



Towards 6G, the European Agenda

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Today: Supporting Advanced Vertical Pilots: 5G PPP E2E Infrastructure



- Main Facility that offers Services to ICT-19 with well defined SLAs
- Experimentation Facility for advanced Experimentation and Testing
- Moving Experimentation Facility Site

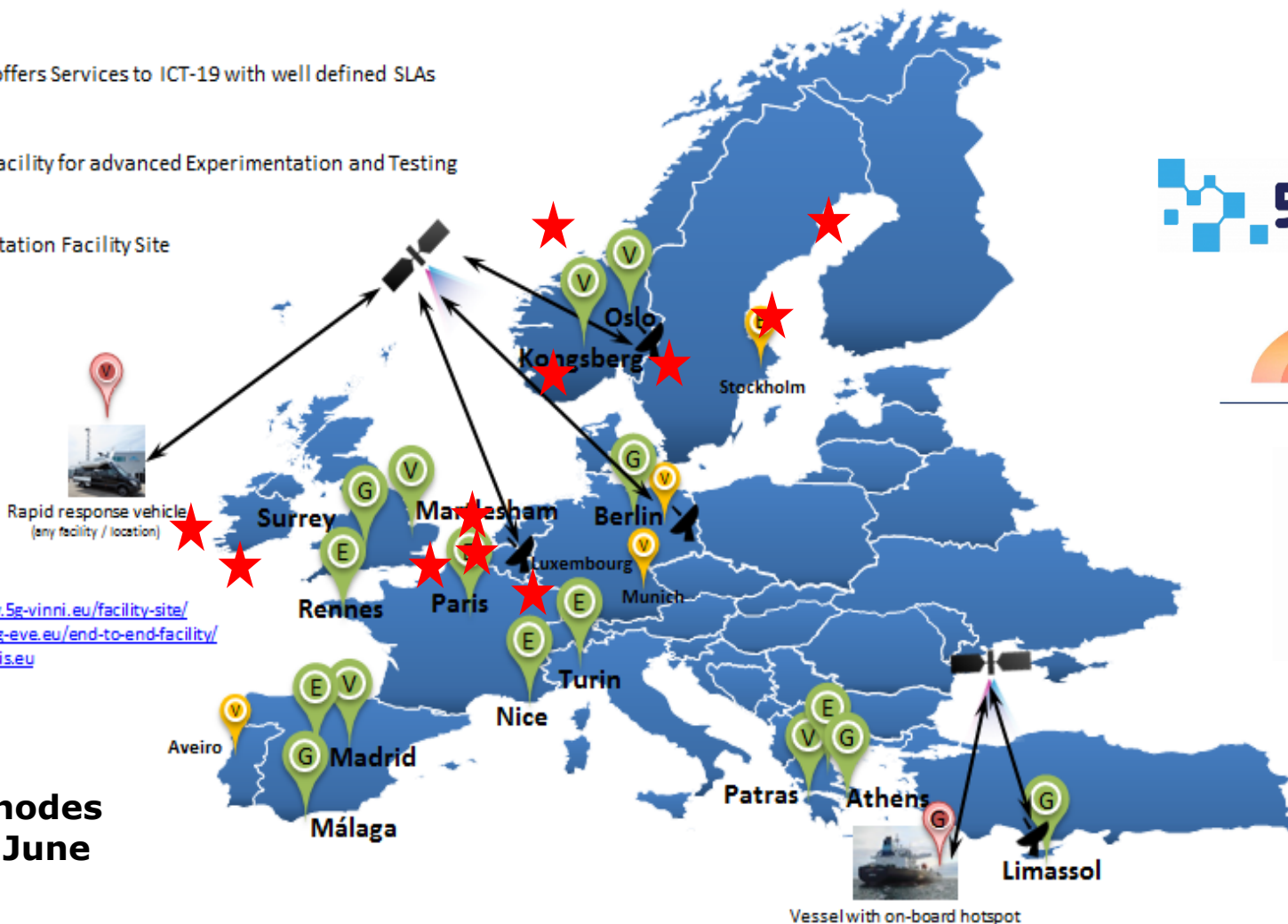
5G-Vinni
5G-EVE
5Genesis



5G EVE



5Genesis









5G-VINNI : <https://www.5g-vinni.eu/facility-site/>
5G-EVE: <https://www.5g-eve.eu/end-to-end-facility/>
5GENESIS: www.5genesis.eu

