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## Agenda

### Wednesday 5 February, 2020

### Morning

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| **09:30 – 11:35** | **Session 1: Setting the scene** |
| 09:30 – 09:40 | Welcome and Introductions<br>Nigel Jefferies , Chairman, WWRF |
| 09:40 – 09:55 | Keynote - A Global Industry Perspective<br>Ashwani Kumar , Vice-President, Standards and Industry, Huawei |
| 09:55 – 10:10 | Special Address<br>Pamela Kumar , Director General, TSDSI (Telecom Standards Development Society of India) |
| 10:10 – 10:30 | Inaugural Address<br>Shri Anshu Prakash * , Secretary, Telecom & Chairman, Department of Telecommunications , Government of India |
| 10:30 – 10:35 | Vote of Thanks<br>Bharat Bhatia , President, ITU-APT Foundation of India |
| 10:35 – 11:35 | High-Level Roundtable Discussion – 5G Deployment: state of play and early lessons from around the world<br>A high-level discussion that will look at the state of play in 5G deployment in different regions and countries arounds the world, and early lessons and challenges that have been seen. By sharing real-world insights and experience from the deployment of 5G networks, experts will address how these early implementations are going, and look at the path ahead as the brave new world of 5G starts to emerge.<br><br>Speakers to include: Tonnie de Koster , Adviser for Digital Single Market International Outreach, European Commission, DG CNECT<br>Sudhir Dixit , Vice Chair Americas, WWRF and Co-Founder, Basic Internet Foundation Oslo<br>Andreas Sommer , Team Leader and Senor Technical Advisor , Project "India-EU Cooperation on ICT-Related Standardisation, Policy and Legislation"<br><br>Moderator: Bharat Bhatia , President, ITU-APT Foundation of India |
| **11:35 – 11:50** | **Morning Coffee and Refreshments** |
| **11:50 – 13:00** | **Session 2: WRC19 – delivering the required spectrum to power the 5G future?**<br>This session will offer the opportunity to look in detail at the outcomes of WRC, and at what these mean for the future of 5G and ensuring that the required connectivity for mobile and other technologies can be met.<br>- What were the decisions at WRC on the key spectrum bands for 5G?<br>- Following these decisions and outcomes, to what extent is the required spectrum now in place to power the 5G future?<br>- 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, WiFi and HAPS alongside those of mobile?<br>- What are the key candidate bands for 5G that are now set to be considered at WRC-23, and what are the next steps in the build up to this? |

Moderator: Yi Shen Chan , Director, Plum Consulting

11:50 – 12:05 Opening Presentation
Bharat Bhatia , President, ITU-APT Foundation of India

12:05 – 13:00 Panel Discussion
Bharat Bhatia , President, ITU-APT Foundation of India
MPS Alawa , Sr. Deputy Wireless Advisor to the Government of India, Department of Telecommunications
Rajesh Mehrotra , Global Spectrum Policy, ESOA
Rajan Mathews , Director General, Cellular Operators Association of India

## Afternoon

**13:00 – 13:45 Lunch**

**13:45 – 15:10 Session 3: Meeting the Regulatory & Cyber-Security Challenges of 5G - Securing the long-term 5G future**
As well as offering huge potential benefits, the emergence of 5G also offers a number of challenges – not least in the area of security, where it is expected to significantly alter the cyber threat landscape that is seen today. Governments, regulators and industry stakeholders are working together in response to this, in order to deliver a co-ordinated and future-proof approach to ensure the security of 5G networks. This session will look at the work that is being done, and the best way forward to deliver secure and robust 5G networks for all.

- How is 5G changing the security landscape, and what is being done to tackle the new security challenges? - How are Governments and industry working to stay one step ahead of the hackers and ensure that a 5G architecture is developed that delivers long-term end-to-end security and resilience? - How can some of the international security concerns that have been raised be addressed by network providers, and how can wide-spread trust and confidence in the security of 5G networks be ensured?

