
GSMA
S. ASEAN International Advocacy & Consultancy
Industry Summit, Promoting Digital Indonesia
Socio-economic Benefits of the Digital Transition and Key challenges
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Industry Summit
Promoting Digital Indonesia

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Key challenge one: spectrum requirements for digital transformation

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Key challenge One:

Spectrum Requirements for digital transformation

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Today's agenda

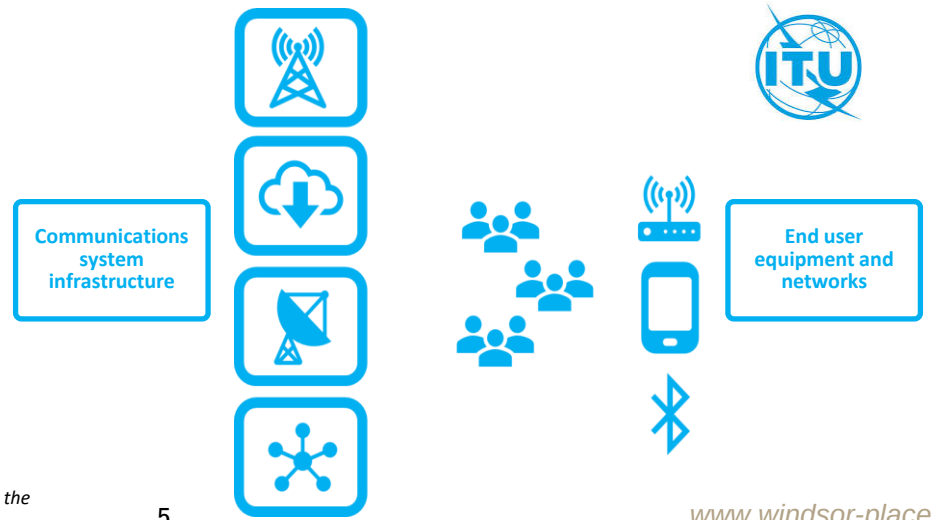
1. Introduction and Background
2. Spectrum Requirements for a digital economy
3. Importance of securing the digital dividend in the 700 MHz band
4. Other key IMT bands needed urgently in Indonesia
5. Conclusions and Recommendations

1. Introduction and Background

- In the 21st century digital economy, “Industrial Revolution 4.0” is being enabled by and driven by communications services and the infrastructure to support them. The essence of concepts such as the digital economy and Industrial Revolution 4.0 is that the ongoing improvements in ICT, investments in digital infrastructure and the increasing ubiquity of connectivity are enabling ever more of the world’s economic activity to be undertaken in the digital realm.

- As a greater proportion of economic activity is digitised the quality and reach of communications services are becoming a more potent differentiator of national efficiency and international competitiveness. Digital infrastructure matters more than ever before. **Ensuring that there is sufficient and affordable radio frequency spectrum available to operators is essential for effective broadband service deployment and participation in a transforming digital economy.**

