

Overview of the 5G-SOLUTIONS Project

Andrea Di Giglio, (TIM)

IOTHINGS week • 25 MAY 2021



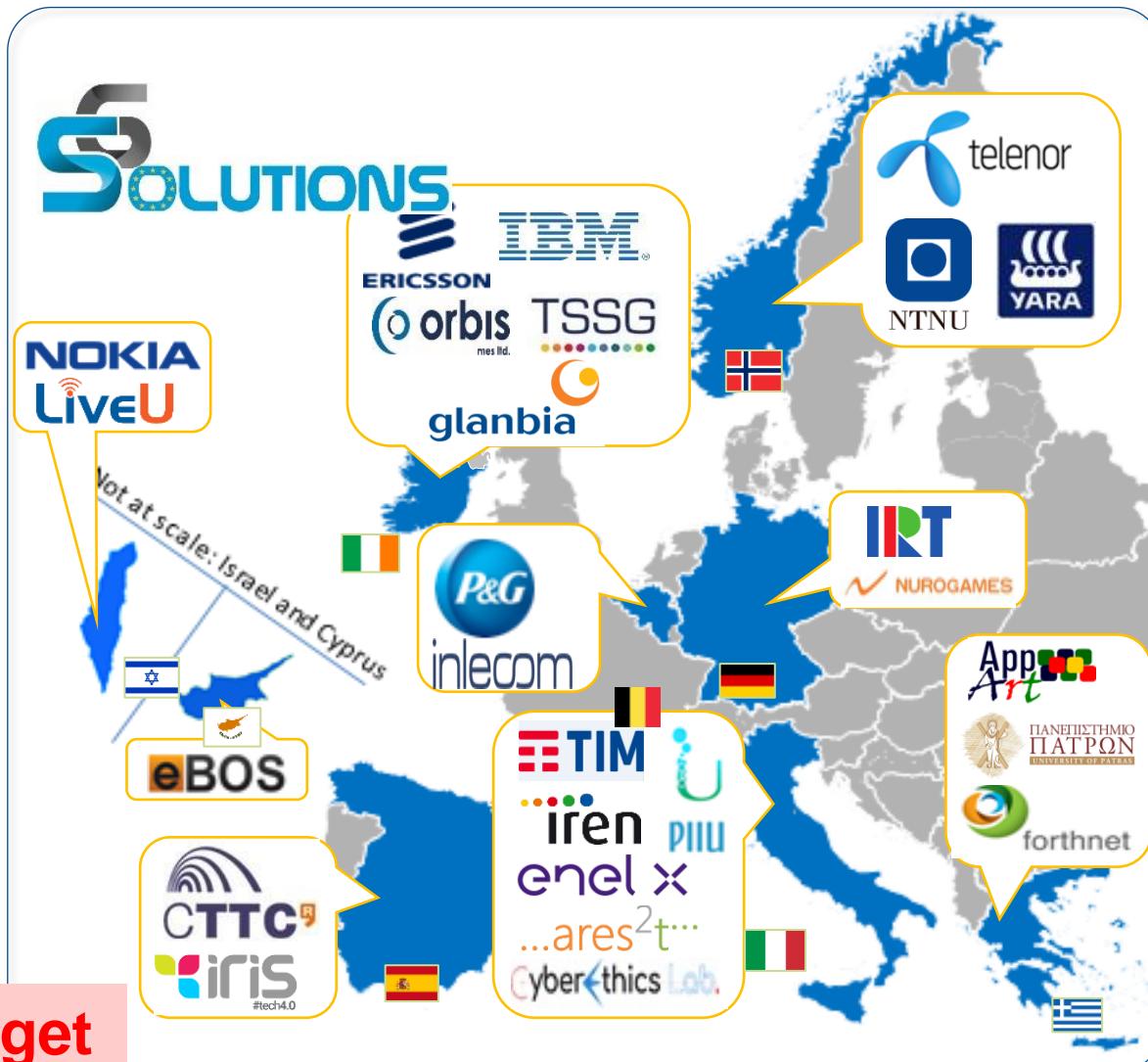
What I'm going to talk about

- I will present the 5G-SOLUTIONS project
- I will say what 5G is (not for experts)
- I will show where 5G-SOLUTIONS fits in the development and use of 5G.
- What awaits us for the future
- Q&A: Questions, Discussion & Answers