**New Sites/nodes
as of 1st of June
2019**



Beyond 5G: Global Context

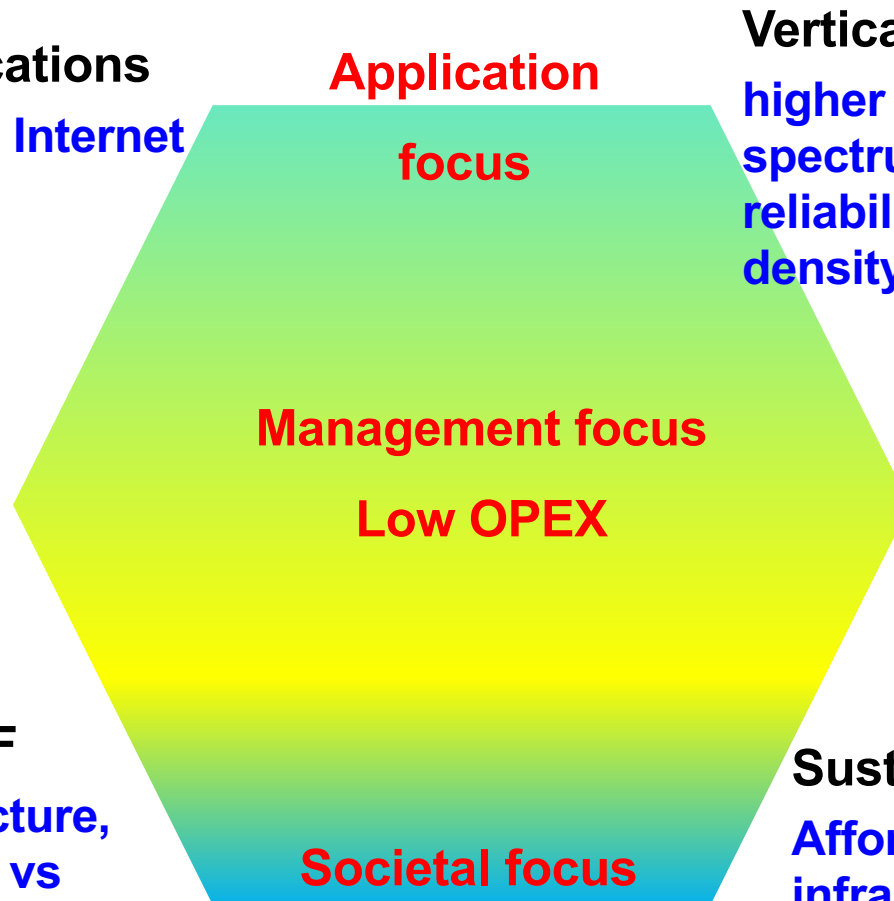
	B5G/6G Initiative
	<ul style="list-style-type: none">- “Secure 5G & Beyond Act” March 2020- DoD Testbed programme, \$ 600 million- Next-G initiative, industry federation
	<ul style="list-style-type: none">- MIC “Roadmap towards 6G”, June 2020- METI support- \$380 million
	<ul style="list-style-type: none">- MSIT 6G programme, September 2020- \$200 million public support
	<ul style="list-style-type: none">- MIIT 6G programme, creation of IMT 2030 Promotion committee (2019)- Multi € Billion until 2035, including industrialisation
	<ul style="list-style-type: none">- 6G Flagship launched in February 2019- € 250 million / 7 years
	<ul style="list-style-type: none">- 6G Smart Networks and Services Joint Undertaking proposal- € 900 millions / 6 years

6 Key Dimensions of 6G

New classes of applications
XR, Holographic coms, Internet of Senses

Fully Automated Infrastructure
Autonomous management, AI..

Ultra low energy/EMF
Optical techs, architecture, optimizing computing vs networking, EMF aware..



Vertical use cases beyond 5G
higher capacity, xGbs speed, new spectrum, sub ms latency, location, reliability beyond 5x9, ultra high device density

Ultra high security
Quantum, blockchain, from component to application

Sustainable Development goals
Affordability of tech, Open Arch, infrastructure access, climate change..

