Session 4:

Transforming Regulatory Regimes in New, Emerging and Converging Technological Scenario

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Topics covered

1. **Spectrum management in a 5G NR world**

2. **Rights of way facilitating telecommunications network deployment**

3. **Digital challenges to regulators**

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1. **Spectrum management in a 5G NR world**

2. **Rights of way facilitating telecommunications network deployment**

3. **Digital challenges to regulators**

1. Spectrum management in a 5G NR world (1)

- Spectrum should be managed so that it creates the maximum long-term benefit to society.

- However, the factors that determine optimal spectrum allocation are highly dynamic because of technology and changes in consumer behaviour.

- As previous generations of technology are phased out, spectrum previously allocated to them needs to be closed down, re-organised, consolidated and reallocated.

- This is a complex and time consuming process and one that must be undertaken continuously.
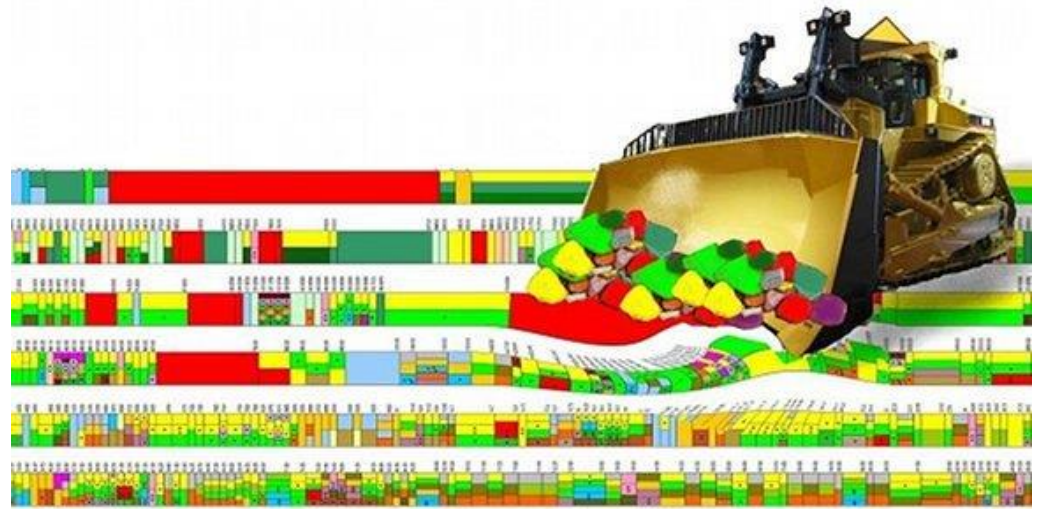
1. Spectrum management in a 5G NR world (2)

- The transition from 2G/3G services to 4G/5G services also requires rethinking the optimal spectrum allocation processes for IMT spectrum.

- While 5G NR technology supports bandwidths including 10, 20, 30, 40, 50, 60,70, 80, 90, and 100 MHz, and more depending on the band dual connectivity and carrier aggregation, **larger block sizes are preferred** to obtain the **maximum benefit from new technologies.**

- Traditional approaches which have resulted in MNOs each having fragmented IMT spectrum holdings over a number of bands should be avoided as it is inefficient.