5G-SOLUTIONS in a nutshell

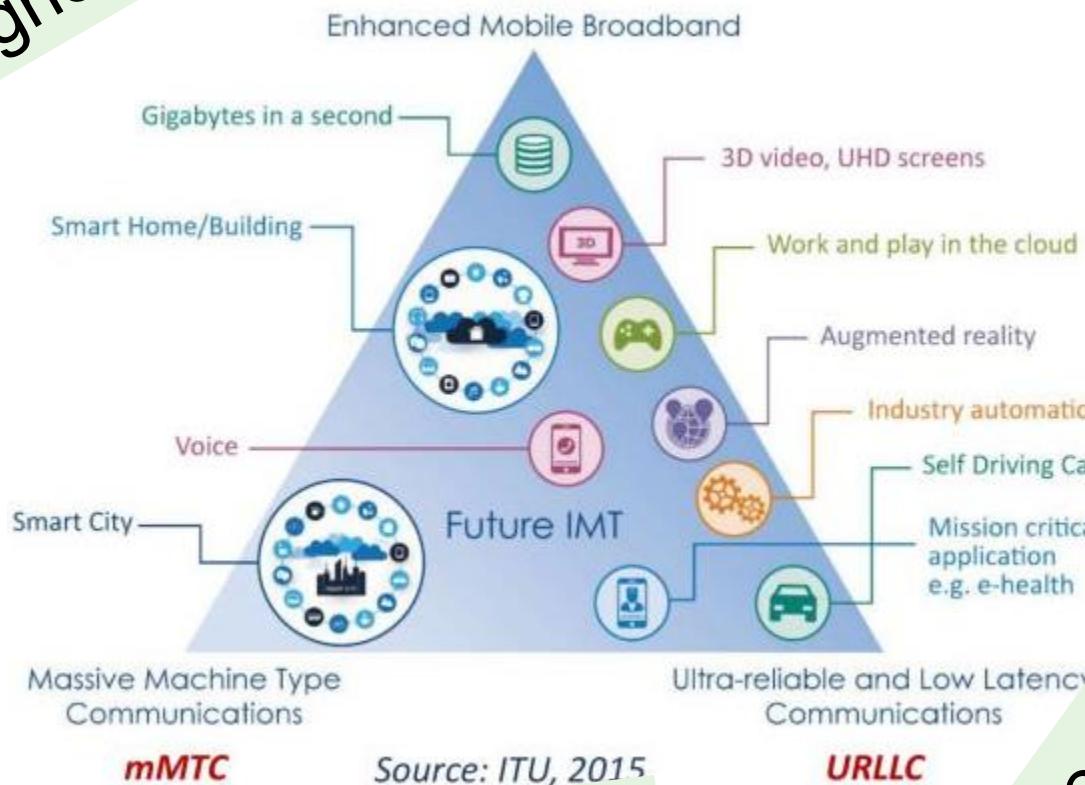
- **Topic:** ICT-19-2019 **Type of Action:** RIA
- **Proposal No:** 856691 **Duration:** 36 months
- **Budget:** €14.293.850
- **Consortium members:** 27 partners from 9 EU member states and associated countries (Israel, Norway)
- **13 partners in existing 5G-PPP Phase 1-3 projects**
- **3 Telecom Operators:** TIM, Telenor and Forthnet
- **2 Telecom Vendors:** Ericsson, Nokia
- **9 Large Industries:** ENEL, GLANBIA, IBM, IREN, LIVE-U, P&G, YARA, EBOS, INTRACOM
- **2 Research Centers:** CTTC, PIIU
- **3 Universities:** NTNU, Patra, TSSG (WIT)
- **9 SMEs:** ARES2T, APP-ART, CyberEthicsLab, INLECOM, IRIS, IRT, NUROGAMES, ORBIS

SMEs cover 46% of the manpower and budget



What's 5G ?

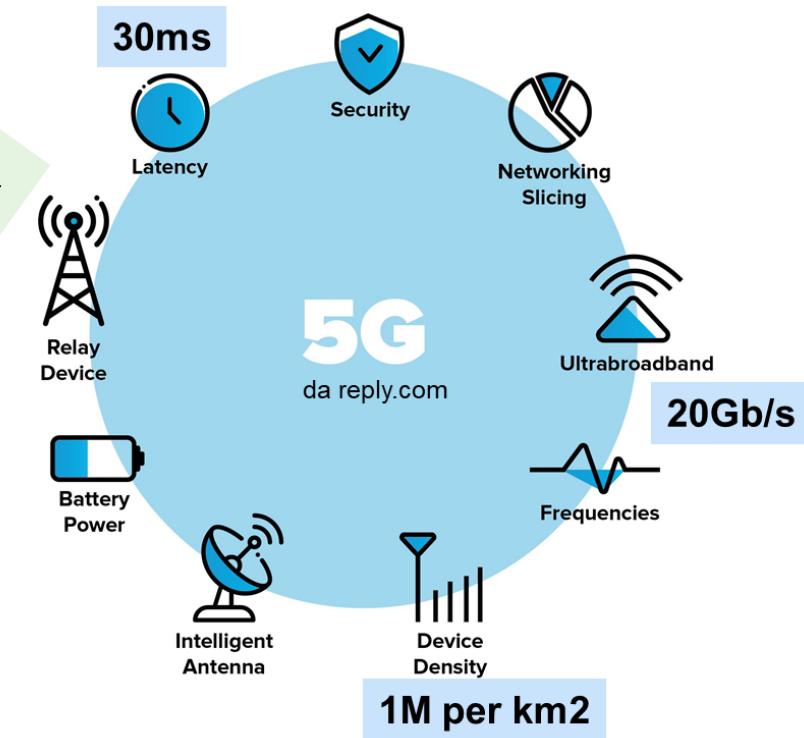
Higher bitrate?