Moderator: Hendrik Berndt , Vice President for Europe, Middle East, Africa, WWRF

13:45 – 14:00 Opening Presentation
Samiran Gupta , Head of India, ICANN

14:00 – 15:10 Panel Discussion
Samant Khajuria , Senior Specialist Cybersecurity, Terma A/S
Debabrata Nayak , CSO, Huawei Telecommunication India
Narendra Nath , Joint Secretary, National Informatics Center, Government of India
P Balaji , Chief Regulatory and Corporate Affairs Officer, Vodafone Idea
Samiran Gupta , Head of India, ICANN
Andreas Sommer , Team Leader and Senor Technical Advisor , Project “India-EU Cooperation on ICT-Related Standardisation, Policy and Legislation”

15:10 – 15:30 Afternoon Coffee and Refreshments

**15:30 – 17:35 Session 4: Evolving 5G business models – Delivering a long-term and sustainable future for 5G**
The shift to 5G involves significant investment and capital expenditure in areas such as R&D, spectrum licence acquisition and infrastructure. A major challenge for mobile operators and other connectivity service provides (CSPs) is to develop sustainable 5G business model that allow them to start recoupling some of these investments. This session will look at the impact that the emergence of 5G is likely to have on current business strategies, and the extent to which there is an understanding of the business models that will likely underpin the long-term future of 5G.

- How is 5G already changing business models for mobile operators and connectivity providers, and to what extent are long-term, sustainable 5G business models starting to emerge?
- Which of the three proposed application scenarios for 5G (enhanced mobile broadband; massive machine-type communication; and ultra-reliable, low-latency, communication) is likely to deliver the most compelling business cases going forward?
- How are mobile operators and other connectivity providers ultimately going to make money from 5G and start to recoup the huge investments that have been made?
- What are the estimated costs of full roll-out of 5G networks in countries arounds the world, and how are these being funded?
- What impact can high roll-out costs have on the feasibility of business models, the longer-term development of 5G, and the overall service offering to consumers?

Moderator: Simon Fletcher , CTO, Real Wireless

15:30 – 15:45 Opening Presentation
Adrian Scrase , CTO, ETSI; and Head of Mobile Competence Centre, 3GPP

15:45 – 17:00 Panel Discussion
Adrian Scrase , CTO, ETSI; and Head of Mobile Competence Centre, 3GPP
Shri Kishore Babu , Deputy Director General, Department of Telecommunications, Government of India

Thursday 6 February, 2020

09:30 – 09:40 Opening and Welcome Remarks
T.R. Dua , Chairman, ITU-APT Foundation of India

09:40 – 09:55 Keynote Presentation
Sameer Sharma , Regional Director a.i. ITU Regional Office Asia-Pacific, Bangkok , ITU

09:55 – 10:10 Special Address
Ravi Gandhi , Former Chief Regulatory Officer, Airtel

10:10 – 10:20 Opening Address
Subodh Kumar Gupta , Member Technology, Department of Telecommunications

10:20 – 10:30 Inaugural Address
Shri Dhotre Sanjay Shamrao * , Minister of State for Communications, Electronics & Information Technology and Human Resources, Government of India

10:30 – 10:35 Vote of Thanks
Bharat Bhatia , President, ITU-APT Foundation of India

## Morning

**10:35 – 10:50** **Morning Coffee and Refreshments**

**10:50 – 13:05** **Session 5: Gearing Up for 5G in India – A focus on national issues**

**10:50 – 12:05** **Session 5.1: Spectrum Pricing & Management for 5G in India**
The National Digital Communications Policy 2018 recognised spectrum as "a key natural resource for public benefit to achieve India's socio-economic goals" and advised "optimal pricing of spectrum." Spectrum is a major component of cost of network roll out. Many countries have already auctioned spectrum for 5G, while the pricing mechanism varies across regions. This subject has always been a matter of debate in India as well. This session will provide global and Indian perspectives to explore best practices in developing pricing and licensing models for 5G.

