

A stylized illustration of a city with various buildings, houses, and people. The scene is overlaid with a network of white lines and icons representing connectivity. Labels like 'CONNECTED CITY', 'CONNECTED THINGS', 'CONNECTED HOUSE', and 'CONNECTED HEALTH' are scattered throughout the scene. The overall color palette is light blue and white.

The views of Europe: 5GPPP/5G IA activities

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& Chair, 5G Initiative Steering Board***

<http://5g-ppp.eu/>

5G PPP Contractual Arrangement

KPIs for Monitoring

- **Business-related KPIs:**
 - Leverage effect of EU research and innovation funding in terms of private investment in R&D for 5G systems in the order of 5 to 10 times;
 - Target SME participation with an allocation of 20% of the total public funding;
 - Reach a global market share for 5G equipment & services delivered by European headquartered ICT companies above the level of 43 % global market share in communication infrastructure.
- **Performance KPIs:**
 - Providing 1000 times higher wireless area capacity compared to 2010;
 - Reducing the average service creation time cycle from 90 hours to 90 minutes;
 - Very dense deployments to connect over 7 trillion wireless devices serving over 7 billion people;
 - Secure & reliable Internet with a “zero perceived” downtime for services provision.
- **Societal KPIs:**
 - Enabling advanced User controlled privacy;
 - Reduction of energy consumption per service up to 90 % (vs 2010);
 - European availability of a competitive offer for 5G systems and technologies;
 - New economically-viable services of high societal value like U-HDTV and M2M applications;
 - Development & availability of 5G skills curricula in partnership with the EIT.

Source: 5G PPP Contractual Arrangement.

28/09/2017

3GPP-PCG#39 & OP#38
28-29 September 2017, Vienna

Establishment of Working Groups and Activities in relation to the 5G PPP Contractual Arrangement

- 5G PPP is contributing to several KPIs and EU policies related matters. For that purpose the following **Working Groups and Activities** have been launched by 5G-IA:
 - WG 5G Vision and Societal Challenges
 - WG 5G Pre-standards
 - WG SME support
 - WG 5G Spectrum
 - WG Trials
 - Activity Community building and PR (Public Relations)
 - Activity 5G International cooperation
 - Follow-up of the 5G PPP Contractual Arrangement, KPIs
- 5G PPP projects launched **technology-oriented Working Groups**
 - WG Architecture
 - Use cases and performance evaluation models
 - Software Networks (SDN and NFV)
 - Network Management, QoS
 - Security
 - 5G Automotive (V2X,...), launched in July 2017

Source: 5G Infrastructure Association.

Completion of Phase 1 Projects

	Name	M1 = July 2015																																																											
		M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12	M13	M14	M15	M16	M17	M18	M19	M20	M21	M22	M23	M24	M25	M26	M27	M28	M29	M30	M31	M32	M33	M34	M35	M36																								
CSA	EURO 5G	Euro-5G																																																											
R&I	5G-NORMA	5G NOvel Radio Multiservice adaptive network Architecture																																																											
R&I	5G-Xhaul	Dynamically Reconfigurable Optical-Wireless Backhaul/Fronthaul with Cognitive Control Plane for Small Cells and Cloud-RANs																																																											
R&I	5G-CrossHaul	Developing an integrated 5G backhaul and fronthaul transport network																																																											
R&I	5G-Ensure	5G Enablers for Network and System Security and Resilience																																																											
R&I	CHARISMA	Converged Heterogeneous Advanced 5G Cloud-RAN Architecture for Intelligent and Secure Media Access																																																											
R&I	COGNET	Building an Intelligent System of Insights and Action for 5G Network Management																																																											
R&I	COHERENT	Coordinated control and spectrum management for 5G heterogeneous radio access networks																																																											
R&I	FANTASTIC 5G	Flexible Air INTerfAce for Scalable service delivery wITHin wireless Communication networks of the 5th Generation																																																											
R&I	Flex5Gware	Flexible and efficient hardware/software platforms for 5G network elements and devices																																																											
R&I	METIS II	Mobile and wireless communications Enablers for Twenty-twenty (2020) Information Society-II																																																											
R&I	mmMAGIC	Millimetre-Wave Based Mobile Radio Access Network for Fifth Generation Integrated Communications																																																											
R&I	SELFNET	SELFNET - FRAMEWORK FOR SELF-ORGANIZED NETWORK MANAGEMENT IN VIRTUALIZED AND SOFTWARE DEFINED NETWORKS																																																											
R&I	SESAME	Small cELLS coordinAtion for Multi-tenancy and Edge services																																																											
R&I	SPEED-5G	quality of Service Provision and capacity Expansion through Extended-DSA for 5G																																																											
R&I	SUPERFLUIDITY	Superfluidity: a super-fluid, cloud-native, converged edge system																																																											
I	SGEx	5G Exchange																																																											
I	SONATA	Service Programing and Orchestration for Virtualized Software Networks																																																											
I	VirtuWind	Virtual and programmable industrial network prototype deployed in operational Wind park																																																											