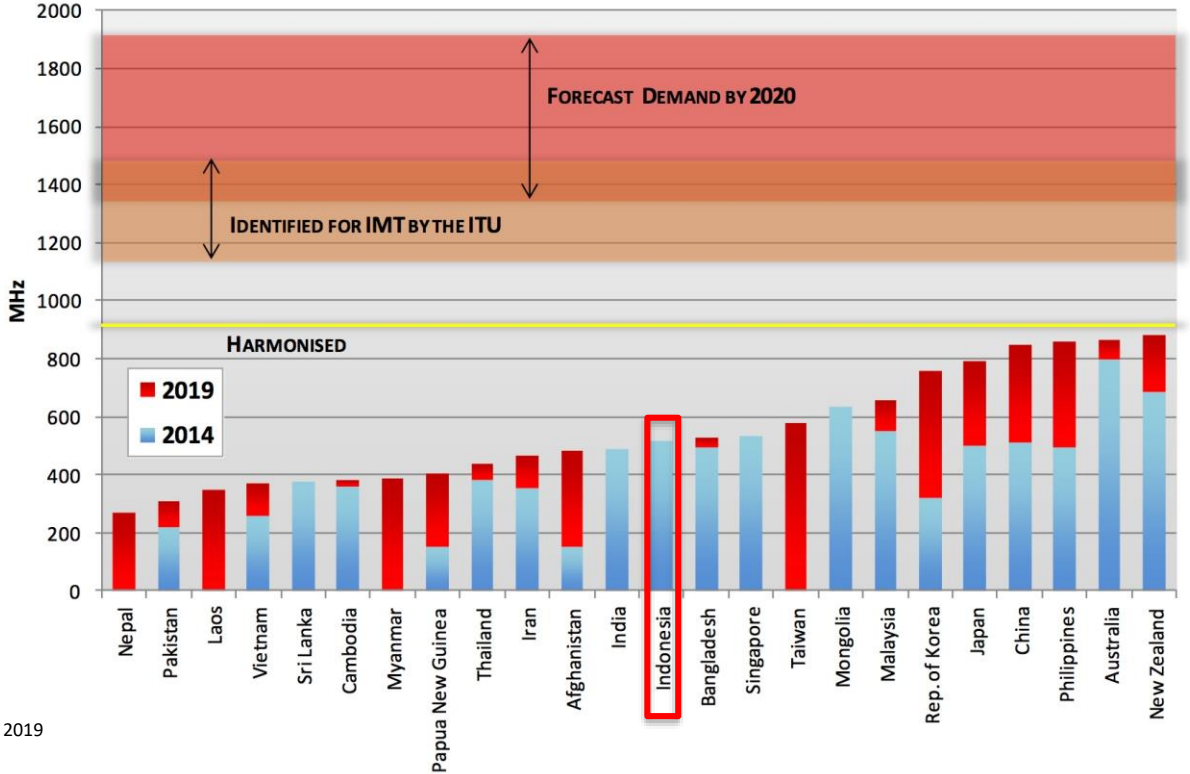
- Digital infrastructure includes Internet backbone, fixed broadband Infrastructure, **mobile communications infrastructure** including optical fibre backhaul, Communications satellites, data and cloud computing Facilities, software platforms and network edge devices including IoT devices.



Source: ITU, *Digital Infrastructure Policy and Regulation in the Asia-Pacific Region*, September 2019

2. Spectrum Requirements for a digital economy

- As of April 2019, Indonesia had released approx 550 MHz of IMT spectrum. This put the country ahead of Vietnam, and Myanmar, but behind the Philippines, Malaysia and Singapore. However, since mid-2019 and into 2020, a number of markets, including Australia, China, Japan, South Korea, Thailand Malaysia, Vietnam and Myanmar, have released or are planning to release significantly more IMT spectrum. **Allocating no new IMT spectrum will mean that Indonesia falls comparatively behind.**



Source: LSTelcom, 2019

2. Spectrum Requirements for a digital economy (2)

It is worth highlighting that:

- developed countries have allocated significantly more IMT spectrum than emerging markets, with the spectrum allocated to a single MNO in certain markets often higher than the entire IMT spectrum allocated in some country markets eg Bangladesh, Pakistan, Nepal etc;
- European countries (except the UK) have even higher levels of IMT spectrum availability due to securing 2 digital dividends (in 800 and 700 MHz) and the making available of 3.4 to 3.8 GHz band;
- **Indonesia falls within group of countries, Vietnam, Thailand, and Pakistan which all look significantly underweight in relation to the largest MNO spectrum holdings (and total IMT spectrum allocated) especially given their large populations and relatively large cities**.
- In terms of the largest MNO spectrum holdings per market excluding mmWave, in Australia Singtel Optus has 324.6 MHz of IMT spectrum, China Mobile has 250 MHz, SK Telecom 297 MHz, Telefonica in Germany has 333.3 MHz, EE in the UK 295 MHz and NTTDocomo more than 360 MHz. Even the Philippines new entrant – which I worked on with the ITU in 2018 - Dito Telecommunity has 210 MHz of spectrum.
- **Going forward, the total IMT spectrum allocated in Indonesia needs to increase as does individual MNO spectrum holdings. This needs to be done without substantial increases in overall spectrum spend**.

