

The European 5G Conference 2022

25th & 26th January

09.00 – 09.10 **Welcome and Introductions**

09.10 – 09.30 **Keynote Presentation**

Pearse O'Donohue, Director, Future Networks, DG CONNECT, European Commission

09.30 – 10.35 **Session 1: The path to the Digital Decade – accelerating 5G rollout across Europe**

As part of her annual State of the Union speech last autumn, European Commission president Ursula von der Leyen announced the upcoming governance framework, “Path to the Digital Decade”. This represented a shift from the targets and voluntary measures that have been the focus of previous plans towards more concrete measures and policies. Part of the framework was focused specifically around 5G and included the requirement for member states to develop a multi-year trajectory, outlining steps they have taken and policies they are planning to achieve the target of delivering 5G coverage for all populated areas in Europe by 2030. With a number of countries failing to meet previous deadlines relating to 5G rollout and release of spectrum, this session will look at the extent to which this new framework can address that.

- What new concrete measures and policies relating to 5G were announced as part of the ‘Path to the Digital Decade’ framework?
- To what extent can these new measures help to get 5G rollout across Europe back on track, and to meet the key 2030 targets?
- Do they strike the correct balance between the delivery of more binding policies whilst avoiding unnecessary bureaucracy?
- To what extent will the proposals included in the framework of potential multi-country initiatives help facilitate EU countries joining forces to make it easier for them to raise funding from existing EU programmes and private investors?
- What are the next steps with regards to getting agreement from the European Parliament and member states, and what is the expected timeline ahead?

Moderator: **Georg Serentschy**, Senior Advisor, Squire Patton Boggs (US) LLP

Panellists:

Rita Wezenbeek, Director, Connectivity, DG CONNECT, European Commission

Annemarie Sipkes, Chair, BEREC; Director of the Telecommunications, Transport and Postal Services Department at the Netherlands Authority for Consumers and Markets (ACM)

Aarti Holla-Maini, Secretary General, GSOA

Maarit Palovirta, Senior Director of Regulatory Affairs, ETNO

Jean-Pierre Faisan, Chair, Communications Working Group, European Wireless Infrastructure Association (EWIA)

10.35 – 10.50 **Refreshments**

10.50 – 11.55 **Session 2: Public Funding of 5G Deployment – encouraging co-operation across member states as a path to growth and recovery**

Investment in 5G features heavily in the Recovery and Resilience Facility (RRF) - the largest component of Next Generation EU, the EU’s landmark instrument for post-pandemic recovery. This signifies a significant paradigm shift in public financing for the sector – never before has so much public investment been available to help drive forward the development of network infrastructures in Europe and boost 5G network rollout. A specific objective for funding has been on multi country

projects (MCPs) and the creation of cross-border initiatives that bring together the expertise of several member states to deliver large-scale projects that no single Member State could develop on its own. This session will look at the specific areas that are being targeted with this funding, including plans for deployment of '5G corridors' – networks along major transport paths to enable advanced Connected and Automated Mobility (CAM) services. It will look at examples of large-scale MCPs that are starting to emerge, and at the work that is being done by the Commission to support and encourage Member States to use funding from their national recovery and resilience plans to join forces and support these initiatives.

- What public funding is being made available to facilitate innovative and forward-looking 5G related projects, and how can this help to ultimately stimulate private investment in these areas?
- What work is specifically being done by the Commission to support and encourage the development of multi country projects and cross-border initiatives?
- What requirements will projects need to meet in order to access the available funding?
- How are the European Commission working together with the automotive, road and rail sectors to harness the power of 5G in order to meet targets that have been set for pan-European 5G Corridors for Connected and Automated Mobility (CAM)?
- What examples of MCPs in this area have been seen and what co-operation models are emerging?

Moderator: **Elisabetta Cafforio**, Principal, Arthur D Little

Panellists:

Eric Gaudillat, Head of Sector, 5G Investment, DG CONNECT, European Commission

Ralf Capito, Director External Affairs, Vantage Towers

Alberto Di Felice, Director for Infrastructure, Privacy & Security Policy, DIGITALEUROPE

Lenka Solcova, Project Co-ordinator, 5G Corridor Munich - Prague

11.55 – 13.00 **Session 3: 5G Equipment ecosystems – the continued evolution of the 5G supply market**

Europe is home to 2 of the 3 major equipment suppliers and is a world leader in investment in 5G trials and pilots. Despite these facts however, the overall investment that is being seen in 5G infrastructure is lagging behind other regions and many vertical sectors are slow to identify 5G business cases and embrace the new possibilities that it can bring. This session will look at what can be done to address these issues, and more broadly at the key trends that are influencing the future development of 5G ecosystems. A particular focus will be given to the emergence of OpenRAN and other associated initiatives such as network virtualisation. To what extent are these likely to be a 'game changer' for the future development of 5G, and what could this mean for European players?

