy rate IDD
1	National Telecom Public Company Limited (NT)	001, 009 009 for NT Mobile	Link
2	dtac TriNet Company Limited (DTN)	+, 004	00400
3	Advanced Wireless Network Company Limited (AWN)	+, 003	
4	AIN GlobalComm Company Limited (AIN)	005	00500
5	True Move H Universal Communication Company Limited (TUC)	006	00600
6	Otaro World Corporation Company Limited (OTARO)	Premium	Standard

Remark : Data as of Quarter 3/2022

Source : Telecommunications Tariffs Bureau, Office of the NBTC

Considering the average international telephone service rate of all regions as of Quarter 3/2022, the average rate was 24.93 baht per minute, or 0.01 baht lower than the previous quarter, accounting for 0.03 percent decrease, as NT (NT 009) reduced the service rate of the Oceania, and NT (NT 009 for NT Mobile) reduced the service rates of the ASEAN countries, Asia, the Middle East, Europe and the Oceania. Thus, the average service rate in this quarter was lower than the previous quarter. However, OTARO (OTARO Premium) has raised the service rate in Europe and North America. As the calling destination countries of OTARO were about 20 countries per channel, which were different from other service providers that had more than 230 countries per number, the service rate increase

had minor impact on the average international telephone service in Quarter 3/2022. In addition, the service rates of TUC, DTN, AWN and AIN remained unchanged, compared to the previous quarter.

Furthermore, by considering the average service rate of each region, the calling to ASEAN countries had the lowest rate at 9.11 baht per minute, followed by Asia⁴² at 18.35 baht per minute, Europe at 18.77 baht per minute, and the Middle East at 20.17 baht per minute respectively. The region that had the highest service rate was Africa at 32.12 baht per minute, followed by South America at 31.31 baht per minute, North America at 28.32 baht per minute, and Oceania⁴³ at 27.75 baht per minute respectively. The details are shown in Chart 31 and 32.

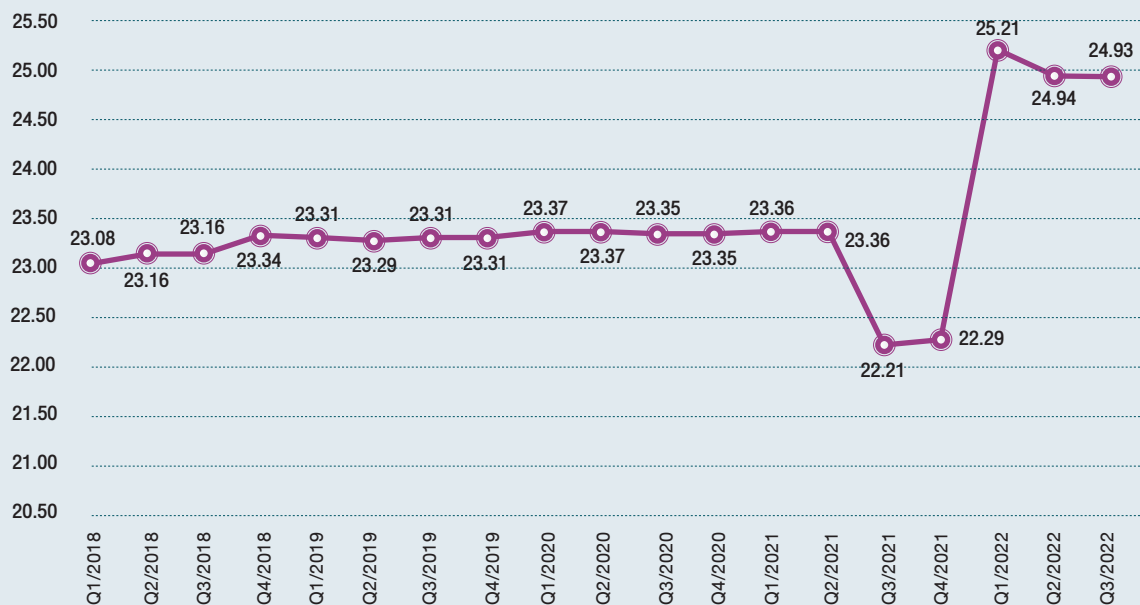
⁴² The service rate of Asia does not include the Middle East and ASEAN countries.

⁴³ The service rate of Oceania countries includes the service rates of Australian and New Zealand.



Chart 31 Average international telephone service rate during Quarter 1/2018 to Quarter 3/2022

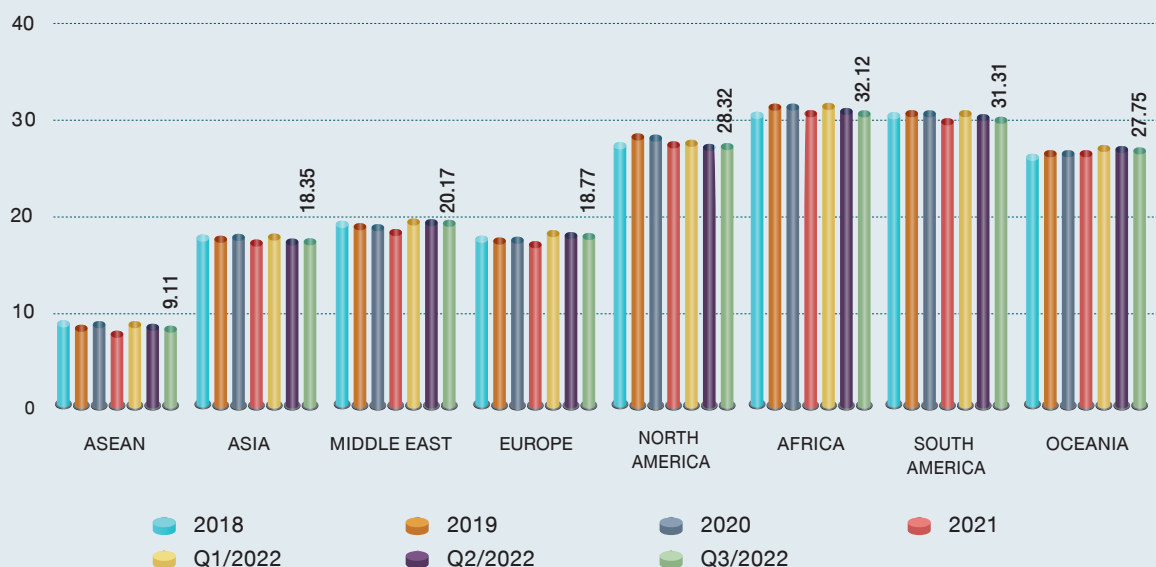
Unit : Baht/Minute



Source : Telecommunications Tariffs Bureau, Office of the NBTC

Chart 32 Average international telephone service rate by region during 2018 to Quarter 3/2022

Unit : Baht/Minute



Remark : In Quarter 1/2022, there was a restructure of average service rate per minute calculation, from calculating an average of the service rate of each number without weighted the number of in-service countries, to calculate total service average rates of each country and each number.

Source : Telecommunications Tariffs Bureau, Office of the NBTC

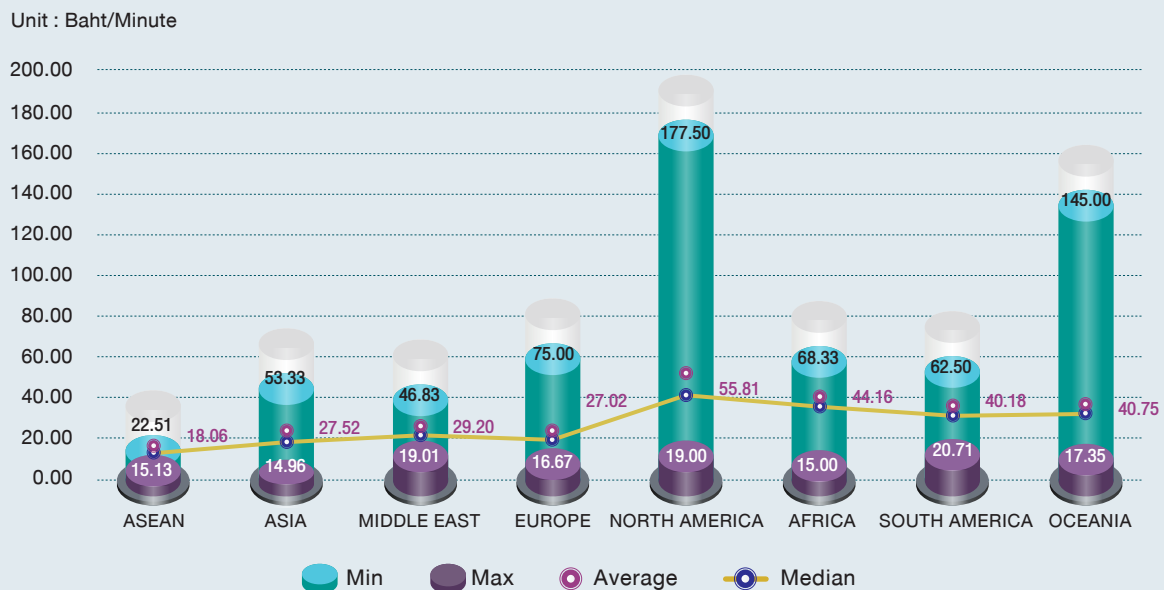


2.6 International mobile roaming service rate regulation. Today, there are 3 types of international mobile roaming service, consisting of Pay per Use, Flat Rate, and Travel Sim. The rates of each service type are different depending on the relevant factors, such as destination countries, usage volume, data speed, and service usage duration. There are 4 major international mobile roaming service operators, including AWN, TUC, DTN, and NT.

1) Pay per use. The international mobile roaming services can be categorized into 6 services, including domestic calls, calls to Thailand, calls to third countries, receiving calls,

SMS, and data service. The domestic call service rate is charged when a caller is abroad and dials the local number of that country. In Quarter 3/2022, the average domestic call service rate of ASEAN countries was the lowest at 18.06 baht per minute, followed by Europe at 27.02 baht per minute, and Asia at 27.52 baht per minute respectively. However, the highest domestic call service rate of North America was 55.81 baht per minute. The range of the lowest and the highest service rates of all regions were between 14.96 to 177.50 baht per minute. The details are shown in Chart 33.

Chart 33 Average domestic call service rate in 2022

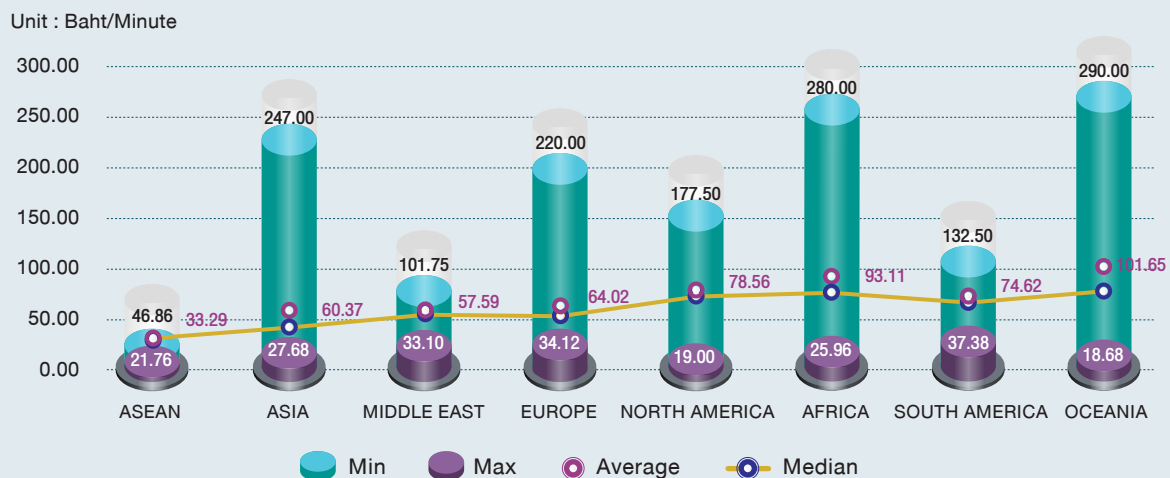


Remark : Data as of Quarter 3/2022

Source : Telecommunications Tariffs Bureau, Office of the NBTC

The Call to Thailand service rate is charged when caller is abroad and dials the phone number of Thailand. In Quarter 3/2022, the average Call to Thailand service rate of ASEAN countries was the lowest at 33.29 baht per minute, followed by the Middle East and Asia

at 57.59 and 60.37 baht per minute respectively. In this regard, the range of the lowest and the highest service rates of all regions were between 18.68 to 290 baht per minute. The details are shown in Chart 34.

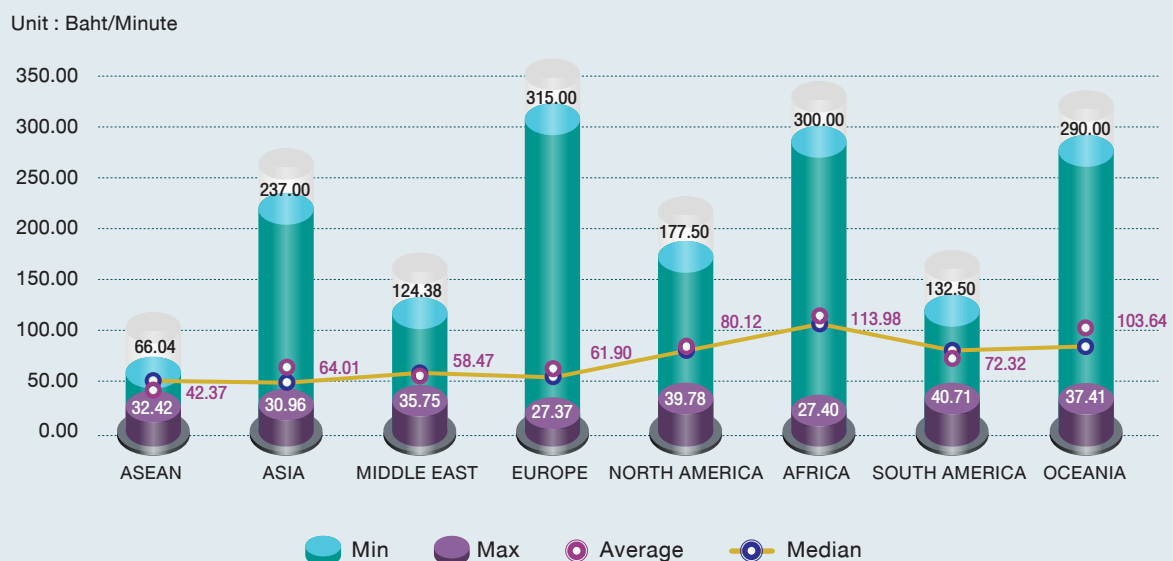
**Chart 34** Average Call to Thailand service rate in 2022

Remark : Data as of Quarter 3/2022

Source : Telecommunications Tariffs Bureau, Office of the NBTC

The Call to third country service rate is charged when caller dials the phone number of another destination country (which is not the country of residence and the country of visit at that time). In Quarter 3/2022, the average Call to third country service rate of ASEAN countries was the lowest at 42.37 baht per minute,

followed by the Middle East and Europe at 58.47 and 61.90 baht per minute respectively, while the highest service rate of Africa was 113.98 baht per minute. In this regard, the range of the lowest and the highest service rates of all regions were between 27.37 to 315 baht per minute. The details are shown in Chart 35.

Chart 35 Average Call to third country service rate in 2022

Remark : Data as of Quarter 3/2022

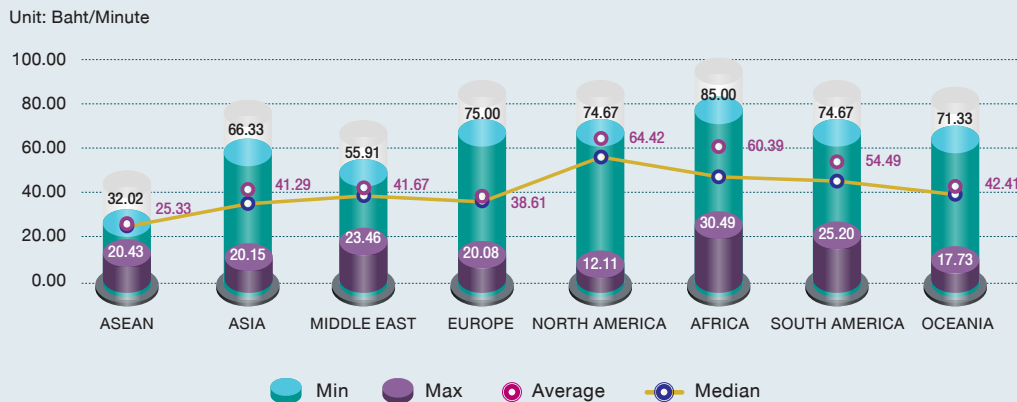
Source : Telecommunications Tariffs Bureau, Office of the NBTC



The receiving call service rate is charged when caller receives a call while staying abroad. In Quarter 3/2022, the average receiving call service rate of ASEAN countries was the lowest at 25.33 baht per minute, followed by Europe and Asia at 38.61 and 41.29 baht per

minute respectively, while North America had the highest service rate at 64.42 baht per minute. In this regard, the range of the lowest and the highest service rates of all regions were between 12.11 to 85 baht per minute. The details are shown in Chart 36.

Chart 36 Average receiving call service rate in 2022



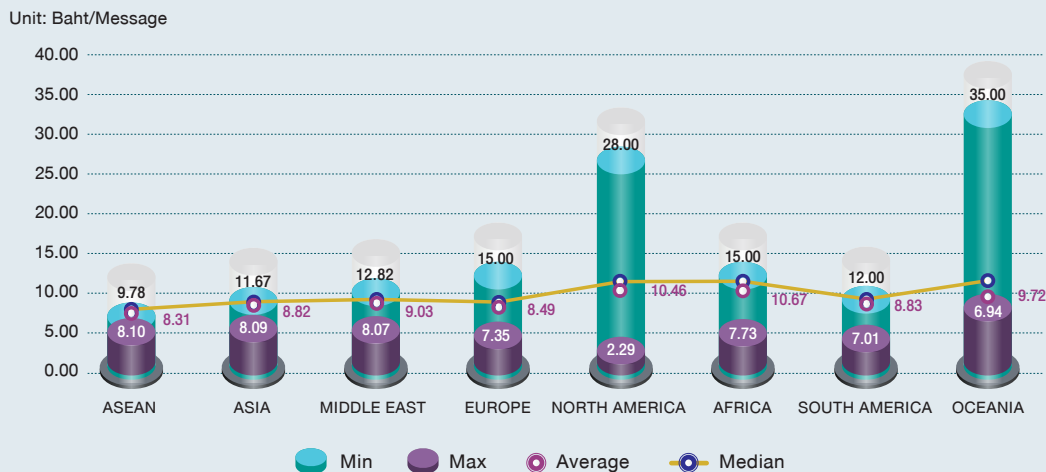
Remark : Data as of Quarter 3/2022

Source : Telecommunications Tariffs Bureau, Office of the NBTC

The Short Message Service (SMS) service rate is charged when user sends SMS while staying abroad. In Quarter 3/2022, the average SMS service rate of ASEAN countries was the lowest at 8.31 baht/SMS, followed by Europe and Asia at 8.49 and 8.82 baht/SMS

respectively, while Africa had the highest average service rate at 10.67 baht/SMS. In this regard, the range of the lowest and the highest service rates of all regions were between 2.29 to 35 baht/SMS. The details are shown in Chart 37.

