# The 6th Asia Pacific Spectrum Management Conference

Monday 3rd – Thursday 6th August 2020 | Held Online
**All times GMT + 7** (Jakarta local time)

**DAY 1**

13.00 – 13.40 **Opening Ceremony**
**Areewan Haorangsi,** Secretary General, Asia Pacific Telecommunity (APT)
**Mario Maniewicz,** Director, Radiocommunications Bureau, ITU
**Dr. Ir. Ismail MT,** Director of Resources Management and Equipment of Posts and Informatics, Ministry of Communication and Informatics, Indonesia

13.40 – 14:00 **'Make your introductions' discovery and networking session**
An opportunity to find out more about the networking and interactive areas of the platform, and to meet with your fellow delegates using the 'speed networking' area!

**Session 1: Leading the way - 5G visions and early experiences across the APAC region**
All around the world, commercial 5G deployment is now underway, and countries in Asia are very much leading the way. In countries across the region, we are seeing examples of 5G networks being launched and the first 5G handsets starting to become available. This session will look at the progress that has been made with the launch of 5G across Asia and elsewhere, and at what needs to be done to ensure that the region takes advantage of the leading position on 5G deployment that it currently enjoys.

- What progress has been seen in countries across the APAC region when it comes to roll-out of 5G? Which countries are being seen as early leaders?
- In examples of roll-out that have been seen, to what extent have early versions of the technology met expectations?
- Beyond the first-movers / early leaders, what plans are being made for rollout of 5G in other countries across the region?
- What are the key spectrum bands that are being seen for 5G at this early stage, and what bands offer the best options to deliver the required connectivity in the longer term?
- How can the APAC region continue to innovate and push forward to ensure that it remains ahead of the game both with the continued roll-out of 5G, and also with the development of future technologies (Beyond 5G or 6G)?

Moderator**: Masanori Kondo,** Deputy Secretary General, APT

14.00 – 14.10 **Introduction: Delivering the 5G future in Asia – Progress made and challenges ahead**
**Stuart Cooke**, Chair, Global Spectrum Team, GSA

14.10 – 14.20 **Case Study – Latest frequency planning and development of 5G in China**
**Ping Li**, Bureau of Radio Regulation, MIIT, China

14.20 – 14.30 **Case Study – Policy to support 5G development of digital economy in Thailand**
**Theetanun Rattanasanyanuphap,** Director of Telecommunication Policy and Resource Management Bureau, National Broadcasting and Telecommunications Commission & **Pratompong Srinuan**, Director of Spectrum Allocation and Telecommunication Infrastructure Development Policy Division, NBTC

14.30 – 14:40 **5G spectrum pricing, make or break the 5G momentum?**
**Stefan Zehle**, CEO, Coleago

14.40 – 15.20 **Panel Discussion and Questions**

15.20 – 16.00 **BREAK**

**Session 2: Managing spectrum in times of crisis – tools and techniques to keep societies connected**

The impact of the Covid-19 pandemic put a huge amount of pressure on communication networks all across the world. The imposed lockdowns and the resulting increase in home-working and use of web streaming and other services significantly increased broadband traffic, as and served to highlight the critical importance of connectivity for business continuity. This session will look at the work that was done by industry and regulators across Asia and the rest of the world to keep societies connected, and at how access to spectrum was managed to help with this.

- How did usage across networks rise during the crisis and what impact was seen for the various connectivity providers and stakeholders?
- What response to this was seen by regulators and industry representatives across different countries, and what spectrum management tools and techniques were utilised as part of this?
- What was learnt about the best ways to put under-utilised spectrum to use in times of crisis and the potential opportunities to rearrange access to it?
- Which approaches worked best, and which were less successful? What lessons can be taken from the communication sector's response to the crisis?
- Did emergency services ultimately have access to sufficient spectrum to facilitate their response to this global crisis? Was anything learnt about the best way to deliver the reliable, robust connectivity that is required?

Moderator: **Scott Minehane**, Managing Director, Windsor Place Consulting

16.00 – 17.00 **Fireside Chat**
**Ian Fogg**, VP Analysis OpenSignal
**Johan Smit,** Executive: International and Spectrum Regulations, Telkom
**Aarti Holla-Maini,** Secretary General, ESOA
**Maritza Delgado**, Program Officer, Environment and Emergency Telecommunications Division, ITU

17.00 – 17.45 **Showcase Session 1**
Stage 1: 5G licensing best practice and global case studies **(hosted by GSMA)**
Stage 2: Delivering the requirements of 5G with 6GHz **(hosted by Coleago Consulting)**
Stage 3: Spectrum monitoring of higher frequency ranges – challenges and solutions **(hosted by LS telcom)**