Operator	450/850 MHz	900 MHz	1800 MHz	2100 MHz	2300 MHz	Total Spectrum
Telkomsel	-	2 x 15	2 x 22.5	2 x15	30	135 MHz
Indosat	-	2 x 12.5	2 x 20	2 x15	-	95 MHz
XL	-	2 x 7.5	2 x 22.5	2 x15	-	90 MHz
Hutchison	-	-	2 x 10	2 x 15	-	50 MHz
Smartfren	2 x 11	-	-	-	30	52 MHz
Sampoerna	2 x 7.5	-	-	-	-	15 MHz

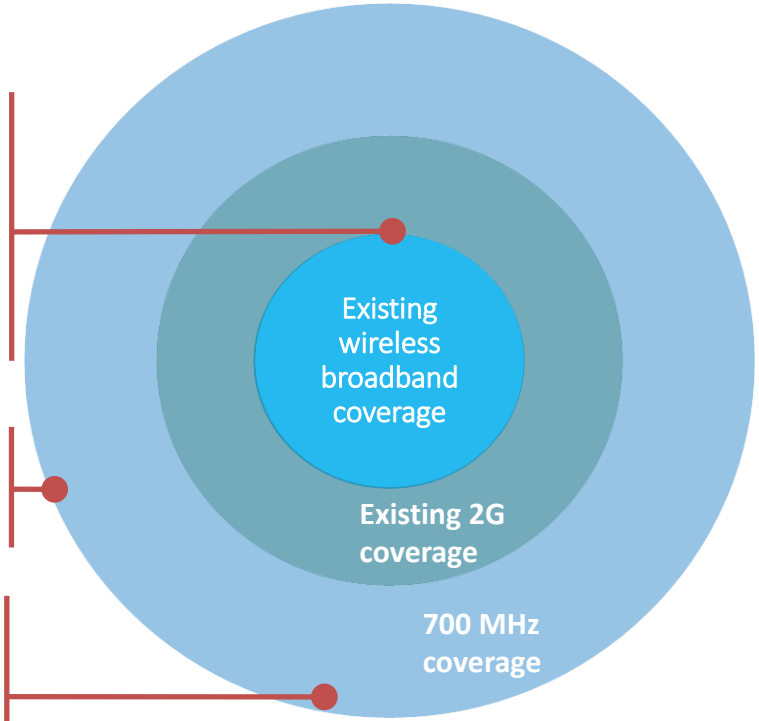
3. Importance of Securing the Digital Dividend in the 700 MHz band

Benefits of 700 MHz deployment over existing IMT spectrum bands – Wireless broadband everywhere

Benefits ***within*** existing coverage
- increased capacity
- increased speed
- in-building coverage
- in-fill of 'blackspots'
- move from 2G at edge to broadband
- Improved ability to deploy VoLTE
- off-loading to 700 MHz

Spectrum ***future proofing***
- Ability to deploy 5G in this band

Benefits ***outside*** existing coverage:
- more extensive coverage
- non-line-of-sight coverage
- lower per-area cost deployment
- more rapid deployment



Updated GSMA report by WPC, *Securing the Digital dividend across the entire ASEAN: A report on the status of the implementation of the APT700 Band* , August 2018

3. Importance of Securing the Digital Dividend in the 700 MHz band (2)

Coverage benefits

- The coverage utilising the 700 MHz spectrum is more extensive and of better quality
- The indoor coverage is often better (due the lower indoor propagation loss)
- Adding a 700 MHz layer will secure better in-building penetration as well as higher speeds with carrier aggregation

Faster wireless broadband speeds and an upgrade path

- The increase in bandwidth is achieved by utilising LTE carrier aggregation/channel aggregation which combines multiple LTE carriers to increase bandwidth and achieve higher data rates of LTE-A and LTE-A Pro.
- This improves the wireless broadband speeds and QoS provided to subscribers including the ability to offer VoLTE and hence accelerate the switchoff of legacy networks
- Ability to deploy 5G in this band – 7th most supported band in early 5G device market

Wider IoT service deployment using APT700

- Narrow-Band- Internet of Things (NB-IoT) and LTE-M are set to become the dominant Low Power Wide Area services
- The use of low bands (below 1 GHz) should be a primary goal for MNOs when offering NB-IoT, with APT700 being an obvious candidate band for deployment of such services as seen regionally in Australia and the Philippines