Chart 37 Average SMS service rate in 2022



Remark : Data as of Quarter 3/2022

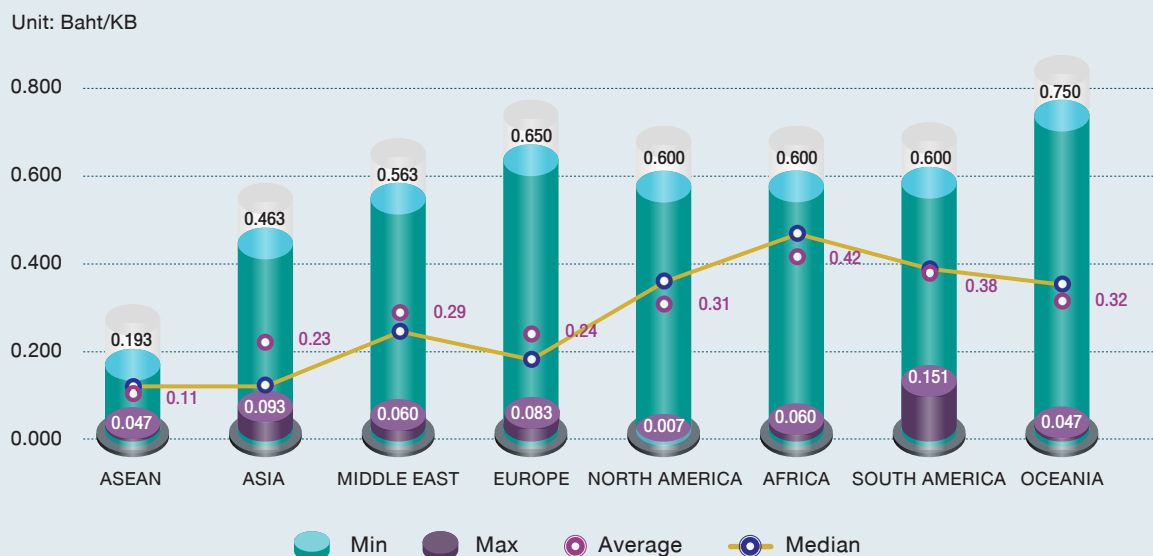
Source : Telecommunications Tariffs Bureau, Office of the NBTC



By considering data roaming in 3G and 4G in each region in Quarter 3/2022, the average rate of data roaming service in ASEAN countries was the lowest at 0.11 baht/KB, followed by Asia and Europe at 0.23 and 0.24 baht/KB

respectively, while Africa had the highest rate at 0.42 baht/KB. In this regard, the range of the lowest and the highest service rates of all regions were between 0.007 to 0.750 baht/KB. The details are shown in Chart 38.

Chart 38 Average data roaming service rate in 2022



Remark : Data as of Quarter 3/2022

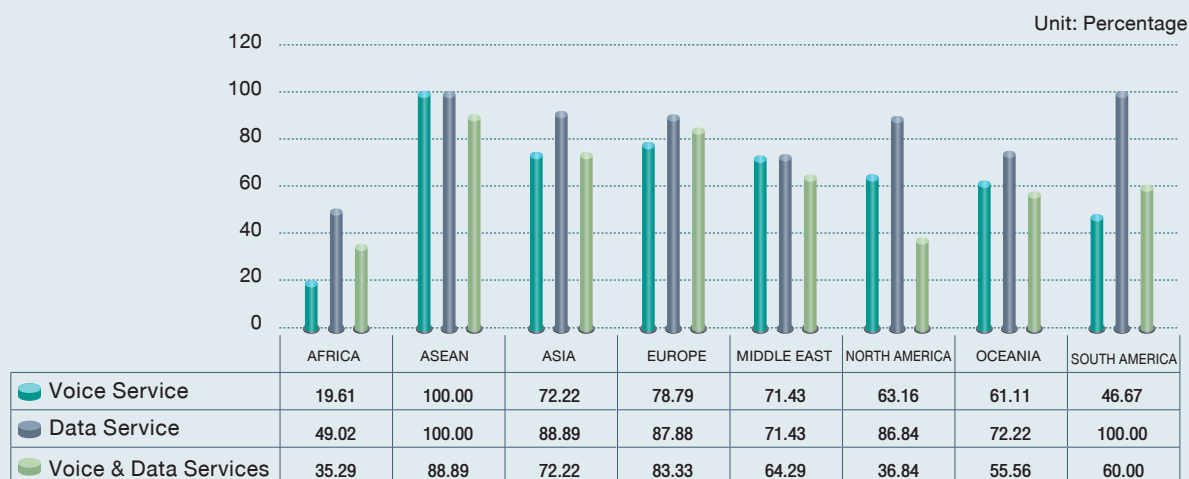
Source : Telecommunications Tariffs Bureau, Office of the NBTC

2) Flat Rate. In 2022, there was a provision of international roaming service flat rate in 8 regions, including ASEAN countries, Asia, the Middle East, Europe, North America, Africa, South America, and Oceania, with the coverage proportion at 78.17 percent. The region with the highest coverage proportion of countries that

had international roaming service flat rate was ASEAN, due to the availability of the flat rate service in all countries, followed by Europe with 88.89 percent. However, Africa had the lowest coverage proportion at 19.61 percent. The most commonly used service was data service. The details are shown in Chart 39.



Chart 39 Number of countries having international roaming service flat rate in 2022



Remark : Data as of Quarter 3/2022

Source : Telecommunications Tariffs Bureau, Office of the NBTC

The range of the international roaming service flat rate was between 93 to 9,500 baht. The countries that had the lowest service rate

were the countries that had the cooperation in data roaming such as ASEAN countries. The details are shown in Table 45.

Table 45 Price range of flat rate international roaming service

Region	Voice Service Only	Data Service Only	Voice and Data
AFRICA	350 - 2,200 baht	279 - 9,500 baht	998 - 3,490 baht
ASEAN	299 - 2,200 baht	93 - 9,500 baht	990 - 3,490 baht
ASIA	350 - 2,200 baht	140 - 9,500 baht	990 - 3,490 baht
EUROPE	299 - 2,200 baht	186 - 9,500 baht	998 - 3,490 baht
MIDDLE EAST	350 - 2,200 baht	140 - 9,500 baht	990 - 3,490 baht
NORTH AMERICA	350 - 2,200 baht	186 - 9,500 baht	998 - 3,490 baht
OCEANIA	299 - 2,200 baht	140 - 9,500 baht	990 - 3,490 baht
SOUTH AMERICA	350 - 2,200 baht	279 - 9,500 baht	998 - 3,490 baht

Remark : Data as of Quarter 3/2022

Source : Telecommunications Tariffs Bureau, Office of the NBTC



3) Travel sim. Travel sim offers both services with flat rate and Pay per Use. When buying a travel sim, a service user is eligible for flat rate usage. The incremental usage will be charged per actual usage. Typically, the travel sim offers the flat rate for data service only, and its service rate varies to the usage duration and the country to use the sim.

As of Quarter 3/2022, the lowest price package was 93 baht, while the highest price package was 2,615.89 baht. The lowest data volume offered was 500 MB, while the highest was 15 GB. The usage duration options available were 3 – 8 options, with the minimum duration of 2 days, and the maximum of 365 days. The details are shown in Table 46.

Table 46 Flat rate package of travel sim in 2022

Region	Package Price	Data Volume	Usage Duration
AFRICA	279.45 - 2,615.89 baht	500 MB - 15 GB	3
ASEAN	93.00 - 2,615.89 baht	500 MB - 15 GB	8
ASIA	111.21 - 2,615.89 baht	500 MB - 15 GB	7
EUROPE	111.21 - 2,615.89 baht	500 MB - 15 GB	7
MIDDLE EAST	111.21 - 2,615.89 baht	500 MB - 15 GB	7
NORTH AMERICA	279.45 - 2,615.89 baht	500 MB - 15 GB	5
OCEANIA	111.21 - 2,615.89 baht	500 MB - 15 GB	7
SOUTH AMERICA	279.45 - 2,615.89 baht	500 MB - 15 GB	3

Remark : Data as of Quarter 3/2022

Source : Telecommunications Tariffs Bureau, Office of the NBTC

The Pay per use travel sim service rate can be classified into 5 services, including domestic calls, calls to Thailand, calls to third countries, receiving calls, and SMS, which is different from the Pay per use international roaming service. The travel sim does not offer

data service as it is included in the Flat Rate package. Such service rate is lower than normal Pay per use data service rates. The 5 services rates vary to each country. The details are shown in Table 47.

Table 47 Pay-per-Use service rate of travel sim in Quarter 3/2022

Services	Service Rate
Domestic Call	6 - 75 baht/minute
Call to Thailand	6 - 75 baht/minute
Call to Third Country	6 - 75 baht/minute
Receiving call	6 - 75 baht/minute
SMS	6 - 11 baht/message

Remark : Data as of Quarter 3/2022. The service rates exclude VAT.

Source : Telecommunications Tariffs Bureau, Office of the NBTC



2.7 Undertaking of telecommunications service rate regulation.

1) Regulation relating to the Order of the National Telecommunications Commission (NTC) No.19/2010 Re: Prohibition of Service Fees Collection in Telecommunications Services from Users in Different Rates for the Same Nature or Type of Telecommunications Services (additional). On April 7, 2021, according to the NBTC board meeting No.7/2021, with the resolution that the on-net calls and off-net calls were not the same type of business, and imposed the telecommunication operators to provide the notification system for the customers to acknowledge the difference between such mobile service provision, as a part of regulation to protect consumers in accordance with the Order of the NTC No.19/2010 Re: Prohibition of Service Fees Collection in Telecommunications Services

from Users in Different Rates for the Same Nature or Type of Telecommunications Services dated July 14, 2010. In this regard, Advanced Wireless Network Company Limited, dtac TriNet Company Limited, and True Move H Universal Communication Company Limited has provided the notification systems for the customers to acknowledge the difference between on-net and off-net mobile phone services, by providing a short alert sound once before transitioning to normal call waiting for an off-net call. The test results of the notification systems have also been submitted to the Office of the NBTC. Thus, the Secretary-General of the NBTC agreed to cease the proceedings of the administrative compulsory measure on the telecommunication licensees in case of fractions and breach of the Order of the NTC No.19/2010 on February 4, 2022.



2) Preparation of the draft Notification of the NBTC on Criteria on Advance Collection of Service Tariff in Telecommunications Services. The Office of the NBTC has prepared the draft Notification of the NBTC on Criteria on Advance Collection of Service Tariff in Telecommunications Services with the aims for consumer protection and public interest. The criteria have been prescribed by covering every service except fixed broadband internet service which has the specific criteria based on the Notification of the NBTC on Criteria on Advance Collection of Service Tariff

in Fixed Broadband Internet Service. Currently, the draft notification is in the consideration process of the NBTC, prior to public hearing and publishing in the Royal Gazette processes. In this regard, once the Notification of the NBTC on Criteria on Advance Collection of Service Tariff in Telecommunications Services is effective, it will provide consumers with more service payment options for convenience, enabling the consumers to control their expenses. It will also promote free and fair competition, and enhance flexibility in service offerings of the telecommunication service providers.



3) Regulation according to the Notification of the NBTC on Criteria on Advance Collection of Service Tariff in Fixed Broadband Internet Service. In 2022, the NBTC had an approval⁴⁴ for TC Broadcasting Company Limited to terminate the advance collection of fixed broadband internet service tariff, as the company wished to collect payment after service. For the fixed satellite service (Express Net Service), the NBTC also had an approval for True Internet Corporation Company Limited⁴⁵, and Triple T Broadband Public Company Limited⁴⁶ to collect advance payment for fixed broadband internet service, and conform with the Notification of the NBTC on Criteria on Advance Collection of Service Tariff in Fixed Broadband Internet Service.

Accordingly, once the Notification of the NBTC on Criteria on Advance Collection of Service Tariff in Fixed Broadband Internet Service is effective, it will provide users with more service payment options, as they can pay in advance or after services, based on their convenience and voluntariness. It also allows the users to gain benefits or fair & reasonable discounts by their advanced service payment, in compliance with the advance payment collection duration. Moreover, the users will be protected from unfair practices, according to the provision on standard of telecommunications service contracts. In addition, the Notification promotes competition in the fixed broadband internet industry, by encouraging the service providers to offer a variety of promotional packages to match users' needs based on usage behavior, satisfaction, and payment convenience.



⁴⁴ The NBTC meeting No.7/2022 meeting on March 23, 2022

⁴⁵ The NBTC meeting No.7/2022 meeting on March 23, 2022

⁴⁶ The NBTC meeting No.16/2022 meeting on June 29, 2022



4

Budget Management in 2022



The Performance and Expenditure Budget of the Office of the NBTC in 2022

In 2022, the Office of the NBTC has carried out the operational plans and the expenditure budget plan for the year 2022 in a total of 6,620.195 million baht (excluding the expenditure budget for the central budget for 145.587 million baht). The overall expenditure budget of the Office of the NBTC, according to the work plan (routine work) and projects of the year 2022 as of December 31, 2022, in a total of 6,024.833 million baht, accounting for 91.01 percent of the allocated budget, was classified into the expenditure budget

for the mission of the NBTC and the Office of the NBTC (routine work) for 3,847.947 million baht, accounting for 93.26 percent, project expenses for 1,087.645 million baht, accounting for 78.19 percent, operating expenses of the Performance Follow-up and Evaluation Committee for 79.241 million baht, accounting for 85.24 percent, and the fund allocation by law for 1,010.000 million baht, accounting for 100.00 percent. The details are as shown in Table 48.

Table 48 Performance and Expenditure budget in 2022

Unit : Million baht

No.	Item	Fiscal Year 2022		
		Plan	Result	Percentage
1	Expenditure Budget of the Office of the NBTC	5,610.195	5,014.833	89.39
1.1	Operating Expenses of the NBTC and the Office of the NBTC	4,126.234	3,847.947	93.26
1.2	Project Expenses	1,390.998	1,087.645	78.19
1.3	Operating Expenses of the Performance Follow-up and Evaluation Committee	92.963	79.241	85.24
2	Fund Allocation by Law	1,010.000	1,010.000	100.00
Total (No. 1 – 2)		6,620.195	6,024.833	91.01
3	Central Budget*	145.587	27.158	18.65
Total (No. 1 – 3)		6,765.781	6,051.992	89.45

Remark : *Central budget is the reserved budget of advance payment in case of emergency and necessity or as specified by the NBTC for 145.587 million baht.

Source : Strategic and Budget Bureau, Office of the NBTC



By comparing the operational plans & results and budget spending for the year 2021 and 2022, the Office of the NBTC was able to spend the budget higher than 90.00 percent. The performance and budget spending of 2021

accounted for 92.76 percent, and those of 2022 accounted for 91.01 percent of the allocated budget respectively. The details are as shown in Table 49 and Chart 40.

Table 49 Comparison of operational plan - result and expenditure budget for the year 2021 and 2022

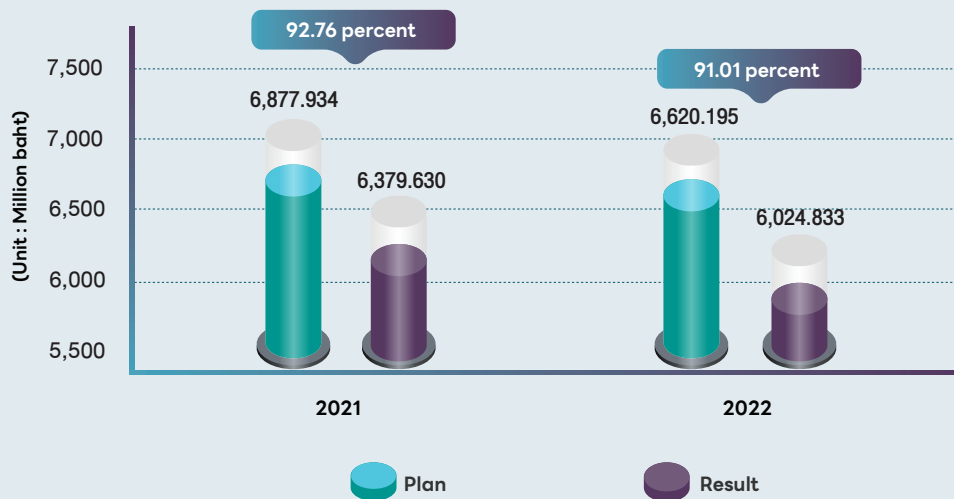
Unit : Million baht

No.	Item	Fiscal Year 2021			Fiscal Year 2022		
		Plan	Result	Percentage	Plan	Result	Percentage
1	Expenditure Budget of the Office of the NBTC	5,767.934	5,269.630	91.36	5,610.195	5,014.833	89.39
1.1	Operating Expenses of the NBTC and the Office of the NBTC	4,427.382	3,996.167	90.26	4,126.234	3,847.947	93.26
1.2	Project Expenses	1,237.520	1,183.677	95.65	1,390.998	1,087.645	78.19
1.3	Operating Expenses of the Performance Follow-up and Evaluation Committee	103.031	89.786	87.14	92.963	79.241	85.24
2	Fund Allocation by Law	1,110.000	1,110.000	100.00	1,010.000	1,010.000	100.00
Total (No. 1 – 2)		6,877.934	6,379.630	92.76	6,620.195	6,024.833	91.01
3	Central Budget*	161.578	31.396	19.43	145.587	27.158	18.65
Total (No. 1 – 3)		7,039.512	6,411.027	91.07	6,765.781	6,051.992	89.45

Remark : *Central budget is the reserved budget of advance payment in case of emergency and necessity or as specified by the NBTC for 2021 for 161.578 million baht, and for 2022 for 145.587 million baht.

Source : Strategic and Budget Bureau, Office of the NBTC

Chart 40 Comparison of operational plan - result and expenditure budget for the year 2021 and 2022



Remark : Table 49 and Chart 40 illustrate the performances excluding the central budget.

Source : Strategic and Budget Bureau, Office of the NBTC



Financial Statements of the Office of the NBTC in 2022

Financial Statements of the Office of the National Broadcasting and Telecommunications Commission Statement of Financial Position as at December 31, 2022

	Notes	(Unit : Baht)	
		2022	2021
Assets			
Current Assets			
Cash and Cash Equivalents	5	16,406,470,505.35	23,267,456,848.18
Short-Term Investments	6	389,632.97	388,100.68
Fee Receivables	7	13,025,782.90	26,094,065.09
Current Portion of Accrued Revenue	8	36,502,074,175.30	45,578,576,014.95
Supply Inventory	9	4,520,811.93	8,207,954.09
Prepaid Expenses	10	30,185,576.04	25,313,972.88
Other Current Assets	11	331,331,531.27	310,300,573.81
Total Current Assets		53,287,998,015.76	69,216,337,529.68
Non – Current Assets			
Bank Deposit with Obligations	12	512,247,117.45	655,137,896.51
Long-Term Investments	13	369,424,719.56	225,153,488.21
Accrued Revenues	8	162,912,742,999.14	194,395,138,999.14
Revenues remitted to Ministry of Finance under Provisional Measures	26	603,806,875.00	603,806,875.00
Radiocommunications & Spectrum Rental Fee Receivables		26,583,652.25	26,583,652.25
Net Property, Plant, and Equipment	14	2,266,575,521.05	1,636,874,334.97
Net Assets from Financial Leases	15	163,098,920.23	238,695,462.66
Net Intangible Assets	16	386,859,283.38	397,039,006.01
Total Non – Current Assets		167,241,339,088.06	198,178,429,714.75
Total Assets		220,529,337,103.82	267,394,767,244.43

The accompanying notes are an integral part of this financial statement.



Office of the National Broadcasting and Telecommunications Commission
Statement of Financial Position
as at December 31, 2022

	Notes	(Unit : Baht)	
		2022	2021
Liabilities			
Current Liabilities			
Creditors and Note Payables	17	721,032,106.48	349,094,669.22
Deferred Incomes	18	94,160,613.67	90,583,659.31
Current Liabilities - Provisions			
for Employee Benefits	19	50,021,864.00	32,086,864.00
Current Portion of Deferred Public Revenue			
to the Treasury	20	27,923,422,665.88	42,433,727,636.13
Current Portion of Deferred Output Tax			
on Spectrum Auction	21	2,108,920,943.25	2,109,593,265.49
Current Portion of Contributions to Digital			
Economy and Society Development Fund	22	1,072,840,541.12	1,997,096,837.03
Current Portion of Financial Lease Payable	23	75,558,662.99	87,927,766.80
Other Current Liabilities	24	753,576,556.47	1,350,771,707.57
Total Current Liabilities		32,799,533,953.86	48,450,882,405.55
Non – Current Liabilities			
Non – Current Liabilities - Provisions			
for Employee Benefits	19	1,203,269,608.00	1,380,535,334.00
Deferred Public Revenue to the Treasury	20	112,196,202,955.54	139,053,954,955.54
Deferred Output Tax on Spectrum Auction	21	10,657,842,999.94	12,717,438,999.94
Contributions to Digital Economy			
and Society Development Fund	22	6,173,689,933.33	7,079,137,933.33
Deferred Revenue from Spectrum Refarming			
to the BTFP	25	27,177,373,915.40	27,174,007,110.32
Net Long-Term Financial Lease Payable	23	87,772,413.24	142,454,616.26
Spectrum Auction Payment Guarantee			
Deposit	8	6,667,531,072.00	7,500,000,000.00
Receivable under Provisional Measure	26	603,806,875.00	603,806,875.00
Radiocommunications and Spectrum			
Service Fee Receivable		26,583,652.25	26,583,652.25
Other Non – Current Liabilities	27	93,594,814.95	72,868,955.42
Total Non – Current Liabilities		164,887,668,239.65	195,750,788,432.06
Total Liabilities		197,687,202,193.51	244,201,670,837.61
Net Asset/Equity			
Capital		198,325,867.44	198,325,867.44
Revenue Above (Below) Accumulated Expenses		22,643,809,042.87	22,994,770,539.38
Net Asset/Equity		22,842,134,910.31	23,193,096,406.82
Total Liabilities and Net Assets/Equity		220,529,337,103.82	267,394,767,244.43

The accompanying notes are an integral part of this financial statement.