***'After hours' session***

**Session 3: Innovation and collaboration – Working together to deliver connectivity to the hardest to reach areas**

Delivering connectivity to 'hard to reach' areas is a major challenge for technology providers and policymakers across the region. In a bid to tackle this issue, satellite operators, MNOs and other key partners who may traditionally have been competitors are increasingly working closer together, collaborating on the development of innovative new projects and solutions. From the most remote, rural, outlying locations to ships and aircraft all over the globe, connectivity is being delivered to areas that it has never before been possible. But there is still a long way to go. This session will look at the work in this area that is being done, the progress that is being made and the challenges that still remain. Focussing on some of the successful projects that are emerging, it will look at how different technology providers can come together to overcome the barriers and continue to connect the hardest to reach areas.

- What tangible progress to narrowing the digital divide has been seen in Asia and across the world over the past few years?
- What innovative and collaborative approaches are being seen? How can new technologies be combined with forward thinking policies to deliver real and tangible progress?
- How are technology companies, connectivity providers and other key stakeholders collaborating to help deliver connectivity in rural areas?
- What work is being done to deliver ubiquitous connectivity on planes and ships and how are satellite operators working with others to achieve this?
- What are the spectrum requirements, and how can it be ensured that access to the necessary bandwidth is available?

Moderator: **Bharat Bhatia**, President, ITU-APT Foundation

19.30 – 21.00 **Presentations and Discussion** (10 minutes intro per speaker, followed by interactive discussion)
**U.K. Srivastava**, Principal Advisor, Telecom Regulatory Authority of India (TRAI)
**Agostinho Linhares**, Manager of Spectrum, Orbit and Broadcasting, ANATEL Brazil
**Jonathan Yap**, Senior Specialist, Group Regulatory Affairs, Axiata Group Berhad
**Ganendra Selvaraj**, Global Spectrum & Regulatory Policy, GSC

**DAY 2**

10.00 – 11.30 *Recap of 'After hours' session*

13:00 – 13:15 **Keynote Presentation**
**Mario Maniewicz,** Director, Radiocommunications Bureau, ITU

13:15 – 13:30 **Keynote Presentation**
**KJ Wee,** Chairman, APG19, APT

**Session 4: Next steps – implementation of WRC-19 decisions and looking ahead to WRC-23**

WRC-19 took place in Egypt at the end of 2019, delivering key decisions and directions on spectrum policy for the next four years and beyond. Now that the dust has settled, the general consensus from most stakeholders seems to be that overall a fair balance was reached. The next steps are now of

course for the outcomes and decisions to be implemented, both in APAC and other regions around the world. This session will look at the work that needs to be done to do this and ensure that the additional bandwidth for IMT is made available as quickly and efficiently as possible. And with attention already starting to switch to WRC-23, it will then move on to look at the key agenda and items expected to feature there.

- What new bands were identified for IMT at WRC-19 and what are now the next steps in order to ensure they are made available as quickly and efficiently as possible?
- With 5G set to be delivered through a mix of technology and a 'network-of-networks', to what extent will the decisions at WRC19 help to meet the future requirements of key technologies such as satellite (including ESIMs), WiFi and HAPS alongside those of mobile?
- Are there any lessons from WRC-19 that can be taken to improve the way in which WRC-23 and future conferences are co-ordinated?
- What are the key agenda items and bands to be discussed at WRC-23, and what are the next steps in the build-up to this?
- With much of WRC-19 focussing on 5G 'capacity' bands, what now needs to be done to ensure that sufficient spectrum is available to deliver 5G coverage?
- The 6GHz band is set to be one of the key topics for discussion in the lead-up to WRC-23. Where does the balance between licenced and licence-exempt use in this band?
- Will we still be talking about 'spectrum for 5G' when we reach 2023, or will the focus have switched to B5G or 6G?

Moderator: **Mario Maniewicz,** Director, Radiocommunications Bureau, ITU

13.30 – 14.40 **Presentations and Discussion** (10 minutes intro per speaker, followed by interactive discussion)
**Luciana Camargos,** Senior Director Future Spectrum, GSMA
**Xu Weizhong,** Chief Strategy Officer, Wireless Product Line, Huawei
**Tare Brisibe**, Global Spectrum & Regulatory Policy, Global Satellite Coalition
**Walid Sami**, Senior Project Manager, EBU

14.40 – 15.10 **Views from outside the region… (10 minutes per speaker)**
Following the earlier session on WRC-23, speakers responsible for WRC-23 preparation in other regions will give their thoughts on the discussion that has taken place.