5G Infrastructure PPP
The European path towards global next generation communication networks

3GPP-PCG#39 & OP#38

28-29 September 2017, Vienna

5G PPP Phase 1 Key Results

5G Spectrum
Requirements,
Evaluation and
Candidate Bands

5G Performance
Evaluation
Framework

5G System,
Functional, Logical
and Physical
Architectures

5G Flexible RAN

5G Multi-Service
Waveform

5G Massive Channel
Access

5G Flexible
Interference
Mitigation and RRM

Technology Enablers
for 5G RAN Platforms
(HW & SW)

5G Integrated
Transport Networks
(FH/BH)

5G Network
Management

Network Softwarization
and Programmability
integrating SDN and
NFV Technologies

Flexible and Agile
Service Deployment

E2E Orchestration in
Single and Multi-
Domains 5G
Virtualized Networks

5G Networks Security
and Integrity

Programmable
Industrial Networks

Pre-Standardization Consensus

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5G PPP leading innovations towards 5G



Thousands of researchers and developers across Europe are working on innovative solutions for the definition of 5G

5G PPP Phase 1 main achievements:

- 5G System design & Evaluation aspects
- 5G Air interface innovations
- Network management & Security innovations
- Virtualization & Service deployment innovations

5G PPP Projects are building pre-standards consensus and provide contributions to standardization as well, in order to strengthen Europe's influence

Phase 1 → Phase 2 Projects

Phase 1	Phase 2 follow up.
5G-Crosshaul	5G TRANSFORMER
5G-NORMA	5G-Monarch
5G-Xhaul	5G-PICTURE
SELFNET	SLICENET
Sesame	5G ESSENCE
SONATA	5GTANGO
EURO 5G	To-Euro-5G
FANTASTIC 5G	ONE5G

Start of 5G PPP Phase 2

5G Infrastructure PPP
The European path towards global next generation communication networks