Office of the National Broadcasting and Telecommunications Commission
Financial Performance Statement
For the Year Ended December 31, 2022

	Notes	(Unit : Bath)	
		2022	2021
Revenue			
Revenue from Spectrum Auction and Satellite Orbital Slot Auction	28	685,317,633.16	60,432,756,970.19
Revenue of State Enterprises under Section 84 Paragraph Three	29	1,594,286,210.87	9,263,898,775.43
Revenue from Licenses and Licensing Application	30	5,437,809,250.43	5,342,109,722.96
Revenue from Numbering Fee	31	3,238,820,869.65	3,261,380,512.93
Revenue from BTFP	32	-	141,804,444.47
Other Revenues	33	130,326,547.19	116,696,071.79
Total Revenue		11,086,560,511.30	78,558,646,497.77
Expenses			
Compensation, Reimbursement, or Remuneration for Television Operators	34	1,649,799,894.97	2,450,212,446.66
Expenses of Remittance to the Treasury	35	2,203,162,794.81	65,028,025,368.01
Expenses on Spectrum Auction and Refarming	36	23,088,605.08	20,260,239.50
Contributions to Digital Economy and Society Development Fund		1,403,741,268.01	5,973,395,118.59
Expenses by the Judgment of the Supreme Administrative Court	37	4,051,559.49	35,410,419.76
Human Resources Expenses	38	1,984,738,099.51	1,812,651,382.33
Pension	39	190,384,828.81	154,547,026.83
Remuneration	40	29,057,750.00	31,077,750.00
General and Administrative Expenses	41	1,224,331,858.68	1,084,783,298.43
Material Expenses	42	42,339,867.42	36,984,320.89
Utility Expenses	43	83,180,175.52	70,407,371.18
Depreciation and Amortization	44	634,036,701.47	610,793,424.38
Financial Support for Education, Research and Development	45	237,544,561.68	213,834,837.50
Contributions to BTFP		1,000,000,000.00	1,100,000,000.00
Contributions to Edtech Fund		10,000,000.00	10,000,000.00
Other Expenses	46	3,512,735.54	8,084,625.51
Total Expenses		10,722,970,700.99	78,640,467,629.57
Revenue Above (Below) Expense before Financial Cost		363,589,810.31	(81,821,131.80)
Financial Cost		9,424,183.94	14,014,140.06
Revenue Above (Below) Net Expense		354,165,626.37	(95,835,271.86)

The accompanying notes are an integral part of this financial statement.

Office of the National Broadcasting and Telecommunications Commission
Statement of Changes in Net Asset/Equity
For the Year Ended December 31, 2022

	Notes	Capital	Revenue Above (Below) Accumulated Expenses	Total Net Asset/Equity (Unit: Baht)
Balance as at December 31, 2020 – as reported		198,325,867.44	24,011,398,523.01	24,209,724,390.45
Public Revenue remitted to the Treasury		-	(920,792,711.77)	(920,792,711.77)
Revenue Below Expenses of the Period		-	(95,835,271.86)	(95,835,271.86)
Closing Balance as at December 31, 2021		198,325,867.44	22,994,770,539.38	23,193,096,406.82
Balance as at December 31, 2021 – as reported		198,325,867.44	22,994,770,539.38	23,193,096,406.82
Gain (Loss) from changes in employee benefits assumption		-	283,662,061.35	283,662,061.35
Public Revenue remitted to the Treasury		-	(988,789,184.23)	(988,789,184.23)
Revenue Above Expenses of the Period		-	354,165,626.37	354,165,626.37
Closing Balance as at December 31, 2022		198,325,867.44	22,643,809,042.87	22,842,134,910.31

The accompanying notes are an integral part of this financial statement.



Office of the National Broadcasting and Telecommunications Commission
Notes to Financial Statement
For the Year Ended December 31, 2022

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Office of the National Broadcasting and Telecommunications Commission
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Office of the National Broadcasting and Telecommunications Commission
Notes to Financial Statements
For the Year Ended December 31, 2022
(Unit: million baht unless specified otherwise)

Note 1 – General Information

The Office of the National Broadcasting and Telecommunications Commission or “the Office of the NBTC” is a juristic person, as a state agency status, established by virtue of the Act on the Organization to Assign Radio Frequency and to Regulate the Broadcasting and Telecommunications Services B.E. 2553 (2010) and its amendment (the Act on the Organization B.E. 2553 (2010) and its amendment), to regulate and develop broadcasting, television, and telecommunications services. The National Broadcasting and Telecommunications Commission, or “NBTC”, is responsible for prescribing policies, criteria, procedures, conditions, fees, and regulations, relating to spectrum management, licensing and spectrum utilizing regulation, business operation in broadcasting, television, and telecommunications services, telecommunication numbering management, telecommunications network access or interconnection, prevention of monopoly or unfair competition, and consumer protection, as well as providing comprehensive broadcasting, television, and telecommunications services. In this regard, the NBTC has set up the Office of the NBTC fund, called “the Broadcasting and Telecommunications Research and Development Fund for Public Interest”, or “BTRF”, managed by the Fund Management Committee according to Section 54 and Section 55 of the Act on the Organization B.E. 2553 (2010) and its amendment.

The Office of the NBTC Head office is located at 87 Soi 8 (Sai Lom), Phaholyothin Road, Samsen Nai, Phaya Thai, Bangkok 10400.

The revenue of the Office of the NBTC shall be under Section 65 of the Act on the Organization B.E. 2553 (2010) and its amendment, described as follows:

- (1) Spectrum license fees and business license fees under Section 42, Paragraph Two, and Section 45, Paragraph Three
- (2) Revenues or benefits accrued from the conduct of duties of the NBTC and the Office of the NBTC
- (3) Revenues derived from the Office of the NBTC’s properties
- (4) Money and properties donated to the Office of the NBTC under the NBTC’s regulations for supporting the operation of the Office of the NBTC
- (5) Subsidies from the government

The revenue of the Office of the NBTC under (1) and (2) after deducting the efficient operations expenses of the Office of the NBTC, necessary burden costs, fund contributions under Section 52, Edtech Fund under the law on national education, and Digital Economy and Society Development Fund under the law on digital development for economy and society, and the rest shall be remitted as public revenue.





Note 2 – Financial Reporting Criteria

These financial statements have been prepared according to the Public Sector Accounting Standards and Policies, prescribed by the Ministry of Finance, as well as the Public Sector Accounting Principles, Standards and Policies, and Accounting Practices regarding to Financial Statement Preparation of Public Sector, as specified in the official letter of the Comptroller General's Department, No. MF 0410.2/C.479 dated October 2, 2020.

The financial statements have been conducted on a historical cost basis, unless disclosed otherwise in the accounting policy.

The financial statements of the Office of the NBTC include accounting transactions of head office and regional offices, which are obligated to submit the financial report according to the Public Accounting Standards.

Note 3 – The New Public Accounting Standards & Policies, and the Revised Public Accounting Standards & Policies

The Ministry of Finance has implemented the New Public Accounting Standards and Policies, described as follows:

The Public Accounting Standards and Policies, effective since the accounting period starting on or after October 1, 2020 onwards.

- The Public Accounting Standard, No.3, regarding to accounting policies, change in accounting estimate and error.
- The Public Accounting Standard, No.23, regarding to non-exchange items revenues.

The Public Accounting Standards and Policies effective since the accounting period starting on or after October 1, 2021 onwards.

- The Public Accounting Policy on Tax Card

The management believes that the above New Public Accounting Standards have no significant effect on implementation with the current period of the financial statement.

Note 4 – Significant Accounting Policy Summary

4.1 Cash and Cash Equivalents

Cash and Cash Equivalents consist of cash on hand, demand deposits, and non-obligation time deposits with less than 3 - month tenure.

4.2 Short-Term Investments

Short-term investments refer to time deposits with at least 3 months tenure, but not exceeding 12 months.

4.3 Fee Receivable

Fee receivable refers to net value to be received after deducting allowances for doubtful accounts, estimated from balance audit at the end of the accounting period.



Note 4 – Significant Accounting Policy Summary (Continued)

Allowances for doubtful accounts are considered from account receivables, that are likely to become uncollectible in the future, estimated from the remaining debt values as at the end of period based on payment history, current financial status of debtors, and legal proceedings against debtors, as well as considering the percentage of debt age and outstanding balance as at the end of the period. The doubtful debts are recognized as an integral part of other expenses in the financial performance statement.

Allowances for doubtful accounts for the fee receivables are estimated in the following rates:

- The outstanding fee receivables not exceeding 180 days, estimating allowance for doubtful accounts at a rate of 0 percent
- The outstanding fee receivables during 181 - 365 days, estimating allowance for doubtful accounts at a rate of 25 percent
- The outstanding fee receivables during 366 - 730 days, estimating allowance for doubtful accounts at a rate of 50 percent
- The outstanding fee receivables overdue longer than 730 days, estimating allowance for doubtful accounts at a rate of 75 percent
- The fee receivables under legal proceedings, estimating allowance for doubtful accounts at a rate of 100 percent

4.4 Accrued Revenues

Accrued revenues refer to income from annual licensing fees, calculated from the licensee's operating revenues occurred in the accounting period, and annually paid within one hundred and fifty days since the accounting period end date, according to the Notification of the NBTC on License Fees for Operating Radio or Television Broadcasting Business B.E. 2555 (2012), and the Notification of the NBTC on Telecommunication Business Licensing Fee, as well as the revenues from spectrum auction according to Section 42 and 45 of the Act on the Organization B.E. 2553 (2010) and its amendment, the Announcement of the National Council for Peace and Order (NCPO) No. 80/2014, the NCPO Order 76/2016, and the NCPO Order 9/2018.

4.5 Radiocommunications and Spectrum Services Fee Receivables

Radiocommunications and spectrum services fee receivables are the receivables collected from debtors that the Office of the NBTC dealt on behalf of the Ministry of Finance. The entry will be recorded in parallel with the 'radiocommunications and spectrum services fee receivables' deposit account. When the debt is paid, the deposit account will be transferred to the deferred public revenue to the treasury account in the section of radiocommunications service fees and violation fines.

4.6 Supply Inventory

Supply inventory refers to the usual operational non-durable assets, with not high values, such as office supplies. It will be recorded on the periodic basis, and calculated by the weighted average method, shown as current assets in the statement of the financial position.



**Note 4 – Significant Accounting Policy Summary (Continued)****4.7 Property, Plant, and Equipment**

4.7.1 Buildings and structures, including building improvement are shown by the net book value, derived from cost price deducted by accumulated depreciation, the building under construction as shown by the cost price on the net book value.

4.7.2 Equipment, recognized by the entries with the minimum price per unit or set, starting from 10,000 baht, except the acquired entries before 2020, as shown by the net book value, derived from cost price deducted by accumulated depreciation as follows:

- The equipment acquired before 1997, as unrecognized in the account, but recognized in the Asset Control Register.
- The equipment acquired during 1997 – 2002, as recognized only by the entry with the value starting from 30,000 baht, while the value less than 30,000 baht is recognized as expense in the Undervalued Inventory Account.
- The equipment acquired during 2003 – 2007, as recognized only by the entry with the value starting from 5,000 baht, while the value less than 5,000 baht is recognized as expense in the Undervalued Inventory Account.
- The equipment acquired during 2008 – 2018, as recognized only by the entry with the value starting from 10,000 baht, while the value less than 10,000 baht is recognized as expense in the Undervalued Inventory Account.
- The equipment acquired from 2019 onwards, as recognized as durable goods, consumable parts or transformed in a short time period.

The cost price includes direct costs relating to asset acquisition to ensure the asset is available in a place where it can be used as required by the administrative section. The cost price of assets formation consists of the material cost, direct labor cost, and other direct costs relating to asset acquisition.

The details of property, plant, and equipment entries with different types, service life, and significant costs, will be recognized separately.

The subsequent cost refers to the cost that occurs after the initial recognition of the item, as an integral recognized part of the net book value of the property, plant, and equipment entries. When there is a high probability that the organization would gain future economic benefits or incremental service capacity from such entry, and is possible to get measurable and reliable cost value, and the replaced items are deducted from the account with the book value. Also, the cost from regular property, plant, and equipment maintenance will be recognized as an expense when occurred.

Depreciation is recognized as an expense in the financial performance statement, calculated with the straight-line Method by the estimated useful life, according to the official letter of the Comptroller General's Department, No. MF 0410.3/C. 43, dated January 29, 2019, regarding to Public Accounting Manual for Lands, Buildings and Equipment as follows:

Type of Asset	Useful Life
Building and its Improvement	3 – 20 years
Electric Appliance and Radio	5 – 15 years
Computer Supply	3 years
Vehicle and Transport	8 years
Office Supply and Others	2 – 8 years



Note 4 – Significant Accounting Policy Summary (Continued)

4.8 Intangible Assets

Intangible assets include the direct cost of computer program development, systems, and website production costs acquired by procurement process, and hiring for development. The Office of the NBTC has the rights to control such asset utilization, and expect to gain economic benefits or service capacity from the asset for more than 1 year. The intangible asset entry is shown by the cost price deducted by accumulated amortization.

The intangible assets acquired since 2020, as recognized only by the entries with the minimum price per unit or set starting from 10,000 baht, except the entries acquired before 2020, are shown by the net book value, which derived from cost price deducted by accumulated amortization as follows:

- The intangible asset acquired during 2010 – 2013 as recognized only by the entry with the value starting from 50,000 baht, while the value less than 50,000 baht is recognized as expense in the Undervalued Inventory Account.
- The intangible asset acquired during 2014 – 2018 as recognized only the entry with the value starting from 30,000 baht, while the value less than 30,000 baht is recognized as expense in the Undervalued Inventory Account.
- The intangible asset acquired in 2019 as recognized only by the entry with the value starting from 20,000 baht, while the value less than 20,000 baht is recognized as expense in the Undervalued Inventory Account.

Amortization of the intangible assets is recognized as expense in the financial performance statement, calculated with the straight-line method by the estimated useful life, which are computer programs with 3 years useful life.

4.9 Finance Lease Creditor

Finance lease creditor is an asset lease, which the organization takes most risks and benefits from such leased asset possession. The rental fee is divided into a portion of financial expense and a portion deducted from finance lease debt to justify the interest rate of each installment to be flat, compared to the balance debt. The financial expense is directly recorded as gain or loss. The acquired asset from the finance lease is categorized into the asset from the finance lease, recorded by fair value or current value of the minimum spending on the finance lease, whichever the lower deducted by the accumulated depreciation and loss on accumulated impairment.

4.10 Deferred Incomes

Deferred incomes from the spectrum auction revenues for digital television service provision are recognized by the actual expense of each installment, relating to the comprehensive digital television service provision to people. The unrecognized incomes are shown as liability in the deferred income statement.

4.11 Provisions

Provisions are recognized when the Office of the NBTC has the liabilities by law that occurred presently or resulted from the past events, with a high probability that the economic benefits will be paid as the settlement, and the liabilities are estimated reliably. The provisions are considered by the discounted cash flow method to be paid in the future, based on the present discounted cash flows, in order to reflect the present value which varies by time and risk of debt. The incremental provision by time is recognized as a financial cost.





Note 4 – Significant Accounting Policy Summary (Continued)

4.12 Remittance as Public Revenue to the Treasury

Revenue or benefits derive from the operations under the authorities of the NBTC and the Office of the NBTC, such as revenue received in a year after deducting the organization's efficient operating expenses, necessary burdens, the contributions to the fund according to Section 52, the Edtech Fund according to the law on national education, and the Digital Economy and Society Development Fund according to the law on digital development for economy and society. The surplus is remitted as public revenue. Furthermore, the Office of the NBTC shall remit the surplus from burden costs of the prior years, which could not be spent completely within 2 years, as public revenue, including any items or projects that the budget has been set up, but has not been spent, or incurred debt obligations within the fiscal year. Those items or projects will be canceled. Then, the Office of the NBTC shall remit the budget of such items or projects as public revenues.

4.13 Revenue from Spectrum Auction

Revenue from spectrum auction, after deducting the cost of the event organizing and the contribution to the Digital Economy and Society Development Fund, under the law on digital development for economy and society, shall be remitted as public revenue, according to the Act on the Organization B.E. 2553 (2010) and its amendment.

4.14 Employee Benefits

The Office of the NBTC is not governed by the Labor Protection Law, the Labor Relations Law, the Social Security Law, and the Compensation Law. The Office of the NBTC regulations regarding the employee benefits are as follows:

4.14.1 Short-Term Employee Benefits

The provisions of short-term employee benefits are recognized as expenses in the financial performance statement, when the employees perform the tasks, without calculating Discounted Cash Flows. The liabilities are recognized by the amount expected to be paid for special remuneration and welfare, as short-term cash, or legal obligation, or constructive obligation to be paid as a result of the employee's work in the past, and this obligation can be reasonably estimated.

4.14.2 Employee Benefits after Retirement

1) Contributions Plan

The Office of the NBTC has set up the provident fund for employees, as a welfare and to promote employees' savings, by contributing to the fund according to organization's regulations on Employee Provident Fund of the Office of the NBTC B.E. 2549 (2006). The assets of the provident fund are separated from the organization's assets, and are managed by the external fund manager. Such provident fund consists of employees' saving money and contributions from the Office of the NBTC. Such contributions are recognized as expenses in the financial performance statement for such transaction period.

2) Defined Benefit Plan

The Office of the NBTC is obligated to pay compensation to employees upon their retirement, according to the NBTC Regulation on Employee's Pension and Welfare after Retirement B.E. 2555 (2012), which is regarded as pension benefit.





Note 4 – Significant Accounting Policy Summary (Continued)

The provisions of employee pension benefits are recognized in the statement of financial position with the present value of the obligations as at the end of the period. The obligations are annually calculated by the independent actuary, with the projected unit credit method.

The debts occurring in the transition period, derive from the difference of the benefit obligations and the liabilities in the financial position statement for the employee benefit plan, according to the existing accounting policy at the accounting policy changing date. The Office of the NBTC recognizes them by calculating the full amount of retained earnings with the retrospective adjustment method.

The full amount of historical service cost is recognized as gain or loss as soon as the plan is revised or scaled down, or when the Office of the NBTC recognizes the relevant restructuring costs.

4.15 Revenue Recognition

The Office of the NBTC recognizes each type of revenues as follows:

- Revenue from spectrum auction under Section 41, Paragraph Two and Section 45, Paragraph Two of the Act on the Organization B.E. 2553 (2010) and its amendment, is recognized on an accrual basis based on related agreement contents.
- Revenue from radiocommunications frequency remuneration is recognized on an accrual basis.
- Revenue from licensing fees based on the Radiocommunications Act is recognized upon license approval.
 - Revenue from business licensing fees is recognized on an accrual basis.
 - Revenue from the numbering fees is recognized monthly on an accrual basis.
 - Revenue from spectrum transfer licensing fees is recognized upon license approval.
 - Revenue from application fees is recognized by revenue type upon the application approval.
- Revenue from the 1 Por Nor radio station is recognized monthly on an accrual basis.
- Revenue from other fees are recognized upon the application approval.
- Revenue from interest earned is recognized on a time proportional basis.
- Other revenues apart from revenues mentioned above are recognized on an accrual basis.

