Finalised Policy for 5G Mobile Network & Services in Singapore

Introduction

On 7 May 2019, the Info-communications Media Development Authority ("IMDA") issued a public consultation on its proposed fifth-generation ("5G") policy and regulatory framework ("Public Consultation"). In the Public Consultation, IMDA sought views and comments on the policy objectives and strategies it should take to develop the 5G ecosystem in Singapore, specifically, in respect of the issuance of the spectrum for 5G networks and facilitating their deployment.

At the end of the two-month Public Consultation on 9 July 2019, IMDA received responses to the Public Consultation from 63 respondents.

On 17 October 2019, IMDA released its overall 5G strategy for Singapore and the policy and regulatory framework for 5G network deployment, after taking into consideration all responses from the Public Consultation.

This client update summarises the salient points of IMDA’s decision regarding its policy and regulatory framework for 5G mobile networks and services in Singapore

IMDA’s Policy and Regulatory Framework

To support the development of Singapore’s 5G innovation ecosystem, IMDA announced that a robust policy design and regulatory framework will be needed to facilitate deployment of resilient and secure 5G systems. IMDA shared that its key policy objectives for the deployment of 5G networks in Singapore are as follows:

- maximise value of 5G for the economy and welfare for the consumers;
- facilitate efficient allocation of scarce spectrum resources;
- bring about 5G networks that are secure and resilient; and
- support the growth of Singapore’s telecommunications sector.

Against the backdrop of these key policy objectives, IMDA has set out its key points of Singapore’s 5G policy and regulatory framework.
Two nationwide, standalone 5G networks as a start

IMDA takes the view that facilities-based competition (i.e. competition at the infrastructure layer) in the mobile market is important, in order to ensure that players in the market have the incentive to invest in new technology, innovate and compete for business. IMDA has therefore decided to facilitate the deployment of at least two nationwide networks as a start.

To facilitate the deployment of two nationwide networks, IMDA will allocate two 100MHz of 3.5 GHz lots, each comprising a 50 MHz unrestricted lot paired with a 50 MHz restricted lot. From the responses IMDA received during the Public Consultation, it held that the mobile services and network industry agreed that the selection of 3.5 GHz lots was optimal, in view of its better propagation characteristics to provide wide-area coverage for the provision of nationwide 5G services. In addition, IMDA announced that it has commenced its exercise to move existing satellite users to alternative bands and targets, in order to free up the 3.5 GHz band for 5G use from 2021 onwards.

Besides the 3.5 GHz band, the 26 GHz and 28 GHz bands (collectively known as the Millimetre Wave or “mmWave”) were the other spectrum bands identified by IMDA for 5G to deliver ultra-high-speed broadband. However, IMDA noted the respondents’ view that given the short-range propagation of mmWave band, the deployment using these bands would likely be localised, mainly for enterprise purposes, and with varying sets of service level agreement. As such, it would be challenging for nationwide operators to share or offer wholesale services over such mmWave deployments.

Bearing the limitation of the mmWave in mind, IMDA has announced that it will assign 100 MHz of the 3.5 GHz band and 800 MHz of the mmWave band as a single package (“Package”), and to award two Packages to the existing Mobile Network Operators (“MNOs”). The award will be made via a Call for Proposal (“CFP”) process, details of which are further explained below.

IMDA will make available the two remaining 800MHz lots of mmWave band to MNOs that are not awarded the Packages, given the industry’s confirmation that the market can accommodate additional localised networks. IMDA has stated that this approach will allow all interested MNOs to commence mmWave deployment earlier and facilitate greater service innovation to enterprise users.

5G spectrum limited to existing MNOs

IMDA has confirmed that it will assign the 5G spectrum to existing MNOs only, given the limited spectrum in the 3.5 GHz band and just sufficient spectrum in the mmWave band for existing MNOs.

IMDA has made clear that the 5G spectrum allocation exercise is not intended to facilitate any merger and/or acquisition of the MNOs nor allow the entry of a new MNO, unlike in other spectrum allocation exercises. Therefore, any joint ventures applying for the Packages can only consist of the existing MNOs, and any MNOs interested in a joint venture should seek IMDA’s views early on the proposed control and ownership structure.
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Given the limited number of players who will hold 5G spectrum, IMDA will mandate the wholesale of 5G capacity to facilitate services-based competition. The mandating of wholesale access will only be imposed on the 3.5 GHz deployment, as IMDA recognises the challenges of sharing or offering wholesale services over the mmWave band which will be deployed for localised use. IMDA has separately issued an industry consultation to MNOs and Mobile Virtual Network Operators (“MVNOs”) on the proposed framework governing the wholesale arrangements for 5G to better facilitate 5G market entry.