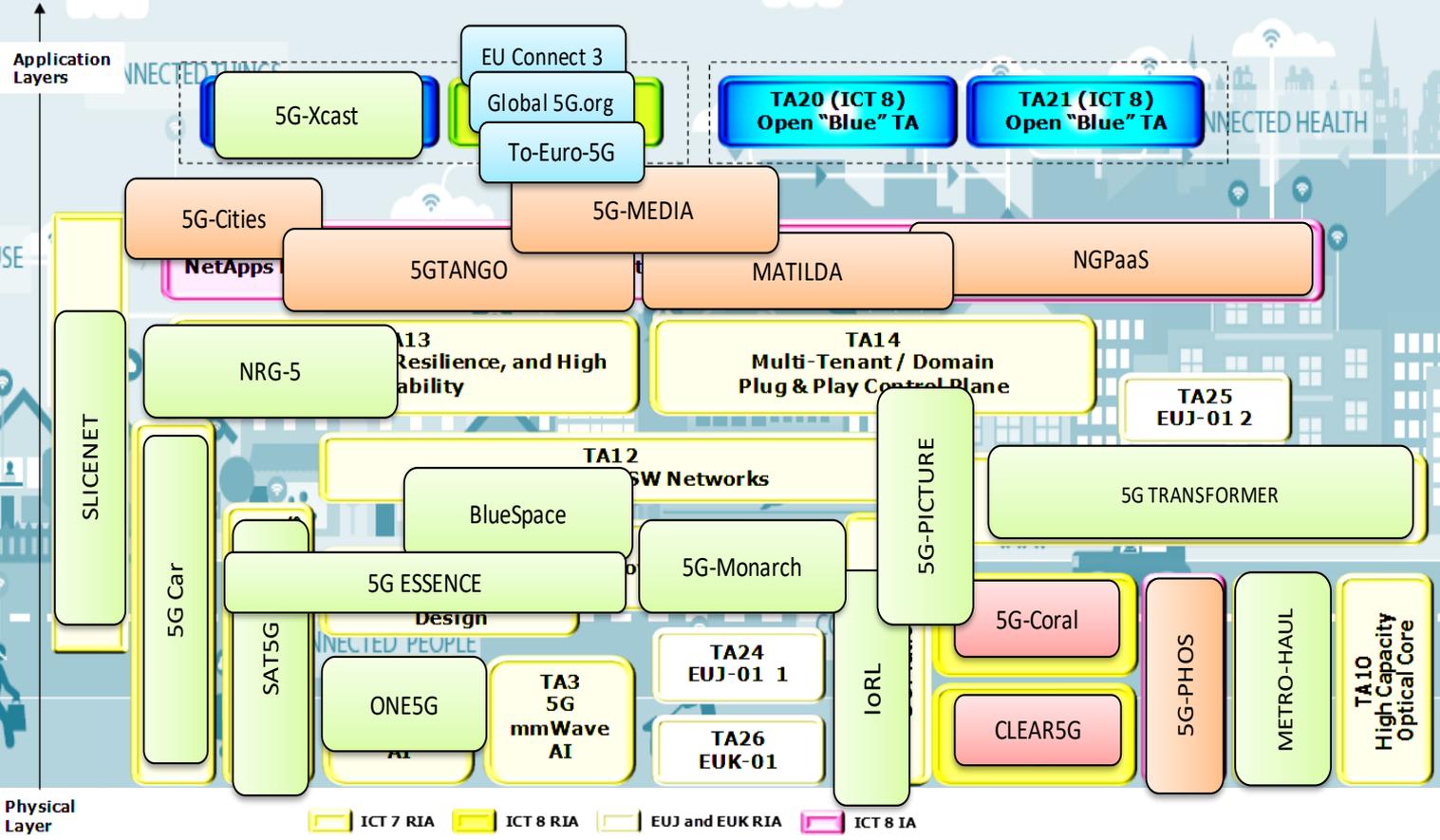
		2017							2018												2019												2020							
		June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug
		M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12	M13	M14	M15	M16	M17	M18	M19	M20	M21	M22	M23	M24	M25	M26	M27	M28	M29	M30	M31	M32	M33	M34	M35	M36	M37	M38	M39
ICT 7	CSA	To-Euro-5G																																						
ICT 7	CSA	Global 5G.org																																						
ICT 7	R&I	5G Car																																						
ICT 7	R&I	5G ESSENCE																																						
ICT 7	R&I	5G TRANSFORMER																																						
ICT 7	R&I	5G-Monarch																																						
ICT 7	R&I	5G-PICTURE																																						
ICT 7	R&I	5G-Xcast																																						
ICT 7	R&I	BlueSpace																																						
ICT 7	R&I	IoRL																																						
ICT 7	R&I	METRO-HAUL																																						
ICT 7	R&I	NRG-5																																						
ICT 7	R&I	ONE5G																																						
ICT 7	R&I	SAT5G																																						
ICT 7	R&I	SLICENET																																						
ICT 8	I	5G-MEDIA																																						
ICT 8	I	5G-PHOS																																						
ICT 8	I	5GTANGO																																						
ICT 8	I	MATILDA																																						
ICT 8	I	NGPaaS																																						
ICT 8	I	5G-Cities																																						

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5G Infrastructure PPP Phase 2 Projects Draft Cartography