Societal benefits to Indonesia

- Benefits of increased capacity that flow from increased IMT spectrum use in general
- Greater range and propagation characteristics means improved coverage and service improvements for consumers
- Rural communities are connected quicker with a better services as a result of expanding APT700 coverage
- Lower capital costs of APT700 deployment mean that consumers pay lower prices for connectivity
- Benefits arising from the revenues to governments from allocation of the 700 MHz band spectrum

3. Importance of Securing the Digital Dividend in the 700 MHz band – Case Studies (3)

A Philippines

- 700 MHz Band 28 deployments in the Philippines since June 2016, had by end of 2018 resulted in 95% population coverage in LTE service experience for customers with APT700 capable devices
- APT700 deployments using pre-existing site and tower infrastructure have resulted in significantly improved service extent and coverage. It will be a core band for the new 3rd player - DIto
- The ability of APT700 to support NB-IoT/LTE-M services is excellent given coverage and lower costs

B Australia

- In Australia APT700 spectrum has been instrumental in extending 4G coverage to regional and remote areas that otherwise would not have been possible to cover economically, or at all
- Prior to APT700 deployment, Telstra's networks covered approximately 85% of population and 100,000 sq. km. The use of APT700 with existing and new 4G sites has helped push Telstra's 4G coverage to over 99% of the population and more than 1.6m sq. km of Australia.
- Telstra considers that APT700 improves 4G in-building coverage. APT700 means that most urban buildings can now get reasonable in-building 4G coverage without augmentation like dedicated antennas
- Telstra confirms that there are material cost benefits in deploying 700MHz over 1800MHz spectrum. The benefits are most fully realised in lower population density areas of regional, rural and remote Australia.

3. Importance of Securing the Digital Dividend in the 700 MHz band (4)

- The biggest challenge to secure the DD in Indonesia is the digital switchover in Java. Other regions will require replanning – especially in relation to non-authorised services – but generally analogue/digital TV services can be moved to below 698 MHz allowing the DD to be secured in those areas. This is similar to the approach in the Philippines (where the DSO is planned for 2023) and Myanmar (yet to commence). Such 700 MHz spectrum could then be allocated in those areas of the country identified by Bakti (with input by Wantiknas) for mobile broadband.

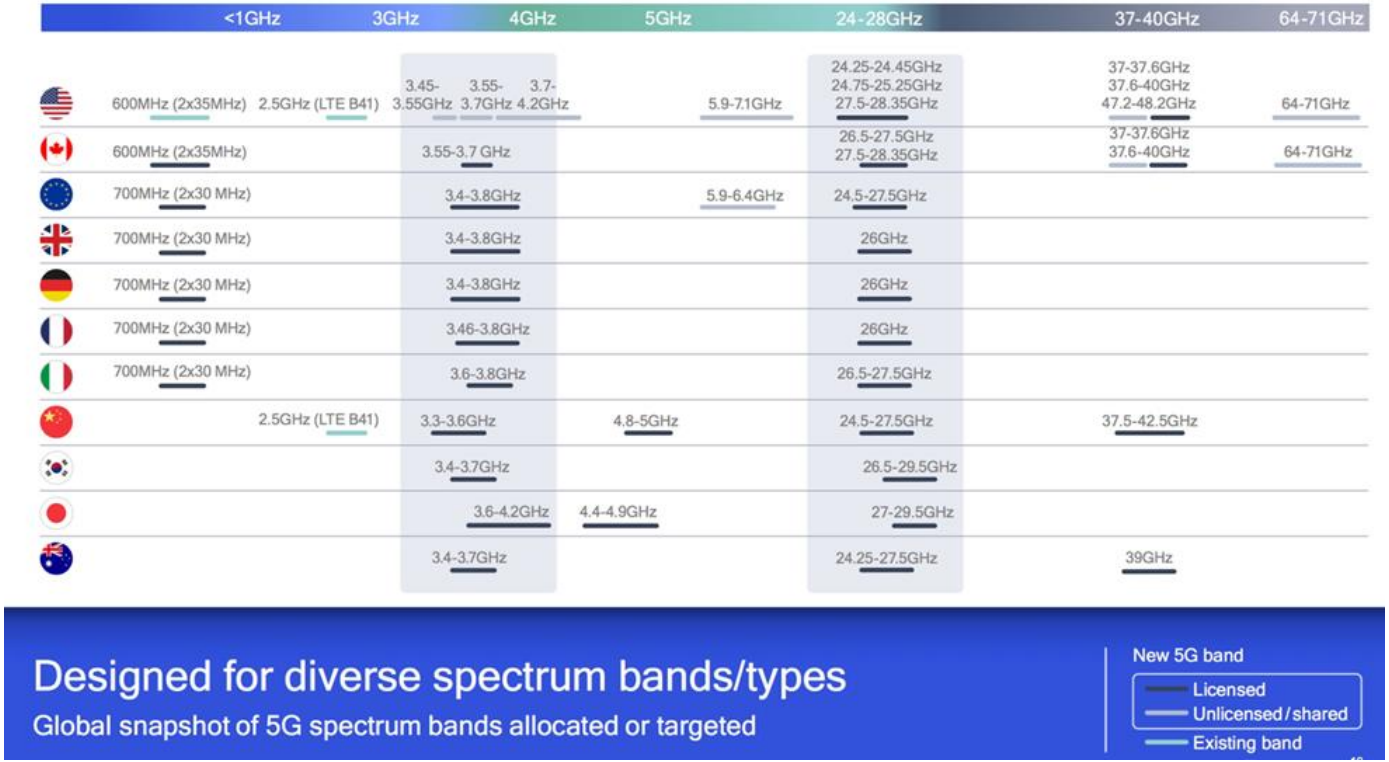
- Furthermore, innovative incentive based spectrum auction approaches may also provide a way to allocate 700 MHz spectrum in Indonesia especially with respect to TV broadcasters in Java.

