

TARGET-X

Trail Platform for 5G Evolution – Cross-Industry on Large Scale

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TARGET-X focuses on integrating 5G in different verticals, use cases and defining new business models and scenarios relevant to the envisioned 5G and 6G. Figure 1.2 1 visualizes the TARGET-X methodology. In the center are five testbeds for four different verticals in two trial sites. After extending the existing 5G coverage to all four verticals, new 5G/6G technologies and features will be deployed and tested on each trial site.

Integrating 5G in five different verticals to validate 6G features

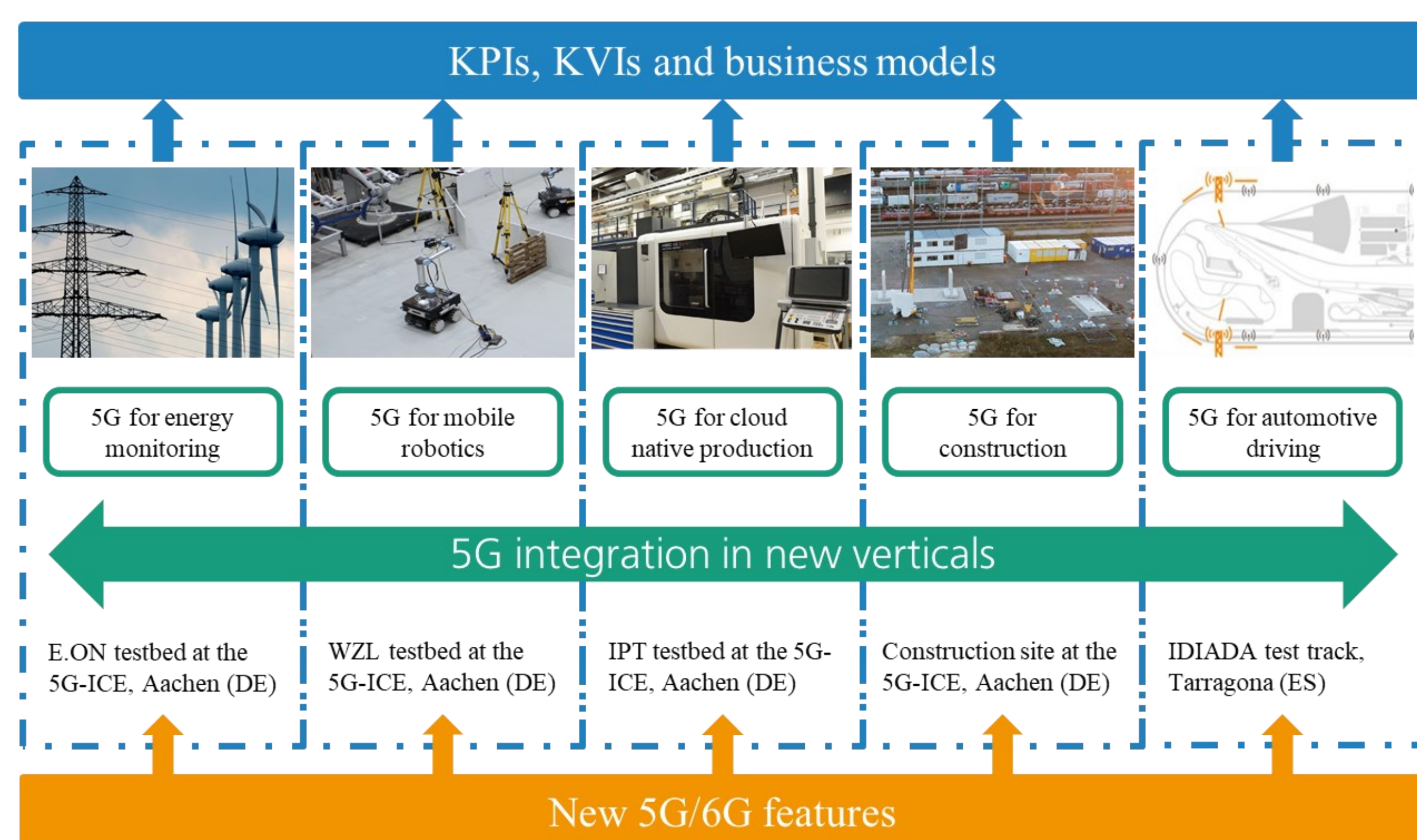


Figure 1: Overview of the five verticals addressed by TARGET-X.

5G for Energy Monitoring: The energy pilots cover different sectors focusing on measurement for energy awareness, carbon and lifecycle emission assessment, data-driven energy decision-making enablers, and the consequent optimization and monetization possibilities in a cross-sector approach. This trial will be built in the RWTH Campus Melaten in Aachen and will showcase Smart Grid technology used in a live setting.

5G for Mobile Robotics: The assembly and mobile robotic use cases will be conducted in WZL's line-less mobile assembly laboratory. The lab consists of multiple robots, real industrial product cases, large-scale metrology systems, and a 5G indoor network as part of the 5G-Industry Campus Europe. The robot fleet is very heterogeneous and can be controlled by open-source control architecture based on ROS.

5G for Cloud Native Production: In addition to the production and mobile communication equipment, the Fraunhofer IPT also has an on-premise Factory Cloud and a TSN testbed, which will be used for real-time communication and computation for cloud-in-the-loop applications. Furthermore, IPT owns extensive measurement and diagnostic to perform performance and diagnostic measurements.

5G for Construction: The Construction Robotics GmbH provides a Reference Construction Site with over 10,000 square meters for research and teaching. The site serves as a reality laboratory where new construction processes and products, networked machines, the implementation of robots, software solutions will be tested under real construction site conditions.

5G for Automotive Driving: The IDIADA Trial Site offers an area of 350 hectares gathering 15 multi-purpose test tracks with a unique controlled environment to develop and validate connected vehicle solutions.

5G/6G technologies developed and validated in TARGET-X:

- 1. Service differentiation in beyond 5G industrial NPN:** TARGET-X will look at advanced methods of differentiation of industrial traffic types and dynamic mechanisms for service differentiation.
- 2. End-to-end support for Layer 2 industrial protocols:** Infrastructures and devices supporting native Ethernet PDU sessions to explore and validate the use for industrial Ethernet communication, such as Time-Sensitive Networking, will be developed.
- 3. Quality of Service framework for industrial applications:** The project will approach the QoS demands from an end-to-end view, considering all involved entities in typical industrial scenarios as worked on in the verticals of the project, to define a QoS framework controlled by a single management entity.
- 4. mmWave for industrial 5G NPN:** TARGET-X will introduce mmWave on testbed shopfloor and validate the pros and cons of this spectrum range for industrial use cases.
- 5. Precise 5G positioning:** During the project, prototype development will be done on a solution where positioning data shall be fused with additional sensor data to reach higher levels of accuracy. The most suitable coupling strategies will be evaluated in the TARGET-X runtime.
- 6. 5G Network Asset Administration Shell:** TARGET-X will introduce relevant sub models in machine AAS instances and 5G Network AAS to realize and automate network/asset orchestration leveraging the interoperability.

How can you be part of TARGET-X?

TARGET-X will make use of Financial Support to Third Parties [FSTP] to identify innovative third-party projects oriented to develop new devices and solutions contributing to the sustainable seamless E2E evolved 5G and 6G in the 4 verticals: manufacturing, energy, automotive and construction sectors. Up to 100 third party projects can be funded, with a total budget of 6 million Euros. This gives especially SMEs and the European Academic and Research community an opportunity to timely engage in experimental activities aimed to validate technological trends for 6G networks.



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