Source: To-EURO-5G



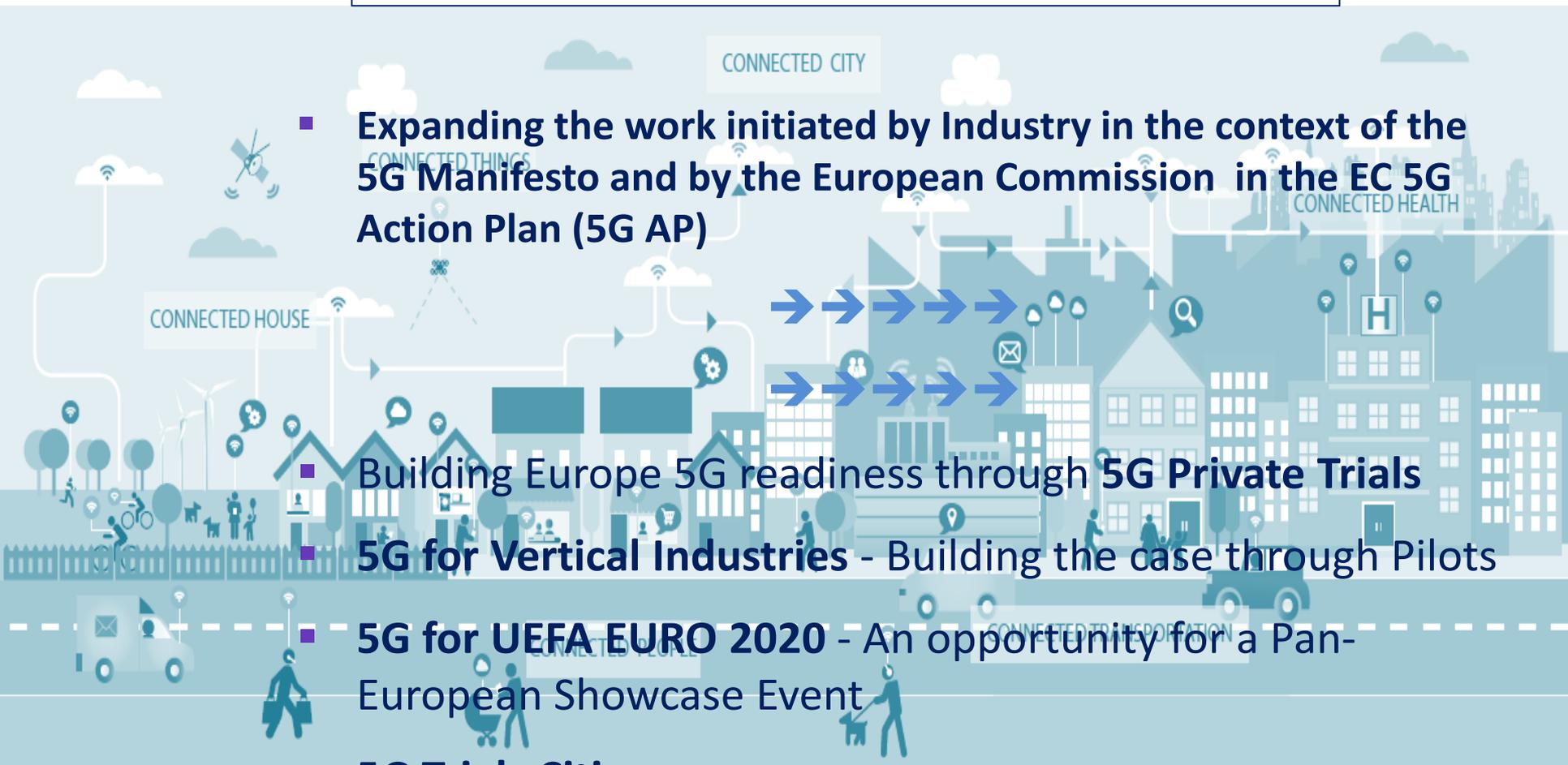
Note: The size and the orientation of the TAs boxes do not indicate the potential size or manpower of future Projects

Phase 2 selection learnings

- Very good coverage of the work programme, as defined by the 5G-IA pre-structuring model (Targeted Actions)
- Leveraging on Phase 1 results and clear move towards software and cloud networks (RAN & CN)
- Effective inclusion of Verticals: automotive, healthcare, energy, media...
- New stakeholders and domains (satellite, optical)
- Strong potential to drive Europe towards 5G trials and demo paving the way towards implementation
- SME presence now above the 20% target

5G Pan-EU Trials Roadmap Version 1.0

Four Main Pillars

- 
- Expanding the work initiated by Industry in the context of the 5G Manifesto and by the European Commission in the EC 5G Action Plan (5G AP)
 - Building Europe 5G readiness through **5G Private Trials**
 - **5G for Vertical Industries** - Building the case through Pilots
 - **5G for UEFA EURO 2020** - An opportunity for a Pan-European Showcase Event
 - **5G Trials Cities**

