



Terms of Reference

Consultancy Service for the Project Titled “A Study on Designing IMT Multiband Auction Formats for Thailand”

1. Rationale

NBTC has a policy to promote efficient allocation and use of spectrum which is a national resource of public interest. Currently, 620 MHz of low-band and mid-band spectrum are allocated for IMT in Thailand. But the rights to the 850, 1500, 2100 and 2300 MHz spectrum bands will be expired in 2025. In addition, the 2100 MHz licenses will also be expired in 2027. If NBTC does not auction any low-band and mid-band spectrums within 2027, existing bandwidth supply will lower to 410 MHz. According to Office of the NBTC's future IMT spectrum demand estimation, a total spectrum of 718 MHz will be required in 2027 and 739 MHz in 2029. The office of the NBTC has planned to release additional spectrum to the market. It consists of spectrum bands that will be expired in 2025 and 2027 (i.e. 850 MHz, 1500 MHz, 2100 MHz and 2300 MHz) and unused spectrum bands that await for allocation (i.e. 1800 MHz, 2100 MHz and 26 GHz). In addition, there is a plan to create criteria and procedure for the licensing of spectrum bands for IMT service. Spectrum assignment according to the criteria will ensure Thailand to have enough supply to meet the future demand.

The choice of spectrum auction format in a criteria and procedure for the licensing of spectrum bands for IMT service depends on the situation. The auction format used for the auction in the 2100 MHz, 1800 MHz and 900 MHz bands in the period 2012 - 2018 is simultaneous multi-round ascending auction (SMRA). SMRA is suitable for auctioning single band with many similar lots. The auction of the 700 MHz, 2600 MHz and 26 GHz bands in 2020 uses clock auction format. This format is suitable for auctioning multiple bands with similar lots in each band, but weak complementarities across bands. However, some of the spectrum bands expected to be released in 2025 are not substitutes. Thus, format for the upcoming auctions may be different from the previous ones. It will depend on current circumstances.

With the reason mentioned above, the Office of the NBTC intends to hire a consultant who specializes in setting up spectrum reserve prices and auction rules to conduct the research project. It aims at getting recommended reserve prices and auction rules for spectrum bands (e.g. 850 MHz, 1500 MHz, 1800 MHz, 2100 MHz, 2300 MHz and 26 GHz), measures that support new entrants, and information in related issues. The project will support the Office of the NBTC to have information used as a basis for shaping criteria and procedure for licensing of IMT spectrum that is in line with international standards and suitable for the Thai mobile market.

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2. Objectives

2.1 To employ the consultant to conduct the study on setting multiband reserve prices and designing multiband auction rules.

2.2 To have study results serving as a reference for setting reserve prices, auction rules, license conditions, and related issues for multiple bands, that are suitable to Thailand's situation.

3. Qualification of the Consultant

3.1 Must be a legal entity working as a consultant in association with telecommunications and ICT that has experiences in IMT spectrum auction design and rules.

3.2 Must have experiences in the telecommunications Industry, past work experiences with a telecom regulatory authority and/or a telecom operator, and works related to spectrum auction design and rules.

3.3 Must not provide a research service regarding spectrum auction design and rules for a telecom licensee in Thailand during the contract period.

3.4 Must propose staffs who have knowledge, competency, and experiences, and are able to dedicate their responsibility to work with the Office of the NBTC at all time during this project in the appropriate amount.

3.5 Has legal capacity.

3.6 Has not been declared bankrupt.

3.7 Has not in the process of closing a business.

3.8 Do not have mutual benefits with other consultants who submit a proposal to the Office of the NBTC on the submission date or do not act as a barrier to fair competition on price in submitting a proposal.

3.9 Do not have a privilege or immunity which may decline to go to Thai court, unless the consultant's government has ordered a waiver of such immunity.

3.10 Must not be a stakeholder or receive any benefits, in a direct or indirect way, in association with spectrum auction design and rules for a telecom operator in Thailand during the contract period.

4. Scope of Work

4.1 Studying spectrum auction formats and case studies related to the formats from at least 5 countries. The formats include at least Simultaneous Multi-Round Ascending Auction (SMRA), Simple Clock Auction (SCA), and Combinatorial Clock Auction (CCA). Analyzing the advantages and disadvantages of each auction format and scenarios that are appropriate for those formats. The information will be used as references to support spectrum design for Thailand.

4.2 Recommending and elaborating on the multiband spectrum auction design for Thailand. Recommendations shall address:

a) Auction methodology

Approved: *[Signature]* Date: *[Signature]*

b) Auction rules in detail including, at least, activity rules, eligibility rules, bidding rules, winning price rules (first-price or second-price auctions), and assignment rules

4.3 Recommending on license conditions and obligations of the auctioned spectrum band(s) as well as regulatory measures for service regulations and licensee compliance, promoting fair competition in the market, consumer protection, and sustainable growth of the environment and the industry.