- It is also critical that the **total amount of IMT** spectrum made available in a market for mobile operators **increases and is priced reasonably. The release of new IMT spectrum does not magically result in more revenues**
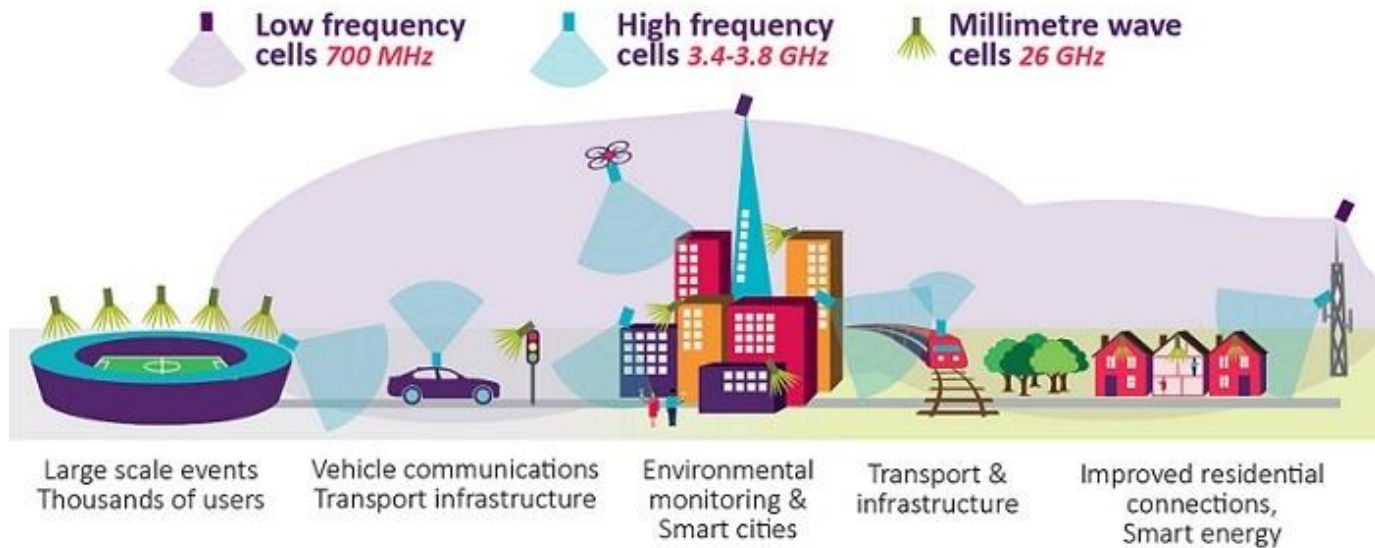
1. Spectrum management in a 5G NR world (3)

- There are benefits from assigning the **700 MHz band (APT700)** and the **3.5 GHz band (3.3-3.8 GHz)**[1].

- Deploying 700MHz allows for improved **wide and indoor coverage, increased wireless broadband speeds** and more **efficient IoT deployments**.

- The ability of mobile operators to quickly utilise 700 MHz spectrum in their service provisioning due to their modern LTE networks will have material benefits in terms of operator capex and opex.

- 700MHz alone or in combination with other IMT spectrum bands can also be used to provide FWA services to customers including in regional and rural areas.

- Furthermore, likely releases of 700MHz between 2019 and 2020 in Asia (Malaysia, Singapore, Thailand, Vietnam, India, and China) will accelerate the availability of affordable Band 28 smartphones and other devices in Asia.

(1): https://www.gsma.com/spectrum/resources/releasing-cband-asean/

Source: everythingRF   *www.windsor-place.com*

1. Spectrum management in a 5G NR world (4)

- Due to its **propagation characteristics** and the potential for **large contiguous bandwidths**, the 3.5 GHz band is ideal for 5G; it provides **capacity** and **coverage**. Sri Lanka needs to refarmits current allocations in this band

- 100 MHz per operator is optimal for delivering good 5G service performance but if not available then 50 to 60 MHz is needed to make it viable (eg like ACCC spectrum cap in Oz 3.6 GHz auction)

- The 2.6 GHz band (especially TDD Band 41) is an another excellent choice for APAC nations wishing to deploy 5G early and efficiently. I was in Colombo a year ago (October 2018) releasing a paper on the benefits of adopting Band 41. Great to see Sri Lanka adopt this band

Low frequency cells *700 MHz* • High frequency cells *3.4-3.8 GHz* • Millimetre wave cells *26 GHz*

Large scale events Thousands of users | Vehicle communications Transport infrastructure | Environmental monitoring & Smart cities | Transport & infrastructure | Improved residential connections, Smart energy

Source: everythingRF

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1. Spectrum management in a 5G NR world (5)

Recommendations:

- Spectrum should be **technology-neutral** (additional charges should be removed)

- **Large, continuous blocks** of hamronised spectrum are crucial for the effective deployment of 5G (ensuring investment certainty and quality of experience for end users).

- In bands that are only partly released, it may be beneficial to introduce mechanisms that ensures continuous spectrum blocks when more spectrum is released later (eg licence conditions)

- Ensure **optimal guard band** sizes to minimise interference say with FSS services but between 5G TDD systems synchronisation will be required.