14.40 – 15:10 **Presentations** (10 minutes per speaker)
**Tariq Al Awadhi**, Chairman, ASMG
**Chris Woolford,** Chairman, ECC, CEPT
**Sergey Pastukh,** Vice-Chairman, RCC WG RA/WRC

15.10 – 15.15 **The Final Word**
**KJ Wee,** Chairman, APG19, APT

15.15 – 15.45 **BREAK**

**Session 5: A focus on high frequencies – The emerging mmWave ecosystem**
mmWave spectrum is utilized or being considered for use by more and more different technologies. Discussions around some of these key frequencies were very prominent at WRC-19 – decisions were taken to identify additional spectrum for IMT in a large portion of the mmWave bands, and also to determine that Earth Stations in Motion (ESIM) are now a part of the FSS (Fixed Satellite Services) in

the 28/18 GHz bands. Against this backdrop and also taking into account the 'squeeze' on spectrum that is being seen by other technologies from 5G technologies and services beginning to roll out in portions of the bands around the world, this session will take the opportunity to look at the emerging mmWave ecosystem for IMT and other technologies in a little more detail, and discuss how the needs of all of these users in these frequencies can be met.

- How much mmWave spectrum was allocated for IMT at WRC-19 and what will this do to the future mmWave landscape? To what extent has this changed plans for IMT within mmWave bands both in Asia and elsewhere around the world?
- Which mmWave frequencies are emerging as the key bands for 5G, and how are these being used by stakeholders both in Asia and around the rest of the world?
- What is the deployment of satellite services in the mmWave bands and what is happening next? To what extent are the decisions made at WRC-19 likely to affect how these frequencies are used by the sector?
- What is the situation in the U.S., where the initial focus on 5G roll-out has been predominantly based around a small portion of mmWave frequencies? What early results are being seen and have these started to change any opinions on the potential that mmWave bands offer?
- What is the true demand for mmWave spectrum and by whom? Will the increasing availability of low- and mid-band spectrum (and with more in the pipeline for the near future) take the pressure off and mean there is less of a focus on mmWave for IMT?
- Does the approach that has been taken in the 26 GHz band strike the right balance between protecting satellite users and enabling the quick and efficient roll-out of 5G services?
- To what extent can the approach that is being seen in the 26 GHz band be transferred and used in other low-, mid- and high bands?

Moderator: **Hans-Martin Ihle**, Associate Director, NERA Economic Consulting

15:45 – 15:50 **Introduction from Moderator**
**Hans-Martin Ihle**, Associate Director, NERA Economic Consulting

15.50 – 17.15 **Presentations and Discussion** (10 minutes intro per speaker, followed by interactive discussion)
**Linda Yu**, Head of Regulatory Division, OFCA, Hong Kong
**Chris Hose**, Executive Manager, Spectrum Planning and Engineering, ACMA
**Tom Sullivan**, Chief, International Bureau, FCC
**Chris Murphy**, Associate General Counsel, Regulatory Affairs, Viasat
**Yiran Jin**, High Band Team Lead, GSA

17.15 – 18.00 **Showcase Session 2**
Stage 1: Private Wireless as key enabler for Enterprise digital transformation (**hosted by Nokia)**
Stage 2: Spectrum – the Answer to Asia-Pacific's Connectivity Questions? **(hosted by GSC-APSCC)**

**DAY 3**

13:00 – 13:20 **Thinking Point: AR/VR – unleashing the next 'Killer App'**
**Bruno Cendon-Martin**, Director of Wireless – AR\VR HW, Facebook

**Session 6: To what extent is co-existence of 5G and satellite services possible in the lower C-band?**

- To what extent is trouble free co-existence between mobile and satellite in the C-band possible?
- What approaches are being seen across Asia and the rest of the world to deliver this and release part of the band for mobile use?
- What factors should regulators be taking into account when looking to deliver this, and how can it be ensured that the needs of satellite and other incumbent users are looked after?
- What size guard band is necessary to ensure protection against interference? What other technological and regulatory solutions can also help facilitate trouble free co-existence?
- How can neighbouring countries work together to ensure that appropriate cross-border agreements are in place to protect border regions when different timings for the reallocation of spectrum are seen?
- How close are we to achieving globally harmonised spectrum allocations for 5G in the C-band, and what benefits could this bring if it was delivered?