4.16 Revenue of State Enterprise under Section 84, Paragraph Three

Revenue of state enterprise under Section 84, Paragraph Three of the Act on the Organization B.E. 2553 (2010) and its amendment stipulates that, when the specified period of 3 years has elapsed since the effective date of the Act, the state enterprise revenue derived from the permission, concession, or contracts, according to Paragraph Two, under the law regarding private sector participation with the state undertakings, whether in whole or in part, shall be deducted by the business licensing fees, calculated from the income portion generated from the permission, concession, or contracts, the expenses for supporting universal basic telecommunications services and social services, under Section 50, only the income portion generated from and permission, concession, or contracts, the expenses incurred from operations under permission, concession, or contracts, as prescribed by the Ministry of Finance. The surplus shall be remitted to the Office of the NBTC. Accordingly, the Office of the NBTC shall remit such revenue as public revenue.



**Note 4 – Significant Accounting Policy Summary (Continued)****4.17 Revenue from Service Provision on Behalf of the State**

Revenue from service provision on behalf of the state is the revenue, under Section 7 of the Notification of the NBTC on Provisional Measures for Consumer Protection in case of Termination of Permission, Concession, or Contracts of Mobile Service Provision B.E. 2556 (2013).

During the protection period, the service providers shall act as the service fee payees on behalf of the state, by separating the receipt account specifically, and report the income and its profit, deducted by the network cost, the telecommunications numbering fees, the administrative cost, and other necessary operating costs. The Office of the NBTC shall audit the surplus prior to forwarding as the public revenue.

4.18 Contributions to Support Education, Research and Development

Contributions to support education, research and development are recognized as expenses upon granting approval to the eligible persons. The remaining funds that are returned in the fiscal year, shall be deducted from the contributions. If the funds are returned after the disbursement period, they will be recognized as returned revenue from contributions to support education, research and development, shown as other non-operating revenues. Such criteria shall apply to the similar items.

4.19 Operating Expenses of the BTFP

The operating expenses of the Broadcasting and Telecommunications Fund for Public Interest (BTFP) refer to assets for BTFP operations, human resources expenses, committee meeting allowance, public relations expenses, meeting administration expenses, operational supplies costs, utility costs, etc. They are disbursed by the Office of the NBTC according to the BTFP regulations.

Note 5 – Cash and Cash Equivalents

	2022	2021
Cash	0.11	0.10
Petty Cash	0.50	0.50
Deferred Checks	0.12	0.88
Financial Institutions Deposits		
Current Account Deposits	234.33	209.53
Saving Account Deposits	16,144.86	23,029.93
Time Account Deposits with less than 3-month tenure	26.55	26.52
Total Cash and Cash Equivalents	16,406.47	23,267.46
Cash and Cash Equivalents consist of		
Cash and Cash Equivalents of income under Section 65 (1) - (2)	4,352.90	3,831.87
Cash and Cash Equivalents of income under Section 65 (3) - (5)	106.57	126.36
Cash and Cash Equivalents of Guarantee Deposits and Others	11,947.00	19,309.23
Total Cash and Cash Equivalents	16,406.47	23,267.46



Note 6 – Short-Term Investments

Time Account Deposits with 3 - 12 months tenure

Total Short-Term Investments

Short-Term Investments consist of

Short-Term Investment from Deposits

Total Short-Term Investments

2022	2021
0.39	0.39
0.39	0.39
0.39	0.39
0.39	0.39

Note 7 – Fee Receivables

Radio Frequency Remuneration Receivables

Numbering Fee Receivables

Service Licensing Fee Receivables

Debtors

Total

Less Allowances for Doubtful Accounts

Total Fee Receivables

2022	2021
3.53	7.61
806.47	812.13
85.11	85.92
29.74	29.01
924.85	934.67
(911.82)	(908.58)
13.03	26.09

To analyze the accrued debt age, the Office of the NBTC's fee receivables can be categorized by accrual debts as follows:

Outstanding Debt less than 180 days

Outstanding Debt more than 180 days but not exceeding 365 days

Outstanding Debt more than 365 days but not exceeding 730 days

Outstanding Debt more than 730 days

Having Legal Dispute

Total

2022	2021
4.79	15.35
1.20	1.57
2.18	2.14
24.97	25.33
891.71	890.28
924.85	934.67

The numbering fee receivables as of December 31, 2022 and 2021 were 806.47 and 812.13 million baht respectively. They consisted of the numbering fee receivables of True Move Company Limited (TrueMove) during March 1, 2014 - December 31, 2015, for 647.29 million baht, and the extra money for 141.13 million baht, as a total of 788.42 million baht. TrueMove has not paid the numbering fees to the Office of the NBTC, by reasoning that it had to comply with the Notification of the NBTC on Provisional Measures for Consumer Protection in case of Termination of Permission, Concession, or Contracts of Mobile Service Provision B.E. 2556 (2013) (Provisional Measures for Consumer Protection). The measures restrict the company to exploit the inactive numbers, resulting in the telecommunications numbering fee burden for the company. However, as the numbering fee can be recognized as a cost to subtract from the service revenue, TrueMove have requested the Office of the NBTC to exempt all telecommunications numbering fees as from September 16, 2013 (as from the termination of contract). The numbering fee amount during September 16, 2013 to February 28, 2014, in a total of 190.97 million baht, that had already been paid to the Office of the NBTC, was requested to be refunded to the company.



**Note 7 – Fee Receivables (Continued)**

Subsequently, according to the resolution of the National Telecommunications Commission (NTC) meeting No.12/2014 on May 7, 2014, the committee disapproved TrueMove's request for the numbering fee exemption. Also, in the resolution of the NTC meeting No.26/2014 on October 14, 2014, the committee assigned the Office to comply with the legal procedures. Then, on August 31, 2015, the Office of the NBTC had filed the lawsuit to the Administrative Court against TrueMove, as in the Undecided Case No.490/2016, which has been in process of fact-finding end date specification by the Court. However, the Office of the NBTC was the defendant for the offense regarding claim for damages occurred for the operations under the Provisional Measures for Consumer Protection, as the expenses were higher than the revenue of the plaintiff, and for the refund of paid-up numbering fee, according to the Undecided Case No.2013/2015, with the monetary value claim for 16,265.06 million baht, together with 7.5 percent per annum interest rate. According to the Administrative Court's order, the following cases have been consolidated; Undecided Case No.1712/2016, 2392/2018, 490/2016, and 1228/2016, having the Undecided Case No.2013/2015 as the main case. The Administrative Court has specified December 22, 2022 as the fact-finding end date.

Note 8 – Accrued Revenues

	2022	2021
Current Portion		
Accrued revenue from 900 MHz Spectrum Auction	20,331.71	20,331.71
Revenue of State Enterprise under Section 84 Paragraph Three	-	9,263.90
Accrued revenue from Licensing Fee	5,019.68	4,832.28
Accrued revenue from 700 MHz Spectrum Auction	11,150.68	11,150.69
Total Current Portion	36,502.07	45,578.58
Non – Current Portion		
Accrued revenue from 900 MHz Spectrum Auction	48,809.12	69,140.83
Accrued revenue from 700 MHz Spectrum Auction	78,054.79	89,205.47
Accrued revenue from 2600 MHz Spectrum Auction	36,048.83	36,048.84
Total Non – Current Portion	162,912.74	194,395.14
Total Accrued Revenues	199,414.81	239,973.72

The accrued revenue from 900 MHz spectrum auction as of December 31, 2022 and 2021, were 69,140.83 and 89,472.54 million baht respectively. The accrued revenue from 700 MHz spectrum auction as of December 31, 2022 and 2021, were 89,205.47 and 100,356.16 million baht respectively. The accrued revenue from 2600 MHz spectrum auction as of December 31, 2022 and 2021, were 36,048.83 and 36,048.84 million baht respectively. The licensees submitted the guarantee deposits on December 31, 2022 and 2021, in a total of 6,666.67 and 7,500.00 million baht, together with the letters of guarantee from commercial banks, according to the Financial Institution Business Act B.E. 2551 (2008), to guarantee the payments for the remaining installments, recognized as the accrued revenue from the spectrum auction, according to the Notification of the NBTC. Nonetheless, according to the Order of the Head of the National Council for Peace and Order (NCPO) No.4/2019 on the Solution for Television and Telecommunication Industries, dated April 11, 2019, Section 6, Paragraph Two, it stipulates the Office of the NBTC to consider the restructuring of the 900 MHz spectrum auction payment term to be 10 equal installments. The first installment shall start from the license granted year. As the Office of NBTC approved the payment restructuring from 2020 onwards, the licensees were obligated to pay installment of the year 2020 together with the compensation of the previous year.



Note 8 – Accrued Revenues (Continued)

The accrued revenue of the state enterprise under Section 84, Paragraph Three for the year ended December 31, 2021, in a total of 9,263.90 million baht, was the revenue from the legitimate telecommunications licensees within the effective period of the Act on the Organization B.E. 2553 (2010), and its amendment. After a three-year period, the state enterprises shall remit the revenue portion occurred from operations of such permission, concession, or contracts according to Paragraph Two, that the state enterprises have performed by law on permitting private companies to undertake the government affairs, whether in whole or in part, after deducted the expenses the surplus shall be remitted to the NBTC. Accordingly, the NBTC shall forward such surplus revenue as public revenue.

The accrued revenues from business licensing fees as of December 31, 2022 and 2021 were 5,019.68 and 4,832.28 million baht respectively. Such accrued revenue refers to the revenue collected from the operators, calculated by the progressive rate of the operating income of telecommunications businesses type 1 to 3, according to the Notification of the NBTC on Telecommunications Business Licensing Fee, and the income from operations of broadcasting or television businesses according to the Notification of the NBTC on License Fees of Operating Radio or Television Broadcasting Business, which imposing the operators to pay the licensing fees within 150 days, as from the end of the accounting period.

Note 9 – Supply Inventory

	2022	2021
Supply Inventory	4.52	8.21
Total Supply Inventory	4.52	8.21

Note 10 – Prepaid Expenses

	2022	2021
Prepaid Land Rental Fees	16.65	19.06
Other Prepaid Expenses	13.54	6.25
Total Prepaid Expenses	30.19	25.31

Note 11 – Other Current Assets

	2022	2021
Pending Input Tax	41.18	26.99
Revenue Department Receivables	65.34	-
Advance Receivables	0.15	0.41
Accrued Interest	1.05	1.03
Advance Payment	212.49	270.84
Other Current Assets	11.12	11.03
Total Other Current Assets	331.33	310.30

**Note 11 – Other Current Assets (Continued)**

Loan Receivable	Undue Balance	Overdue Balance less than 15 days	Overdue Balance more than 15 days	Total
2022	0.15	-	-	0.15
2021	0.41	-	-	0.41

Note 12 – Bank Deposits with Obligations

	2022	2021
Special Saving Deposits	512.25	655.14
Total Bank Deposits with Obligations	512.25	655.14

The 500.00 million baht bank deposit with obligations is the deposit account of a commercial bank, with the obligation to maintain the deposit for the home loans of employees.

Note 13 – Long - Term Investments

	2022	2021
Time Account Deposits with tenure more than 12 months	369.42	225.15
Total Long-Term Investments	369.42	225.15



Note 14 – Net Property, Plant, and Equipment

December 31, 2022

Item	Building and Building Improvement	Electric Appliance and Radio	Computer	Vehicle and Transport	Office Supplies and Others	Total
Cost Price						
Opening Balance	935.78	2,269.10	835.34	196.67	399.38	4,636.27
Increase During the Period	152.71	704.75	128.66	52.50	92.53	1,131.15
Decrease During the Period	(14.26)	(248.00)	(107.47)	(1.90)	(69.81)	(441.44)
Closing Balance	1,074.23	2,725.85	856.53	247.27	422.10	5,325.98
Less Accumulated Depreciation						
Opening Balance	659.72	1,919.65	764.79	179.04	337.81	3,861.01
Increase During the Period	156.36	503.85	124.82	5.32	86.59	876.94
Decrease During the Period	(6.80)	(214.53)	(107.44)	(1.61)	(65.73)	(396.11)
Closing Balance	809.28	2,208.97	782.17	(182.75)	358.67	4,341.84
Work in Progress						
Work in Progress at Closing Balance	1,274.94	2.97	3.92	-	0.61	1,282.44
Book Value						
As at December 31, 2021	1,120.17	349.45	74.05	17.63	75.57	1,636.87
As at December 31, 2022	1,539.89	519.85	78.28	64.52	64.04	2,266.58



Note 14 – Net Property, Plant, and Equipment (Continued)

Item	December 31, 2021					
	Building and Building Improvement	Electric Appliance and Radio	Computer	Vehicle and Transport	Office Supplies and Others	Total
Cost Price						
Opening Balance	904.17	2,253.71	828.68	197.09	392.74	4,576.39
Increase During the Period	31.70	27.21	32.37	0.20	18.91	110.39
Decrease During the Period	(0.09)	(11.82)	(25.71)	(0.62)	(12.27)	(50.51)
Closing Balance	935.78	2,269.10	835.34	196.67	399.38	4,636.27
Less Accumulated Depreciation						
Opening Balance	630.78	1,718.45	742.89	174.15	325.76	3,592.03
Increase During the Period	28.94	213.03	41.50	5.51	23.35	312.33
Decrease During the Period	-	(11.83)	(19.60)	(0.62)	(11.30)	(43.35)
Closing Balance	659.72	1,919.65	764.79	179.04	337.81	3,861.01
Work in Progress						
Work in Progress at Closing Balance	844.11	-	3.50	-	14.00	861.61
Book Value						
As at December 31, 2020	803.03	535.26	85.79	22.94	78.16	1,525.18
As at December 31, 2021	1,120.17	349.45	74.05	17.63	75.57	1,636.87



Note 15 – Net Assets from Financial Leases

	December 31, 2022		
	Computer	Vehicle and Transport	Total
Cost Price			
Opening Balance	325.97	137.10	463.07
Increase During the Period	22.43	-	22.43
Decrease During the Period	(118.00)	(15.72)	(133.72)
Closing Balance	230.40	121.38	351.78
Less Accumulated Depreciation			
Opening Balance	155.79	68.58	224.37
Increase During the Period	70.58	27.26	97.84
Decrease During the Period	(117.94)	(15.59)	(133.53)
Closing Balance	108.43	80.25	188.68
Book Value			
As at December 31, 2021	170.18	68.52	238.70
As at December 31, 2022	121.97	41.13	163.10

	December 31, 2021		
	Computer	Vehicle and Transport	Total
Cost Price			
Opening Balance	266.79	136.22	403.01
Increase During the Period	59.90	10.80	70.70
Decrease During the Period	(0.72)	(9.92)	(10.64)
Closing Balance	325.97	137.10	463.07
Less Accumulated Depreciation			
Opening Balance	82.78	51.03	133.81
Increase During the Period	73.69	26.83	100.52
Decrease During the Period	(0.68)	(9.28)	(9.96)
Closing Balance	155.79	68.58	224.37
Book Value			
As at December 31, 2020	184.01	85.19	269.20
As at December 31, 2021	170.18	68.52	238.70

**Note 16 – Net Intangible Assets****Cost Price**

Opening Balance

Increase During the Period

Decrease During the Period

Closing Balance

Less Accumulated Amortization

Opening Balance

Increase During the Period

Decrease During the Period

Closing Balance

Work in Progress

Work in Progress at Closing Balance

Book Value**As at December 31**

2022	2021
1,793.06	1,689.74
717.93	118.42
(421.50)	(15.10)
2,089.49	1,793.06
1,519.64	1,336.79
630.22	197.94
(395.30)	(15.10)
1,754.56	1,519.63
51.93	123.61
386.86	397.04

Note 17 – Creditors and Note Payables

Creditors

Paychecks

Total Creditors and Note Payables

2022	2021
514.96	212.18
206.07	136.91
721.03	349.09

Note 18 – Deferred Incomes

Deferred Radiocommunications Remunerations

Deferred Numbering Fees

Others

Total Deferred Incomes

2022	2021
68.52	67.66
11.39	8.59
14.25	14.33
94.16	90.58



Note 19 – Provisions for Employee Benefits

Pension Benefit Plan

According to the NBTC Regulation on Employee's Pension and Welfare after Retirement B.E. 2555 (2012), the Office of the NBTC is obligated to pay compensation to retirees, or employees forced and mandatory leave without guilt, or died, who have been worked at least one year, as well as the resigning employees without guilt, who have been worked for the organization at least three years, and their resignations have been approved by the authorized appointing person, or the designated person. Such employees shall receive the pension amounts by calculating the working period multiplied by the amount of the last salary.

In the case any employee is injured or harmed or abused on their duties, he/she shall receive an extra pension, which is 24 times the amount of the last salary. If died before receiving the extra pension, he/she shall receive the extra pension at 30 times the amount of the last salary.

The Office of the NBTC provides the pension fund account, as a budget source for employee's pension and support after retirement. The source of funds consists of the initial money allocated from the annual expenditure budget, allocated money from the annual expenditure budget, interest of the pension fund, and others. In case of insufficient pension funds to be paid to the employees, the Office of the NBTC shall reimburse the employee pension from the Office of the NBTC's Central Budget for sufficient payment for the employee in that year.

The present value of the provisions for employee benefits to be paid is as follows:

	2022	2021
Current Liabilities - Provisions for Employee Benefits	50.02	32.09
Non - Current Liabilities - Provisions for Employee Benefits	1,203.27	1,380.53
Present Value of Provisions for Employee Benefits	1,253.29	1,412.62

Changes in the present value of the provisions for employee benefits as of December 31 are as follows:

	2022	2021
Opening Balance of Provisions for Employee Benefits	1,412.62	1,297.09
Current Service Cost	169.55	131.31
Historical Service Cost	(39.85)	-
Net Interest of Net Provisions for Employee Benefits	25.94	20.83
Total	155.65	152.14
Actuarial Gains	(251.91)	-
Total	1,316.35	152.14
Paid Employee Benefits	(63.06)	(36.61)
Closing Balance of Provisions for Employee Benefits	1,253.29	1,412.62

**Note 19 – Provisions for Employee Benefits (Continued)**

Actuarial Gains for the year ended December 31 are as follows:

	2022	2021
Experience Changes	46.76	-
Financial Assumption Changes	(313.44)	-
Demographic Assumption Changes	14.77	-
Total	(251.91)	-

Main Assumptions for actuarial gains and losses are as follows:

Main Assumptions	Age Range	Percentage per Annum
1. Discount Rate		0.72 to 5.57
2. Salary Increase Rate	Less than 40 years	8.0
	From 40 years to less than 55 years	6.0
	From 55 years and above	4.0
3. Employee Turnover Rate	Less than 30 years	2.5
	From 30 years to less than 55 years	0.5
	From 55 years and above	0.0
4. Mortality Rate	The assumptions relating to the future mortality rate derive from Thai Mortality Ordinary Table 2017 (TMO 2017) with the rate revision at 3.0 percent per year.	

Sensitivity of Main Assumptions

Changes in each main assumption, relating to actuarial analysis, may occur reasonably at the end of the reporting period. The results of assumption sensitivity analysis, and the impact of the defined benefit plan obligations as of December 31 are as follows :

Impact of the Defined Benefit Plan Obligations					
	Changes in Assumption	Increase in Assumptions		Decrease in Assumptions	
	Percentage	million baht		million baht	
		2022	2021	2022	2021
Discount Rate	1.00	(137.91)	(165.97)	164.08	198.62
Expected Salary Increase Rate	1.00	159.64	205.67	(137.00)	(174.10)
Employee Turnover Rate	20.00	(0.84)	(9.61)	0.84	9.81
Revision of Mortality Rate	1.00	0.02	0.84	(0.00)	(0.93)

Risks involved in the benefit project, under the projected unit credit method, are the differences of the actual salary increase rate, the employee turnover rate, and the mortality rate with the implemented assumptions, for example, the actual salary increase rate is higher than expected, while the employee turnover rate is less than expected, this may affect actuarial losses. Moreover, the current economic situations may affect the discount rate to be higher or lower, due to the rate is used to measure the fair value of liabilities. However, this benefit plan has no specific risk to the organization or investment risk, as the project does not involve fund establishment.



Note 19 – Provisions for Employee Benefits (Continued)

The analysis of employee benefit payment maturity without the discount rate since 2021 is shown below.