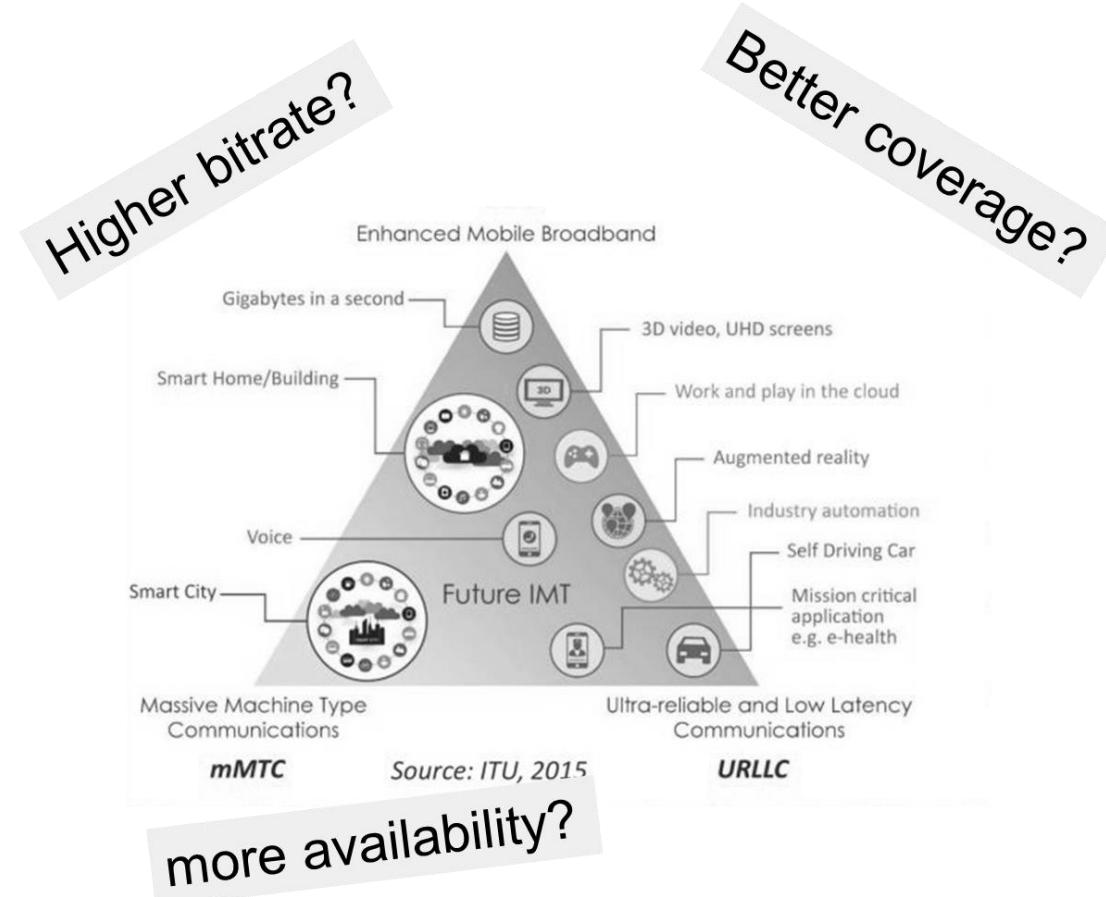
more availability?

Better coverage?

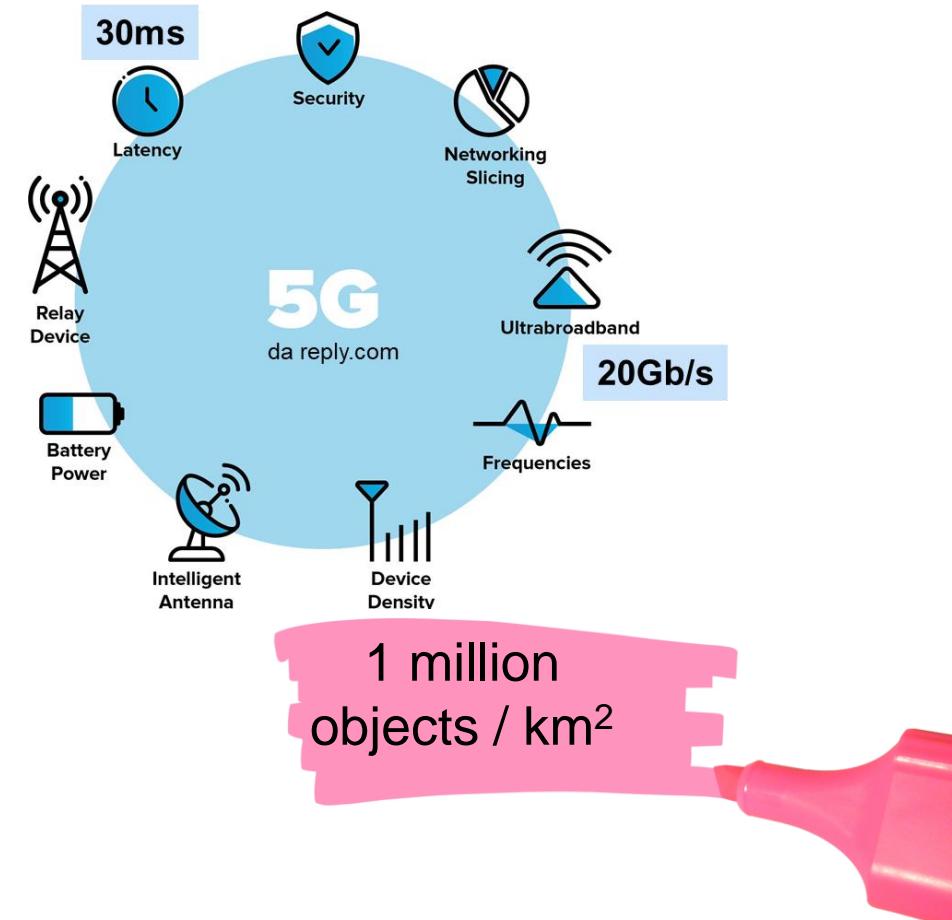
Higher number of objects?