Moderator: **Richard Womersley,** Director, Spectrum Consulting, LS Telecom

13:20 – 13:25 **Introduction from moderator**
**Richard Womersley,** Director, Spectrum Consulting, LS Telecom

13.25 – 14.45 **Presentations and Discussion** (10 minutes intro per speaker, followed by interactive discussion)
**Bui Ha Long,** Deputy Director of Radio Frequency Policy and Planning Division, ARFM
**Khoirul Anwar**, Director, Research Centre for Advanced Wireless Technologies of Telcom University
**Siti Hajar**, Specialist, Spectrum Policy, Axiata
**Mohaned Juwad**, Senior Manager, Spectrum Policy, Intelsat

14.45 - 15.00 **Speed Networking Session**

15.00 – 15.30 **BREAK – Opportunity for partner and bilateral meetings**

**Session 7: 2.3GHz, 2.6GHz and beyond – exploring the wider mid-band ecosystem**
All around the world, regulators are looking for options to open up additional mid-band spectrum for IMT (both 4G and 5G), beyond the C-band. The 2.6GHz band is one band that is being considered in the APAC region – it has good propagation characteristics and in addition has already been awarded to China Mobile, guaranteeing a hardware ecosystem. This session will look at case studies from countries in Asia and elsewhere, as well as examining the 2.3GHz, the 4.4-5GHz and other options that are being explored to provide alterative options for IMT services, both in APAC and around the world.

- What are the most realistic options to provide the required mid-band spectrum for IMT both in the APAC region and around the rest of the world?
- Beyond the C-band, how much additional mid-band spectrum is actually needed in order to both extend the development of 4G with wide bandwidth, and provide available spectrum for early 5G implementation?
- To what extent can other bands such as the 2.3GHz, 2.6GHz and 4.4-5GHz bands offer an option?
- What are the relative pros and cons of making spectrum in the 2.6GHz bands available on a paired (FDD) or an unpaired (TDD) basis? What is the situation across the region with countries favouring each respective approach?
- How advanced is the development of the ecosystem across the mid-band frequencies, and what national plans are being seen across Asia?
- What other users are present in these key bands, and how can it be ensured that the needs of all stakeholders are met?

Moderator: **Aamir Riaz**, Programme Officer, ITU

15.30 – 15.40 **National Case Study: Finding the required spectrum in Bangladesh**
**Shahidul Alam**, Director General, Spectrum Division, Bangladesh Telecommunications Regulatory Commission

15.40 – 15.50 **National Case Study: Finding the required spectrum in China**
**Liu Guangyi**, Chief Technical Officer, Wireless Department, China Mobile Research Institute

15.50 – 16.00 **National Case Study: Finding the required spectrum in Saudi Arabia**
**Mohammad Aljnoobi,** Director, Frequency Allocation and Regulation, CITC, Saudi Arabia

16.00 – 16.10 **National Case Study: Finding the required spectrum in UK and Europe**
**Chris Woolford**, Director of International Spectrum Policy, Ofcom

16.10 – 16.40 **Panel Discussion**

16.45 – 17.30 **Showcase Session 3**
Stage 1: MW & mmW spectrum for 5G wireless backhaul **(hosted by ETSI)**
Stage 2: 5G is ON **(hosted by Huawei)**
Stage 3: Modernizing spectrum and telecommunications management **(hosted by Access Partnership)**

***'After hours' session***

**Session 8: Meeting the connectivity requirements of vertical industries**
A major focus area for regulators all around the world at present is on the best way to provide vertical industry users with access to 5G spectrum. A number of different licencing models are being explored by regulators around the world in order to deliver this, including the option to offer vertical users the opportunity to acquire spectrum directly, through localised 5G licences. This session will explore the pros and cons of the various approaches that are being seen and discuss the best way forward to ensure an efficient and flexible spectrum framework that satisfies the many varied 5G and vertical use cases.

- What examples of 5G commercial use cases are being seen across the region and how are their connectivity requirements being met?
- What approaches are available to regulators looking to provide vertical users with access to the required spectrum?
- What spectrum has been identified for vertical industries and in which bands?
- What are the benefits in providing access to spectrum directly to vertical users as opposed to the traditional method of using networks provided by traditional MNOs? What new challenges are raised?
- How are vertical sectors planning to use any spectrum that they are granted access to and what business models are being developed?
- What spectrum bands are being considered, and to what extent can vertical users demonstrate sufficient value to society to justify access to sometimes hugely valuable spectrum in this way?