MID-TERM 5G PPP REVIEW



EUROPEAN COMMISSION

DIRECTORATE-GENERAL FOR RESEARCH & INNOVATION
Directorate D - Industrial Technologies
D2. Advanced Manufacturing Systems and Biotechnologies
The Head of Unit

Brussels,
RTD-D2/JT/GW

Subject: Data reporting of the cPPPs to the mid-term review and annual monitoring exercise 2016

INDICATIVE TIMELINE FOR THE MID-TERM REVIEW

The Commission intends to appoint a Group of Experts under its revised Work Programme 2016/2017. Subject to the opinion of this group, the indicative timeline for the mid-term review of all the cPPPs would be as follows:

- | | |
|----------------|---|
| April 2017 | Appointment and first meeting of the expert group |
| Mid May 2017 | Reception of the annual progress monitoring reports from all the cPPPs. |
| September 2017 | Final report from the expert group |
| October 2017 | Public discussion of the findings of the Group of Experts at a major conference in Brussels |

EUCNC 2017 - Oulu



Successful edition of EUCNC 2017 in June 2017, with more than 650 participants, where many 5G PPP Phase 1 projects had a booth in the exhibition area and participated in various workshops, whereas 5G-IA Representatives delivered presentations on topics such as spectrum, connected cars, security and 5G PPP collaboration.

- EUCNC 2017 was the occasion of the **official launch of the 5G PPP Phase 2 Projects**, with the presentations by each of the 23 new projects,

Global 5G Events & MoU

CONNECTED CITY



✉ Signing Ceremony in the 3rd Global 5G Event on 24 May 2017, Tokyo

Multilateral MoU include:

- 5G Forum (Korea),
- 5G Americas (Americas),
- IMT-2020 (5G) Promotion Group (China),
- 5G-IA (Europe)
- 5GMF (Japan),
- Telebrasil – Projeto “5G Brasil” (Brazil)
- To promote 5G globally as it approaches 2020.

H2 2017 main events

- 
- **EU – China 5G Development Workshop**, 12 July 2017, Brussels, DG CONNECT & 5G-IA
 - **Futurecom 2017**, 2-5 October 2017, Sao Paulo: speaking invitation by Futurecom (also partner of the 5G Global event Oct. 2018), and cooperation meetings with Telebrasil-Projeto 5G Brasil
 - **ITU-R IMT-2020 Workshop**, 4 October 2017, Munich: IMT-2020 Evaluation Group
 - **5G PPP Phase 3 Info Days**, 17 October, Ljubliana, and 9-10 November, Budapest
 - **5G Week 2017, Fokus Fuseco Forum**, 9-10 November 2017, Berlin: Invitation from Fraunhofer to speak at the FFF17 conference on 10th November, Phase 2 MATILDA Workshop, SDN-NFV WG for IEEE session
 - **4th 5G Global Event**, 22-24 November, Seoul: conference, trials roadmap, Phase 2 projects promotion