Example KPI's

	5G	6G
Traffic capacity	10 Mbps/m ²	1-10 Gbps/m ³
DL rate	20 Gbps	1 Tbps
UL Rate	10 Gbps	1 Tbps
Uniform User experience	50-100 Mbps 2D	> 1Gbps 3D
Latency	1 ms	0,1 ms
Jitter	NS	1 microsec
Reliability	1 E-5	1 E-9
Energy/bit	NS	1 pJ/bit
Location accuracy	10 cm 2D	1 cm 3D
Inference Reliability	-	- TBD
Energy Goal	-	- TBD

Expected testbed dimensions

Radio

- Towards THz coms, significant range,
- AI assisted Phy, spectrum sharing, cell free networks
- Reconfigurable intelligent Surfaces
- Full duplex (AI assisted?)
- 3D networks operation and planning
- Densification, compute/radio energy optimisation

Expected testbed dimensions

Networks

- Disaggregation, Open arch validation and issue solving;
- Extreme Cloud-Edge convergence towards a huge distributed computing fabric, covering Core, RAN & Device, seamless integration
- Split computing, optimized resource placement (IoT)
- E2E on the fly slicing
- AI powered network control and security
- Landscape quantum security deployments

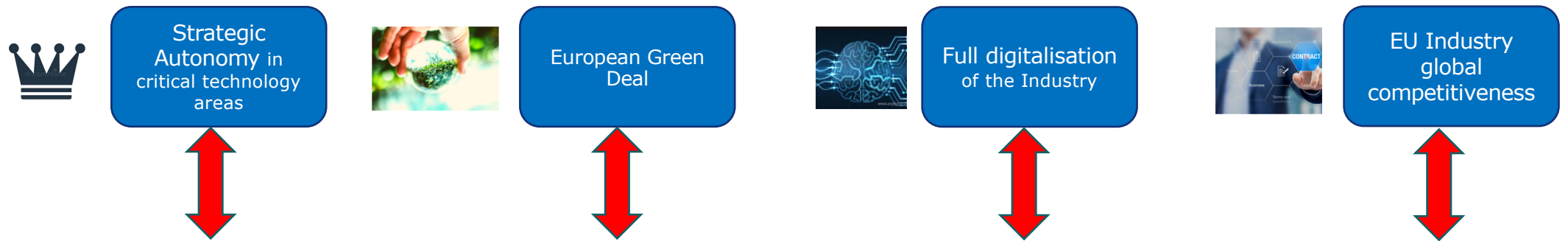
Expected testbed dimensions

Verticals and Use Cases

- Internet of Sense, merging sensing and communication;
- High capacity/speed applications: hologram, Digital Twins, XR/VR, immersive environments and Edge;
- Ultra low latency, ultra high reliability applications
- Ultra low positioning capabilities
- Combined low energy platform + use case

Towards a 6G European Initiative

5G PPP: ICT-52 implementation of 8 6G exploratory projects, 1 flagship= 60 M€ (bridging phase)



Industry 6G Partnership Proposal (Smart Networks & Services)

https://ec.europa.eu/info/files/european-partnership-smart-networks-and-services_en



Accelerating 5G Deployment: CEF2, pan European corridors for Connected Cars

6G Vision and technologies across a comprehensive supply chain

Tentative Planning

Partnership and Work Programme status (dates tentative)

- Kick off legal act (SBA) Council negotiations: 26 February
- Early draft Work Programme presentation to MS: end of March
- Regular consultation with MS on Work programme, every 6 weeks
- Stable draft Work programme: Summer 2021
- Final SBA Adoption: Q3 2021
- Launch of Calls after SBA adoption, Q3/4 2021

More info:

5G Trials Verticals Phase 3

https://5g-ppp.eu/wp-content/uploads/2020/03/5PPP_VTF_brochure_v2.1.pdf

Smart Networks and Services (6G) Roadmap proposal

<https://5g-ia.eu/sns-horizon-europe/>

Horizon Europe Partnerships

https://ec.europa.eu/commission/presscorner/detail/en/IP_21_702

Smart Network and Services (6G) EC announcement

[https://ec.europa.eu/digital-single-market/en/news/europe-puts-forward-](https://ec.europa.eu/digital-single-market/en/news/europe-puts-forward-proposal-joint-undertaking-smart-networks-and-services-towards-6g)

[proposal-joint-undertaking-smart-networks-and-services-towards-6g](https://ec.europa.eu/digital-single-market/en/news/europe-puts-forward-proposal-joint-undertaking-smart-networks-and-services-towards-6g)