4.4 Recommending on the licensing of multiple spectrum bands for Thailand. This includes spectrum caps and measures to invite new market entrants that will help promote fair competition in the mobile industry (e.g. set-asides), if appropriate. In addition, studying and recommending appropriate pricing methodology used to set the multiband auction reserve prices for Thailand.

4.5 The consultant has an obligation to verify the reliability of spectrum value estimation conducted by the Office of the NBTC, based on academic principles. The targeted bands include the bands that will be expired in 2025 and 2027 (e.g. 850 MHz, 1500 MHz, 2100 MHz and 2300 MHz), and the unused bands that await for allocation (e.g. 1800 MHz, 2100 MHz and 26 GHz).

4.6 Holding the following two conferences using an external venue (Not at the Office of the NBTC):

4.6.1 The consultant shall host a workshop to present completed study results and recommendations related to spectrum auction design for Thailand to the Office of the NBTC's officers. The workshop shall have at least 50 attenders. In addition, the consultant shall provide additional information when requested by the Office of the NBTC.

4.6.2 The consultant shall host a seminar to share study results about IMT multiband auction format design for Thailand with external organizations, the Office of the NBTC's officers and related parties. There shall be at least 100 attenders. The consultant shall also provide additional information when requested by the Office of the NBTC.

The consultant shall pay expenses of hosting the conferences mentioned above, in accordance with No. 11 of Section 1 Expenses of Organising Conferences in NBTC Regulation on Expense B.E. 2563, that is shown in Appendix 1.

5. Qualification of Team Members

The members of the consultant team must have knowledge and specialisation to be able to work in accordance with TOR. Requirements for degree qualifications and experiences of the members, and the number of members are specified as follows:

5.1 Project manager (Number of members required : 1 person, working for 3 months) : Having at least 20 years of experience in the area of economics, telecommunications, research, engineering, or law. Holding at least a master's degree.

5.2 Specialist in economics, telecommunications, research, or engineering (Number of members required : 1 person, working for 3.5 months) : Having at least 11 years of experience in IMT spectrum auction design and rules. Holding at least a master's degree.

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5.3 Specialists (Number of members required : 3 - 6 persons, each of which working for 3.5 months) : Having at least 11 years of experience in the area of economics, ICT, telecommunications, business administration, accounting and finance, engineering, research, data analysis, or law. Holding at least a master's degree.

Note

(1) Experiences include experiences before and after the graduation date for the highest degree.

(2) Members indicated in No. 5.3 must include a Thai person so that knowledge and technology would be transferred to the said person, unless this service or consultancy service could not have a Thai person to take part in it.

(3) In the case of a Thai person who is a part of members indicated in No. 5.3, the consultant can provide his/her degree qualification and experiences pursuant to pay rate for Thai Consultant

6. Project Duration

Within 120 days after the date of signing agreement

7. The deliverables

There are 3 phases that the deliverables shall be submitted, as follows:

Phase	Due Date of Submission	The deliverables
1	Within 30 days after the date of signing agreement	1. A soft copy of Inception Report which includes rationale, objectives, scope of study, work plan, and research team structure with CVs of team members. 2. A soft copy of Progress Report 1 which includes research information as indicated in No. 4.1 in Scope of Work
2	Within 90 days after the date of signing agreement	A soft copy of Progress Report 2 which includes research information as indicated in No. 4.2 - 4.4 in Scope of Work
3	Within 120 days after the date of signing agreement	1. Do according to Scope of Work No. 4.5 - 4.6 2. A soft copy of Final Report which includes research information as indicated in No. 4.1 - 4.6 in Scope of Work

8. Budget

The budget, derived from the budget of Telecommunications Policy and Resources Management Bureau for the 2024 fiscal year in hiring the consultant for study, research, evaluation, or system development services, shall not exceed 9,000,000 Thai baht. This already includes VAT and all other expenses.

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9. Payment Terms

The Office of the NBTC shall pay to the consultant for the deliverables submitted in each phase, as follows:

Phase 1 pay 30% of the total contract amount, after the consultant has submitted all the deliverables of phase 1 and the inspection committee has given their approval to the deliverables.

Phase 2 pay 50% of the total contract amount, after the consultant has submitted all the deliverables of phase 2 and the inspection committee has given their approval to the deliverables.

Phase 3 pay 20% of the total contract amount, after the consultant has submitted all the deliverables of phase 3 and the inspection committee has given their approval to the deliverables.