	Current Portion (not exceeding 1 year)	Non- Current Portion (more than 1 year, but not exceeding 3 years)	Long-Term Portion (more than 3 years)	Total
	million baht	million baht	million baht	million baht
As at December 31, 2022				
Provisions for Employee Benefits	50.02	87.72	6,213.70	6,351.45
Total	50.02	87.72	6,213.70	6,351.45

Note 20 – Deferred Public Revenue to the Treasury

	Opening Balance	Transactions during the Period		Closing Balance
	As at January 1, 2022	Accrued Remittance Increase (Decrease)	Remittance	As at December 31, 2022
Current Portion				
Fines	3.48	3.08	(3.48)	3.08
Revenue from 700 MHz Spectrum Auction	8,454.18	8,450.73	(8,454.18)	8,450.73
Revenue from 900 MHz Spectrum Auction	18,434.82	18,434.42	(18,434.82)	18,434.42
Revenue from 1800 MHz Spectrum Auction	5,321.92	1.10	(5,321.92)	1.10
Revenue from TV Digital Spectrum Auction	1.28	4.96	(1.28)	4.96
Revenue from 2600 MHz Spectrum Auction	5.33	0.77	-	6.10
Revenue from 26 GHz Spectrum Auction	27.98	4.19	-	32.17
Revenue from FM Spectrum Auction	-	568.38	(568.38)	-
Revenue from Satellite Orbital Slot Usage Fee	-	2.00	-	2.00
Revenue from Beautiful Number Auction	0.05	0.07	(0.05)	0.07
Revenue remitted under Section 84	9,263.90	1,594.28	(10,858.18)	-
Revenue from the 1 Por Nor Radio Station	25.64	4.59	(25.64)	4.59
Remittance as Public Revenue in 2021	895.15	-	(895.15)	-
Remittance as Public Revenue in 2022	-	984.20	-	984.20
Total Current Portion	42,433.73	30,052.77	(44,563.08)	27,923.42
Non – Current Portion				
Revenue from 700 MHz Spectrum Auction	68,516.69	(8,427.11)	-	60,089.58
Revenue from 900 MHz Spectrum Auction	64,998.24	(18,430.64)	-	46,567.60
Revenue from 2600 MHz Spectrum Auction	5,539.02	-	-	5,539.02
Total Non - Current Portion	139,053.95	(26,857.75)	-	112,196.20
Total Deferred Public Revenue to the Treasury	181,487.68	3,195.02	(44,563.08)	140,119.62

**Note 20 – Deferred Public Revenue to the Treasury (Continued)**

	Opening Balance	Transactions during the Period		Closing Balance
	As at January 1, 2022	Accrued Remittance Increase (Decrease)	Remittance	As at December 31, 2022
Current Portion				
Radiocommunications Service Fee and Violation Fines	0.02	-	(0.02)	-
Fines	3.96	3.48	(3.96)	3.48
Revenue from 700 MHz Spectrum Auction	0.47	10,912.15	(2,458.44)	8,454.18
Revenue from 900 MHz Spectrum Auction	24,743.77	15,199.38	(21,508.33)	18,434.82
Revenue from 1800 MHz Spectrum Auction	10,636.11	2.99	(5,317.18)	5,321.92
Revenue from TV Digital Spectrum Auction	613.48	53.04	(665.24)	1.28
Revenue from 2600 MHz Spectrum Auction	5.32	0.01	-	5.33
Revenue from 26 GHz Spectrum Auction	26.11	7,585.48	(7,583.61)	27.98
Revenue from Beautiful Number Auction	0.20	0.05	(0.20)	0.05
Revenue remitted under Section 84	2,004.55	9,263.90	(2,004.55)	9,263.90
Revenue from the 1 Por Nor Radio Station	27.85	25.64	(27.85)	25.64
Remittance as Public Revenue in 2019	499.01	-	(499.01)	-
Remittance as Public Revenue in 2020	2,330.32	-	(2,330.32)	-
Remittance as Public Revenue in 2021	-	895.15	-	895.15
Total Current Portion	40,891.17	43,941.27	(42,398.71)	42,433.73
Non – Current Portion				
Revenue from 700 MHz Spectrum Auction	31,310.46	37,206.23	-	68,516.69
Revenue from 900 MHz Spectrum Auction	80,193.44	(15,195.20)	-	64,998.24
Revenue from 2600 MHz Spectrum Auction	5,539.02	-	-	5,539.02
Total Non - Current Portion	117,042.92	22,011.03	-	139,053.95
Total Deferred Public Revenue to the Treasury	157,934.09	65,952.30	(42,398.71)	181,487.68

Note 21 – Deferred Output Tax on Spectrum Auction

	2022	2021
Current Portion		
900 MHz Spectrum Auction	1,330.11	1,330.11
700 MHz Spectrum Auction	729.48	729.48
Accrued Revenue – Telecommunications service	49.33	50.00
Total Current Portion	2,108.92	2,109.59
Non – Current Portion		
900 MHz Spectrum Auction	3,193.12	4,523.23
700 MHz Spectrum Auction	5,106.39	5,835.88
2600 MHz Spectrum Auction	2,358.33	2,358.33
Total Non – Current Portion	10,657.84	12,717.44
Total Deferred Output Tax on Spectrum Auction	12,766.76	14,827.03



Note 22 - Contributions to Digital Economy and Society Development Fund

	Opening Balance	Transactions during the Period		Closing Balance
	As at January 1, 2022	Accrued Remittance Increase (Decrease)	Remittance	As at December 31, 2022
Revenue from Section 65	153.31	1,301.25	(1,287.17)	167.39
700 MHz Spectrum Auction	334.49	334.49	(334.49)	334.49
900 MHz Spectrum Auction	570.97	570.96	(570.97)	570.96
1800 MHz Spectrum Auction	938.33	-	(938.33)	-
FM Spectrum Auction	-	102.49	(102.49)	-
Total Current Portion	1,997.10	2,309.19	(3,233.45)	1,072.84
700 MHz Spectrum Auction	2,675.91	(334.49)	-	2,341.42
900 MHz Spectrum Auction	3,425.76	(570.96)	-	2,854.80
2600 MHz Spectrum Auction	977.47	-	-	977.47
Total Non - Current Portion	7,079.14	(905.45)	-	6,173.69
Total Contributions to Digital Economy and Society Development Fund	9,076.24	1,403.74	(3,233.45)	7,246.53

	Opening Balance	Transactions during the Period		Closing Balance
	As at January 1, 2021	Accrued Remittance Increase (Decrease)	Remittance	As at December 31, 2021
Revenue from Section 65	322.88	1,290.23	(1,459.80)	153.31
700 MHz Spectrum Auction	-	668.98	(334.49)	334.49
900 MHz Spectrum Auction	1,680.85	-	(1,109.88)	570.97
1800 MHz Spectrum Auction	1,876.65	-	(938.32)	938.33
26 GHz Spectrum Auction	-	1,338.28	(1,338.28)	-
Total Current Portion	3,880.38	3,297.49	(5,180.77)	1,997.10
700 MHz Spectrum Auction	-	2,675.91	-	2,675.90
900 MHz Spectrum Auction	3,425.76	-	-	3,425.76
2600 MHz Spectrum Auction	977.47	-	-	977.47
Total Non - Current Portion	4,403.23	2,675.91	-	7,079.14
Total Contributions to Digital Economy and Society Development Fund	8,283.61	5,973.40	(5,180.77)	9,076.24

In compliance with Section 24 of the Digital Development for Economy and Society Act B.E. 2560 (2017), the contributions to Digital Economy and Society Development Fund as of December 31, 2022 and 2021, were 7,246.53 and 9,076.24 million baht respectively. The Office of the NBTC has allocated the budget at a rate of 15 percent of the revenue from spectrum allocation and the Office of the NBTC's revenue, as from January 25, 2017 onwards.

**Note 23 – Net Financial Lease Payable**

	December 31, 2022		
	Less than 1 year	1 – 5 years	Total
Aggregate Minimum Financial Lease Payable	82.07	92.46	174.53
Interest of Hire – Purchase Contract/Deferred Financial Lease	(6.51)	(4.69)	(11.20)
Present Value of the Total Minimum Financial Lease Payable	75.56	87.77	163.33

	December 31, 2021		
	Less than 1 year	1 – 5 years	Total
Aggregate Minimum Financial Lease Payable	96.85	150.57	247.42
Interest of Hire – Purchase Contract/Deferred Financial Lease	(8.92)	(8.12)	(17.04)
Present Value of the Total Minimum Financial Lease Payable	87.93	142.45	230.38

Changes in financial lease liabilities are as follows:

	2022	2021
Closing Balance as at January 1	230.38	276.33
Increase in Financial Lease Liabilities	26.02	78.38
Reimbursement of Financial Lease Liabilities	(104.27)	(132.02)
Deferred Interest of Financial Lease	11.20	7.69
Closing Balance as at December 31	163.33	230.38

Note 24 – Other Current Liabilities

	2022	2021
Accrued Expenses	747.29	840.92
Accrued Withholding Tax	2.97	4.26
Revenue Department Payable	-	491.71
Other Current Liabilities	3.32	13.88
Total Other Current Liabilities	753.58	1,350.77

Note 25 - Deferred Revenue from Spectrum Refarming to the BTFP

The deferred revenue from spectrum refarming to the BTFP as of December 31, 2022 and 2021, in a total of 27,177.37 and 27,174.01 million baht respectively, were the money to be remitted to the BTFP, according to the spectrum refarming ratio, in order to reallocate such spectrum according to the Notification of the NBTC on Criteria and Procedure for Spectrum Licensing for International Mobile Telecommunications Service in the Frequency Band of 700 MHz, 1800 MHz, 2600 MHz, and 26 GHz. The BTFP shall disburse the fund to those affected by spectrum refarming as compensation, reimbursement, or remuneration, according to the Act on the Organization B.E. 2553 (2010) and its amendment.



Note 25 – Deferred Revenue from Spectrum Refarming to the BTFP (Continued)

The Office of the NBTC has allocated the 2600 MHz spectrum band that was refarmed for reallocation based on the ratio to be remitted to the BTFP for 30,174.34 million baht. The first installment was allocated to the BTFP in 2020 for 3,000.33 million baht. For the 6-remaining installment for 27,140.01 million baht, the Office of the NBTC shall allocate to the BTFP when receiving payment for the spectrum licensees during 2025 – 2030.

Note 26 – Receivable under Provisional Measure

Receivable under the provisional measure as of December 31, 2022 and 2021 for 603.81 and 603.81 million baht respectively, were the revenue from service provision on behalf of the state in 2019, in a total of 603.81 million baht, deriving from the minimum income remittance of mobile service provision on the 1800 MHz and 850 MHz spectrum bands during the consumer protection period, under the Notification of the NBTC on Provisional Measures for Consumer Protection, in case of Termination of Permission, Concession, or Contracts of Mobile Service Provision B.E. 2556 (2013). According to Section 7 of the Notification, it assigns the service providers to be the payees of the service provision revenue, on behalf of the state during the protection period, by separating the receipt account specifically, and reporting the income amount and its profit, deducted by the interconnection cost, the telecommunication numbering fee, the administrative cost, and other necessary operating costs. Then, the surplus shall be submitted to the Office of the NBTC for auditing before forwarding as public revenue. In this regard, the service providers have refused the Office of the NBTC's order to submit such revenue. Currently, it is in the process of filing the lawsuit to the Administrative Court.

Such revenue from service provision on behalf of the state, in a total of 603.81 million baht, has already been remitted completely as public revenue in 2019, by the Office of the NBTC, shown as remittance to the Ministry of Finance under the provisional measure.

Note 27 – Other Non - Current Liabilities

	2022	2021
Contract Insurance Deposits	87.20	59.41
Performance Insurance	5.76	6.68
Damage Insurance	0.09	6.07
Deposit of the Monument Construction	0.39	0.39
Other Deposits	0.15	0.32
Total Other Non - Current Liabilities	93.59	72.87

Note 28 – Revenue from Spectrum Auction and Satellite Orbital Slot Auction

	2022	2021
Revenue from TV Digital Spectrum Auction	-	50.87
Revenue from 700 MHz Spectrum Auction	-	51,460.00
Revenue from 26 GHz Spectrum Auction	-	8,921.89
Revenue from FM Spectrum Auction	683.32	-
Revenue from Satellite Orbital Slot Usage Fee	2.00	-
Total Revenue from Spectrum Auction and Satellite Orbital Slot Auction	685.32	60,432.76

**Note 29 – Revenue of State Enterprises under Section 84, Paragraph Three**

The Office of the NBTC had the revenue of state enterprises under Section 84, Paragraph Three for the year ended December 31, 2022 and 2021, for 1,594.29 and 9,263.90 million baht respectively, which were the revenue from legitimate spectrum licensees for telecommunications service provision under the Act on the Organization B.E. 2553 (2010) and its amendment. The Act stipulates that, when the specified period of three years has elapsed since the effective date of the Act, the state enterprise revenue derived from the licensing, concession, or contracts, according to Paragraph Two, under the law, regarding to private sector participation with the state undertakings, whether in whole or in part, shall be deducted by the operating expenses. The surplus shall be remitted to the NBTC. Accordingly, the NBTC shall remit such surplus revenue as public revenue.

Note 30 – Revenue from Licenses and Licensing Fees

	2022	2021
Revenue from Radiocommunications Spectrum Remunerations	310.40	294.92
Revenue from Telecommunications Service Licensing Fees	4,934.35	4,798.36
Revenue from Broadcasting Service Licensing Fees	0.84	58.65
Revenue from Television Service Licensing Fees	179.17	169.92
Revenue from Drone Service Licensing Fees	4.54	3.96
Revenue from Satellite Service Licensing Fees	3.55	6.78
Revenue from Licensing Fees under Section 70	3.87	8.15
Revenue from Other Fees – Telecommunications Service	-	0.05
Revenue from Other Fees – Broadcasting and Television Service	1.09	1.32
Total Revenue from License Application and Licensing Fees	5,437.81	5,342.11

Note 31 – Revenue from Numbering Fees

	2022	2021
Revenue from Numbering Fees	3,238.82	3,261.38
Total Revenue from Numbering Fees	3,238.82	3,261.38

Note 32 – Revenue from Broadcasting and Telecommunications Research and Development Fund for Public Interest (BTFP)

The revenue from BTFP for the year ended December 31, 2021 in a total of 141.80 million baht. The revenue from BTFP in 2020 in a total of 499.01 million baht, were the subsidy for the satellite television signal transmission expenses, remained from closing the account of the BTFP, according to the resolution of the BTFP Committee meeting No.12/2020 on October 29, 2020. The total revenue has been remitted as public revenue. Also, the revenue from BTFP in 2021 in a total of 141.80 million baht was the rebate from some portion of the 1st installment of the TV digital spectrum auction revenue to the Office of the NBTC, in accordance with the judgment of the Supreme Administrative Court.



Note 33 – Other Revenues

	2022	2021
Revenue from the 1 Por Nor Radio Station	4.01	25.79
Net Profit from Disposal of Assets	12.64	-
Interest Earned	58.84	66.11
Other Revenues	54.84	24.80
Total Other Revenues	130.33	116.70

Note 34 – Compensation, Reimbursement, or Remuneration for Television Operators

	2022	2021
Compensation from Returning TV Digital Licenses	-	411.76
Compensation for MUX Operators	1,649.80	2,038.45
Total Compensation, Reimbursement, or Remuneration for Television Operators	1,649.80	2,450.21

Note 35 – Expenses of Remittance to the Treasury

	2022	2021
Remittance from 900 MHz Spectrum Auction	3.78	4.18
Remittance from 1800 MHz Spectrum Auction	1.10	2.99
Remittance from TV Digital Spectrum Auction	4.96	53.04
Revenue of State Enterprise under Section 84, Paragraph Three	1,594.29	9,263.90
Remittance from Beautiful Number Auction	0.07	0.05
Remittance from 700 MHz Spectrum Auction	23.62	48,118.38
Remittance from 2600 MHz Spectrum Auction	0.77	0.01
Remittance from 26 GHz Spectrum Auction	4.19	7,585.48
Remittance from FM Spectrum Auction	568.38	-
Remittance from Satellite Orbital Slot Usage Fee	2.00	-
Total Expenses of Remittance to the Treasury	2,203.16	65,028.03

Note 36 – Expenses on Spectrum Auction and Refarming

	2022	2021
Expenses Allocated to the BTFP from Auction of Refarmed Spectrum	3.37	-
Multiband Auction Operating Expenses	-	13.22
FM Spectrum Auction Operating Expenses	12.45	-
Satellite Auction Operating Expenses	7.27	7.04
Total Spectrum Auction and Refarming Expenses	23.09	20.26

**Note 37 – Expenses by the Judgment of the Supreme Administrative Court**

	2022	2021
Expenses by the Judgment of the Supreme Administrative Court	4.05	35.41
Total Expenses by the Judgment of the Supreme Administrative Court	4.05	35.41

The expenses by the judgment of the Supreme Administrative Court for the year ended December 31, 2021 for 35.41 million baht was the expense by the judgment of the Supreme Administrative Court for the Undecided Case No.515/2021 for 23.60 million baht relating to the Notification of the NTC on Criteria for Allocation and Management of Telecommunication Numbers B.E. 2551 (2008), and the judgment for the Undecided Case No.445/2021 (Decided Case No.918/2021) for 11.81 million baht, relating to provision of number portability.

The expenses by the judgment of the Supreme Administrative Court for the year ended December 31, 2022 for 4.05 million baht was the expense by the judgment of the Supreme Administrative Court for the Undecided Case No.894/2014 for 3.38 million baht, relating to violation by noncompliance with the mobile number portability provision, and the expense by the judgment of the Supreme Administrative Court for the Undecided Case No.159/2019 for 0.67 million baht, relating to subscription television business licenses.

Note 38 – Human Resources Expenses

	2022	2021
Employee Payrolls	1,268.90	1,150.16
Special Remuneration	228.61	222.33
NBTC Remuneration	18.25	19.37
Monthly Remuneration	115.61	126.72
Medical Expenses	217.95	158.20
Welfares	29.39	35.42
Provident Fund	106.03	100.45
Total Human Resources Expenses	1,984.74	1,812.65

Note 39 – Pension

	2022	2021
Pension	187.39	152.14
Medical Expenses	2.99	2.41
Total Pension	190.38	154.55

Note 40 – Remuneration

	2022	2021
Meeting Allowances	29.06	31.08
Total Remuneration	29.06	31.08



Note 41 – General and Administrative Expenses

	2022	2021
Domestic Travel Expenses	29.52	12.19
Rental Fees	144.46	150.96
Maintenance Fees	327.12	351.75
Service Fees	149.49	157.13
Entertainment Allowances	16.96	2.73
Formality Fees	4.39	10.69
Taxes and Charges	11.38	17.73
Training and Seminar Expenses	63.52	22.70
Public Relations Expenses	154.85	118.47
Meeting Administrative Expenses	38.83	16.38
Radiocommunications Calibration Expenses	9.23	1.96
Consultant Fees	199.37	217.97
Money for Donation and Charity	2.10	0.04
Miscellaneous	13.20	4.06
International Travel Expenses	59.91	0.02
Total General and Administrative Expenses	1,224.33	1,084.78

Note 42 – Material Expenses

	2022	2021
Material Costs	31.74	29.05
Equipment Costs below the Threshold	10.60	7.93
Total Material Expenses	42.34	36.98

Note 43 – Utility Expenses

	2022	2021
Electricity Charges	38.06	31.43
Water Supply Charges	1.12	0.98
Office Telephone Usage Charges	1.50	1.99
Mobile Phone Usage Charges	17.95	17.01
DSTV Cable TV Service Charges	0.07	0.07
Internet Service Charges	21.74	15.85
Postage Fees	2.74	3.08
Total Utility Expenses	83.18	70.41

**Note 44 – Depreciation and Amortization**

	2022	2021
Depreciation – Building and Building Improvement	32.59	28.94
Depreciation – Electric Appliance and Radio	199.60	213.03
Depreciation – Computer	49.83	41.50
Depreciation – Vehicle and Transport	5.00	5.51
Depreciation – Office Supply and Others	23.77	23.35
Depreciation – Financial Lease	97.84	100.52
Total Depreciation	408.63	412.85
Amortization – Computer Programs	225.41	197.94
Total Amortization	225.41	197.94
Total Depreciation and Amortization	634.04	610.79

Note 45 – Financial Support for Education, Research and Development in Broadcasting, Television, and Telecommunications Businesses

	2022	2021
Financial Support for Education, Research and Development	233.80	212.98
Scholarship Support Expenses	3.74	0.85
Total Financial Support for Education, Research and Development in Broadcasting, Television, and Telecommunications Businesses	237.54	213.83

Note 46 – Other Expenses

	2022	2021
Losses from Assets Disposal	-	7.14
Losses from Termination of Financial Lease	0.19	0.91
Doubtful Debts	3.32	0.03
Total Other Expenses	3.51	8.08

Note 47 – Significant Dispute and Litigation

1. The significant disputes and litigations, having the Office of the NBTC as the plaintiff, with the total monetary value claims of 4,857.68 million baht, consist of the following cases:

1.1 The Office of the NBTC was the plaintiff for the breach of lease of the 98.5 MHz radio station, and claimed for compensation according to the Undecided Case No.9278/2015 (the Undecided Case No.4800/2010, and the Decided Case No.4067/2011), with the monetary value of 43.18 million baht. Currently, it is in process of debtor's assets investigation for legal execution.