2018 expected main events

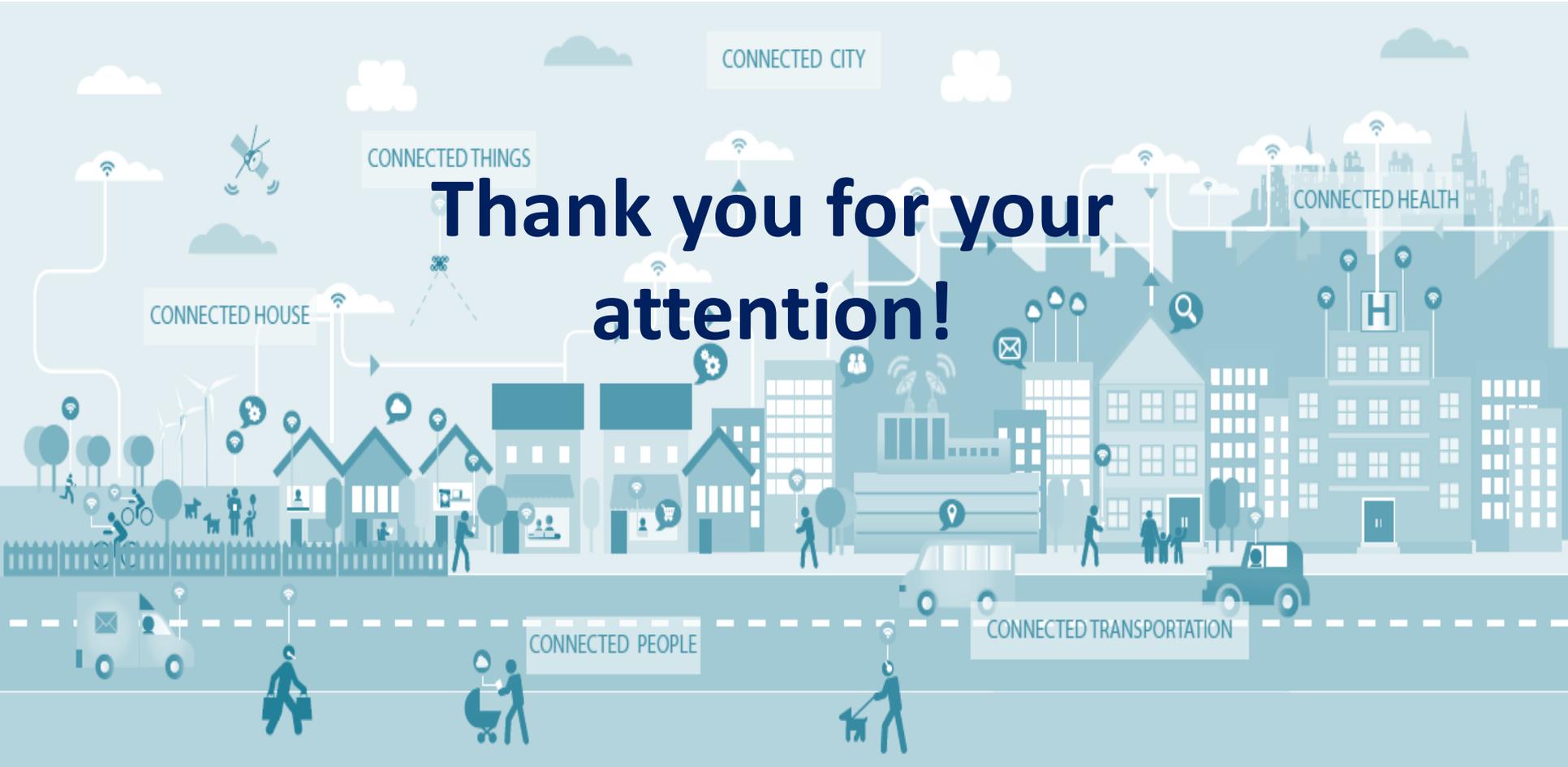
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- The background is a stylized illustration of a smart city. It features various buildings, houses, and people. Labels like 'CONNECTED CITY', 'CONNECTED THINGS', 'CONNECTED HOUSE', 'CONNECTED HEALTH', 'CONNECTED PEOPLE', and 'CONNECTED TRANSPORTATION' are scattered throughout. There are also icons for Wi-Fi, a satellite, a car, a person with a briefcase, a person with a stroller, and a person with a dog. The overall theme is connectivity and smart infrastructure.
- **MWC 2018**, 26 February – 1st March 2018, Barcelona
 - **5th 5G Global Event** (in conjunction with 5G World North America), 16-17 May 2018, Austin (USA)
 - **5G World Congress**, 10-11 April 2018, London
 - **EUCNC 2018**, June 2018, Ljubljana, Slovenia
 - **6th 5G Global Event** (in conjunction with Futurecom 2018), October 2018, Sao Paulo

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- More than other regions in the world, **Europe's vision for 5G is very ambitious**, aiming at a deep ecosystem transformation
- **5G will be a full connectivity platform**, and not only an improved air interface, even aggregated with other technologies

→ *DT: WE NEED A JOINT INDUSTRY PUSH FOR A MUCH MORE INNOVATIVE 5G SYSTEM ARCHITECTURE IN ORDER TO BE ABLE TO DELIVER ON THE 5G VISION !*

- Let's implement 5G PPP Phase 2 projects, prepare Phase 3, towards **5G commercial deployments and 5G Evolution...**



Thank you for your attention!

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