10. The Consultant's Proposal Submission

The consultant must create the Project Proposal which includes the Technical Proposal and the Financial Proposal, detailed as follows:

10.1 **Technical Proposal** shall comprise of quality and quantity of works

10.1.1 Company Profile

10.1.2 Consultant Work and Experience composed of quality and quantity of works

10.1.3 Management and Working Procedure – streamlining TOR into work plan and methodology that correspond to timelines of the Office of the NBTC in the clearest and most concrete manner.

10.1.4 Qualification of Team Members composed of profile, degree qualification, past work experience of the members proposed to work on the project in accordance with No.5 Qualification of Team Members.

10.1.5 Self-signed certificate clarifying that the consultant is not a stakeholder and would not receive any benefits, in a direct or indirect way, in association with Thailand's mobile service market during the contract period.

10.2 **Financial Proposal** shall comprise of the following:

Price quotation shall provide the cost of conducting each task indicated in TOR, VAT and all other expenses, and total project cost.

10.3 **Proposal Submission Procedure** - the consultants must submit the following proposal:

Submitting the Technical Proposal, the Financial Proposal, and letter to Head of Procurement Committee informing the submission of these proposals within the timeline prescribed in an invitation letter.

11. Selection Criteria to Evaluate the Proposal

11.1 The Office of the NBTC will evaluate the proposals of all the consultants, unless the submitted proposal documents do not meet the requirements indicated in No. 10.1. Failures of the requirements include submitting insufficient documents or sufficient but error documents. When evaluating the proposals, we will consider whether the consultancy service is worthwhile or be able to meet the project's objectives by using the following qualitative criteria:

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| (1) Consultant Work and Experience | 100 points (weigh 30%) |
| (2) Management and Working Procedure | 100 points (weigh 30%) |
| (3) Qualification of Team Members | 100 points (weigh 40%) |

Detailed information on scoring using these qualitative sub-criteria is described in Appendix 1 attached to this TOR. The proposals of the consultants that pass minimum requirements for qualitative criteria must receive the weighed score of at least 80%

11.2 The Office of the NBTC will select the proposal of the consultant that pass minimum requirements for qualitative criteria indicated in No. 11.1 and obtain the highest score. We will examine the appropriateness of the Financial Proposal of the selected consultant and negotiate pay rate for the consultancy service and other things, as deemed appropriate and pursuant to criteria to calculate pay for the consultant indicated in related regulations and laws.

12. Other Conditions

12.1 The consultant must keep confidential of information of the Office of the NBTC, operators and other information received in this study project, and shall not disclose such information to any third person or use it for any other purposes beyond this project.

12.2 The copyright of all works and documents including electronic file received from the results of the study is solely owned by the Office of the NBTC. The distribution of documents or duplicating extra copies beyond the amount of the agreement is the Office of the NBTC's equitable right.

12.3 In case of need to change a team member of this project, the consultant shall ask permission from the Office of the NBTC before changing that team member. A substitute must have the same or better qualifications than the replaced member. However, the Office of the NBTC reserves the right to reduce pay for the member, as deemed appropriate.

12.4 If the consultant is unable to complete tasks by the due date specified in the contract and the Hiring Party still does not terminate the contract, it must pay a fine of 0.1% of the contract price starting from the date after the due date specified in the contract or the date that the Hiring Party expands the contract period till the day the tasks are completed. In addition, the consultant agrees to let the Hiring Party claim for damages resulting from delays caused by the consultant fails to perform the work punctually on the excess amount that is not covered by the fine and pay for it.

12.5 Chosen consultant shall create a work plan that helps achieve TOR's desired goals within the specified time prescribed in the project contract. The plan includes detailed task plans and expected percentage of work completion in each month. The consultant shall submit the plan to the inspection committee within 15 days after the date of signing agreement. It will be used as a tool for monitoring and tracking the project progress. It is considered as a part of the project contract.

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Appendix 1

Regulation Related to Term of Reference

NBTC Regulation on Expense B.E. 2563

No. 11 of Section 1 Expenses of Organising Conferences

Types of Expenses	Payment Rate
Food Expenditures	- Organising at Office of the NBTC : not exceed 300 baht per meal per person - Organising outside Office of the NBTC : not exceed 650 baht per meal per person
Refreshment and Drink Expenditures	- Organising at Office of the NBTC : not exceed 70 baht per person for the half-day - Organising outside Office of the NBTC : not exceed 150 baht per person for the half-day

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Appendix 2

Document attached to TOR

Criteria to Select the Consultant

A Project Titled “A Study on Designing IMT Multiband Auction Formats for Thailand”

(1) Consultant Work and Experience: 100 points (weigh 30%), the aspects of consideration are as follows:

Quality of Works: considering whether works of the consultant are most correspond or close to scope of work and objectives of this project. The maximum possible score is 90 points.

