



Thailand 3G Auction Review Report

National Broadcasting and Telecommunications Commission

By



International Telecommunication Union

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I. Executive Summary

This Report reviews the new practice of radio spectrum auctions recently introduced in Thailand. It has been prepared following the country's first spectrum auction, carried out by the National Broadcasting and Telecommunications Commission (the NBTC) in October 2012, in which licenses for 3G radio spectrum in the 2.1 GHz band were auctioned.

Broadband is a key driver of economic and social development. Particularly in developing countries, where broadband penetration remains low, broadband access primarily depends on availability of suitable wireless networks. The technical and economic nature of mobile telecommunications networks renders radio spectrum a scarce resource. Successful broadband policy, and its impact on economic and social development, depend significantly on good radio spectrum management. Because the price of spectrum affects the use of spectrum, and consequently the development of broadband, spectrum pricing is particularly important.

The primary objectives of charging for the right to use radio spectrum are essentially twofold. First, pricing may be used to ration a scarce resource pursuant to a fair and transparent allocation protocol to maximize efficiency of use and economic value. This is clearly part of Thailand's policy and legal framework for the information and communications technology (ICT) sector. Secondly, pricing may be used to obtain a rental return to the public for private use of a public asset. The latter objective does not appear to be articulated as a policy objective in the laws and Government policy statements of Thailand. Sometimes States will have countervailing policy objectives that may reduce the economic value of or potential rental return from the spectrum. These include, for example, widening geographic coverage (as in Thailand) and specifying a preferred technology.

It is increasingly recognized that long term fiscal benefits will be greater from a profitable ICT industry that contributes both directly through taxation of telecommunications service providers and indirectly through the economic uplift generated by development of ICTs across the economy. As a result, notwithstanding high auction revenues in some countries early in the history of 3G, the policy emphasis internationally is often less on immediate revenue for the State, and more on generating a healthy ICT sector.

Radio spectrum can be assigned by market-based methods, such as auctions and beauty contests, or alternatively administrative methods such as administrative incentive pricing that attempts to determine the value of spectrum by calculating its opportunity cost. Market-based methods are increasingly preferred because of their propensity to distribute radio spectrum more efficiently.

Spectrum auctions can be designed to promote universal service objectives under a country's broadband policy. Spectrum auctions should be evaluated not only for their immediate fiscal benefits (the amount collected from the auction), but also for the benefits they will bring in advancing national broadband policy, in particular encouraging broadband infrastructure investment. Spectrum prices are volatile, and depend on many market related and technical conditions amongst other factors. Hence, any international comparisons of auction results over the years or in different countries have to be viewed in the relevant context and treated with caution.

Thailand's 3G auction of 2012 needs to be understood in the context of the existing mobile telecommunications market and the policy objectives expressed by the Government and the legislature in the Act "Organization to Assign Radio Frequency and to Regulate the Broadcasting and Telecommunications Services B.E. 2553 (the Organization Act)".

The policy objectives reflected in the Government's ICT 2020 policy, the National Broadband Policy and the Organization Act guide the focus of NBTC's radio spectrum management and the conduct of auctions. The focus is on increasing access to ICTs across the population, and use of radio spectrum efficiently by competing telecommunications operators and for other public goods. Neither the ICT and broadband policies nor the Organization Act identified maximizing revenue to the State from radio spectrum licensing or auctions as a policy objective.

Thailand's mobile telecommunications operators use infrastructure and radio spectrum rights under concessions from TOT and CAT, which are Government owned operators. The three largest mobile operators are AIS, dtac and True Move, which together represent approximately 96% market share. The concession arrangements have complicated the market thereby undermining the development of the sector in Thailand. Following the introduction of the Organization Act, licensing radio spectrum directly to operators through auctions is expected to reduce their dependence on TOT and CAT, which also operate their own mobile telecommunications services (albeit that they have small market shares).

The NBTC designed the auction of 2x45 MHz spectrum to license nine spectrum blocks, each having the standard minimum amount of 2x5 MHz with the aim of allowing bidders to determine their desired amount of spectrum pursuant to market forces. This reflected a reduction from the 2x15 MHz block size in the attempted 2010 3G auction which the NBTC's predecessor, the NTC, was prevented from carrying out. The new block size was also intended to encourage competition by making it more feasible for new entrants and smaller operators to gain a foothold in the market.