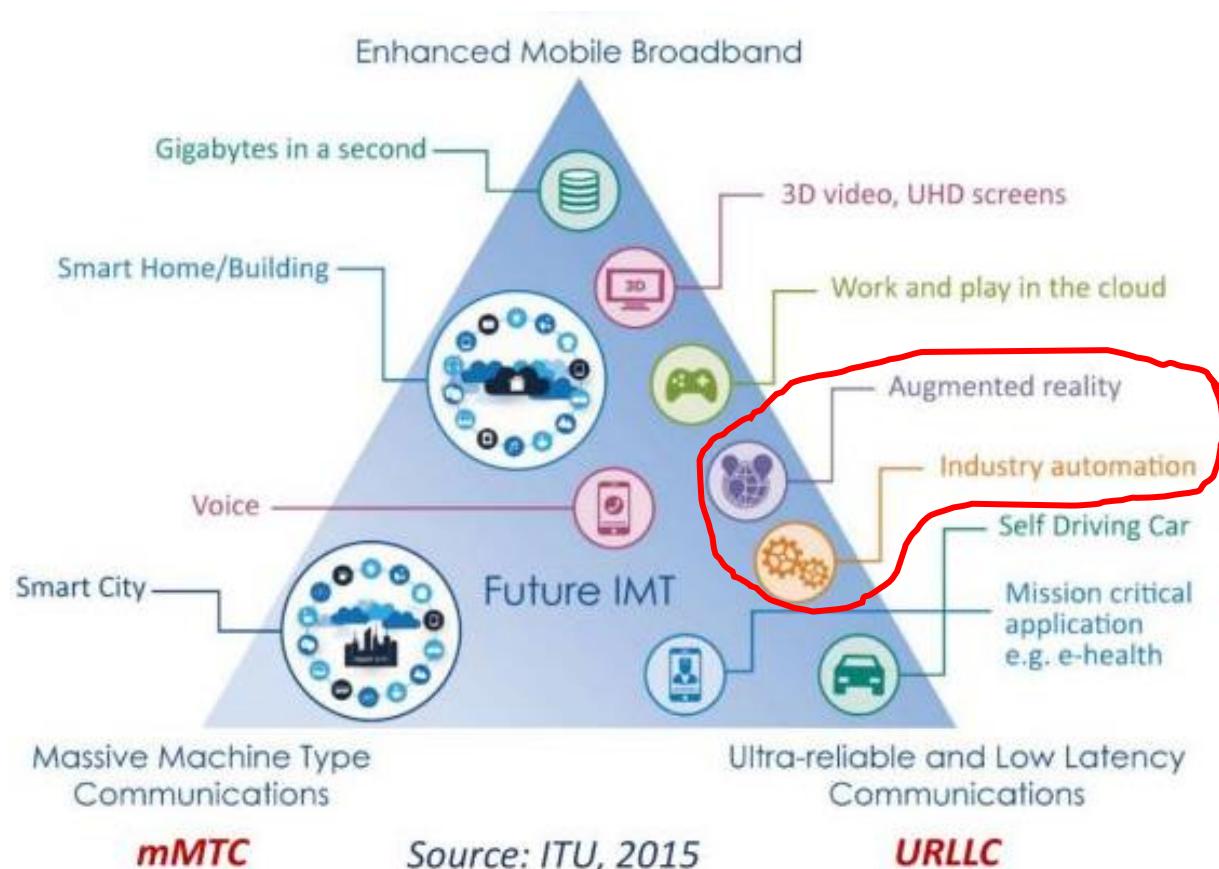
What's 5G ?