- What factors are contributing to the low level of investment in 5G infrastructure that is being seen across some member states?
- How can Europe address these and ensure that it is taking advantage of its position of strength in the networks Equipment market for 5G?
- What examples of networks based on Open RAN platforms are starting to emerge in Europe?
- How disruptive are Open RAN and other associated initiatives such as network virtualisation set to be for the 5G supply chain in Europe?
- What might this mean for the development of 5G in Europe in both the short term and long term? What advantages could it bring and what challenges exist?
- To what extent is it important that a harmonised approach to the development of the 5G ecosystem is achieved, both in Europe and globally?
- Is there a risk that the emergence of OpenRAN and virtualRAN risks moving the network equipment market from a European strength (Ericsson/Nokia etc) into an American strength?

(software companies running their solutions on hardware provided by the big cloud providers e.g. Google, Amazon Web Services)? How can this be avoided?

Moderator: **Janette Stewart**, Partner, Analysys Mason

Panellists:

Peter Stuckmann, Head of Unit, Future Networks, DG CONNECT, European Commission

Bo Andersson, PTS; Co-Chair, BEREC Working Group on Wireless Network Evolution

David Bachmann, Co-President, European Association of Next Generation Telecommunications Innovators (EANGTI) & CEO, ng-voice GmbH

Olivier Simon, Director of Radio Innovation, Orange

13.00 – 13.45 **Lunch**

13.45 – 15.00 **Session 4: Cyber Security – Working together to secure European and Global 5G networks**

The last 12 months have seen a continuation of efforts from European policymakers to deliver a common European approach to the cybersecurity of 5G networks. Following the launch of the EU 5G toolbox in 2020, a new cyber certification scheme for 5G has been proposed in an effort to coordinate standards and efforts for 5G security across member states. This session will take stock of the various initiatives and programmes launched in Europe in recent years to bolster cybersecurity and to counter the vastly expanded threat landscape resulting from the roll out of 5G. It will look at how Europe is striving to maintain its global leadership position on cybersecurity, and at work that is being done with partners on an international level to secure the global supply chain.

- What progress, successes and possible shortcomings have been seen with regards to the implementation of the EU 5G Toolbox across member states?
- How is Europe working with other regions to ensure the security of the complex global 5G supply chain?
- To what extent will the proposed EU-wide cybersecurity certification scheme on 5G, in combination with measures identified in the EU 5G Toolbox, be enough to guarantee the robustness and resilience of 5G and future generations and ensure Europe's cybersecurity leadership position?
- How can this also help to build consumer confidence in 5G security?
- How can emerging technologies such as AI and blockchain be harnessed to help secure the 5G supply chain?
- Following the work that is being done on the EU Mega Constellation, what role can satellites play in deliver secure connectivity for 5G and future networks?

Moderator: **Lorenzo Pupillo**, Associate Senior Research Fellow, CEPS & Head of the Cybersecurity, CEPS Initiative

Panellists:

Andreas Mitrakas, Head of Market Certification and Standardisation Unit, European Union Agency for Cybersecurity (ENISA)

Bart Groothuis MEP, Rapporteur on Europe's cyber security directive, NIS, European Parliament

Mikko Karikyö, Chief Product Security Officer & Head of Product Security, Ericsson

Robert Mazzolin, Chief Technology Strategist, Rhea Group

Annemie Turtelboom, Member responsible for special report on 5G security, The European Court of Auditors

Lorena Boix Alonso, Director, Digital Society, Trust and Cybersecurity, DG CONNECT, European Commission

15.00 – 15.20 **Afternoon Break**

15.20 – 15.40 **Thinking Point: Experiences in deploying 5G Standalone networks in China**

Deployment of 5G standalone has to date in Europe been a little slower than expected. This thinking point will explore the situation regarding rollout of 5G standalone in China, one of few places in the world who have deployed 5G standalone networks to date. What have their experiences been, and what results have been seen?

Wang Zhiqin, Chair, IMT-2020 (5G) Promotion Group of China; and Vice President, China Academy of Information and Communications Technology (CAICT)

15.40 – 16.50 **Session 5: Beyond 5G - The journey towards a sustainable 6G**

5G network rollout are in full swing with in Europe and elsewhere around the world. As we have just seen however, initial network deployments do not use all the capabilities currently defined for 5G. Building on the last session which explored the next step in the 5G journey of 5G standalone, this session will now take things one step further and explore the path towards 6G. It will look at the early expectations and visions for 6G and how it will differ from 5G; as well as the work that is being done to define technical requirements and standards. It will also look at the potential that 6G has to help to contribute to key policy goals and targets around sustainability, and the work that needs to be done to deliver on this.