Moderator: Bharat Bhatia , President, ITU-APT Foundation of India

10:50 – 11:05 Setting the Scene - A global perspective on 5G spectrum pricing
Yi Shen Chan , Director, Plum Consulting

11:05 – 11:20 National perspective on 5G spectrum pricing in India
P.K. Sinha , Member (Finance), Department of Telecommunications

11:20 – 12:10 Panel Discussion
Parag Kar , Vice President, Government Affairs, India and South Asia, Qualcomm
Vikram Tiwathia , Deputy Director General, Cellular Operators Association of India
Yi Shen Chan , Director, Plum Consulting
Rajat Mukarji , Director General, BIF
Rajeev Prakash , Deputy Director General, Department of Telecommunications

## Afternoon

**12:05 – 13:05** **Session 5.2: Role of Indian Academia, Research & Standards bodies in driving Innovation in 5G**
5G technology is poised to bring in new use cases across industry verticals. India is pushing for indigenous approach in bringing standards to enable relevant use cases for 5G adoption. The Panel will discuss 5G use cases as well as those of Emerging Technologies and how they can help augment the operators revenues with delivery of affordable, innovative and future ready services such as AI & VR and their applications across verticals. Pamela Kumar , Director General, TSDSI (Telecom Standards Development Society of India)

12:05 – 12:15 Setting the Context - Role of Indian Academia, Research and Standards bodies in driving innovation in 5G
Shri Kishore Babu , Deputy Director General, Department of Telecommunications, Government of India

12:15 – 13:15 Panel Discussion
Speakers to include: Kiran Kuchi , Founder and CEO, WiSig Networks
Preetham Uthaiah , EVP Marketing & Strategy, Saankhya Labs
Shri Kishore Babu , Deputy Director General, Department of Telecommunications, Government of India
Brejesh Lal , NCC co-ordinator, IIT Delhi

**13:05 – 14:00** **Lunch**

**14:00 – 17:15** **Session 6: Driving digital and socio-economic transformation: Working together to deliver the benefits of 5G to all areas of society**

If harnessed correctly, 5G has the potential to positively impact all areas of society and truly deliver digital transformation. This morning's sessions will look at some of the different areas and use cases that 5G can impact across rural and urban environments, and in both developed and developing countries.

**14:00 – 15:20** **Session 6.1: Driving digital transformation in urban environments**

5G is already starting to transform cities all around the globe, and improving environmental, social and economic aspects of urban life. Underpinned by the increased speed, reliability and capacity offered by 5G networks, 'smart cities' are becoming a reality. This session will look at some of the innovative new use cases that are emerging for both businesses and consumers, as well as at the challenges that lay ahead to ensure that the potential of 5G in urban areas is truly achieved.

- What new services and use cases can be enabled by 5G in cities and urban areas, and what impact are these already starting to have on communities and societies?
- What lesson have been learnt from field trials and test beds of 5G in urban areas that can be transferred to a real-world situation?
- What will be the best way to deliver the densification of networks that will be necessary to provide the required network connectivity in urban areas and how can regulators work to deliver a licencing regime that conducive to easy roll-out of small-cells and 5G more generally?
- As the volume of data increases, which areas in future end-to-end 5G networks offer the greatest risk of becoming potential 'bottlenecks', and how can network operators plan now to avoid these appearing?
- With approximately 70% of 5G use cases in urban areas expected to occur indoors, how can it be ensured that the required connectivity is delivered inside building as well as on the streets in urban areas?

Moderator: Debashish Bhattacharya , Dy. Director General, BIF

14:00 – 14:10 Case Study: 5G & Smart Cities
Sushil Kumar , DDG, TEC

14:10 – 14:20 Case Study: 5G & Intelligent Transport & Logistics
Seshadri Mohan , Professor, UA Little Rock

14:20 – 15:20 Panel Discussion
Seshadri Mohan , Professor, UA Little Rock
Benoit Sauveroche , First Counsellor, Delegation of the European Union to India and Bhutan
Narang Kishor , Mentor & Principal Design Architect, Narnix Technolabs
Sushil Kumar , DDG, TEC