1.2 The Office of the NBTC was the plaintiff for the breach of lease of the 1 Por Nor radio station, and claimed compensation according to the Undecided Case No.17794/2014 (the Undecided Case No.6024/2009, and the Decided Case No.1935/2011), with the monetary value of 69.28 million baht. The Supreme Court has sentenced the defendant to pay the compensation, as the debtor has no assets for compulsory performance.



Note 47 – Significant Dispute and Litigation (Continued)

1.3 The Office of the NBTC was the plaintiff for the offense of remitting the revenue from mobile service provision on the 1800 MHz spectrum band, during the consumer protection period, as from the effective date of the Provisional Measures for Consumer Protection, in case of Termination of Permission, Concession, or Contracts of Mobile Service Provision B.E. 2556 (2013) until the end of mobile service period on the 1800 MHz band, according to the Undecided Case No.1228/2016, with the monetary value of 3,637.64 million baht. Also, the Office of the NBTC was the defendant of the Undecided Case No.2013/2015, 1712/2016, 2392/2018 and 490/2016, which have been consolidated by the Court's order, having the Undecided Case No.2013/2015 as the main case. The Central Administrative Court has specified December 22, 2022 to be the fact-finding end date, and according to the Undecided Case No.1441/2016 with the monetary value of 950.56 million baht. Besides, the Office of the NBTC was the defendant of the Undecided Case No.1997/2015 and 2399/2018, which have been consolidated by the Court's order, having the Undecided Case No.1997/2015 as a main case. Currently, it is in the consideration process of the Supreme Administrative Court.

1.4 The Office of the NBTC was the plaintiff for the offense of the breach of radiocommunications devices rental contract, according to the Undecided Case No.2618/2006 (the Decided Case No.646/2007), with the monetary value of 8.18 million baht, which have on process of investigating and collecting the debtor's assets.

1.5 The Office of the NBTC was the plaintiff for the offense of overdue payment for annual licensing fees according to the Undecided Case No.2730/2019 (the Decided Case No.1550/2020), with the monetary value of 34.77 million baht, which have been on process of filing a writ of certiorari.

1.6 The Office of the NBTC was the plaintiff for the offense of overdue payment for annual licensing fees according to the Undecided Case No.2731/2019 (the Decided Case No.4952/2019), with the monetary value of 114.07 million baht, which have been in the process of investigating the debtor's assets for legal execution.

2. The significant disputes and litigations, having the Office of the NBTC as the defendant, with the total monetary value claims of 64,217.35 million baht, consist of the following cases:

2.1 The Office of the NBTC was the defendant for the administrative contract dispute according to the Undecided Case No.701/2017 (the Undecided Case No.1370/2015, and the Decided Case No.1911/2017), with the monetary value of 9.32 million baht, which have been in the trial process of the Supreme Administrative Court.

2.2 The Office of the NBTC was the defendant for the offense of prescribing the administrative fine at the rate of 140,000.00 baht per day, by the Secretary-General of the National Broadcasting and Telecommunications Commission according to the resolution of the NTC meeting No.13/2015 on June 30, 2015, and the judicial decision of the Undecided Case No.100/2018 (the Undecided Case No.1927/2015, and the Decided Case No.510/2018), with the monetary value of 58.94 million baht, which have been on the date for the pronouncement of the judgment, by the Supreme Administrative Court.

2.3 The Office of the NBTC was the defendant for the infringement of the administrative organization or government official occurred from legislation, in case of prescribing the Notification of the NBTC on Provisional Measures for Consumer Protection, in case of Termination of Permission, Concession, or Contracts of Mobile Service Provision B.E. 2556 (2013), and the Notification of the NBTC on Provisional Consumer Protection in case of Termination of Permission, Concession, under the NCPO Order No.94/2014, on Suspension the Implementation of the Act on the Organization to Assign Radio Frequency and to Regulate the Broadcasting and Telecommunications Services. The plaintiff required the defendants to pay compensation for 4,254.49 million baht with interest to the plaintiff, according to the Undecided Case No.203/2022 (the Undecided Case No.1651/2015 and the Decided Case No.729/2022). Currently, it is on appealing to the Supreme Administrative Court. The appeal has been accepted by the Court on July 18, 2022.





Note 47 – Significant Dispute and Litigation (Continued)

2.4 The Office of the NBTC was the defendant for the offense, regarding to damage claim of implementation according to the Notification of the NBTC on Provisional Measures for Consumer Protection in case of Termination of Permission, Concession, or Contracts of Mobile Service Provision B.E. 2556 (2013), in case that the expenses were higher than revenues of the litigant, and request for the telecommunications numbering fee refund that the litigant paid for 190.97 million baht according to the Undecided Case No.2013/2015, with the monetary value of 16,265.06 million baht with a 7.5 percent per annum interest rate, which the Administrative Court rendered the order to consolidate the Undecided Case No.1712/2016, the Undecided Case No.2392/2018, the Undecided Case No.490/2016, and the Undecided Case No.1228/2016, having the Undecided Case No.2013/2015 as the main case. Also, the Administrative Court has specified December 22, 2022 as the end date of fact-finding.

2.5 The Office of the NBTC was the defendant for the offense regarding imposing an order to remit the revenue from service provision under the Notification of the NBTC on Provisional Measures for Consumer Protection in Case of Termination of Permission, Concession, or Contracts of Mobile Service Provision B.E. 2556 (2013), according to the Undecided Case No.749-751/2022 (the Undecided Case No.1997/2015, 1441/2016, and 2399/2018), (the Decided Case No.526-528/2022 in the Central Administrative Court), with the monetary value of 950.56 million baht. Currently, it is in the consideration process of the Supreme Administrative Court.

2.6 The Office of the NBTC was the defendant for the offense of prescribing the litigant, the administrative fine at the rate of 210,000.00 baht per day, until the litigant would submit a complete account separation report of the telecommunications business for the year 2012, according to the Notification of the NBTC on Criteria and Procedures for Accounting Separation in Telecommunications Business, according to the Undecided Case No.215/2018 (the Undecided Case No.59/2016, and the Decided Case No.1517/2018), with the monetary value of 22.89 million baht. The Administrative Court scheduled August 16, 2022, as the first day of the new trial. Currently, it is on the date for the pronouncement of the judgment.

2.7 The Office of the NBTC was the defendant for the dispute over the revenue and expenses in the provisional consumer protection period, under the Notification of the NBTC on Provisional Measures for Consumer Protection, in case of Termination of Permission, Concession, or Contracts of Mobile Service Provision B.E. 2556 (2013), and the Notification of the NBTC on Provisional Consumer Protection in case of Termination of Permission, Concession under the NCPO Order No.94/2014, on Suspension the Implementation of the Act on the Organization to Assign Radio Frequency and to Regulate the Broadcasting and Telecommunications Services, according to the Undecided Case No.741/2016, with the monetary value of 1,881.45 million baht with a 7.5 percent per annum interest rate. The Central Administrative Court has the judgment. Currently, it is in process of filing the case to the Subcommittee on Laws and Cases, and to the NBTC to consider the appeal which is due on January 27, 2023.

2.8 The Office of the NBTC was the defendant for the offense, regarding to telecommunications equipment and network usage remuneration, during the provisional consumer protection period, under the Notification of the NBTC on Provisional Measures for Consumer Protection in case of Termination of Permission, Concession, or Contracts of Mobile Service Provision B.E. 2556 (2013), according to the Undecided Case No.1229/2022 (the Undecided Case No.918/2015, and the Decided Case No.730/2022), with the monetary value of 5,365.84 million baht with interest. The Office of the NBTC filed for an appeal amendment to the Supreme Administrative Court on December 20, 2022.



Note 47 – Significant Dispute and Litigation (Continued)

2.9 The Office of the NBTC was the defendant for the offense, regarding to the resolution of the NTC meeting No.32/2015 on December 2, 2015, that approved the Telecommunications Type 2 licensees with infrastructure ownership and Type 3 licensees to be responsible for universal basic telecommunications service and social service under the Universal Service Obligations (USO), according to the Undecided Case No.161/2018, with the monetary value at the rate of 4 percent of the telecommunications business operational revenue (during January 1, 2011, - May 30, 2012), together with the additional money amount equal to the amount of the outstanding debts multiplied by the MLR+2 loan interest. The defendants submitted the clarifications to the Administrative Court on December 2, 2022.

2.10 The Office of the NBTC was the defendant for the offense, regarding to imposing an order to remit the revenue from service provision on the 900 MHz spectrum band during the provisional consumer protection period under the Notification of the NBTC on Provisional Measures for Consumer Protection in Case of Termination of Permission, Concession, or Contracts of Mobile Service Provision B.E. 2556 (2013), and its amendment, according to the Undecided Case No.175-176/2020 (the Undecided Case No.661/2017, 736/2017, and the Decided Case No.802-803/2020), with the monetary value of 7,221.00 million baht with interest based on request appended to the plaint. Currently, it is in the consideration process of the Supreme Administrative Court.

2.11 The Office of the NBTC was the defendant for the offense of having the resolution and/or order prescribing the administrative fine at the rate of 169,244.00 baht per day, due to violation or noncompliance with the Notification of the NTC on the Mobile Number Portability Criteria and the guidelines on the mobile operator transfer, according to the Undecided Case No.1370/2017, with the monetary value of 7.33 million baht. The defendant has submitted additional testimony on April 30, 2019.

2.12 The Office of the NBTC was the defendant for the offense of having the resolution and/or prescribing the administrative fine at the rate of 5,400,591.64 baht per day, due to violation or noncompliance with the Notification of the NTC Re: Criteria for Mobile Number Portability and condition guidelines on the mobile operator transfer, according to the Undecided Case No.306/2020 (1283/2015), and the Undecided Case No.307/2020 (1357/2017), with the monetary value of 221.42 million baht. Currently, it is in scheduling process of the end date of fact-finding by the Court.

2.13 The Office of the NBTC was the defendant for the offense, regarding to damage claim of implementation according to the Notification of the NBTC on Provisional Measures for Consumer Protection in case of Termination of Permission, Concession, or Contracts of Mobile Service Provision B.E. 2556 (2013), and its amendment, during November 1, 2015 to December 3, 2015, according to the Undecided Case No.1712/2016, with the monetary value of 709.65 million baht, which the Administrative Court rendered the order to consolidate the Undecided Case No.2013/2015, the Undecided Case No.2392/2018, the Undecided Case No.490/2016, and the Undecided Case No.1228/2016, having the Undecided Case No.2013/2015 as the main case. Also, the Central Administrative Court has specified December 22, 2022 as the end date of fact-finding.

2.14 The Office of the NBTC was the defendant for the revocation request of the NBTC's resolution relating to operational fee payment for trial radio renewal, according to the Undecided Case No.195/2019, with the monetary value of 42.59 million baht. Currently, the defendant has submitted additional testimony. It is in the trial process of the Central Administrative Court.

2.15 The Office of the NBTC was the defendant for the dispute over the resolution of the NBTC meeting No.20/2018 on October 31, 2018, which approving the criteria and consideration results of network usage fee of the plaintiff in mobile service provision on the 900 MHz spectrum band, during the provisional consumer protection period, under the Notification of the NBTC on Provisional Measures for Consumer Protection in case of Termination of Permission, Concession, or Contracts of Mobile Service Provision B.E. 2556 (2013), according to the Undecided Case No.1775/2019, with the monetary value of 5,564.87 million baht. The Administrative Court received the defendant's testimony on October 25, 2021.





Note 47 – Significant Dispute and Litigation (Continued)

2.16 The Office of the NBTC was the defendant for the dispute over Agenda 5.3.6 of the resolution of the NBTC meeting No.10/2020 on June 10, 2020, regarding to the compensation details confirmation of the 2500 – 2690 MHz spectrum refarming of MCOT Public Company Limited, which specified the plaintiff's spectrum holding duration for 6 years and 5 months, and specified the value of compensation, reimbursement, or remuneration, by dividing into installments to be in line with the installments of the 2600 MHz spectrum auction payment, which were unlawful, inappropriate, and unfair, according to the Undecided Case No.2239/2020, with the monetary value of 3,235.84 million baht. The defendant has submitted the additional testimony to the Central Administrative Court on July 19, 2022.

2.17 The Office of the NBTC was the defendant for the unlawful order/regulation regarding spectrum auction payment and returning letters of guarantee, according to the Undecided Case No.1942/2019, with the monetary value of 27.00 million baht. Currently, it is in the trial process of the Central Administrative Court.

2.18 The Office of the NBTC was the defendant for the dispute over the NBTC's meeting No.5/2020 resolution on March 25, 2020, and No.9/2020 on May 17, 2020, regarding to the final day of administrative fine in the case that the plaintiff did not comply with the Notification of the NTC Re: Criteria for Mobile Number Portability and condition guidelines on the mobile operator transfer based on the Notification of the NTC Re: Criteria for Mobile Number Portability, according to the Undecided Case No.2212/2020, with the monetary value of 604.87 million baht (the total amount from the Undecided Case No.306/2020 (1283/2015) which the defendant has submitted the additional testimony on March 2, 2022, and the Undecided Case No.307/2020 (1357/2017) with the monetary value of 221.42 million baht), which the defendant has submitted the additional testimony on March 2, 2022.

2.19 The Office of the NBTC was the defendant for the dispute over the agenda 5.3.6 of the resolution of the NBTC meeting No.10/2020 on June 10, 2020, regarding to the compensation details confirmation of the 2500 – 2690 MHz spectrum refarming, according to the Undecided Case No.2229/2020, with the monetary value of 17,543.96 million baht with interest based on request appended to the plaint. The defendant has submitted the additional testimony on June 10, 2022.

2.20 The Office of the NBTC was the defendant for the dispute over the agenda 5.2.15 of the resolution of the NBTC meeting No.5/2020 on March 25, 2020, regarding to the agreement on assigning the defendant to remit the revenue from mobile service provision on the 850 MHz and 1800 MHz spectrum band, during the provisional consumer protection period, since the effective date of the provisional measures, according to the Undecided Case No.642/2021, with the monetary value of 143.71 million baht. On March 3, 2022, the prosecutor filed an objection to the testimony to the Central Administrative Court.

2.21 The Office of the NBTC was the defendant for the dispute over prescribing the administrative fine at the rate of 186,669 baht per day (one hundred, eighty-six thousand, six hundred, and sixty-nine baht) as from May 16, 2014, in case of noncompliance with the Notification of the NBTC on the Maximum Rate of Service Tariff for Domestic Mobile Voice Service B.E. 2555 (2012). Also, there have been the request for 1) repealing the Administrative Order of the Secretary-General of the NBTC, according to the official letter No.5012/22962 dated July 17, 2014, 2) repealing the resolution of the agenda 5.2.4 of the NBTC meeting No.15/2020 on August 26, 2020, and 3) repealing the Administrative Order according to the official letter No. 2402/29488 dated September 28, 2020, according to the Undecided Case No. 2927/2020, with the monetary value of 86.56 million baht. The defendant has submitted the additional testimony on September 19, 2022.



Note 48 – Obligations

- Service Contract Obligations

The Office of the NBTC had the service contract obligations for public relations and maintenance, in a total of 110.80 million baht (Year 2021 for 148.63 million baht).

- Capital Expenditure Obligations

Non – accrued Contracts	2022	2021
Land, Building and Structure	1,519.56	1,950.85
Equipment and Others	353.36	614.34
Total	1,872.92	2,565.19

- Procurement Contract Obligations and Other Services Obligations

As of December 31, 2022 and 2021, the Office of the NBTC had the obligations from the procurement contracts and other services, categorized by contract duration as follows:

	2022	2021
Less than 1 year	615.12	562.58
Total	615.12	562.58

- Operational Lease Obligations

As of December 31, 2022 and 2021, the Office of the NBTC had the minimum advance payment according to the noncancellable leases and service contracts as follows:

2022			
	Less than 1 year	1 – 5 Years	Total
Lease Agreement			
Space Rental Fees	15.27	0.81	16.08
Property Rental Fees	288.16	-	288.16
Land Leases			
Service Contracts	0.37	-	0.37
Area Fees	0.76	-	0.76
Total Obligations	304.56	0.81	305.37

**Note 48 – Obligations (Continued)**

	2021		
	Less than 1 year	1 – 5 Years	Total
Lease Agreement			
Space Rental Fees	36.26	21.07	57.33
Property Rental Fees	20.59	18.18	38.77
Land Leases			
Service Contracts	9.49	-	9.49
Area Fees	8.45	-	8.45
Total Obligations	74.79	39.25	114.04

Note 49 – Public Revenue Report

The public revenue report show in a separate report, accompanying the financial statement note, which is an integral part of the financial statement note.



Office of the National Broadcasting and Telecommunications Commission
Expenditure Budget Position Report
For the Year Ended December 31, 2022

Expenditure Budget Position Report for the Fiscal Year 2022

Item	Net Budget after Transferred Change	Purchase Order/Contract	Disbursement	Balance
1. Expenditure Budget	5,755.78	1,361.52	3,680.74	713.79
1.1 Operating Expenses of the NBTC and the Office of the NBTC	4,126.23	565.75	3,282.20	278.29
1.2 Project Expenses	1,391.00	736.27	351.38	303.35
1.3 Central Budget	145.59	6.06	21.10	118.43
1.4 Operating Expenses of the Performance Follow-up and Evaluation Committee	92.96	53.45	25.79	13.72
2. Allocated Budget to the Fund	1,010.00	-	1,010.00	-
Total	6,765.78	1,361.52	4,690.47	713.79

Reserved Budget for Overlapping Disbursement Position Report (Before the Fiscal Year 2022)

Item	Reserved Budget for Overlapping Disbursement (Net)	Disbursement	Balance
1. Reserved Budget for Overlapping Disbursement 2020	261.68	230.38	31.29
1.1 Project Expenses	261.68	230.38	31.29
2. Reserved Budget for Overlapping Disbursement 2021	1,515.78	725.97	789.81
2.1 Operating Expenses of the NBTC and the Office of the NBTC	398.72	392.85	5.87
2.2 Project Expenses	1,023.10	254.66	768.45
2.3 Central Budget	23.87	8.38	15.49
2.4 Operating Expenses of the Performance Follow-up and Evaluation Committee	70.09	70.09	-
Total	1,777.46	956.36	821.10

**Expenditure Budget Position Report for the Fiscal Year 2021**

Item	Net Budget after Transferred Change	Purchase Order/Contract	Disbursement	Balance
1. Expenditure Budget	5,929.51	1,515.78	3,785.24	628.49
1.1 Operating Expenses of the NBTC and the Office of the NBTC	4,427.38	398.72	3,597.44	431.22
1.2 Project Expenses	1,237.52	1,023.10	160.58	53.84
1.3 Central Budget	161.58	23.87	7.53	130.18
1.4 Operating Expenses of the Performance Follow-up and Evaluation Committee	103.03	70.09	19.69	13.25
2. Allocated Budget to the Fund	1,110.00	-	1,110.00	-
Total	7,039.51	1,515.78	4,895.24	628.49

Reserved Budget for Overlapping Disbursement Position Report (Before the Fiscal Year 2021)

Item	Reserved Budget for Overlapping Disbursement (Net)	Disbursement	Balance
1. Reserved Budget for Overlapping Disbursement 2019	21.06	19.36	1.70
1.1 Project Expenses	21.06	19.36	1.70
2. Reserved Budget for Overlapping Disbursement 2020	1,168.13	880.05	288.08
2.1 Operating Expenses of the NBTC and the Office of the NBTC	329.02	316.12	12.90
2.2 Project Expenses	767.68	492.85	274.83
2.3 Central Budget	0.84	0.84	-
2.4 Operating Expenses of the Performance Follow-up and Evaluation Committee	70.59	70.24	0.35
Total	1,189.19	899.41	289.78



Office of the National Broadcasting and Telecommunications Commission
Public Revenue Report
For the Year Ended December 31, 2022

	2022	2021
Collected Public Revenue		
Public Revenue – Non-Tax Revenue	3,195.02	65,952.30
Total Collected Public Revenue	3,195.02	65,952.30
<u>Less</u> Public Revenue Drawn Back from the Treasury	-	-
Public Revenue Allocated by Law	-	-
Net Collected Public Revenue	3,195.02	65,952.30
Deferred Public Revenue to the Treasury at the Beginning of the Period	181,487.68	157,934.09
Public Revenue Remitted to the Treasury	(44,563.08)	(42,398.71)
Deferred Public Revenue to the Treasury	140,119.62	181,487.68
<u>Adjusted</u> Deferred Public Revenue to the Treasury	-	-
Net Public Revenue Transaction	140,119.62	181,487.68

Public Revenue – Non-Tax Revenue

	2022	2021
Fines	3.08	3.48
Revenue from 900 MHz Spectrum Auction	3.78	4.18
Revenue from 1800 MHz Spectrum Auction	1.10	2.99
Revenue from TV Digital Spectrum Auction	4.96	53.04
Revenue from 700 MHz Spectrum Auction	23.62	48,118.38
Revenue from 2600 MHz Spectrum Auction	0.77	0.01
Revenue from 26 GHz Spectrum Auction	4.19	7,585.48
Revenue from FM Spectrum Auction	568.38	-
Revenue from Satellite Orbital Slot Usage Fee	2.00	-
Revenue from Beautiful Number Auction	0.07	0.05
Revenue of State Enterprises under Section 84 Paragraph Three	1,594.28	9,263.90
Revenue from the 1 Por Nor Radio Station	4.59	25.64
Surplus remitted as Public Revenue of 2021	-	895.15
Surplus remitted as Public Revenue of 2022	984.20	-
Total Public Revenue – Non-Tax Revenue	3,195.02	65,952.30



Internal Audit Report of the Office of the NBTC in the Fiscal Year 2022

According to the Order of the National Broadcasting and Telecommunications Commission (NBTC) No. 2/2021, dated February 19, 2021, the Internal Audit Committee has been appointed, comprising of 5 members as follows:

- | | |
|-----------------------------------|--------------|
| (1) Admiral Jeerapat Pansakul | Chairman |
| (2) Miss Siluck Pannoum | Commissioner |
| (3) Rear Admiral Wonsuree Boonmee | Commissioner |
| (4) Dr. Anada Pruetti-angkura | Commissioner |
| (5) Mrs. Supa Yaimuang | Commissioner |

The Internal Audit Committee has performed its authority under Section 3 of the Regulation of the National Broadcasting and Telecommunications Commission, on Internal Audit B.E. 2554 (2011), with the rights to perform their duties without interference from the NBTC, the Office of the NBTC, and any organizations, as well as the Ministry of Finance's Internal Control Standards for Government Agencies B.E. 2561 (2018) and its amendment.