With respect to network sharing, IMDA has decided not to impose sharing requirements at a network wide level for the time being, in recognition that MNOs would have their own business strategy, commercial object and deployment plans. If multiple deployments are found to be infeasible, IMDA will reassess the need to require network sharing as part of its regulatory measures to resolve industry bottlenecks.

Key obligations and requirements for nationwide 5G networks

Network Rollout and Performance

For the definition of 5G, IMDA will reference the standards and specifications of 5G as defined in the 3rd Generation Partnership Project (“3GPP”) Release 15 and beyond, or standards/specifications recognised by the International Telecommunication Union (“ITU”) for the international mobile telecommunications (“IMT”) 2020.

Based on responses from the industry and bearing in mind its policy objectives, IMDA has assessed that MNOs must minimally achieve at least 50% outdoor Standalone (“SA”) coverage using the 3.5 GHz band within 24 months from the commencement of the 3.5 GHz spectrum right in 2021 (i.e. by end of 2022). This is in view of global industry consensus that only 5G SA networks can deliver full-fledged 5G capabilities such as network slicing, ultra-reliable low latency communications and massive machine type communications. This is opposed to 5G Non-standalone (“NSA”) networks, which are built over existing 4G networks and can only deliver faster speeds.

IMDA is looking for 3.5 GHz spectrum right holders to achieve nationwide outdoor coverage within 5 years from the commencement of the spectrum rights, but it will leave it to the MNOs to propose a reasonable timeline as part of the CPF evaluation criteria. IMDA will not stipulate any requirement for 5G coverage in road and MRT tunnels at this juncture but reserves the right to do so in the future.

In contrast for mmWave spectrum right holders, IMDA will allow flexibility in choosing SA or Non-standalone (“NSA”) deployment for the mmWave band only, until such time that the mmWave SA ecosystem becomes mature (at which point, IMDA will require deployment on SA basis within 24 months, as determined by IMDA). IMDA will require MNOs to put the mmWave spectrum to use within 12 months from the commencement of the spectrum right.
Network Design and Resilience

IMDA has decided that the design of 5G networks must meet the key resilience and security requirements stipulated in the relevant IMDA Codes of Practice (and to exceed such requirements where possible); and be architected based on the following principles, at the outset:

- **Defence-in-Depth**: Adopt security-by-design principles by implementing various defence mechanisms which are secure and scalable (e.g. capability to turn on encryption upon request);
- **Zero-trust Environment**: Ensure that the 5G network is always secure and trusted through deployment of network security solutions (e.g. implementing a “demilitarised zone” and other relevant measures);
- **Network Element Assurance**: Ensure that a risk assessment strategy and policy will be applied to the 5G infrastructure (e.g. policy compliance to the Network Equipment Security Assurance Scheme presently being defined by 3GPP and Global System for Mobile Communications (“GSMA”) and demonstrate how security assurance is achieved such as security testing of equipment);
- **Resilience by Outcome**: Demonstrate end-to-end network resilience to minimise outages and impact;
- **Minimise Dependency**: Configure network, to the extent feasible, to minimise instances where a failure of the (a) fibre network used to provide broadband services, and/or (b) infrastructure used to provide other mobile services in a geographical area, could also affect 5G services in the same geographical area; and
- **Adopt Technology**: Use of advanced technologies for resilience purpose, e.g. automation and machine learning to detect, respond and recover from service disruption expeditiously.

Additionally, any 5G NSA deployment should, to the extent possible, meet all resilience and security requirements, unless such requirements are only supported on 5G SA networks. This would include the underlying 4G networks used to support 5G NSA networks.

Spectrum Right Duration

The duration of the spectrum rights will be set for a duration of 15 years for the 3.5 GHz band and approximately 16 years for mmWave band. This is to provide sufficient investment certainty without having too long a duration in recognition of the fast pace at which mobile technology moves.
Assignment of spectrum via a Call for proposal approach

As mentioned earlier, IMDA will assign the Packages via a call for proposal ("CFP") approach instead of an auction mechanism. Interested MNOs will compete based on the merits of their proposals that can best deliver future-ready 5G networks to meet the IMDA’s policy objectives. For the remaining mmWave lots, IMDA will allocate them administratively. IMDA will issue the CFP documents to all existing MNOs on a confidential basis.

To participate in the CFP, applicants will have to submit detailed proposals that meet IMDA’s key obligations and requirements. The key obligations and requirements are summarised as follows:

- provide 5G SA networks with at least 50% coverage within 24 months from the commencement of the 3.5 GHz spectrum right;
- put to use the mmWave band within 12 months from assignment;
- design of the 5G networks should meet key resilience and cybersecurity requirements stipulated in the relevant IMDA Codes of Practice (and to exceed such requirements where possible); and be architected based on principles such as Defence-in-Depth and Zero-Trust Environment at the outset;
- provide 5G wholesale services based on IMDA’s regulatory requirements and principles to other MNOs/MVNOs upon request;
- the applicants are to indicate their offer price for one lot of 3.5 GHz band, which must be higher than S$55 million. The applicant must also submit bank guarantee(s) equivalent to the base price of S$55 million.

