interdigital

Webinar: Transatlantic perspectives on 6G Vision, Roadmap and Development Model

Date: 02 March 2022

Time: 04:00 PM – 05:00 PM GMT

The Networking Channel

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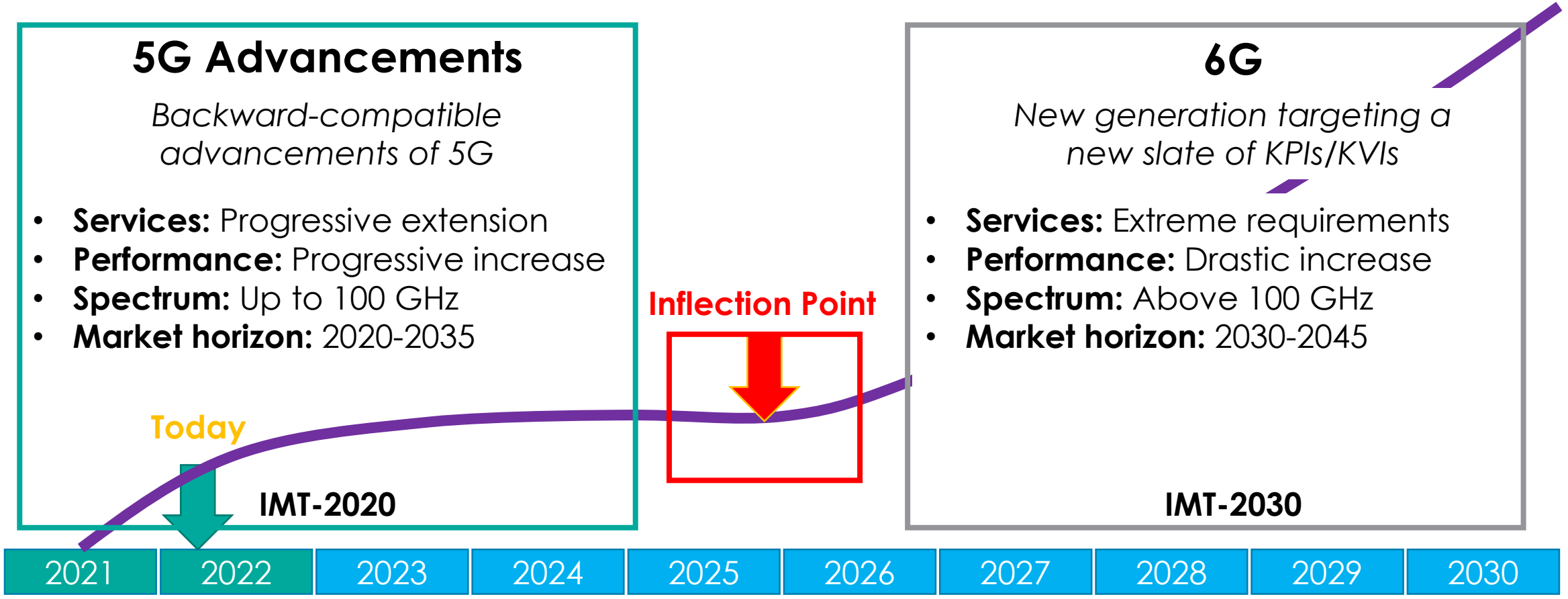
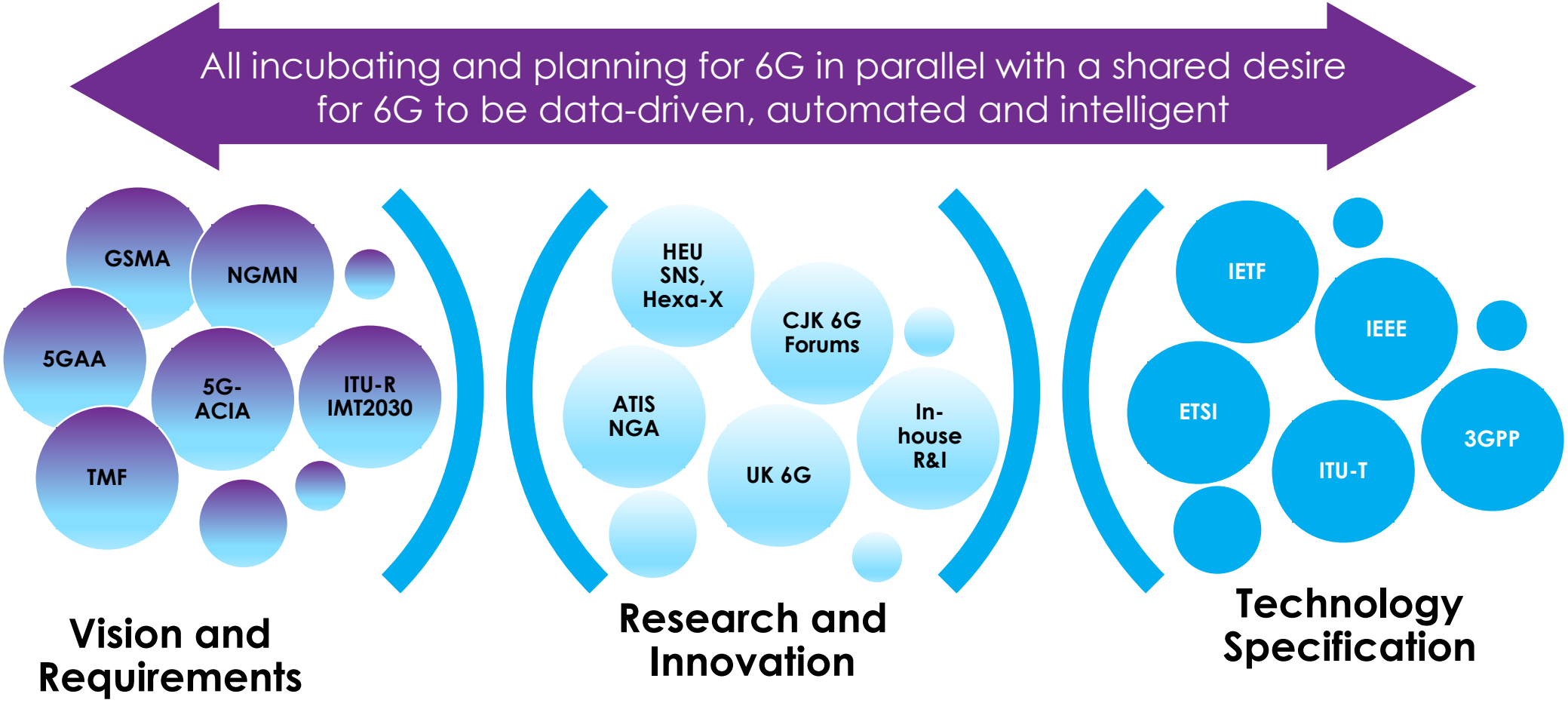
Agenda