**Moderator: Colin Thomson**, Head of Practice, Infrastructure, Access Partnership

19:25 – 19:30 **Introductory Presentation**
**Colin Thomson**, Head of Practice, Infrastructure, Access Partnership

19:30 – 19:45 **Introductory Presentation**
**Shingo Uni**, Deputy Director, Land Mobile Communications Division, Radio Department, Telecommunications Bureau, MIC Japan

19.45 – 21.00 **Presentations and Discussion** (10 minutes intro per speaker, followed by interactive discussion)
**Raymond Qiao,** Head of Industry Collaboration, Ericsson
**Reza Arefi**, Director of Emerging Spectrum Strategies, Intel
**Dennis Wong**, Senior Vice President of Emerging Technologies, Commercial Group, HKT
**Heidi Himmanen,** Chief Specialist, Finnish Transport and Communications Agency, Traficom

**DAY 4**

10.00 – 11.30 *Recap of 'After hours' session*

**Session 9: A focus on low frequencies – the emerging shape of spectrum usage in the sub-1 GHz band**

Over the last 12 months, a number of countries across the APAC region have made some significant progress in assigning the 700MHz band – countries such as China, India, Malaysia, Thailand and Vietnam, have all now either re-allocated spectrum in the band to mobile or have plans to do so in 2020. When making the spectrum available, each country faces a number of decisions on how exactly to do this. This session will look at some of these questions in more detail, as well as more generally looking at the overall state of play of the spectrum landscape below 1-GHz band and the shape of the bandplan that is emerging and the various users in it.

- What is the current state of play with regards to the re-assignment of the 700MHz band across the region, and where can we expect to be by the end of 2020?
- What are the relative pros and cons of making the frequencies available on a paired (FDD) or an unpaired (TDD) basis?

- Should regulators be looking at making the spectrum in the band initially available for 4G and then transition to 5G at a later stage, or is there an argument to allocate it for 5G use straight away?
- When working on the digital switchover, should countries be solely considering the 700MHz band, or also looking at including the use of 600MHz for mobile broadband in their spectrum roadmaps?
- How are the emergence of new digital broadcasting standards shaping the future of the broadcast sector and its spectrum requirements? How can these be incorporated into the long-term UHF bandplan?

Moderator: **Makram Chehayeb**, Manger, Aetha Consulting

13.00 – 14.15 **Presentations and Discussion** (10 minutes intro per speaker, followed by interactive discussion)
**C. Mani Chaulagain,** Member of the Board (Technical), Nepal Telecommunications Authority
**Kai Sahala**, Head of 5G, Asia-Pacific, Japan, Nokia
**Andreas Wilzeck,** Head of Spectrum and Innovation, Sennheiser
**Cristian Gomez,** Director, Spectrum Policy and Regulatory Affairs, Asia-Pacific, GSMA
**Amal Punchihewa**, Advisor and Consultant, Asia-Pacific Institute for Broadcasting

14.15 – 15.00 **Showcase Session 4**
Stage 1: Industry Transformation Powered by 5G **(hosted by Ericsson)**
Stage 2: Care, Connectivity and Recovery in the Era of COVID **(hosted by Viasat)**

15.00 – 16.00 **BREAK – Opportunity for partner and bilateral meetings**

**Session 10: Planning Ahead – A focus on national roadmaps for 5G and the connected world**
Across the region, countries are putting into place their national plans and roadmaps for 5G development. This session will take the opportunity to hear case studies from representatives of some of these on their plans and preparations for 5G and the connected world of the future.

- What examples of spectrum roadmaps are being seen across the region?
- How important are these in encouraging investment in next generation networks and new technologies?
- To what extent are we seeing co-ordination across the region on both timing and bandplans, especially in neighbouring countries?
- How can regulators plan ahead to ensure that they are not left behind when it comes to 5G rollout?

Moderator: **Christopher Martin,** Head of Region, Asia & US Access Partnership

16.00 – 16.10 **Presentation: IMT2020 (5G) Policy, Regulatory & Spectrum considerations**
**Aamir Riaz**, Programme Officer, ITU

16:10 – 16:20 **Presentation**
**Bernard Barani**, Deputy Head of Unit, Future Connectivity Systems, European Commission

16.20 – 16.30 **Country Case Study: Myanmar national roadmap plans**
**Seint Seint Aye**, Director, Posts and Telecommunications Department, Ministry of Transport and Communications, Myanmar

16.30 – 16.40 **Country Case Study: Indonesia national roadmap plans**
**Denny Setiawan**, Director of Spectrum Policy and Planning, Ministry of Communications and Informatics, Indonesia

16.40 – 17.00 **Q&A and Discussion**

17:00 – 17:10 **Closing Remarks**
**Atsuko Okuda,** Regional Director, Asia and the Pacific, ITU

17.10 – 18.00 **HAVE YOUR SAY… Conference conclusions and key takeaways**
Opportunity for all stakeholders to bring their audio and video feed live to give the key conclusions, thoughts and takeaways from the conference