- **Lower frequencies are going to be optional for Sri Lanka and many emerging markets** given the cost of infrastructure. Lower frequencies should make services more affordable

1. Spectrum management in a 5G NR world – 5G deployment challenge (6)

Summary	Suggestions customized for Asia-Pacific from 2018 ITU Report "Setting the Scene for 5G: Opportunities& Challenges"
Investment case	Policymakers may consider undertaking their own independent economic case assessment of the commercial viability of deploying 5G networks while in the interim facilitating 4G network deployment and where appropriate 2G/3G switchoff
Harmonize spectrum	Regulators should allocate/assign globally harmonized 5G spectrum including 3.5 GHz, mmWave, 2.6 TDD GHz, 2.3 GHz, 700 and 600 MHz
Spectrum roadmap	Regulators should adopt a spectrum roadmap and a predictable roadmap renewal process
Spectrum sharing	Regulators may consider allowing sharing to maximize efficient use of available sharing spectrum, particularly to benefit rural areas
Spectrum pricing	Regulators may consider selecting spectrum award procedures that favour investment (As opposed to auction returns)
Sub-1 GHz spectrum	Policymakers should consider supporting the use of affordable wireless coverage (eg through the 700 & 600 MHz bands) to reduce the digital divide
Fibre investment incentives	Policymakers, where the market has failed, may consider stimulating fibre investment and passive assets through PPPs, investment funds and the offering of grant funding, etc.
Fibre tax	Policymakers may consider removing any tax burdens associated with deploying fibre networks to reduce the associated costs
Copper to fibre	Policymakers may consider adopting policies/financial incentives to to encourage migration from copper to fibre & stimulate deployment of fibre
Wireless backhaul	Wireless Operators may consider a portfolio of wireless technologies for 5G backhaul backhaul in addition to fibre, including point-to-multipoint (PMP), microwave and mmWave radio relays, satellites etc
Access/sharing of passive infrastructure	Policymakers may consider allowing access to government-owned infrastructure such as utility poles, traffic lights and lampposts to give wireless operators the appropriate rights to deploy electronic small cell apparatus to street furniture. And Regulators may consider continuing to elaborate existing duct access regimes to encompass 5G networks allowing affordable fibre deployments
Access costs	Policymakers/Regulators may consider ensuring reasonable fees are charged to operators to deploy small-cell radio equipment
Asset database	Policymakers may consider holding a central database identifying key contacts, showing assets such as utility ducts, fibre networks, CCTV posts, lampposts, etc. This will help operators cost and plan their infrastructure deployment more accurately
Wayleaves (ROW)	Policymakers may agree upon standardized wayleave agreements to (rights of way) reduce cost and time to deploy fibre & wireless
5G test beds	Policymakers to encourage 5G pilots and test beds to test 5G technologies, & use cases, and to stimulate market engagement

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1. **Spectrum management in a 5G NR world**

2. **Rights of way facilitating telecommunications network deployment**

3. **Digital challenges to regulators**

2. Rights of way facilitating telecommunications network deployment (1)

Infrastructure Deployment

- Deployment of network infrastructure typically involves:

  - Erection of towers and poles to accommodate telecommunications equipment;
  - Suspension of fibre optic cable on poles;
  - Digging trenches and direct burying of fibre optic cable;
  - Digging trenches and constructing ducts for the laying of cable; and
  - Installation of telecommunications equipment and cables within commercial and residential buildings

- Necessary Permissions:

  - Permission from **public and/or private land owners** to access land for the erection of towers and poles.
  - 'Rights of way' to allow fibre optic cable to be suspended or laid underground through public and/or private land
  - Permission from building owners for installation of telecoms equipment and cables

2. Rights of way facilitating telecommunications network deployment (2)

Challenges of Deploying Telecommunications Infrastructure

- Deploying telecommunications infrastructure is complex, expensive and risky in many jurisdictions.

- Operators forecasting demand for network services must consider uncertain future consumer behaviour, unknown behaviour of competitors and difficult to predict technological change.

- Process may involve seeking approval from multiple local government authorities and communities.