The NBTC did not follow its predecessor, the NTC, in limiting the number of auctioned licenses to one less than the number of bidders (known as the N-1 approach). That approach naturally intensifies competition for the licenses, but in Thailand it would not intensify competition in the market. Indeed, it risked either exclusion of any smaller bidder that might seek to participate or possibly even one of the three larger bidders. Either result risked leaving radio spectrum unused and creating a greater concentration of market power. Thus the NBTC considered that the N-1 approach would not advance the policy objective of the Thai legislation of promoting free and fair competition and ensuring spectrum would be used efficiently for ICT services and public goods.

The NBTC is duty bound to enable deployment of high speed services as soon as possible, covering a substantial portion of the territory, to implement the policy objectives of universal service and, in turn, the national broadband plan. For this reason, it included substantial population coverage obligations in the licenses. Licensees obtaining 2x10 MHz or more would be required to provide network coverage up to 50% of the Thai population within two years after the license, as well as having a presence in every province, and 80% within four years. The 2.1 GHz band is not optimal for wide coverage due to its limited signal propagation qualities compared to

lower frequency bands. Nevertheless, the required pace of rollout does not appear to have resulted in lower auction proceeds, for example if compared with India's rollout conditions for the same band and its similar level of auction proceeds measured on a per capita basis.

However, such network coverage obligations might present significant financial challenges for small operators and new entrants. To prevent excessive costs to small operators and new entrants, the NBTC set lower coverage obligations of 20% and 40% population coverage within two and four years respectively for a bidder obtaining a single spectrum block of 2x5 MHz.

The NBTC also wished to avoid larger operators acquiring and hoarding radio spectrum by virtue of their financial power. Thus, as is common in spectrum auctions, it capped the amount of radio spectrum any operator could obtain in the 2.1 GHz band. The NBTC set spectrum caps at 2x15 MHz per operator. It was concerned that spectrum caps higher than this level would pose the possibility of spectrum hoarding and reduce competition in the market. Conversely, it was concerned that spectrum caps lower than this would weaken licensees' business plans by preventing them from obtaining enough bandwidth for a 3G network operating in the 2.1 GHz band.

Conscious of the cost, particularly to new entrants and smaller operators, of rolling out new networks, the NBTC prepared infrastructure sharing and other regulations prior to the 2.1 GHz auction but these had not come into force at the time of the auction. Whether such infrastructure sharing regulation will have an impact in future auctions will depend on the regulation being effective, including adequate details on technical feasibility, pricing principles, timelines for providing access and enforceability.

Another significant step in this auction, which focused on consumer benefits, was a licensing condition requiring 3G licensees to lower the retail price of their 3G services by 15%.

In the 2012 auction, the new licensees were required to provide telecommunications network service with the minimum capacity of 10% of their networks to mobile virtual network operators (MVNOs), when receiving such service request. The NBTC provided this in order to ensure that there would be significant retail level competition, thereby benefiting consumers. Although there is much to be said for not burdening investors rolling out new infrastructure with obligations to carry their competitors on their network capacity, there is no evidence that this reduced bidder interest in the licenses.

The NBTC followed the simultaneous multiple round (SMR) method of bidding, which involves bidders bidding at the same time but with bids submitted in rounds, between which bidders may consider and change their bidding strategy, giving them greater control over their own choices. The NBTC set a reserve price at 70% of the market value as calculated by Chulalongkorn University. The University had recommended a reserve price of at least 67%. This is not an unusual level to set a reserve price. Indeed, reserve prices are often set well below the estimated value.

The NBTC aimed to ensure that the entire 2.1 GHz band would be used for 3G services, and so it sought to ensure that the reserve price would not be so high that it might risk some of the blocks

not being sold. It also sought to avoid putting the reserve price beyond the means of smaller operators and new entrants. Furthermore, the reserve price was at a similar (slightly higher) level as had been used in the attempted 2010 auction. The fact that there had been demand for the spectrum then at that price provided some reassurance that there would be bidders for the spectrum in the 2012 auction. As it transpired, the only bidders were Advanced Wireless Network, DTAC Network, and Real Future, which are subsidiaries of the three largest operators, AIS, dtac, and True Move, respectively, and they obtained the radio spectrum at or a little above the reserve price. There was some competitive bidding from Advanced Wireless Network, which sought the right as the highest bidder to choose the radio bands it preferred.

The 2.1 GHz spectrum auctioned was not combined with any other spectrum bands, in particular bands below 1GHz. This would make it challenging for new entrants not having 2G networks and services to earn supplementary revenue, or access to infrastructure sharing, to make a successful business case. A “combinatorial auction,” i.e., making the 2.1 GHz band available in combination with other bands, was not possible at this time simply because such other spectrum is still tied up under existing licenses and the concession arrangements. Restrictions on foreign ownership to 49% may also have dampened investor demand for the spectrum licenses.