	Time	Speaker (Title)	Affiliation	Role	Perspectives
	16.00-16. 05 (5 min)	Alain Mourad Head of Future Wireless Europe	InterDigital Europe	Moderator	H2020 EMPOWER
	16.05-16.15 (10 min)	David Boswarthick Director New Technologies	ETSI	Panelist	ETSI
	16.15-16.25 (10 min)	Mikko Uusitalo Head of Radio Systems Research Finland	Nokia	Panelist	H2020 HEXA-X
	16.25-16.35 (10 min)	Douglas Castor Head of Future Wireless North America	InterDigital Inc.	Panelist	ATIS NGA
	16.35-17.00 (25 min)	All			Q&A

Session Introduction (1/2)



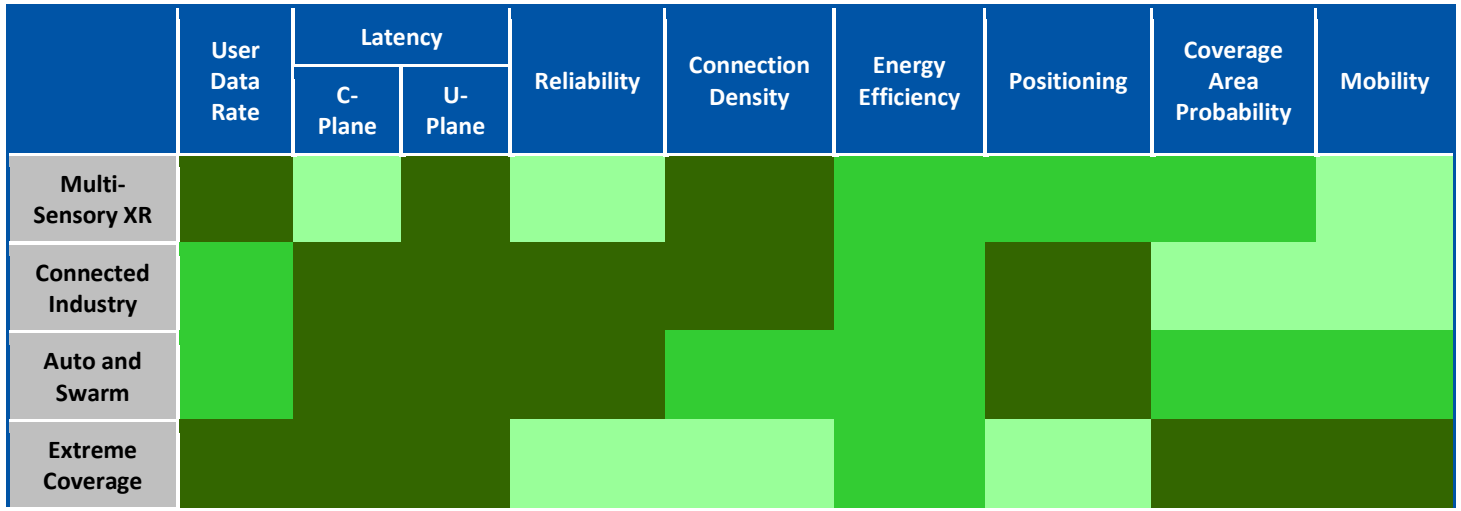
Session Introduction (2/2)



EMPOWER Roadmap: Envisioned Services

H2020 EMPOWER www.advancedwireless.eu

1. Multi-Sensory Extreme Reality (XR) and Haptics
2. Connected Industries and Automation
3. Autonomous Vehicles and Swarm Systems
4. Extreme Coverage and Reaching the last Billion



ITU-R IMT2030 DRAFT

1. Holographic communication, tactile internet and VR/AR-based sensing
2. Industry 4.0, fully autonomous driving and navigation, and smart rail-systems
3. UAV-based systems, integrated
4. satellite and radar networks
2. Smart cities and massive IoT
3.

EMPOWER Roadmap: IMT-2030 Target Capabilities

Wireless Capabilities	IMT-2020	IMT-2030
Spectrum	Up to 100 GHz	Carrier frequencies up to 300 GHz
Bandwidth	At least 100 MHz; Up to 1 GHz	Single channel bandwidth above 10 GHz
Peak data rate (DL/UL)	20 Gbps (DL) 10 Gbps (UL)	Peak data rate exceeding 200 Gbps (downlink) and 100 Gbps (uplink) Update: 1 Tbps (current IMT-2030 assumption)
User data rate (DL/UL)	100 Mbps (DL) 50 Mbps (UL)	Average user data rate exceeding 1 Gbps (downlink) and 0.5 Gbps (uplink) for multi-sensory XR and volumetric media streaming
U-plane Latency	4 ms for eMBB 1ms for URLLC	U-plane latency below 0.5 ms for connected industries, autonomous vehicles and tactile use cases Update: 25 us to 1 ms (current IMT-2030 assumption)
C-Plane Latency	Below 20 ms (10 ms desired)	Control plane latency below 5 ms for connected industries, autonomous vehicles and tactile use cases
Reliability	Up to 5 nines	Reliability up to 8 nines for connected industries and autonomous vehicles
Connection Density	1 device per sqm	Connection density up to 10 devices per sqm (10m devices per km2) for ultra-massive sensor networks
Energy Efficiency	Qualitative	Terminal and network energy efficiencies up by 1000x today's values 5G system Update: 100 to 1000x (current IMT-2030 assumption)
Positioning Accuracy	NA	Positioning accuracy below 5 cm (indoor) and 10 cm (outdoor) helped by joint sensing and communications
Mobility	Up to 500 kmh	Mobility exceeding 1000 kmh for flying objects (e.g. airplanes) supported by the integration with non-terrestrial networks