The Internal Audit Committee's performances under its authority for the year 2022 has focused on preventive monitoring and recommendations for developing and improving the operation efficiency of the Office of the NBTC to promote a systematic work process based on Corporate Governance Code, and preventing misconduct or corruption, as well as emphasizing on monitoring issues concerning risks and effects on performances of the NBTC and the Office of the NBTC regularly. Accordingly, the Internal Audit Committee has organized 12 meetings to consider the significant issues as follows:

1. Revising the charter of the Internal Audit Committee and the Internal Audit Committee Administration Department, in compliance with the Ministry of Finance's Internal Control Standards for Government Agencies B.E. 2561 (2018) and its amendment, to ensure the operational practices comply to the charter preparation framework specified by the Ministry of Finance, and fit with current organizational situation.

2. Examining validity and reliability of the financial report of the Office of the NBTC by verifying the accounting record and financial statement preparation. No evidences of incorrect financial statements against the essence of financial reporting standards have been found.

3. Verifying and evaluating the operations in finance, accounting, and supply management of the Office of the NBTC, and offering recommendations for improving and developing for more operation efficiency, as well as following up operations according to the recommendations given in the internal audit report for the year 2020 and 2021.

4. Reviewing the efficiency and appropriateness of the risk and anti-corruption management, which may affect the organization significantly, and conducting sufficiency assessment and following up operations under the risk management plan consistently, as well as offering risk management recommendations for more efficiency and effectiveness.



5. Verifying the internal control evaluation of the Office of the NBTC, including the performance efficiency and effectiveness evaluation of the Office of the NBTC's monitoring-related bureaus. No significant issues or faults have been found. The internal control has been conducted sufficiently and appropriately, in compliance with the Ministry of Finance's Internal Control Standards for Government Agencies B.E. 2561 (2018).

6. Monitoring the operating systems under Corporate Governance Code, to comply with the NBTC regulations, orders, and operational standards, focusing on the target-oriented operations, according to the NBTC's policies with transparency.

7. Monitoring the operations and assessing the project expenditures of the Office of the NBTC to ensure the project undertakings have complied with the vision, mission, strategic plan, and strategies of the Office of the NBTC, as well as assessing the accuracy and cost-effectiveness of budget expenditure. According to the overall monitoring, no evidence of inappropriate conducts against the significance of the relevant rules, regulations, and agreements have been found.

From the operations mentioned above, the Internal Audit Committee concluded that the overall performance of the Office of the NBTC in 2022 has complied with Corporate Governance Code with transparency, efficiency and effectiveness, aligning with related laws, regulations, and criteria. Furthermore, the budget expenditure was cost-effective. The risk management and internal control were sufficiently performed. No significant observations have been found. Moreover, the financial statement preparation has been

carried out in compliance with the certified accounting standards appropriately, as well as the information disclosure in the financial statements has been conducted adequately and reliably.

For the year 2022, the Internal Audit Committee has conducted regulations, offered regulatory observations and recommendations to the operation and the management teams straightforwardly, by preparing the internal audit report and recommendations to the NBTC for every 180 days period. Moreover, the Committee has visited the NBTC regional offices to enhance mutual understanding regarding internal audit practices, and be informed about the problems and challenges of the Office of the NBTC tasks performing, as well as offering guidance and useful recommendations for operation improvement, to encourage the officials in the regional offices.

Besides, even though the COVID-19 pandemic situation has been eased up, the Internal Audit Committee still focused on adopting digital technology to continuously implement with management and coordination, that align with the Office of the NBTC's significant policies which emphasize on organizational transformation to be the digital organization. The Internal Audit Committee has recognized the important of utilizing digital technology to develop and enhance operations in every aspect to create integrated information as internal and external organization benefit.

Admiral

(Jeerapat Pansakul)

Chairman of the Internal Audit Committee





5

Policy and Work Plan and Expenditure Budget Plan in 2023



Significant Policy and Work Plan for the year 2023

In 2023, the NBTC and the Office of the NBTC has prescribed significant policies and work plans to drive the mission of regulating broadcasting, television, telecommunications, and satellite services as follows:

1) Licensing and regulating the use of spectrum bands in a consolidated manner for the public interest.

2) Allocating spectrum and prescribing licenses for broadcasting and television services according to the legal framework, and promoting diversity in content creation at all levels, to align with the evolving social context, and respond to the civil development directions in a democratic system, as well as enhancing the quality of life for the people.

3) Enhancing the standards of broadcasting and television services, in terms of increasing competitiveness locally and internationally, promoting the production of high-quality and societal beneficial programs, and promoting the integration of licensees, program producers, and media professionals associated with broadcasting and television

services, to formulate ethical standards of the profession, and regulate professional conduct or self-regulation under ethical standards.

4) Uplifting Thailand's radio broadcasting service to international standards to foster a creative society and sustainable economy.

5) Promoting and supporting the establishment of mechanisms to monitor content that impacts people, viewers, or listeners, as well as content that violates the law in broadcasting and television services, by procuring equipment and tools for content verification, and fostering engagement through networks of viewers and listeners from various communities or organizations across all regions, academics, and individuals with valuable knowledge and expertise that contributes to the development of broadcasting and television businesses.

6) Restructuring the Office of the NBTC towards full-fledged digital integration and becoming a fully digital organization.





7) Driving the academic cluster and cultivating knowledge among the Office of the NBTC's personnel to enhance their expertise at an advanced level, elevating the Office of the NBTC to international standards, to position the organization as a leading international organization in regulating competition, and actively participating in international arenas.

8) Managing satellite orbital slots, utilizing international satellite orbital slots, and regulating satellite services for the benefit of the nation and its citizens.

9) Enhancing consumer protection to keep pace with challenges in the digital society, and develop efficient and up-to-date mechanisms for resolving complaints.

10) Enhancing the capabilities of the telecommunications network by expanding

the coverage of fiber network, and achieving high-speed connectivity to the gigabit level, and promoting efficient utilization of the telecommunications network for maximum benefits.

11) Providing universal service supply for basic broadcasting, television, and telecommunications services, including services for persons with disabilities, diverse needs, and underprivileged people.

12) Accelerating the communication lines arrangement, and implementing underground cabling in priority areas.

13) Maintaining standards of the Integrity and Transparency Assessment in the operations of the Office of the NBTC in an AA-level and striving for sustainable development.





Significant Policy and Work Plan for the Year 2023



— 01 —

Licensing and regulating the use of spectrum bands in a consolidated manner for the public interest.



— 02 —

Allocating spectrum and prescribing licenses for broadcasting and television services and promoting diversity in content creation.



— 03 —

Enhancing the standards of broadcasting and television services, in terms of increasing competitiveness.



— 04 —

Uplifting Thailand's radio broadcasting service to international standards.



— 05 —

Promoting and supporting the establishment of mechanisms to monitor content that impacts people and fostering engagement through networks of viewers and listeners.



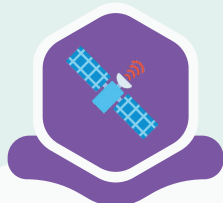
— 06 —

Restructuring the Office of the NBTC towards full-fledged digital integration and becoming a fully digital organization.



— 07 —

Driving the academic cluster and cultivating knowledge among the Office of the NBTC's personnel to position the organization as a leading international organization in regulating competition.



— 08 —

Managing satellite orbital slots, utilizing international satellite orbital slots, and regulating satellite services for the benefit of the nation and its citizens.



— 09 —

Enhancing consumer protection to keep pace with challenges in the digital society, and develop efficient and up-to-date mechanisms for resolving complaints.



— 10 —

Enhancing the capabilities of the telecommunications network and promoting efficient utilization of the telecommunications network for maximum benefits.



— 11 —

Providing universal service supply for basic broadcasting, television, and telecommunications services, including services for persons with disabilities, and underprivileged people.



— 12 —

Accelerating the communication lines arrangement, and implementing underground cabling in priority areas.



— 13 —

Maintaining standards of the Integrity and Transparency Assessment in the operations of the Office of the NBTC in an AA-level and striving for sustainable development.





Expenditure Budget Plan of the Office of the NBTC for the year 2023

According to the resolution of NBTC meeting No.35/2022 on December 21, 2022, and the NBTC meeting No.2/2023 on January 18, 2023, the NBTC approved the expenditure budget for the year 2023 of the Office of the NBTC, in a total of 6,271.250 million baht, by considering the necessity and appropriateness in carrying out the core missions of the organization, and aligning with the National Strategy plan, the National Digital Economy

and Society Development Plan and Policy, and relating plans at various levels, including 3 master plans of the organization, and the strategic plan of the Office of the NBTC, as well as carrying out important and urgent missions to drive the policies of the government and the NBTC, by considering efficiency and the benefits to be gained. The details are shown in Table 50.

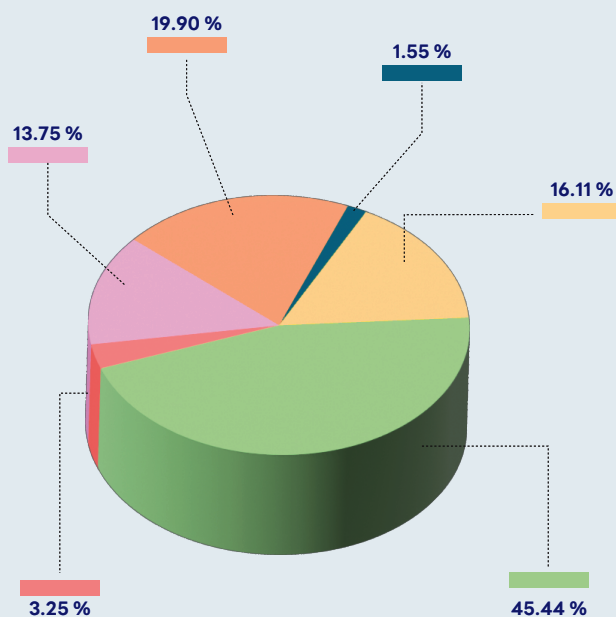
Table 50 Expenditure budget plan of the Office of the NBTC for the year 2023

Unit: Million baht

No.	Item	Amount
1	Expenditure Budget of the Office of the NBTC	5,261.250
1.1	Operating Expenses of the NBTC and the Office of the NBTC	4,143.203
	Human Resources Expenses	2,160.161
	General and Administrative Expenses	1,448.476
	Expenses on Lands, Buildings and Equipment	149.142
	Other Expenses	385.424
1.2	Project Expenses	870.596
1.3	Central Budget	149.986
1.4	Operating Expenses of the Performance Follow-up and Evaluation Committee	97.465
2	Allocated Budget to the Funds	1,010.000
2.1	Broadcasting and Telecommunications Research and Development Fund for Public Interest	1,000.000
2.2	Edtech Fund	10.000
	Total (No. 1 – 2)	6,271.250

Source: Strategic and Budget Bureau, Office of the NBTC



**Chart 41** Expenditure budget plan of the Office of the NBTC for the year 2023 by strategies

- **Strategy 1**
Elevate the good governance development and become a high-performance organization in the digital era, for 2,849,926 million baht.
- **Strategy 2**
Upskill workforce for regulatory excellence for the digital economy and society era, for 203.764 million baht.
- **Strategy 3**
Enhance Capacity in spectrum and satellite management for the utmost benefit of the nation and people, and empower the NBTC regional offices for regulation and public service, for 862.021 million baht.
- **Strategy 4**
Develop the regulation potential and promote broadcasting, television, and telecommunications services to comply with the changing context, for 1,248.074 million baht.
- Operating expenses of the Performance Follow-up and Evaluation Committee for 97.465 million baht
- Allocated budget to the funds for 1,010.000 million baht

- **Strategy 1** : Elevate the good governance development and become a high-performance organization in the digital era, in a total of 2,849,926 million baht, to elevate the Office of the NBTC to be sustainable good governance and high performance organization, and step towards becoming a fully digital organization, as well as driving organizational administration work plans, strategic and internal affairs management work plans, for 2,366.829 million baht, and project operating budget of 11 projects for 483.097 million baht.
- **Strategy 2** : Upskill workforce for regulatory excellence for the digital economy and society era, in a total of 203.764 million baht, to drive the personnel development work plans for excellence in regulating to prepare for the digital economy and society era, as well as creating knowledge assets for

personnel to have academic proficiency to support the organization to become a leading international regulatory organization, and for personnel in broadcasting, television, telecommunications services and the people to be ready for the digital economy and society era, for 163.046 million baht, and the project operating budget of 7 projects for 40.718 million baht.

- **Strategy 3** : Enhance capacity in spectrum and satellite management for the utmost benefit of the nation and people, and empower the NBTC regional offices for regulation and public service, in a total of 862.021 million baht, to drive the mission of spectrum and satellite management of the nation to be more efficient, in line with relevant national plans and policies to align with the changing environment, and developing international collaboration networks for spectrum



management and regulating broadcasting, television, telecommunications, and satellite services, as well as enhancing the potential of the NBTC regional offices, and improving the efficiency of spectrum monitoring and regulating, for 710.812 million baht, and the project operating budget of 16 projects for 151.209 million baht.

- **Strategy 4:** Develop the regulation potential and promote broadcasting, television, and telecommunications services to comply with the changing context, in a total of 1,248.074

million baht, to support the mission of driving and implementing management work plans of broadcasting, television, and telecommunications services with free and fair conduct, and promoting ethical standards for professionals in the broadcasting and television industries, as well as protecting consumers in broadcasting, television, and telecommunications services, for 1,052.502 million baht, and the project operating budget of 22 projects for 195.572 million baht.

Table 51 Projects sorted by strategies for the year 2023

Unit: Million baht

No.	Details	Budget for 2023
Strategy 1 : Elevate the good governance development and become a high-performance organization in the digital era, for 11 projects		
1	The Project on Financial Management and Analytical and Monitoring System of the Research and Development Fund Bureau Total Budget Proposed Budget for 2023 Committed Budget to 2024	9.271 23.178 9.271 13.907
2	The Data-Driven Organization Preparation Project Total Budget Appropriation Budget for 2022 Proposed Budget for 2023	4.616 10.434 5.818 4.616
3	The Project on Enhancing the Efficiency of the Office of the NBTC's One-Stop Service System Total Budget Proposed Budget for 2023	4.472 4.472 4.472
4	The Project on Cyber Security of the Office of the NBTC Website Total Budget Appropriation Budget for 2020 Appropriation Budget for 2021 Appropriation Budget for 2022 Proposed Budget for 2023	4.399 17.827 2.827 4.601 6.000 4.399
5	The Single Sign-On Management System Development Project Total Budget Appropriation Budget for 2022 Proposed Budget for 2023	11.787 33.676 21.889 11.787





No.	Details	Budget for 2023
6	The Project on ERP System Improvement to Support the Operation According to the New Organizational Structure Total Budget 7.254 Proposed Budget for 2023 7.254	7.254
7	The Project on Improving and Enhancing the Office of the NBTC's Human Resources Management System and HRSS System Total Budget 11.900 Proposed Budget for 2023 9.520 Committed Budget to 2024 2.380	9.520
8	The Project on Information Infrastructure System and the New NBTC Office Building System Total Budget 582.705 Proposed Budget for 2023 145.676 Committed Budget to 2024 437.029	145.676
9	The Project for the construction of new office building of the Office of the NBTC Total Budget 2,743.000 Appropriation Budget for 2019 685.750 Appropriation Budget for 2020 534.133 Appropriation Budget for 2021 681.324 Appropriation Budget for 2022 420.851 Proposed Budget for 2023 270.423 Committed Budget to 2024 150.519	270.423
10	The Project on Equipment Procurement for Detecting and Tracking the Movement of Assets under the Assets Administration with RFID System Development Project (Phase 3) Total Budget 5.344 Proposed Budget for 2023 5.344	5.344
11	The NBTC Employee Portal Development Project Total Budget 14.765 Appropriation Budget for 2022 4.430 Proposed Budget for 2023 10.335	10.335
Strategy 2 : Upskill workforce for regulatory excellence for the digital economy and society era, for 7 projects		
1	The NBTC E-Learning System Development Project Total Budget 3.500 Proposed Budget for 2023 3.500	3.500
2	The Project on NBTC Scholarship Program 2022 for NBTC officials (Overseas Master Degree) Total Budget 3.300 Appropriation Budget for 2022 3.000 Proposed Budget for 2023 0.200 Committed Budget to 2024 0.100	0.200



No.	Details	Budget for 2023
3	The Project on NBTC Scholarship Program 2023 for NBTC officials (Overseas Master Degree)	3.800
	Total Budget	5.000
	Proposed Budget for 2023	3.800
	Committed Budget to 2024	0.900
	Committed Budget to 2025	0.300
4	The Omni-Channel Contact Center System Project	10.218
	Total Budget	17.030
	Appropriation Budget for 2022	6.812
	Proposed Budget for 2023	10.218
5	The Study Project on Computable General Equilibrium Model for Macro-economic Impact Assessment (Under the MoU between the Office of the NBTC and Victoria University, Australia)	7.000
	Total Budget	7.000
	Proposed Budget for 2023	7.000
6	The Strategic Database System (SDS) Development Project	9.000
	Total Budget	9.000
	Proposed Budget for 2023	9.000
7	The Survey Project on Thai Radio, Television, and Telecommunications Media Usage and Access	7.000
	Total Budget	7.000
	Proposed Budget for 2023	7.000

Strategy 3 : Enhance capacity in spectrum and satellite management for the utmost benefit of the nation and people, and empower the NBTC regional offices for regulation and public service, for 16 projects