- Approval processes may differ between local government authorities and that there is often a lack of understanding of the approval process among government officials

- Other barriers that may hamper deployment include:
  - Existing fibre infrastructure being damaged by subsequent construction works; and
  - An absence of in-building standards for telecommunications equipment

2. Rights of way facilitating telecommunications network deployment (3)

Recommendations

- For governments to accelerate the rate of infrastructure deployment, unnecessary obstructions need to be removed and other barriers such as approval processes

- **New types of approval processes** can be implemented and **infrastructure sharing** should be encouraged.

- To address the evident concerns with infrastructure deployment and to assist in **reducing the cost of infrastructure deployment** it is recommended to:

  - Adopt national guidelines for obtaining approvals;
  - Adopt a one stop approval process;
  - Create a national database of telecommunications infrastructure;
  - Encourage infrastructure sharing; and
  - Develop in-building telecommunications standards

2. Rights of way facilitating telecommunications network deployment (4)

Infrastructure Approvals

- Infrastructure deployment projects are subject to a range of necessary approvals to ensure that the **environment and public safety is protected and disruption keep to a minimum**.

- Infrastructure approval guidelines would provide a **common reference point** for all stakeholders and establish a framework for identifying and assessing approval requirements for different types of projects

- Guidelines should take into consideration the different land law systems in each jurisdiction

- Practice and procedures to observe include:
  - Necessary supporting information concerning each project application;
  - Timelines for each application;
  - Detailed reasoning for rejecting applications;
  - Identification of situations where community consultation must take place and its process;
  - A schedule of fees for applications and approvals and the process for making payments; and
  - Dispute resolution process between applicant and approving authority.

- The adoption of guidelines would create a common understanding of the approval process and would promote non-discriminatory practices.

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Infrastructure Approvals – Differing Land Law Systems – example of SAARC countries

Country	Land Law System	Comments
Afghanistan	Customary law/ Deed registration	As of 2015, only an estimated 10% of rural property and 30% of urban property owners have official deeds given by a court or the government. Many people use an informal system that relies on customary law. Acquiring and registering a deed is costly and difficult. Additionally, a title or registration of title is no guarantee of establishing ownership and obtaining land rights. Title deeds may be registered with numerous institutions at several locations, creating significant opportunities for fraud and corruption with multiple titles being registered at different locations for the same or overlapping areas of land
Bangladesh	Informal settlement/ formal registration	Titling and registration of land ownership is set out in the *Transfer of Property Act 1882* and *Registration Act of 1908*. However, land rights are insecure in large measure because of an inefficient, expensive, and corruption-prone system of land titling and registration. The majority of urban residents access land through the informal market where land rights are neither registered nor transferred according to the requirements of the law, or by squatting on public land.
India	Deeds registration system/ cadastral-based records of land rights	India has a dual land recordkeeping system that includes national and state laws governing a deeds registration system and state-level laws establishing cadastral-based records of land rights for revenue purposes. Together, they form a fairly comprehensive, decentralized and functional land recordkeeping system. However, the parallel systems are inefficient, as the records maintained by the two systems are sometimes inconsistent. The land records maintained do not constitute land title, only evidence of title. Overall, this dual system often does little to enhance tenure security and, in some cases, actually renders land tenure less secure. The system often presents an inaccurate picture of landholdings on the ground, due to a large number of unrecorded transactions
Maldives	Private ownership ('amilla bin') and state ownership ('bandaara bin')	Private ownership is where individuals or entities have purchase lland from the state. State ownership is where the state has granted usage rights to individuals or entities for the occupation of the land. Where a bandaara bin is granted to a party, the usage rights over the bandaara bin is unlimited and can even be passed through inheritance, as if it was owned outright by the deceased.
Nepal	Digitization process for land records	Although Nepal has implemented a digitization process for land records, many registrations and transfers are still recorded in paper form. The records are vulnerable to loss, destruction, and distortion and misinformation. An estimated 48% of all landholdings are registered in Nepal, but the records often go back decades and are not considered reliable. An integrated system is not yet in place. Foreigners cannot own or rent land in Nepal. Foreigners may acquire land in the name of a business entity registered in Nepal; however, they may not acquire land as personal property. However, it is widely believed that foreigners own and rent land on the informal market.
Pakistan	Informal settlement/ unregistered ownership	Freehold land in Pakistan tends to be retained by families and passed inter-generationally by inheritance. Ownership is rarely registered. Despite formal laws mandating registration, incentives for registering land are weak or nonexistent and procedures complicated and lengthy. Land is typically titled in the name of the head of household or eldest male family member of an extended family.
Sri Lanka	Registration of title system	A title registration system was introduced under the *Registration of Title Act No. 21 of 1998* but this has not progressed as intended. This Act was put in place to address the problems with the deeds registration system. Under this system, certainty of ownership of a land is guaranteed by the government, taking away repeated examinations of the past title. Therefore, title registration is expected to minimize land disputes and forgeries.