With SG & MY keen to deploy 4G/5G in the 700 MHz band addressing cross-border interference issues is critical

Java is the key challenge area for securing the 700 MHz given number & density of TV stations

4. Other key IMT bands needed urgently in Indonesia

- 5G is the next exciting step in the evolution of mobile wireless communications technology revolution, promising improved connectivity, greater network speeds and bandwidth, and very low latency. The other key spectrum bands are 3.3-3.8 GHz, 2.6 GHz and mmWave (26-28 GHz).



Source: Qualcomm, *The case for 5G NR Spectrum*, 5G ASEAN Conference, Hanoi, March 2019

4. Other key IMT bands needed urgently in Indonesia (2)

- The equity efficiency trade-off often involves a trade-off between investment in cities and investment in regional areas. Cities are driving economic growth because they enable the deep specialisations which drive competitive advantage in the modern connected global economy. Smart cities use deeply embedded digital technology to achieve highly efficient operation both from an economic and an environmental perspective.

- Similarly Indonesia needs to ensure it has sufficient mid-band capacity spectrum to support wireless broadband services in the countries key urban areas including Jakarta, Surabaya, Medan, Makassar, etc.

- The key capacity spectrum bands include:

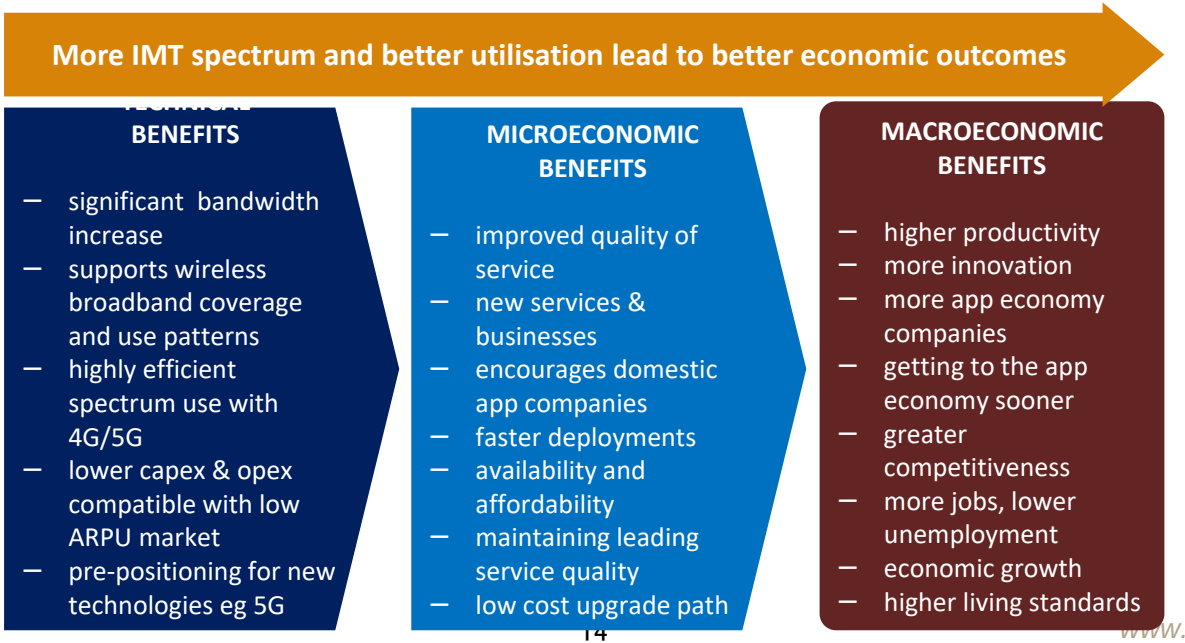
  3.5 GHz band. Due to its propagation characteristics and the potential for large contiguous bandwidths, the 3.5 GHz band is an ideal frequency band for 5G as it is able to provide both capacity and coverage. It is pioneer band for 5G deployment globally. While more work is being done by SDPPI with some assistance from the World Bank, there would seem to be potential to release some IMT spectrum in the 3.3 and 3.5 GHz band.

  2.6 GHz band. Currently this band is mainly being used for satellite broadcasting until 2024 but there is a strong economic case for early discussions – with appropriate compensation – for the early handback of this spectrum allocation. The release of an additional 190 MHz of key IMT spectrum which can be used for 4G/5G is critical.