Criteria for Consideration	Scoring		
	(a)	(b)	(a) and (b)
(a) Having work experiences with a telecommunications regulatory authority and/or a telecom operator in other countries (b) Having research or projects related to spectrum auction design	50 points	80 points	90 points

Quantity of Works: considering the number of works of the consultant that has scope correspond or close to work described in TOR. The maximum possible score is 10 points.

Criteria for Consideration		Scoring			
		0	1	2	≥3
Considering the number of previous works that has scope correspond or close to this TOR that the consultant submits the proposal to.	The number of projects	0	1	2	≥3
	Score	0 points	4 points	8 points	10 points

(2) Management and Working Procedure: 100 points (weigh 30%), the aspects of consideration are as follows:

Considering scoring based on whether the proposal be able to streamline TOR into work plan and methodology that correspond to timelines of the Office of the NBTC in the clearest and most concrete manner.

The consultant’s score for this topic depends on whether or not its work plan and methodology wholly meets TOR’s requirements. In addition, the comparison between each consultant will be considered in scoring. Only one proposal that completely fulfils TOR’s requirements, and provides details in the clearest and most appropriate way will get “very good” score. The other proposals that completely fulfils TOR’s requirements but providing details in less clear way will get “good” score, and proposals meeting TOR’s requirements but

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giving too little details will get “fair” score. The proposal that does not give any details on a topic prescribed in Criteria for Consideration will not receive the score.

Criteria for Consideration	Scoring			
	Poor	Fair	Good	Very Good
(a) Knowledge and understanding an overview of auction rule design	0	13	20	25
(b) Conceptual framework	0	13	20	25
(c) Methodology to achieve the project’s objectives	0	13	20	25
(d) Work plan and project management (This includes tasks, timelines and team member accountability that correspond to requirements prescribed in TOR)	0	13	20	25

(3) Qualification of Team Members Mentioned in No.5: 100 points (weigh 40%), the aspects of consideration are as follows:

The consultant have to provide details and evidence about degree qualification and expertise/experience of the consultant’s team members. The maximum possible score is 100. Scoring consists of the following three parts:

Qualification of Members of the Consultant	Scoring			
	Considering Degree Qualification		Considering Experiences	
	Meet the Requirements	Above the Requirements	Meet the Requirements	Above the Requirements
Part 1				
Project Manager Having at least 20 years of experience in the area of economics, telecommunications, research, engineering, or law. Holding at least a master's degree.	8 points	10 points	8 points	10 points
Part 2				
Specialist Specialist in economics, telecommunications, research, or engineering. Having at least 11 years of experience in IMT spectrum auction design and rules. Holding at least a master's degree.	8 points	10 points	8 points	10 points

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Qualification of Members of the Consultant	Scoring			
	Considering Degree Qualification		Considering Experiences	
	Meet the Requirements	Above the Requirements	Meet the Requirements	Above the Requirements
Part 3				
Specialist (Person No. 1) Having at least 11 years of experience in the area of economics, ICT, telecommunications, business administration, accounting and finance, engineering, research, data analysis, or law. Holding at least a master's degree.	8 points	10 points	8 points	10 points
Specialist (Person No. 2) Having at least 11 years of experience in the area of economics, ICT, telecommunications, business administration, accounting and finance, engineering, research, data analysis, or law. Holding at least a master's degree.	8 points	10 points	8 points	10 points
Specialist (Person No. 3) Having at least 11 years of experience in the area of economics, ICT, telecommunications, business administration, accounting and finance, engineering, research, data analysis, or law. Holding at least a master's degree.	8 points	10 points	8 points	10 points

(3.1) Scoring criteria in part 1 and part 2 are detailed below:

(3.1.1) Qualification of project manager (The maximum possible score is 20)

- 1) Degree qualification prescribed in No.5
- 2) Experiences prescribed in No.5

(3.1.2) Qualification of specialist in economics, telecommunications, research, or engineering who has experiences in IMT spectrum auction design and rules (The maximum possible score is 20)

- 1) Degree qualification prescribed in No.5
- 2) Experiences prescribed in No.5

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(3.2) Scoring criteria in part 3 for members of the consultant prescribed in No.5: the consultant is able to propose no more than 6 specialists. The evaluator will give a score for top 3 best specialists in terms of degree qualification and experiences proposed. (The maximum possible score is 60)

- 1) Degree qualification prescribed in No.5
- 2) Experiences prescribed in No.5

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