- How will 6G differ from 5G?
- Should 6G be considered as an evolution of 5G or should we be looking to take a ‘clean slate approach’?
- What were the initial visions and ambitions for 5G, and how many of these may actually remain pipedreams until 6G comes around?
- What is the path to 6G going to look like, and what early work is already being done to shape this?
- What are early expectations and visions and how realistic are these?
- What potential technology trends are likely to play a part in shaping 6G, and how can Europe ensure that it is in a position to take advantage of the benefits offered by these future technologies?
- How can Europe make the most of competitive advantages that it has in areas such as edge computing and cybersecurity to ensure that we do not miss out as this new wave of technologies starts to emerge?
- How important is a co-ordinated European approach in order to deliver this?
- How can 6G help to provide a new approach to delivering sustainability and tackling the UN sustainable development goals?

Moderator: **Matti Latva-aho**, 6G Flagship Director, University of Oulu

Panellists:

Cristina Data, Director of Spectrum Policy and Analysis, Ofcom

Bernard Barani, Deputy Head of Unit, Future Connectivity Systems, DG CONNECT, European Commission

Volker Ziegler, 6G Leadership, Chief Architect, Nokia Bell Labs

Dr Wen Tong, CTO, Wireless Network, Huawei

Nicolas Chuberre, Solution Line Manager, Thales Alenia Space

DAY 2

09.00 – 10.10 **Session 6: Powering the enterprises of the future – what is the best approach to meet vertical connectivity needs and how can this be delivered?**

Across Europe and elsewhere around the world, regulators are putting plans in place to deliver the required connectivity to vertical industries in order to enable them to take advantage the benefits of 5G. Significant divergence in is being seen across Europe, with a number of different models being brought in to allocate spectrum directly to vertical users rather than to mobile operators. This session will explore the impact that these divergent approaches that are being seen might have, and at whether there is a need to look at intervention at a European level to deliver a more co-ordinated approach. Furthermore, it will explore the extent to which this apparent trend towards the use of regulatory intervention to meet the connectivity needs of vertical sectors is necessary. For example, Telenor and Telia were awarded licences in a recent Danish auction, that came with an obligation to make spectrum available for private networks; whilst two other operators, TDC and Three, are both deploying private 5G networks in the country on purely commercial terms. Where is the balance between the use of regulatory intervention and market forces to deliver the required vertical connectivity for 5G?

- Are there advantages to the divergence in approaches to deliver vertical connectivity that is being seen across member states (for example in fostering experimentation and innovation), or will this in the long-term hamper economies of scale and constrain scope for private networks in some jurisdictions?
- Is there a need for a more co-ordinated approach in Europe and to what extent is this possible?
- To what extent is there a need for intervention at a European level to encourage this to happen?
- What form could this intervention take and where does the balance lie between coordinating approaches and making allowances for national differences across member states?
- What spectrum bands are most suited for local use and possible development of private networks?
- What work is being done at a European level to study the use of the 3.8GHz – 4.2GHz band to provide a solution to deliver localised broadband connectivity, and what potential does this approach have?
- How successful has the approach that has been seen across many countries of making spectrum (mainly in the 3.5GHz / mmWave bands) available direct to vertical users rather than to mobile operators?
- Should the approach of creating private networks in this way be seen as a threat or an opportunity for MNOs, and what new business models are being facilitated by this move away from the traditional approach?
- Has this led to a surge in the advent of 5G verticals or is spectrum lying around remaining unused?
- To what extent is there actually a market failure when it comes to making spectrum available for private networks that requires regulatory intervention (administrative licencing models, set asides and obligations); or would the issue actually be addressed on commercial terms without intervention?
- With other regions (eg LatAm) just starting to explore options for delivering vertical connectivity, to what extent is there the possibility of delivering a globally coordinated approach?