Each proposal will be evaluated based on the following criteria and weights assigned:

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<tr>
<th>Evaluation criteria</th>
<th>Details</th>
<th>Weight assigned</th>
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<tbody>
<tr>
<td>Network Design &amp; Resilience</td>
<td>This criterion will assess whether the applicants’ proposed 5G networks come with designs that (i) not only meet but exceed key resilience and security requirements stipulated in the relevant IMDA Codes of Practice, and (ii) are architected based on specified principles.</td>
<td>40%</td>
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<tr>
<td>Network Rollout and Performance</td>
<td>This criterion will look at the applicant’s proposed network rollout and performance potential, such as the extent of 5G coverage, timeline/speed of network rollout (including achieving nationwide</td>
<td>35%</td>
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<table>
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<tr>
<th>Evaluation criteria</th>
<th>Details</th>
<th>Weight assigned</th>
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<td>outdoor coverage), capabilities of the proposed 5G system, including its ability to support use-cases, and performance standards beyond the key requirements set by IMDA.</td>
<td></td>
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<tr>
<td>Spectrum Offer Price</td>
<td>This criterion will look at the offer price submitted beyond the base price.</td>
<td>15%</td>
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<td>Financial Capability</td>
<td>This criterion will assess whether the applicants have the financial ability to fund their proposed 5G network rollout and meet their project costs.</td>
<td>10%</td>
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<td>Wholesale services</td>
<td>Mandatory compliance, in line with IMDA’s framework.</td>
<td>N.A.</td>
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The indicative timeline for the CFP is as follows:

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<th>Milestone</th>
<th>Indicative Timeline</th>
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<tr>
<td>Issuance of the CFP</td>
<td>By October 2019</td>
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<tr>
<td>Submission deadline to the CFP</td>
<td>21 January 2020</td>
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<tr>
<td>Decision on the CFP / Notification of award</td>
<td>Mid-2020</td>
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IMDA will score and rank the proposals, and it will assign the Packages to the two applicants with the highest scores. The successful applicants will then choose their preferred 3.5GHz and mmWave lots.

Thereafter, the remaining MNOs who wish to obtain the mmWave lots will be allowed to discuss and select their preferred mmWave lots from the remaining lots. There will generally be no spectrum premium payable for the mmWave band.

Proposal from the successful applicants will be binding and will form part of their licence. The successful applicants are required to submit a performance bond amounting to 5% of its budgeted capital expenditure and will be tied to the key performance milestones and commitments in the proposals.

Other initiatives

The other IMDA initiatives that aim to bolster Singapore’s digital economy include the following:

- Launch of three new 5G use cases – IMDA will be supporting two enterprise use cases and one consumer use case to encourage the development of an inclusive 5G innovation ecosystem.
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- Partnerships with the industry and people – These include the launch of Singapore MentorConnect programme to attract and retain more women to join the infocomm sector, and collaboration with several consulting firms to pilot a training programme for data protection professionals.

- Collaboration with China-based science and technology enterprise incubator – This will support deep tech companies’ market discovery and access into China’s and Singapore’s tech ecosystems.

Concluding Remarks

In May 2019, IMDA initially proposed to have at least two nationwide 5G networks. However, with the release of IMDA’s final plans to have four licences up for grabs, this will allow the four existing MNOs (which are presently M1, Singtel, Starhub and TPG Telecom) to provide 5G services, although two of the allocations are likely to only be for localised 5G deployment due to the short-range propagation of mmWave band.

The allocation of spectrum to all MNOs is expected to spur competition and give consumers greater choice. Nevertheless, given that only two allocations are suited for nationwide development, IMDA’s framework to govern wholesale arrangements for 5G will be critical to ensure that the two MNOs which have been allocated the 3.5 GHz spectrum make the spectrum to available qualifying MNOs / MVNOs on a fair and reasonable basis, to facilitate services-based competition at the nationwide level.

On the basis that MNOs granted the nationwide network are to commence deployment from 2021 and MNOs granted mmWave spectrum rights are to deploy within 12 months of the spectrum allocation in 2020, consumers can expect 5G coverage across Singapore by 2022.

5G will be a key connectivity infrastructure for Singapore, capable of supporting the transformation of many industry sectors. In view of the importance of 5G, the spectrum allocation by way of a CFP process is a practical approach to award spectrum to operators that can maximise the potential of 5G to boost the Singapore digital economy and strengthen Singapore’s position as a global business and connectivity hub.

If you have any queries, or wish to take part in the CFP process or provide feedback to IMDA on the regulatory frameworks to facilitate market competition, do let us know and we will be happy to discuss this further with you.
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