1	The Project to Supply Mobile Licensing Vehicle Development of the Regional Office of the NBTC for 1 Item	1.955
	Total Budget	14.705
	Appropriation Budget for 2021	-
	Appropriation Budget for 2022	12.750
	Proposed Budget for 2023	1.955
2	The Project on Spectrum Monitoring System Integration and Long-Distance Station Control	1.339
	Total Budget	8.925
	Appropriation Budget for 2021	-
	Appropriation Budget for 2022	7.586
	Proposed Budget for 2023	1.339
3	The Project on Frequency Scanner and Transmission Station Searching Device Provision for 4 Sets	7.000
	Total Budget	28.000
	Appropriation Budget for 2021	-
	Appropriation Budget for 2022	21.000
	Proposed Budget for 2023	7.000
4	The Prototype Development Project on Radio Frequency Monitoring and Management System of the National Spectrum Monitoring Center	5.204
	Total Budget	9.461
	Appropriation Budget for 2022	4.257
	Proposed Budget for 2023	5.204





No.	Details	Budget for 2023
5	The Project on Radio Broadcasting Analyzing and Transcription System Development Total Budget 9.502 Appropriation Budget for 2022 4.276 Proposed Budget for 2023 5.226	5.226
6	The Procurement of Radio Frequency Remote Monitoring Stations, for 5 Stations Project Total Budget 59.375 Proposed Budget for 2023 8.907 Committed Budget to 2024 50.468	8.907
7	The Procurement of Handheld Real-Time Bandwidth Radio Frequency Diagnostic Device for 10 MHz – 42 GHz Frequency Bands for 22 Sets Project Total Budget 53.900 Proposed Budget for 2023 13.475 Committed Budget to 2024 40.425	13.475
8	The Project on Enhancing Spectrum Tracking and Reporting System and Spectrum Regulating with Video Streaming Technology Total Budget 6.247 Proposed Budget for 2023 0.937 Committed Budget to 2024 5.310	0.937
9	The Procurement of Data Storage Equipment for Radio Broadcasting Stations, for 48 Sets Project Total Budget 22.455 Proposed Budget for 2023 3.368 Committed Budget to 2024 19.087	3.368
10	The Project on R&S Control Center Nestor BSM for Fix station Monitoring (5 sensors) Total Budget 30.452 Appropriation Budget for 2021 - Appropriation Budget for 2022 7.672 Proposed Budget for 2023 22.780	22.780
11	The Project on Prototype Development of NBTC Spectrum Monitoring Regional Center Total Budget 9.732 Appropriation Budget for 2022 6.326 Proposed Budget for 2023 3.406	3.406
12	The Construction and Building Assembly Project of the NBTC Sub-region office (Roi-Et) Total Budget 69.027 Appropriation Budget for 2022 20.708 Proposed Budget for 2023 48.319	48.319
13	The Security System Integration Project of the Office of the NBTC, Region 2 Total Budget 6.636 Appropriation Budget for 2022 4.645 Proposed Budget for 2023 1.991	1.991
14	The Employee Accommodation Construction Project of the Office of the NBTC, Region 2 Total Budget 12.102 Proposed Budget for 2023 12.102	12.102



No.	Details	Budget for 2023
15	The Project on Landscape Construction and Building Assembly of the NBTC Sub-region office (Chiang Rai)	9.760
	Total Budget	30.500
	Appropriation Budget for 2021	-
	Appropriation Budget for 2022	20.740
	Proposed Budget for 2023	9.760
16	The Project on Spectrum Propagation Monitoring Station and Regulations of the Office of the NBTC, Region 4	5.440
	Total Budget	9.940
	Appropriation Budget for 2022	4.500
	Proposed Budget for 2023	5.440
Strategy 4 : Develop the regulation potential and promote broadcasting, television, and telecommunications services to comply with the changing context, for 22 projects		
1	The Project on Enhancing Online Data Monitoring System Efficiency	9.320
	Total Budget	19.320
	Appropriation Budget for 2022	10.000
	Proposed Budget for 2023	9.320
2	The Project to Study Guidelines for Thailand's Television Broadcasting Regulation Development to Match the Changing Ecosystem of the Industry	0.997
	Total Budget	4.832
	Appropriation Budget for 2022	3.835
	Proposed Budget for 2023	0.997
3	The Project on Social Dimensional Output Monitoring and Evaluation with CIPP Model for Broadcasting Cluster	0.650
	Total Budget	4.400
	Appropriation Budget for 2022	3.750
	Proposed Budget for 2023	0.650
4	The Project on Enhanced Database Development with Data Visualization for Broadcasting Cluster	3.500
	Total Budget	3.500
	Proposed Budget for 2023	3.500
5	The Project on Live Broadcasting Center Improvement and Sport News and Competition Important Events of Thailand	38.048
	Total Budget	76.097
	Appropriation Budget for 2022	38.049
	Proposed Budget for 2023	38.048
6	The Project on Transition Support System Development for Licensing in Broadcasting Business	2.737
	Total Budget	9.737
	Appropriation Budget for 2022	7.000
	Proposed Budget for 2023	2.737





No.	Details	Budget for 2023
7	The Program Content Monitoring and Analytical System Development Project Total Budget 15.727 Proposed Budget for 2023 12.582 Committed Budget to 2024 3.145	12.582
8	The Collaboration Project on Royal Office's News Production and Live Broadcasting of Royal Ceremonies and Ceremonial State for Broadcasting or Television Service Provision Total Budget 15.000 Proposed Budget for 2023 15.000	15.000
9	The Survey and Analysis of Thailand's Radio Listening Rating Project Total Budget 6.678 Proposed Budget for 2023 6.678	6.678
10	The Management System Development Project for Technical Standards Inspection of Radio Broadcasting Devices Total Budget 5.300 Proposed Budget for 2023 5.300	5.300
11	The Project on Illegal Content Detection System for Regional radio and Television Broadcasting – Phase 2 Total Budget 130.000 Appropriation Budget for 2022 65.000 Proposed Budget for 2023 20.000 Committed Budget to 2024 45.000	20.000
12	The Project on Telecommunications Service Database and Analytical Report System Development Total Budget 10.000 Appropriation Budget for 2022 7.000 Proposed Budget for 2023 3.000	3.000
13	The Project on Mobile Service Consumer Behavior Survey via Online Application (3 rd Year) Total Budget 8.813 Appropriation Budget for 2022 3.966 Proposed Budget for 2023 4.847	4.847
14	The Bangkok's Communication Lines Survey and Database Project Total Budget 20.477 Appropriation Budget for 2022 - Proposed Budget for 2023 10.239 Committed Budget to 2024 10.238	10.239
15	The Communications Lines Management System Project for People's Safety (P-Safe) Total Budget 4.607 Appropriation Budget for 2022 - Proposed Budget for 2023 2.534 Committed Budget to 2024 2.073	2.534



No.	Details	Budget for 2023
16	The searching and Arresting System Development Project	13.298
	Total Budget	18.997
	Appropriation Budget for 2022	5.699
	Proposed Budget for 2023	13.298
17	The Consultant-Hiring Project for Telecom Wholesale Roadmap Preparation	2.659
	Total Budget	8.863
	Proposed Budget for 2023	2.659
	Committed Budget to 2024	6.204
18	The Project on Supporting for the Provision of Universal Basic Telecommunication Services and Social Service	21.694
	Total Budget	144.630
	Appropriation Budget for 2022	4.339
	Proposed Budget for 2023	21.694
	Committed Budget to 2024	24.587
	Committed Budget to 2025	28.926
	Committed Budget to 2026	31.819
	Committed Budget to 2027	33.265
19	The Project on Advertising Media Production and Publicity under USO Plan for the Year 2023	8.000
	Total Budget	8.000
	Proposed Budget for 2023	8.000
20	The Co-Project with Telecommunications Business Licensees on Improving and Enhancing Complaints Resolution Regarding Telecommunications Business	0.651
	Total Budget	0.651
	Proposed Budget for 2023	0.651
21	The IT System Development Project for Improving the “Any Registration” System	7.548
	Total Budget	8.880
	Appropriation Budget for 2022	1.332
	Proposed Budget for 2023	7.548
22	The Project on Telecommunications Interconnections Database System Development	6.290
	Total Budget	9.200
	Appropriation Budget for 2022	2.910
	Proposed Budget for 2023	6.290



6

Problems and Obstacles and Solution Directions of Broadcasting, Television, and Telecommunications Businesses, which are Significant to People



Problems and Obstacles and Solution Directions of Broadcasting, Television, and Telecommunications Businesses, which are Significant to People

1. Problems and Obstacles and Solution Directions of Broadcasting and Television Businesses

Problems and Obstacles

According to the study and analysis of factors related to community service provision, it shows that the NBTC notifications have supported spectrum licensing for temporarily test or trial, and spectrum allocation (prescribing licenses for spectrum use according to Section 41 of the Act on the Organization to Assign Radio Frequency and to Regulate the Broadcasting and Telecommunications Services B.E. 2553 (2010) and its amendment). However, as the community television service provision on the digital terrestrial network has high cost of station establishment and management, and the essential skills and knowledge are needed to operate in various aspects, which are more complicated than online service provision, especially the aspect of technical equipment and signal transmitting networks, the program content production aspect, and social network aspect, such as leadership skill, creating motivation or awareness within the community, to foster cooperation and collaboration on operation, etc. Moreover, according to the results of community television management at 3 prototype stations, including Community Media Society of Phayao, Phayao TV Station, Media for Happiness (Sue Sang Sook) Foundation, Ubon Ratchathani Community TV Station, Rak Thai Foundation, and Secured Andaman

Community TV Station, in a 2-year period (during 2017–2018), the obstacles to community television production beyond budget constraints include a limited number of personnel interested in working on community media. However, even with interest, limitations in time and lifestyle within the community can still be obstacles to participating in community media endeavors. In addition, after participating in the initial station operations, even though the personnel have received training and skills in community media production and the use of technologies related to community television services, they were unable to produce content consistently as they might need time to adapt and acquire the necessary skills, due to the unfamiliarity and learning curve involved in community television work, or even the content was produced, it was unable to broadcast as certain pieces of content might not address the needs of people in the area. It is necessary to promote skill development for staff or community members interested in or willing to participate in community television networks. Providing continuous knowledge and skill development related to media production and technology will enhance their potential and readiness to engage in the operations effectively.

Solution

To ensure the sustainable, appropriate and maximal beneficial community television services for the public and the community, there should be measures to promote and support





these services, including television service provision in community service category. The Office of the NBTC has appointed the working committee on considering licensing approach and determining the nature of community television services, to study and analyze the provision of Thailand Community television services within the context of Thai laws, the need, the viewers' technological behaviors, and other relevant factors affecting community television services, as well as suggestions or feedback regarding the licensing approach and the nature of community television services of Thailand, to be used as part of the NBTC's decision-making process in prescribing strategies, policies, or guidelines on preparing criteria, methods, and conditions of spectrum licensing or community television services operations. In addition, the working committee is responsible for proposing measures to promote, support, or develop community television service provision, to ensure sustainable, appropriate and maximal beneficial community television services for the public and the community. Currently, the working committee is in the process of gathering data to report on the operation progress.

2. Problems and Obstacles and Solution Directions of Telecommunications Business

Problems and Obstacles

The expansion of the communication network is driven by the increasing usage demands of the public in both Bangkok and other provinces. As from 2018, the number of communication lines on the electricity poles of the Metropolitan Electricity Authority (MEA), and the Provincial Electricity Authority (PEA) has accumulated densely into a large quantity, which may affect the safety of people, and can lead to accidents and endanger people lives and property. The Office of the NBTC has been aware of the importance of addressing the issues and has taken action to create a plan for organizing communication lines and bringing communication lines underground, and supervised and coordinated with the operators to ensure that the arrangement of communication lines follows the established plan, as well as following the Cabinet Resolution on November 23, 2021. In this regard, the Office of the NBTC has collaborated with relevant stakeholders to develop a comprehensive plan

for organizing communication lines, aiming to improve and upgrade the telecommunications network to be more orderly. This initiative seeks to create a beautiful landscape and ensure the safety of people. However, during 2021 to 2022, the COVID-19 pandemic situation has influenced the implementation of planned activities, including the communication lines arrangement, especially the installation of underground communication lines. This requires appropriate technology, budget allocation, and skilled personnel to carry out the tasks, as well as the collaboration with relevant stakeholders, such as obtaining permits for underground access.

Solution

The Office of the NBTC has supported the communication lines organizing operations by partially funding some expenses using the budget allocated from the Broadcasting and Telecommunications Research and Development Fund for Public Interest within the budget framework, not exceeding 700 million baht, for the operations in 2022 – 2023 in 16 priority areas in Bangkok. Moreover, the Office of the NBTC has supported the work by allowing deduction of partial expenses from the revenue to allocate for the basic telecommunications service provision and social services. In addition, the Office of the NBTC has participated in the evaluation of the progress of organizing communication lines to ensure a smooth implementation in both Bangkok and other provinces, for the safety of people lives and property, and the promotion of Thailand towards becoming the ASEAN metropolis aligns with the government's policy. However, the Office of the NBTC should create continuous understanding among relevant stakeholders, especially agencies within the designated areas under the communication lines organizing plan to expand cooperation and drive operations on a broader scale, which will have an impact on organizing communication lines and bringing communication lines underground according to the established plan, as well as amending the regulations to be modern, flexible, and in line with the current situation, for developing society and economy, and maximizing benefits for the people.





Appendix



The Management Team of the Office of the NBTC

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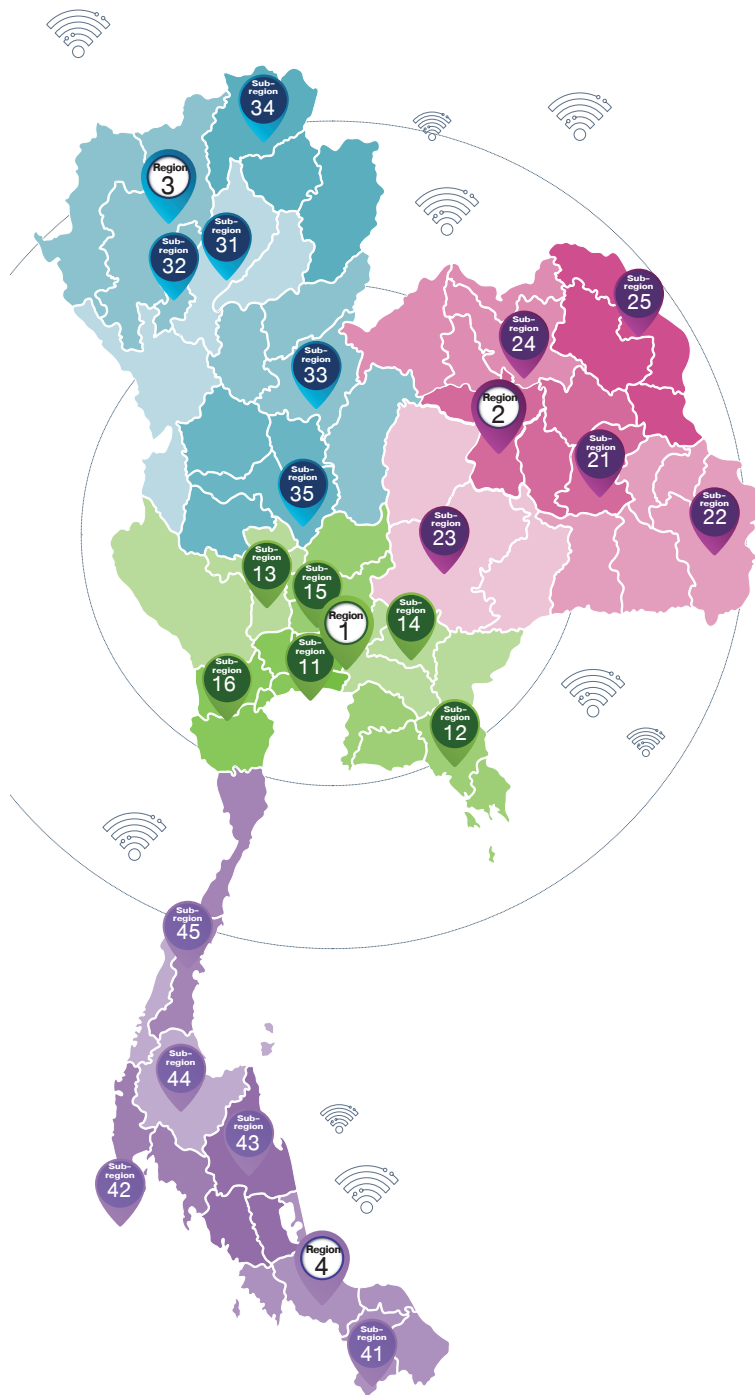
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Locations and Areas of Responsibility of the Regional Offices of the NBTC



Region 1	Office of the NBTC, Region 1 (Central) The areas of responsibility consist of the following.
Sub-region 11	NBTC Sub-region Office (Samut Prakan) Area of Responsibility : Samut Prakan, Bangkok, Nonthaburi, Pathum Thani
Sub-region 12	NBTC Sub-region Office (Chanthaburi) Area of Responsibility : Chanthaburi, Trat, Rayong, Chonburi
Sub-region 13	NBTC Sub-region Office (Subhan Buri) Area of Responsibility : Subhan Buri, Kanchanaburi, Chai Nat, Sing Buri
Sub-region 14	NBTC Sub-region Office (Prachin Buri) Area of Responsibility : Prachin Buri, Nakhon Nayok, Chachoengsao, Sa Kaeo
Sub-region 15	NBTC Sub-region Office (Phra Nakhon Si Ayutthaya) Area of Responsibility : Phra Nakhon Si Ayutthaya, Ang Thong, Lopburi, Saraburi
Sub-region 16	NBTC Sub-region Office (Ratchaburi) Area of Responsibility : Ratchaburi, Phetchaburi, Samut Sakhon, Samut Songkhram, Nakhon Pathom
Region 2	Office of the NBTC, Region 2 (Northeast) The areas of responsibility consist of the following.
Sub-region 21	NBTC Sub-region Office (Roi Et) Area of Responsibility : Roi Et, Maha Sarakham, Khon Kaen, Kalasin
Sub-region 22	NBTC Sub-region Office (Ubon Ratchathani) Area of Responsibility : Ubon Ratchathani, Sisaket, Surin, Amnat Charoen, Yasothon
Sub-region 23	NBTC Sub-region Office (Nakhon Ratchasima) Area of Responsibility : Nakhon Ratchasima, Buriram, Chaiyaphum
Sub-region 24	NBTC Sub-region Office (Udon Thani) Area of Responsibility : Udon Thani, Nong Khai, Nong Bua Lamphu, Loei
Sub-region 25	NBTC Sub-region Office (Nakhon Phanom) Area of Responsibility : Nakhon Phanom, Sakon Nakhon, Mukdahan, Bueng Kan
Region 3	Office of the NBTC, Region 3 (North) The areas of responsibility consist of the following.
Sub-region 31	NBTC Sub-region Office (Lampang) Area of Responsibility : Lampang, Phrae, Tak
Sub-region 32	NBTC Sub-region Office (Lamphun) Area of Responsibility : Lamphun, Chiang Mai, Mae Hong Son
Sub-region 33	NBTC Sub-region Office (Phitsanulok) Area of Responsibility : Phitsanulok, Phetchabun, Uttaradit, Sukhothai
Sub-region 34	NBTC Sub-region Office (Chiang Rai) Area of Responsibility : Chiang Rai, Nan, Phayao
Sub-region 35	NBTC Sub-region Office (Nakhon Sawan) Area of Responsibility : Nakhon Sawan, Kamphaeng Phet, Uthai Thani, Pichit
Region 4	Office of the NBTC, Region 4 (South) The areas of responsibility consist of the following.
Sub-region 41	NBTC Sub-region Office (Yala) Area of Responsibility : Yala, Pattani, Narathiwat, Songkhla, Satun
Sub-region 42	NBTC Sub-region Office (Phuket) Area of Responsibility : Phuket, Phang Nga, Krabi
Sub-region 43	NBTC Sub-region Office (Nakhon Si Thammarat) Area of Responsibility : Nakhon Si Thammarat, Trang, Phatthalung
Sub-region 44	NBTC Sub-region Office (Surat Thani) Area of Responsibility : Surat Thani, Ranong
Sub-region 45	NBTC Sub-region Office (Chumphon) Area of Responsibility : Chumphon, Prachuap Khiri Khan

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