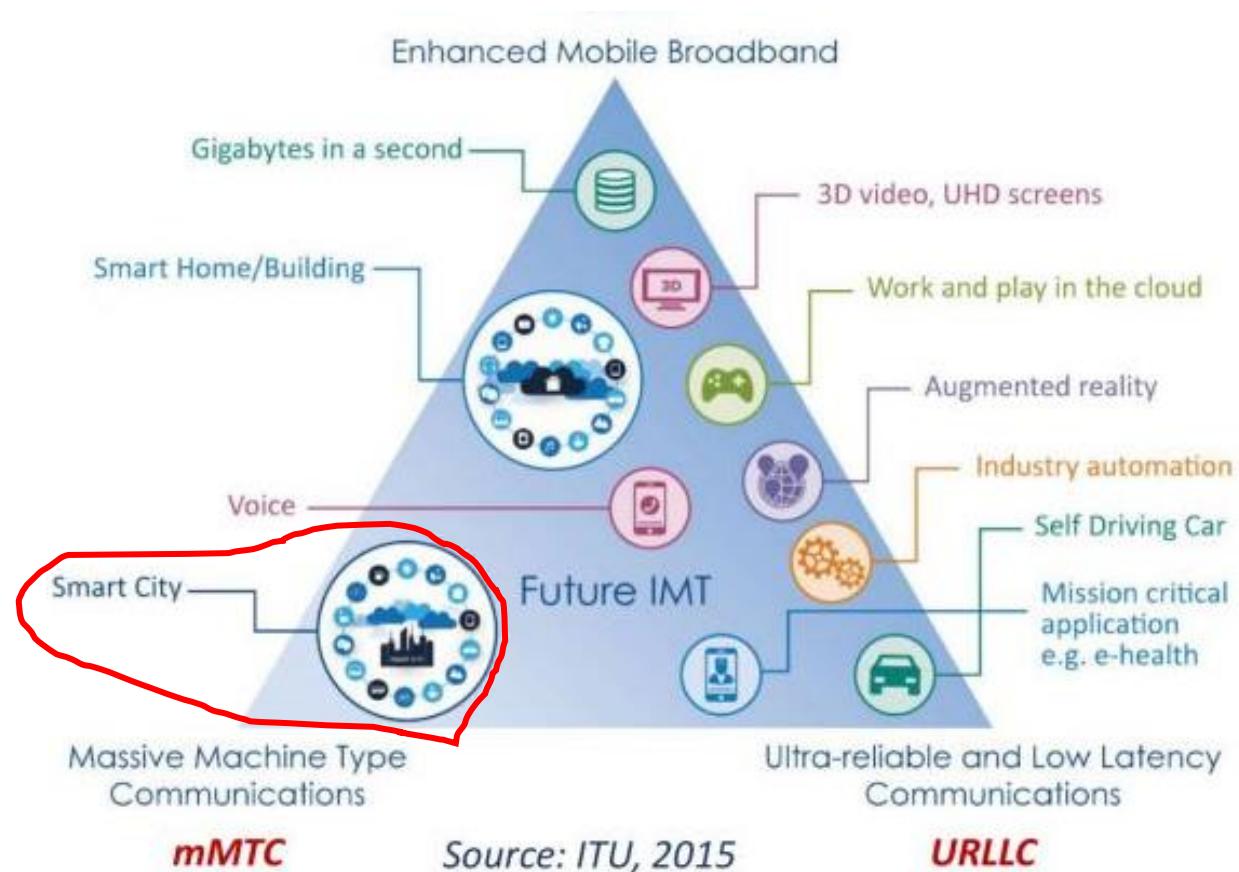
Higher number of objects



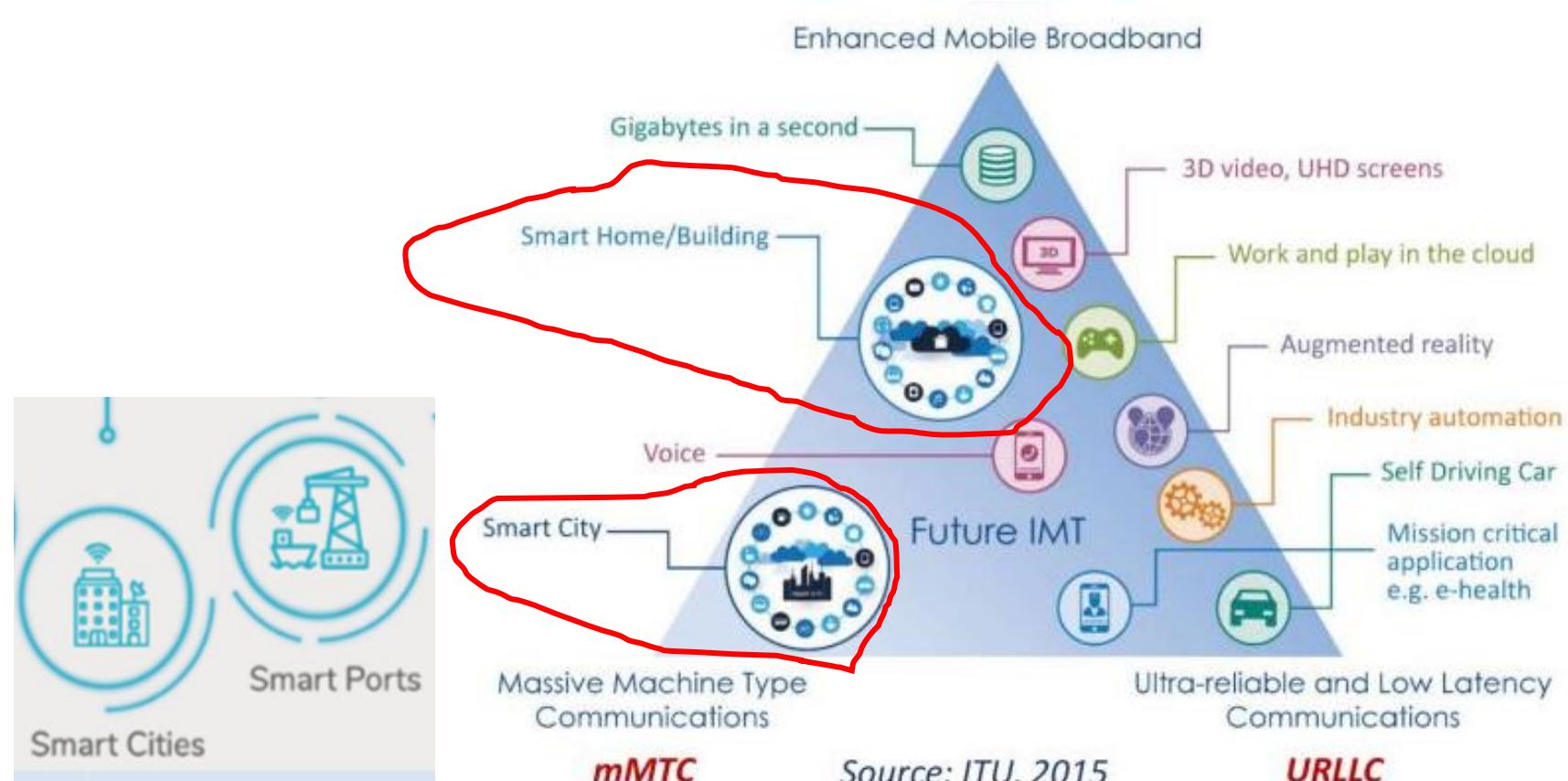
Use cases 5G - SOLUTIONS



Use cases 5G - SOLUTIONS



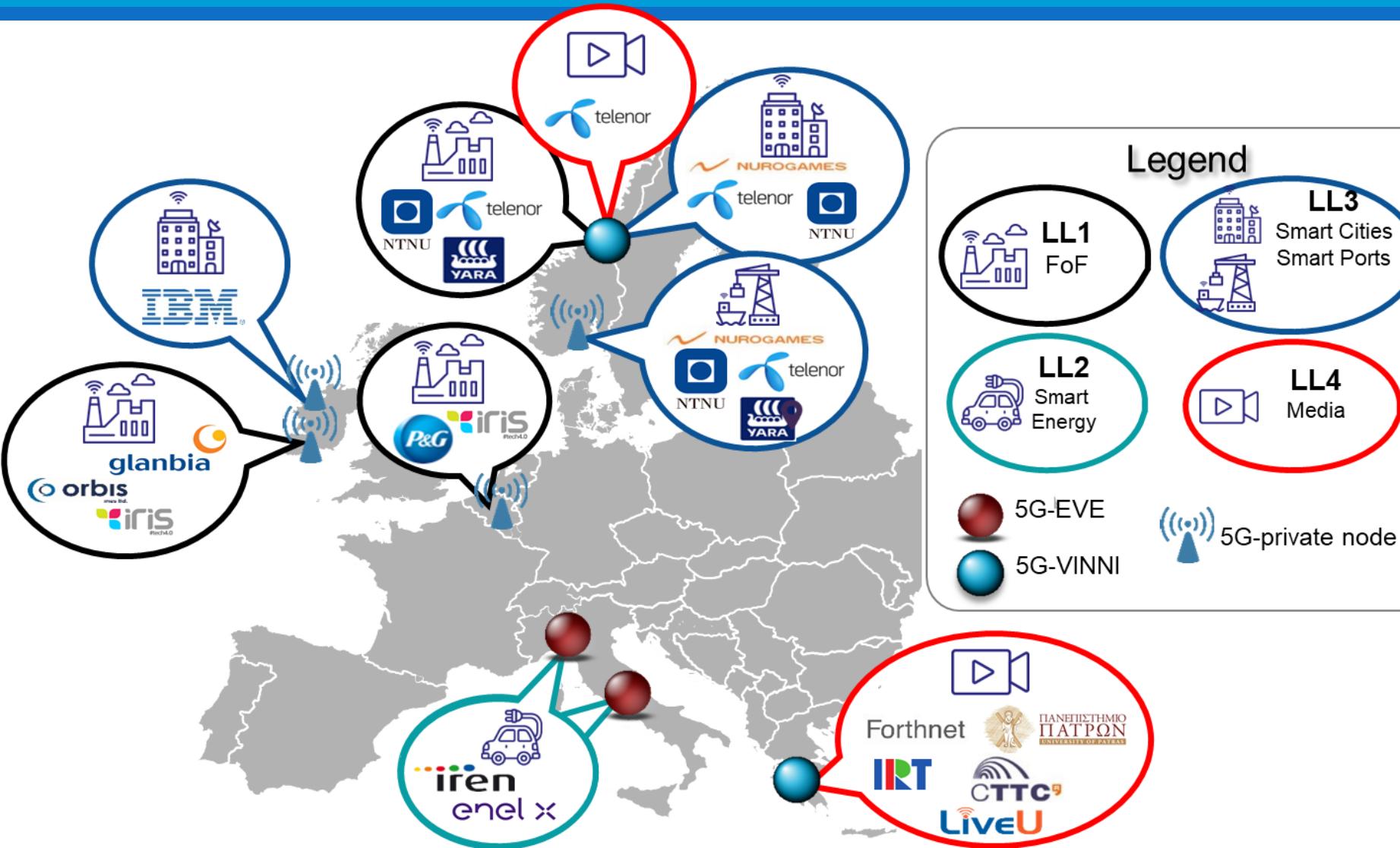
Use cases 5G - SOLUTIONS



Use cases 5G - SOLUTIONS



Summary of tests

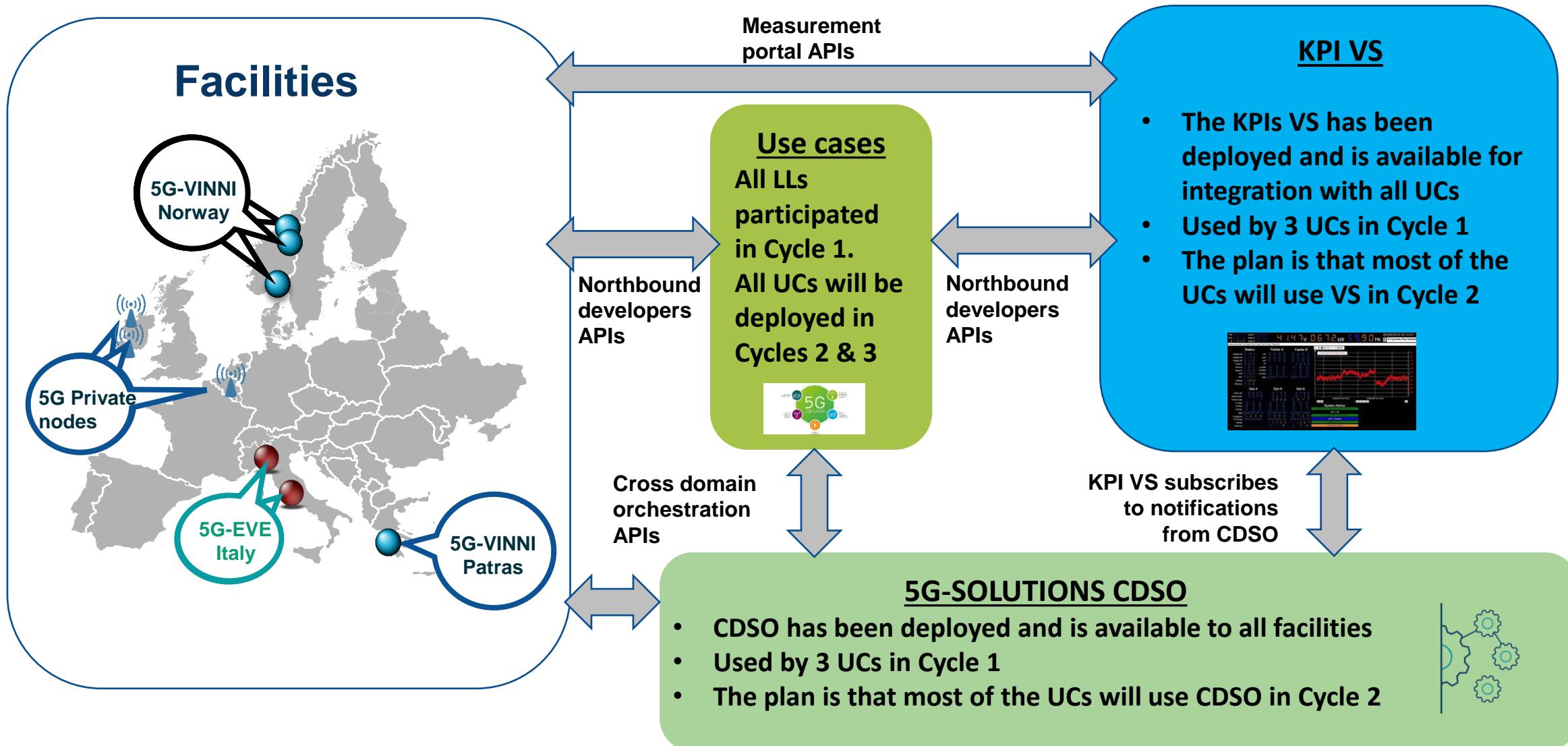


Industry



citizens

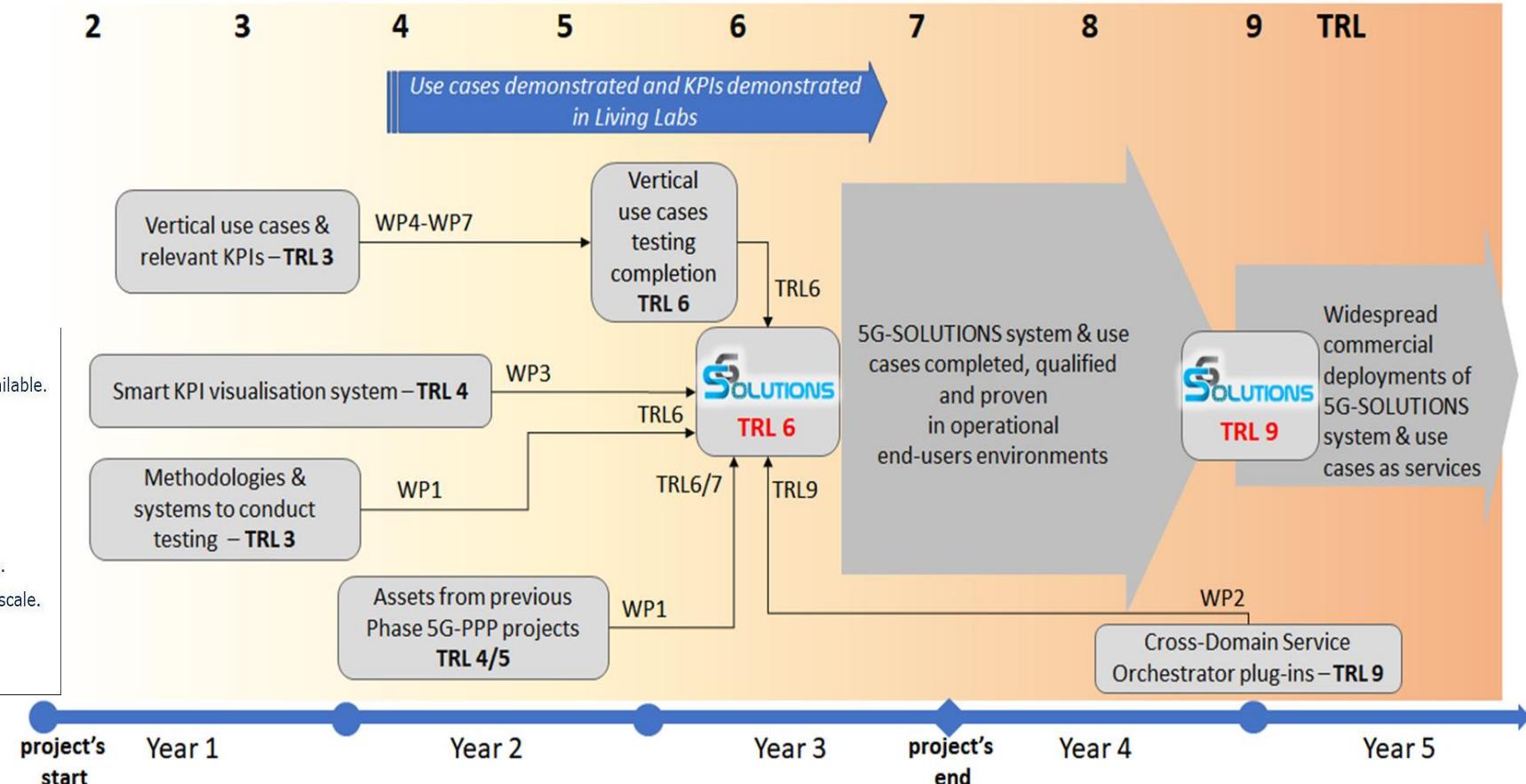
Use Cases, CDSO and KPI VS overview and status



Where we are?

Vertical

- TRL 0: Idea.** Unproven concept, no testing has been performed.
- TRL 1: Basic research.** Principles postulated and observed but no experimental proof available.
- TRL 2: Technology formulation.** Concept and application have been formulated.
- TRL 3: Applied research.** First laboratory tests completed; proof of concept.
- TRL 4: Small scale prototype** built in a laboratory environment ("ugly" prototype).
- TRL 5: Large scale prototype** tested in intended environment.
- TRL 6: Prototype system** tested in intended environment close to expected performance.
- TRL 7: Demonstration system** operating in operational environment at pre-commercial scale.
- TRL 8: First of a kind commercial system.** Manufacturing issues solved.
- TRL 9: Full commercial application**, technology available for consumers.