**15:20 – 15:40** **Afternoon Coffee and Refreshments**

**15:40 – 17:25** **Session 6.2: Not just for the digital 'haves' – the role of 5G in tackling the digital divide**

If harnessed in the right way, 5G has the potential to help transform the lives of citizens in rural areas and developing regions as well as in cities and urban hubs. For this to happen, there is a need to think creatively when developing connectivity technologies and solutions, and to ensure that the connectivity requirements of individual regions and communities are fully understood. This session will start by looking at the challenges and opportunities that 5G offers for rural communities, and the approach that needs to be taken to ensure that 5G helps to narrow rather than widen the digital divide. It will then go on to examine the potential that 5G can offer if harnessed in the right way, and examine some specific casde studies in the areas of healthcare, agriculture and mobile money.

- How do the requirements of 5G differ in rural areas from those in large cities, and how can it be ensured that the connectivity provided to communities and regions meets their specific requirements?
- How can it be ensured that the network and infrastructure is in place to enable 5G to close rather than widen the digital divide?
- What innovative solutions to deliver rural connectivity are already being seen in different regions around the world?
- What new services and use cases can be enabled by 5G in rural areas, and what difference can this make to the lives of communities and societies in these areas?
- What mix of different technologies will be required to deliver 5G to rural areas, and how are technology companies, connectivity providers and other key stakeholders working together to achieve this?

Moderator: Adrian Scrase , CTO, ETSI; and Head of Mobile Competence Centre,, 3GPP

**15:40 – 16:10** **Part 1: Innovating to deliver rural connectivity - Global Initiatives and Projects**

A look at some of the ways in which stakeholders are coming together to deliver rural connectivity.

15:40 – 15:50 Frugal 5G Networks - Addressing the challenges of rural broadband connectivity
Pranav Jha , Senior Research Scientist, IIT Bombay

15:50 – 16:00 Innovations in rural connectivity, smart cities and M2M
Shri Vipin Tyagi , Executive Director, C-DOT

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| 16:00 – 16:10 | Sudhir Dixit , Vice Chair Americas, WWRF and Co-Founder, Basic Internet Foundation Oslo |
| **16:10 – 17:25** | **Part 2 Case Studies – Revealing the potential of 5G in rural areas** |
| 16:10 – 16:20 | Case Study: 5G use case in Healthcare<br>We have heard about some of the creative ways in which 5G is being brought to rural communities. Now we will examine the potential that exists once the connectivity is provided, and the ways in which it is already starting to make a difference to the lives of citizens and communities. Zainul Charbiwala , Co-Founder and CTO, Tricog Health |
| 16:20 – 16:30 | Case Study: 5G use case in Agriculture<br>Vivek Singh , Deputy CEO & CTO, SkyMet Weather Services |
| 16:30 – 16:40 | Case Study: Digital payment and Mobile Money<br>Knud Erik Skouby , Professor, Department of Electronic Systems, Aalborg University |
| 16:40 – 17:10 | Panel Discussion<br>Knud Erik Skouby , Professor, Department of Electronic Systems, Aalborg University<br>Zainul Charbiwala , Co-Founder and CTO, Tricog Health<br>Vivek Singh , Deputy CEO & CTO, SkyMet Weather Services<br>Sudhir Dixit , Vice Chair Americas, WWRF and Co-Founder, Basic Internet Foundation Oslo<br>Pranav Jha , Senior Research Scientist, IIT Bombay<br>Shri Vipin Tyagi , Executive Director, C-DOT |
| 17:10 – 17:25 | What's ahead? Looking beyond 5G<br>- What will come after 5G: B5G or 6G? What is the likely timeframe to B5G/6G trials and rollout?<br>- What will the world look like beyond 5G? What will B5G or 6G bring that 5G has not? Sudhir Dixit , Vice Chair Americas, WWRF and Co-Founder, Basic Internet Foundation Oslo |
| **17:25 – 17:45** | **Wrap Up and Conclusions**<br>Nigel Jefferies , Chairman, WWRF<br>Bharat Bhatia , President, ITU-APT Foundation of India<br>Pamela Kumar , Director General, TSDSI<br>Debashish Bhattacharya , Dy. Director General, BIF |