See ITU, *Digital Infrastructure Policy and Regulation in Asia Pacific Region*, September 2019, Appendix A

2. Rights of way facilitating telecommunications network deployment (6)

Exemplar Rights of Way Regulation Outline

- *Chapter 1*: Preliminary (citation, definitions, application, etc.)

- *Chapter 2*: Establishment of Low-Impact Facilities (definition, etc.)

- *Chapter 3*: Establishment and Maintenance of Underground Facilities (application, grant, obligations, powers, etc.)

- *Chapter 4*: Establishment of Underground Facility (application, grant, obligations, powers, etc.)

- *Chapter 5*: Additional Requirements (local govt laws, customary law, etc.)

- *Chapter 6*: Right of Authority to seek removal of underground or overground facility

- *Chapter 7*: Dispute Resolution and Appeals Process

See ITU, *Digital Infrastructure Policy and Regulation in Asia Pacific Region*, September 2019, Appendix B

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2. Rights of way facilitating telecommunications network deployment (6)

One Stop Centre ('OSC') Approval Process

- The OSC model is used in some markets to facilitate more efficient rollout of telecommunications infrastructure

- Involves establishment of a government body that facilitates the licensing process by obtaining co-current permission from the relevant authorities on behalf of the infrastructure provider

- Especially useful where multiple permits needed for site planning and installation as it is a practical means of dealing with bureaucratic inefficiencies

National Infrastructure Database

- International best practice is to create a national infrastructure database so location of existing infrastructure can be identified before new project commences

- Enables coordinated collaborative construction and development of infrastructure assets

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1. **Spectrum management in a 5G NR world**

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3. **Digital challenges to regulators**

3. Digital challenges to regulators (1)

- **Policy:** The high and growing importance to of ICT, broadband and related technologies results in sector policy being critical to national economic performance and competitiveness.

- National broadband policy including the various policy approaches taken to broadband coverage, bandwidth and affordability are therefore central to policy. Government funding to subsidise rural and regional network deployment is lacking, private investment should be encouraged and facilitated to enhance broadband **affordability**

- Innovative use of public-private partnerships, financing mechanisms, technology, and non-traditional market players can help to close the digital access gap.

	1.50%	
		1.33%
0.77%		
Fixed broadband	Mobile broadband	Digitalisation
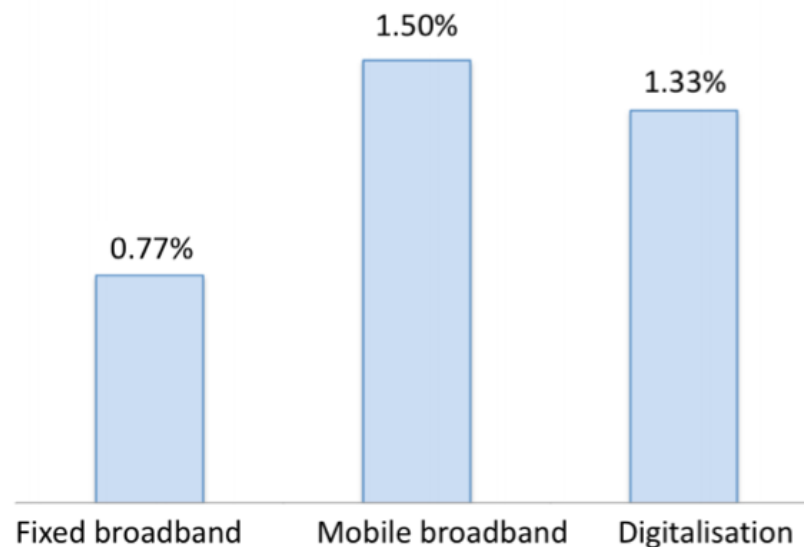
ITU's 2018 Report on *The Economic Contribution of Broadband, Digitization and ICT Regulation*, the transformative power for economic and social growth of connectivity through telecommunications and the internet is empowering people. According to the model used in the ITU Report, an increase of 10% in the digital ecosystem development index results in a 1.3% growth in GDP per capita.