*Update based on ITU-R IMT-2030 DRAFT compared to initial EMPOWER roadmap

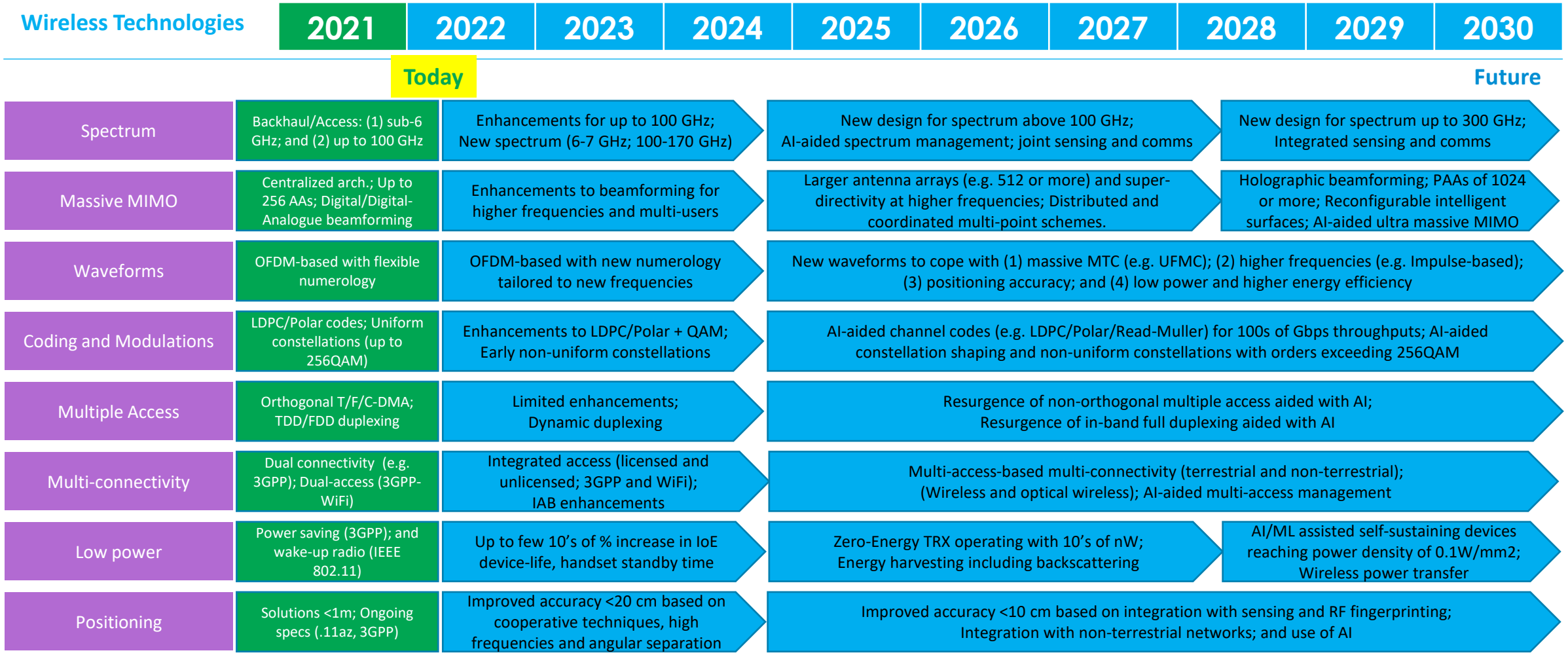
EMPOWER Roadmap: NET-2030 Target Capabilities