Moderator: **Soren Sorensen**, Associate Director, NERA

Panellists to include:

Eric Fournier, Director for Spectrum Planning and International Affairs, ANFR France; & Chair, RSPG
Jonas Wessel, Director, Spectrum Department, PTS

Dave Wright, Head of Global Wireless Policy, HPE

Antonio Franchi, Head of 5G and 6G Strategic Programme, European Space Agency

Luigi Ardito, Senior Director of Government Affairs EMEA, Qualcomm

10.10 – 11.25 **Session 7: The 5G ‘sweet-spot’ – Forecasting and meeting increasing needs for spectrum in the mid-band frequencies**

Mid-band has been critical for 5G rollout to date both in Europe and around the rest of the world. Whilst a large amount of spectrum has now been made available in the 3.5GHz band (and in some cases elsewhere), a recent GSMA study claimed that this is only the start and in order to meet future needs for 5G, an additional 2GHz of mid-band spectrum will be required by 2030. This session will look at the extent to which this figure is a realistic estimate of what is actually required, and at the different bands and options that are available in order to meet these growing needs. Specific focus will be given to the parts of the C-band not yet allocated to 5G (3.3GHz – 3.4GHz and the 3.6GHz – 3.8 GHz), 4.8 GHz, 6 GHz and 10 GHz ranges, all of which will be considered at WRC-23. How can the need for additional bandwidth for 5G be balanced with the needs of other key users across the mid-band frequencies – satellite, WiFi and more?

- Most countries have now completed their 5G awards, and most MNOs now have at least 70-100 MHz of 3.5 GHz spectrum. For how long will this be enough, and where can we find more spectrum for second carriers or increased capacity?
- To what extent is the figure provided by the GSMA study of an additional 2GHz by 2030 an accurate reflection for member states across Europe?
- What scope is there to use spectrum in the C-band to help meet these needs (beyond the 3.4GHz – 3.8GHz section that has already been allocated)?
- What is the current situation regarding the 6GHz band across Europe, and how will decisions made in this band impact the future shape of mid-band frequencies more broadly?
- What other bands provide options, and to what extent could WRC-23 help to provide a clearer picture?
- How important is it that a co-ordinated approach across the mid-band frequencies is seen in the region, and globally?
- Should the next capacity layer in the band be allocated through traditional exclusive use licences, or could new shared use models emerge?
- How can policymakers balance the requirements of 5G in mid-band frequencies with the needs of other key users in the bands?

Moderator: **Amit Nagpal**, Partner, Aetha Consulting

Panellists to include:

Chris Woolford, Director, International Spectrum Policy, Ofcom

Heidi Himmanen, Chief Adviser, Digital Connections, Finnish Transport and Communications Agency Traficom

Glyn Carter, Future Spectrum Director, GSMA

Martha Suarez, President, Dynamic Spectrum Alliance

Petra Vorwig, Global Spectrum & Regulatory Policy, GSOA

Alessandro Casagni, Director, Wireless Regulatory Policy, Huawei (on behalf of: Ericsson, Huawei, Nokia & ZTE)

11.24 – 11.45 **Break**

11:45 – 12:05 **Thinking Point: Introducing the Metaverse**

Bruno Cendon Martin, Director of Wireless - AR\VR HW, Meta

12.05 – 13.15 **Session 8: The evolving connectivity landscape – new spectrum bands, new technologies, new approaches**

The way in which connectivity is provided today is very different to how it was delivered ten years ago. And similarly, as the journey towards the next phase of future wireless connectivity continues, it can be expected that the connectivity ecosystem in 2030 will be very different to that which we see today. With the demand for connectivity set to increase at an exponential rate and wireless communication set to become more and more vital for all aspects of daily lives, connectivity technologies, systems and regulatory frameworks will all need to evolve in order to keep pace. This session focus on what this evolution of the connectivity landscape will look like, and at what needs to be done to ensure that the power of wireless can continue to push our world forward. Focus will be given to new technologies that are emerging; at innovative new ways of finding the bandwidth to enable these; and at the possibility of collaborative new business models.

- What will the overall connectivity ecosystem look like in 2030, and how will it likely differ from today?
- There was a time that mid-band spectrum were considered too high frequency to be used for mobile technology, but this has of course change hugely. As the evolution of technologies and systems continues, how will the demand for different spectrum bands be set to change?
- What scope in the future can be played by terahertz frequencies and other bands that have traditionally been considered as unusable?
- To what extent is the way in which we access spectrum set to change? What role can spectrum sharing and other innovative methods play in increasing spectrum efficiency?
- What new challenges and opportunities might the use of these new bands bring?
- How are technologies evolving, and how might this affect what are currently considered as traditional models of connectivity, and the connectivity landscape more broadly?
- What role can non-terrestrial technologies play in helping to deliver cost-effective and high-capacity connectivity in future wireless networks?
- What scope is there for increased collaboration between mobile and satellite providers, and the emergence of hybrid terrestrial-satellite systems?