3. Digital challenges to regulators (2)

Regulatory Reform and Legislation Amendments

- Important to establish and maintain independent regulatory bodies consistent with WTO trade commitments

- Ensure that sector regulation is done on a fair, nondiscriminatory basis especially if the Government is a shareholder in sector licensees

- Inclusion of open access, improved facilitating telecommunications rights of way regulation, infrastructure sharing, FTTH pre-deployment and QoS/QoE

- Updating of outdated telecommunication laws and legacy subsidiary regulation (PSTN, ISDN, copper cables, narrowband services, etc.)

3. Digital challenges to regulators (3)

Collaborative Regulation

- Important because telecommunications regulators do not control all of the regulatory tools and/or have a legislative mandate to regulate certain aspects

Tools for best practice:

- Space for digital experimentation
- A pro-competition frameworks for digital transformation
- Regulatory incentives
- Stakeholder engagement vehicles
- Robust and enforceable mechanisms for consumer protection
- Market-based and dynamic mechanisms for spectrum management
- Regulatory Impact Assessment (RIA)
- Agile data-driven monitoring solutions
- Diversified mechanisms for consumer engagement and feedback
- Effective channels for dynamic collaboration among regulatory authorities
- Regional and international cooperation
- Regulatory expertise

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3. Digital challenges to regulators (4)

Regulatory changes in relation to the regulation of online services
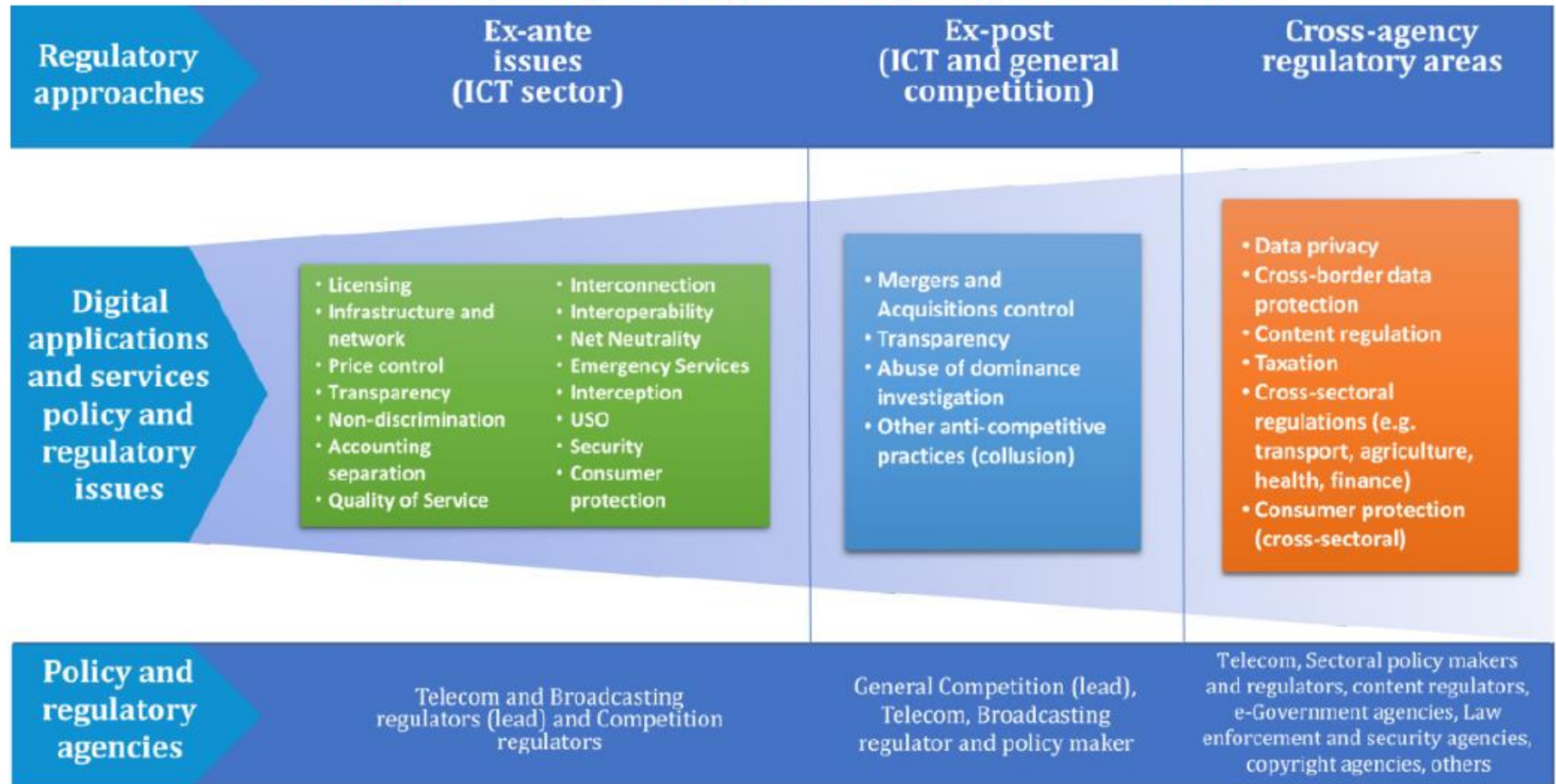
- Governments and industry regulators need to have strong understanding of digital platforms given the global trend of heightened levels of regulatory and enforcement of platform activity.