Network Capabilities

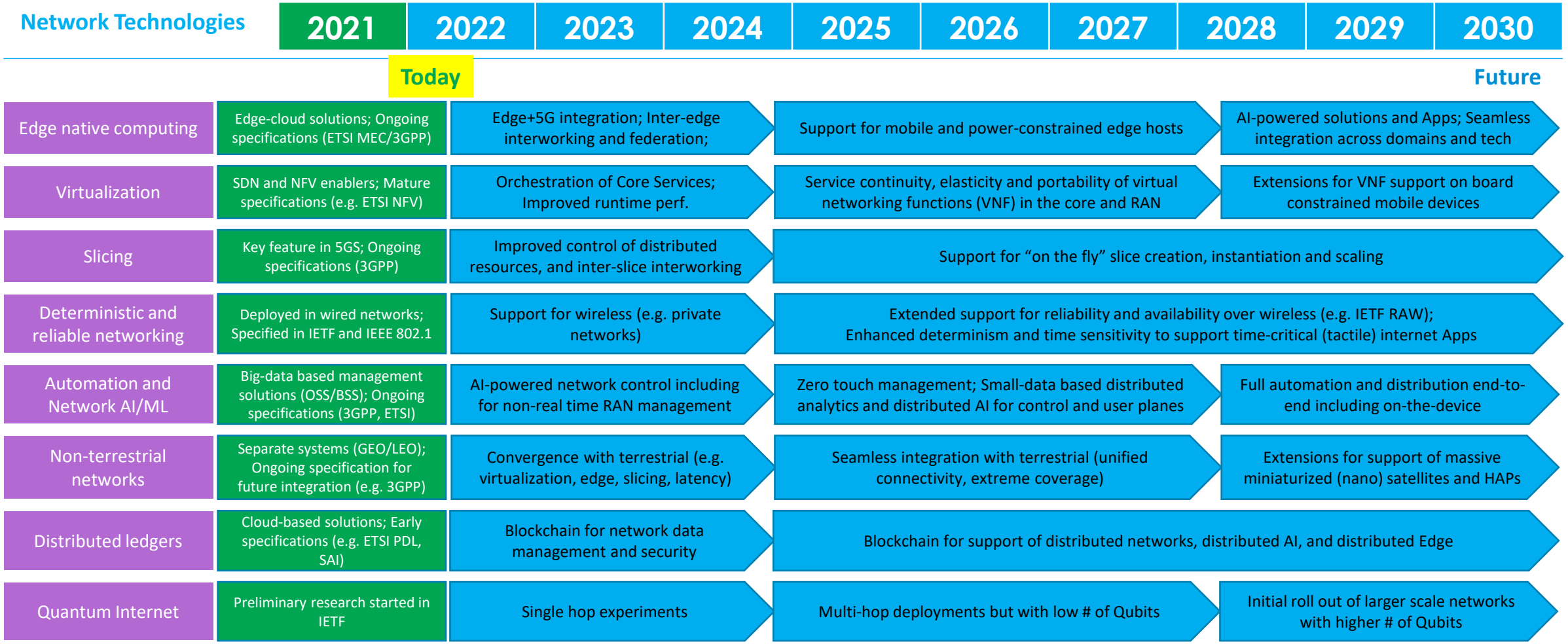
	NET-2020	NET-2030
Automation	Human operated	Self-operating requiring human operators to only validate the decisions
Flexibility	Service-based and slicing limited to core/transport	Fine-grain flexibility based on micro-services and improved end-to-end slicing (core; transport; access; device)
Service deployment time	Few hours	Reduced by a factor of 10 compared to similar tasks in 2020, based on slice creation and instantiation on the fly
Latency	Few tens of ms	Enabling application to application response time in the few milliseconds range
Determinism and Resilience	Limited to wired	Extended to support deterministic and resilient networking for industrial wireless
High network bandwidth	100s Gbps and a few biillion devices	Supporting Terabits per second throughputs and trillions of devices
Data-driven and distribution	Centralized big-data based analytics in core and cloud	Supporting small-data based distributed analytics and distributed AI
Energy consumption	Moderate	A significant energy reduction of network operation compared to 2020
EMF-awareness	Moderate	Support deployment in areas with challenging EMF limits (due to spectrum bands and network densification)
Coverage	Segregated terrestrial and satellite	Ubiquitous based on integration of terrestrial and non-terrestrial networks (satellites and HAPs)
Security and trust	Moderate	Enhanced security based on cyber-physical integration; AI; and quantum keys

*Reference: Horizon Europe, Smart Networks and Services, 2021-2027

EMPOWER Roadmap: IMT-2030 Technology Trends



EMPOWER Roadmap: NET-2030 Technology Trends



Tentative Questions

1. **[David]** ~~In 5G, ETSI has brought in noticeable technology contributions such as ETSI NFV, ETSI MEC, and ETSI DECT-2020.~~ How do you see this success repeating and boosted in 6G? Through what new technologies and what engagement models?
2. **[Mikko]** ~~HEXA-X for 6G has been likened to METIS for 5G.~~ How would you describe the HEXA-X approach in setting the international agenda for 6G ~~compared to METIS in 5~~G?
3. **[Doug]** ATIS NGA is new in that it didn't have an equivalent predecessor in 5G. How do you evaluate the journey thus far and where do you see the next big milestones?
4. **[Mikko/Doug]** ~~In Europe, we had 5G-IA and now 6G-IA, and in the USA, ATIS NGA, both with similar structure, scope and stakeholders~~. How do you see the two organizations joining forces to promote a transatlantic vision and roadmap for 6G?
5. **[David]** How does ETSI look at the American model of the NGA developing under ATIS? ~~Should we expect similar alliances on 6G to develop under ETSI~~? And how do you see ETSI and ATIS partnering on the 6G pre-standard research and standardization?
6. **[All]** Where does the EMPOWER roadmap align with the HEXA-X, NGA and ETSI roadmaps for 6G services, capabilities and technologies, and where not?