Moderator: **Marc Eschenberg**, Partner, Aetha

Panellists to include:

Alexander Kuehn, Head of Spectrum, BNetzA

Branimir Stantchev, Head of Sector, Spectrum for Wireless Broadband, European Commission

Eiman Mohyeldin, Chair, 6G Spectrum Team, GSA

Simon Watts, Chair, Standards Working Group, GSOA

Lorelien Hoet, Government Affairs Director, Europe, Microsoft

13.15 – 14.05 Lunch

14.05 – 15.20 **Session 9: Delivering digital equality - Meeting the target of 5G connectivity for all by 2030**

One of the targets of the Commission's digital decade is to deliver 5G coverage to all populated areas in Europe by 2030. Current coverage is estimated to be at around 13%, which shows how ambitious this target to deliver digital equality for all European citizens and societies actually is. For it to be achieved, stakeholders and connectivity providers will need to work together. This session will look at the different technologies, spectrum bands and connectivity models that will need to be part of the solution to deliver this, and at the extent to which regulatory intervention will be required. It will look at what should be considered as the definition of 5G in relation to the targets that have been set, and at how it can be ensured that the different connectivity requirements of communities across Europe can be met.

- How should '5G' be defined in the context of the target that has been set? Should minimum acceptable levels be set in terms of key aspects such as speed and latency?
- How can the level of coverage be monitored and what parameters should be used to do this (number of base stations, population coverage/quality)?
- Can more basic 5G delivered using low-band (ie 700MHz) frequencies be sufficient to meet these targets, or should we be aiming for the additional possibilities that are offered by mid-range 5G?
- How can it be ensured that the connectivity that is required fits with the specific needs to the communities and areas that it is serving?
- Is there a need to introduce regulatory tools such as universal service obligations to help deliver on these targets, or can they be met through private competition alone?
- Where does the delivery of digital equality for European businesses and industrial areas fit within the Commission targets? What needs to be done to ensure that all businesses throughout Europe are given the opportunity to reap the potential that new digital technologies such as IoT, AI, edge computing and augmented reality can offer?
- What technology mix will be required to help deliver the required connectivity? Alongside mobile broadband, what role can fixed wireless access (FWA) play?
- What role can satellite play in helping to deliver the required connectivity, particularly with recent moves that have been seen towards inclusion of satellite technology in mobile handsets?

Moderator: **Richard Marsden**, Managing Director, NERA

Panellists to include:

Konstantinos Masselos, President, Hellenic Telecommunications & Post Commission (EETT)

Daniel Olle, Technical Unit Manager, Telecoms & Audio-visual Division, Spanish Competition and Markets Commission (CNMC)

Philippe Lefebvre, Head of Sector, 5G Deployment Strategy, Future Connectivity Systems, DG CONNECT

Emma O'Toole, Senior Manager, Spectrum, GSMA

Stefan Zehle, Co-Founder & CEO, Coleago Consulting

Peng Zhao, Government Affairs and Policy, OneWeb

15.20 – 15.40 **Afternoon Break**

15.40 – 16.35 **Session 10: Delivering densification - Streamlining the rollout of 5G networks in urban areas**

Small Cell and macro cell technologies are seen as being pivotal to successful 5G rollout and the densification of networks that will be required to meet needs in urban areas. Despite this however, Small Cell adoption across Europe has been relatively slow to date. This session will look at the reasons for this apparent reticence from operators to deploy small cells to date, and at what is being done to encourage and streamline the rollout process going forward.

- What is the situation with regards to roll out of new small cells in Europe?
- Why have so few been seen – is it due to operators reusing existing sites or implementing dynamic spectrum sharing (DSS) to reuse 4G spectrum bands; or is it because of red tape and bureaucracy?
- What measures have been taken to streamline and speed up the rollout of 5G networks once spectrum has been allocated? Is there more that could be done?
- What are the current processes relating to acquisition of cell sites across different member states, and is there a need for more harmonisation?
- What is the business case for the use of small cells and macro cells, and what balance should operators be looking to achieve between reusing existing sites and deploying new ones?

- What specific challenges and circumstances arise when considering the delivery of required connectivity indoors and inside buildings? How can this be provided, and how can MNOs and others work together to provide the connectivity that is required?

Moderator: **Andy Hudson**, VP, Strategy, Sitenna

Panellists:

Gilles Bregant, Director General, ANFR

Sergi Figuerola, Chief Technology and Innovation Officer, i2CAT Foundation

Hans Hammar, Head of Radio, Market Area Europe and Latin America, Ericsson

Victor Dot Piulachs, Head of Small Cell Business Line, Cellnex Telecom (on behalf of EWIA)

16.35 – 17.20 **Final Conclusions & Wrap Up**