Regulator/Authority	Action
Australia	**June 2019** – ACCC Digital Platforms Inquiry. Immediate legislative reforms on takedown provisions after Christchurch. Further reforms coming
European Commission	Partnering with US Federal Trade Commission to investigate abuse of dominance by digital platforms
France	July 2019, Digital services tax of 3 percent which will be eliminated once a new international agreement on digital taxation is reached
G20	**June 2019** – Published 'Statement on Preventing Exploitation of the Internet for Terrorist and Violent Extremism Conductive to Terrorism (VECT)'
New Zealand	15 May 2019 Christchurch call. Range of reforms following March attack
UK Competition Markets Authority	**3 July 2019** - Announced 'Online Platforms and Digital Advertising Market Study'
US Department of Justice	**24 July 2019** - Opened review into Big Tech's market power

3. Digital challenges to regulators (5)

Regulatory changes in relation to the regulation of online services

Exhibit 38: Regulatory and legislative responses to digital applications and services

Regulatory approaches	Ex-ante issues (ICT sector)	Ex-post (ICT and general competition)	Cross-agency regulatory areas
Digital applications and services policy and regulatory issues	• Licensing • Interconnection • Infrastructure and network • Interoperability • Price control • Net Neutrality • Transparency • Emergency Services • Non-discrimination • Interception • Accounting separation • USO • Quality of Service • Security • Consumer protection	• Mergers and Acquisitions control • Transparency • Abuse of dominance investigation • Other anti-competitive practices (collusion)	• Data privacy • Cross-border data protection • Content regulation • Taxation • Cross-sectoral regulations (e.g. transport, agriculture, health, finance) • Consumer protection (cross-sectoral)
Policy and regulatory agencies	Telecom and Broadcasting regulators (lead) and Competition regulators	General Competition (lead), Telecom, Broadcasting regulator and policy maker	Telecom, Sectoral policy makers and regulators, content regulators, e-Government agencies, Law enforcement and security agencies, copyright agencies, others

Source: ITU, 2018

3. Digital challenges to regulators (6)

Regulatory changes in relation to the regulation of online services

- Reforms are also occurring in relation to the applicable taxation regimes

- Global online service providers and services often not subject to the same taxation on revenue and profits as national operators – online service providers are able to put in place international tax optimization strategies

- Exploiting the difference in treatment of economically equivalent transactions between jurisdictions is known as base erosion and profit shifting ('BEPS')

- Effect of BEPS is the erosion of corporate tax base of many countries in a manner not intended by domestic policy

- EU, Australia, the UK and France are reforming the taxes paid in relation to digital services. E.g. France passed a law on 11 July 2019 that imposes a 3% tax on companies with digital revenue of at least €750M worldwide and €25M in France.

Thank you

I am happy to answer any questions