5. Conclusions and Recommendations

- In conclusion, the Indonesian economy exhibits multiple characteristics that strongly suggest that the release of additional IMT spectrum will generate significant economic benefits. It faces ongoing service quality challenges in wireless telephony and broadband services, it has relatively undeveloped fixed line infrastructure, its regional ASEAN competitors are moving strongly to improve their telecommunications infrastructure, and strong digital infrastructure is need to support economic growth.

- All these factors suggest that the benefits from additional IMT spectrum including the ability for 4G wireless for regional and rural areas (using 700 MHz) and rapid 5G deployments would be significant.



Thank you

WPC's recent spectrum management and regulatory papers

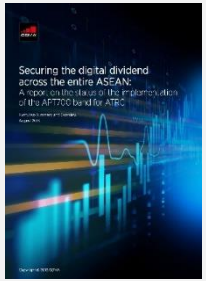
Our recent papers with the GSMA and the ITU are all are available publicly for download

WPC's recent thought leadership

Examples

"Discusses the current use of the C-band in ASEAN, the different options to release the band for mobile use, and the factors that need to be taken into account in deciding on the way forward. Recommendations for developing the roadmap to release the 3.5 GHz band in ASEAN are also provided.."

For the GSMA with Plum Consulting, published August 2019 at 5G Seminar in Hanoi

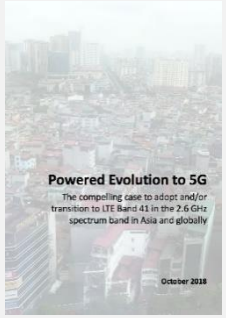


"A six-step plan is recommended in order to secure the digital dividend and APT700 spectrum across the entire ASEAN."

For the GSMA, published August 2018 at seminar for ATRC in Singapore

"Digital Infrastructure Policy and Regulation in the Asia Pacific region explores key regulatory aspects of digital infrastructure including spectrum, rights of way, legislation, broadband targets, QoS etc"

For ITU launched at ITU Regulatory Roundtable, Bangkok, September 2019



"Exploring the technical, commercial and regulatory issues associated with adopting 3GPP Band 41 in the 2.6 GHz band in Asia and globally needed for affordable 5G services"

WPC Industry study launched in Colombo, Sri Lanka in October 2018