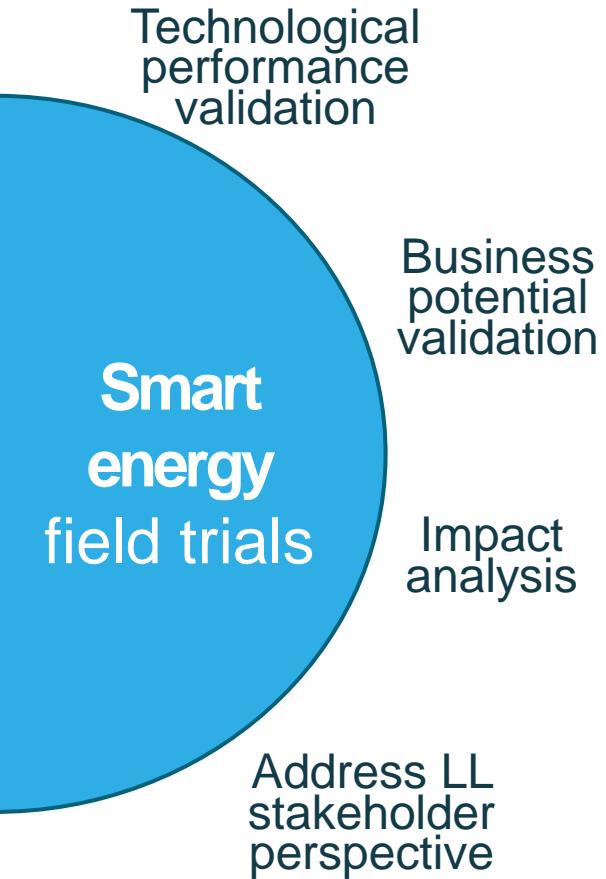
>140 Technological KPIs to be validated

Expected Impact Indicators	Target values with respect to 4G
Network slicing	Meet target KPI values during infrastructure, spectrum and RAN sharing and network slicing.
Multi tenancy & flexibility	
Traffic type	
User data rate	Guaranteed user data rates >50Mbps
Latency	10-fold less (<1ms) with less than 10% jitter
Reliability	>99.999%
Positioning accuracy	<1m for outdoor devices

- Reducing **environmental pollution**
- Providing a **wider approach to smart city**
- Reducing **both CAPEX and OPEX of energy consumption**
- Improving **safety and reducing crime**
- **Productivity** gains in the manufacturing sector thanks to process optimisation inside digital factories

Living Lab title	Technological KPIs					
	Data Rate (Mbps)	Mobility (km/h)	Latency (ms)	Connection Density (devices/m ²)	Reliability (%)	Positioning Accuracy (m)
LL1: Factories of the Future	>100	>30	<5	>0.1	>99.999	<0.5
LL2: Smart Energy	-	-	<10	>10 ⁻²	>99.999	-
LL3: Smart Cities & Ports	>100	-	<10	>1	>99.99	<0.5
LL4: Media & Entertainment	<1000	<100	<100	>1	>99.99	<10

Objectives



Smart energy

Vertical UCs represent **Smart Energy** environment.

Scope:

- validating 5G technologies as key innovation factors for the forthcoming decade
- identifying and meeting business oriented KPIs
- introducing new requirements and control-based optimization strategies in advanced industrial verticals domain as DSM
- evaluating business impacts

Partners Involved

...ares²t...

The logos of the partners involved are displayed:

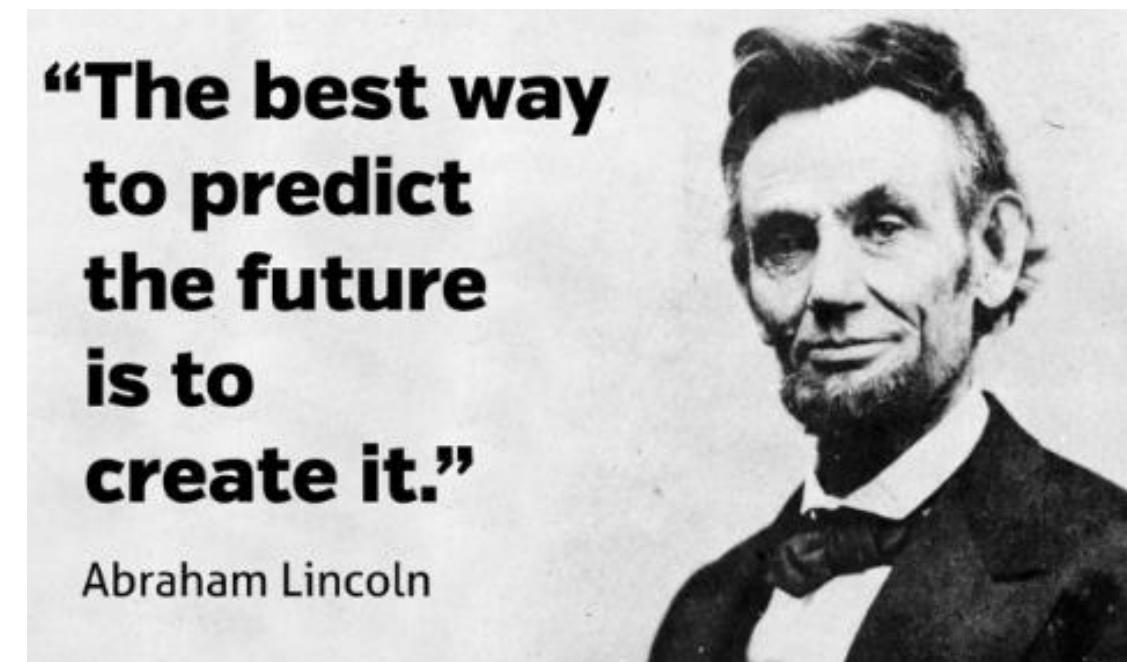
- CRAT**: Logo consisting of the letters C, R, A, T in colored squares (orange, yellow, blue, green).
- enel x**: Logo with the word "enel" in purple and "x" in purple.
- iren**: Logo with the word "iren" in black and three colored dots (yellow, red, green) above the letter "i".

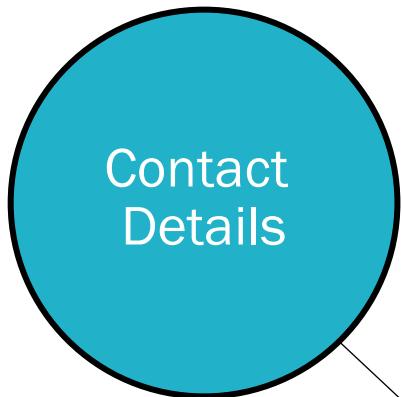
Conclusions and take-away

- EU funded projects implement the most advanced and updated technology
- In recent years the objectives of the projects are increasingly product-oriented, considering business KPIs and social impact.
- Collaboration between large companies, universities, research centers and SMEs is very close

**“The best way
to predict
the future
is to
create it.”**

Abraham Lincoln





TIM



Andrea Di Giglio



andrea.digiglio@telecomitalia.it