The revenues to the State from the auction will be substantial, totaling THB 41.63 billion (approximately US\$ 1.36 billion). On a megahertz per person basis, the prices were well above many other countries’ revenues for the 2.1 GHz spectrum, and favorable compared with international benchmarks. In addition to revenues obtained from spectrum auctions, the Thai Government can expect over the long term to secure fiscal gains. Such revenue can be expected to come in the form of taxes paid by the licensees as their businesses grow as well as from growth in the sector and across the overall economy from increasing use of ICTs.

The NBTC has carried out a sophisticated auction using the internationally recognized method of simultaneous multi-round (SMR) bidding. As described further in this report, it weighed a number of complex interrelated factors in designing the licenses and the auction process, making broadband infrastructure rollout a priority. With the assistance of experienced international experts in spectrum auctions, the NBTC managed the process in a transparent and professional manner, doing so in pursuit of the policy objectives set by the law and Government policy statements.

A key consideration for the future includes strengthening the NBTC’s public consultation processes. Although the NBTC did carry out its statutorily required public consultation and took into consideration input received during the consultation process, it might consider organizing more regular meetings with potential bidders long before commencing auction design.

Meeting Thailand’s radio spectrum needs will be challenging. The NBTC will benefit from learning actively from its experiences and those of others. This might include, for example, conducting small auctions of residual spectrum in order to build the NBTC’s track record and experience with the process. It might also consider combinatorial spectrum auctions that allow bidders to seek frequencies from several different bands in order to maximize the prospects of an economically viable business. As mentioned above, effective infrastructure sharing regulation should be an important cost saving measure and should be introduced as soon as possible. Lastly,

the concession structure continues to hang over the sector and resolving the manner of termination and transition to a licensing regime needs to be set out more plainly for all to see.

The 2.1GHz spectrum auction in Thailand was the first time ever spectrum had been auctioned in the country. The process appears to have attracted the interest of the public and sparked some controversy. It is the beginning of a learning curve, not only for the NBTC, but also the Government, NGOs, consumers, and the Thai population at large.

The requirement that spectrum be auctioned arises under the Thai Organization Act. Spectrum auctions will therefore continue to be employed to allocate spectrum, including frequencies that will become available in the near future when the current concessions expire or new spectrum lots are identified. The 2012 auction has raised an awareness of the importance of spectrum as a scarce resource. Given the complexity of such auctions, there will be benefits from carrying out awareness campaigns and educational programs for stakeholders.

The complex Thai telecommunications market is constrained by the Built-Transfer-Operate concession scheme which has been established for decades. It is a challenge for the country to accelerate sector growth and advance towards the goal of universal national broadband deployment while the concession agreements are still in place. The industry needs more robust allocation mechanisms, including an effective licensing scheme, as is widely recognized as good practice internationally. This recent Thai auction represents an important step in the move towards healthy spectrum licensing frameworks.

The efficient allocation of spectrum for the benefit of the population through use for public goods and telecommunications services was a central part of the NBTC's thinking as it designed the licenses and the auction. Consistent with the law and policy statements of Government, the NBTC had its eye on the long term benefits and socio-economic impact that an efficiently managed spectrum brings to society as a whole.

In summary, principles, objectives, design and the outcome of the 2012 Thai 3G auction were consistent with international practice and achieved the explicit and implicit goals of the NBTC in managing the radio spectrum resource, in that:

- Spectrum licenses were efficiently and fairly assigned with minimal disruption and without legal challenges from the participants;
- The accompanying licenses incorporate important measures to improve competition including infrastructure sharing and better access spectrum for MVNO's,
- As well, the 2.1 GHz 3G licenses include provisions to benefit consumers by ensuring prices reductions of 15% in comparison to 2G services at the time, and
- Finally, prices paid for spectrum by the eventual winners were non-trivial and compare with international benchmarks prices for 2.1 GHz paid at auction;

This Report on the 2012 Thai 3G auction touches on numerous factors relevant for consideration when licensing spectrum, and compares the auction in Thailand with similar practices in other countries. The Report considers spectrum licensing from a number of perspectives and shows how it relates to important matters of economic policy. It explores in particular how the NBTC

worked through such issues as it designed the 2012 auction to help quicken the pace at which Thailand will enjoy the benefits of mobile technologies.

The range of interconnected issues covered by this Report demonstrates the complexity not only of spectrum auctions, but of auctioning spectrum in Thailand in particular. It is hoped that this Report contributes to a greater understanding of such matters in Government circles, within the NBTC itself, among stakeholders in Thailand.