5G | Power Up Greece

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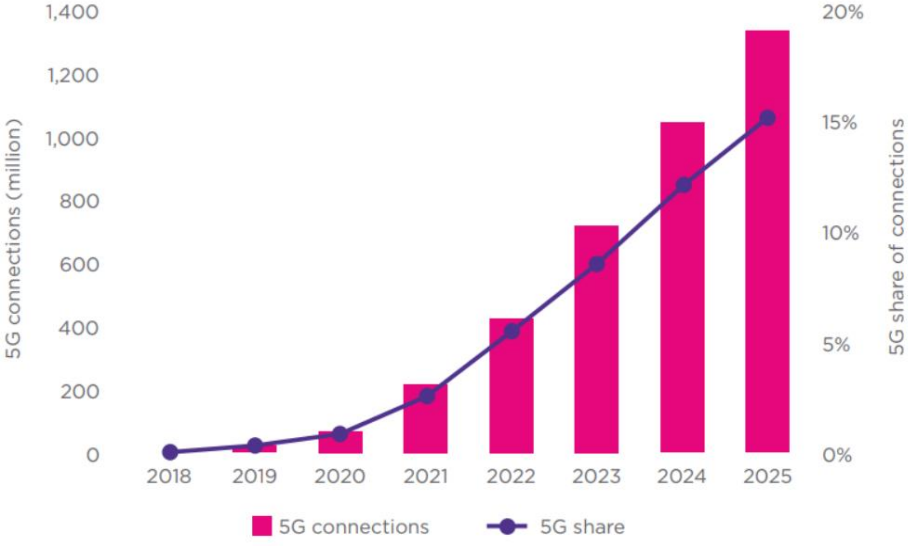
HELLENIC ENERGY

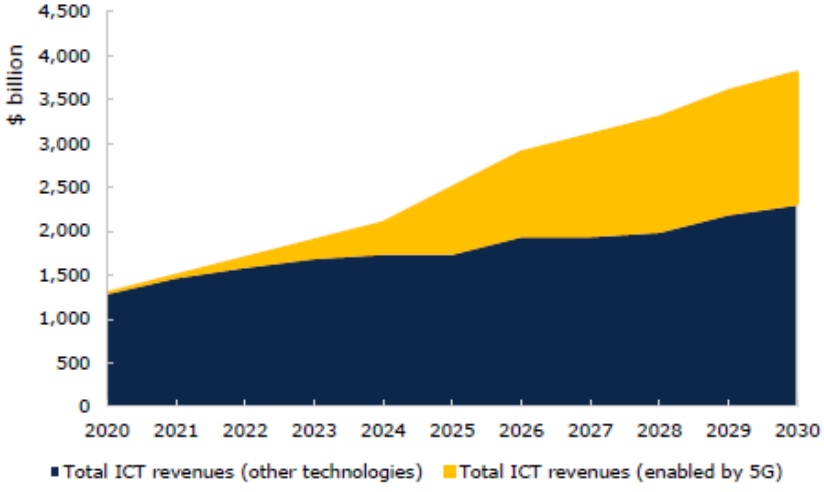
5G global expectations and projections

- **5G is a synonymous with global technology explosion** and key element for **the 4TH industrial revolution** *(the era of the Cyber Physical Systems and Connected Things):*

Global 5G connections estimations



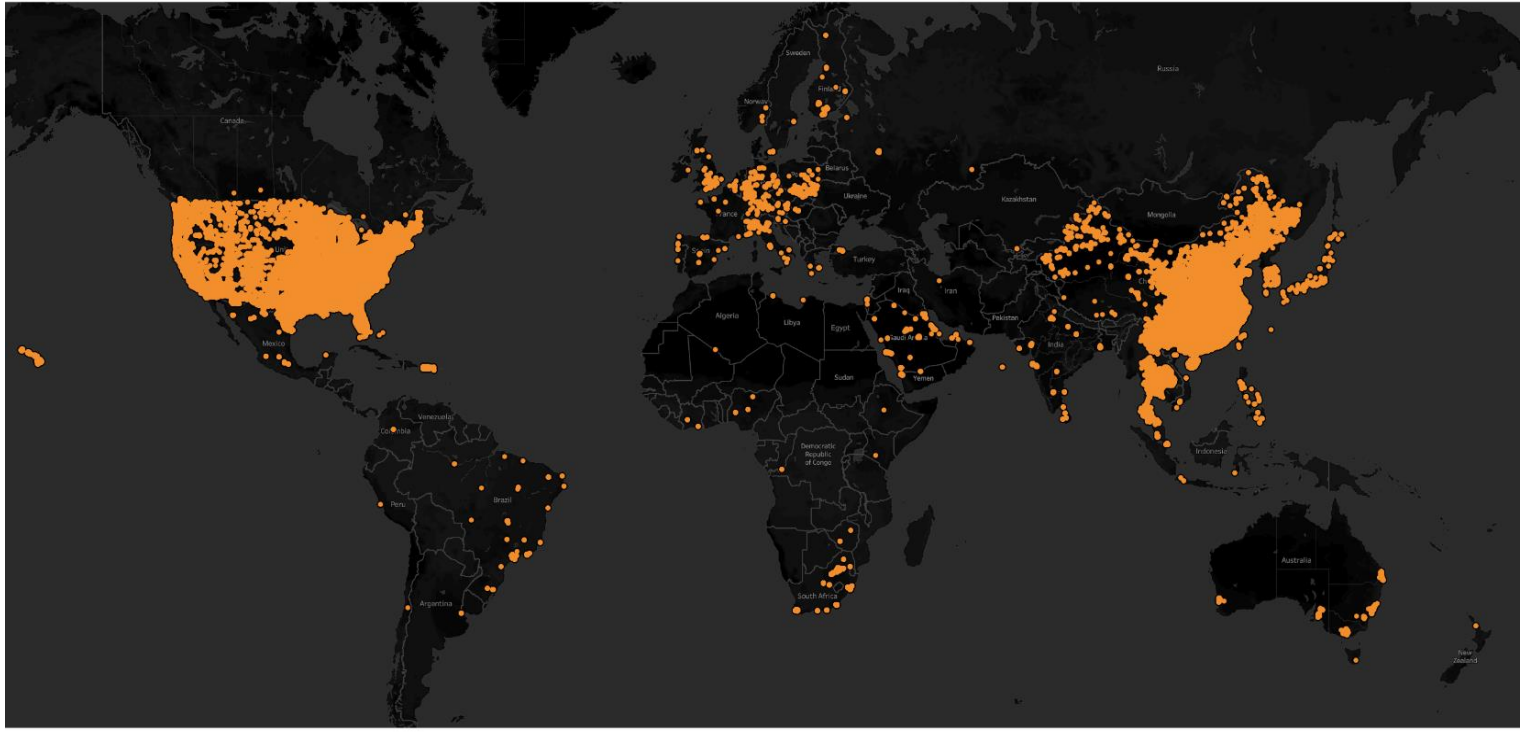
Total ICT revenue forecast split between 5G enabled and other technologies



Source:
- *GSMA*
- *Axon consulting*

5G global footprint

- **5G Stand Alone is increasingly commercially deployed and trailed across markets, pushing the road to new services and business models.**

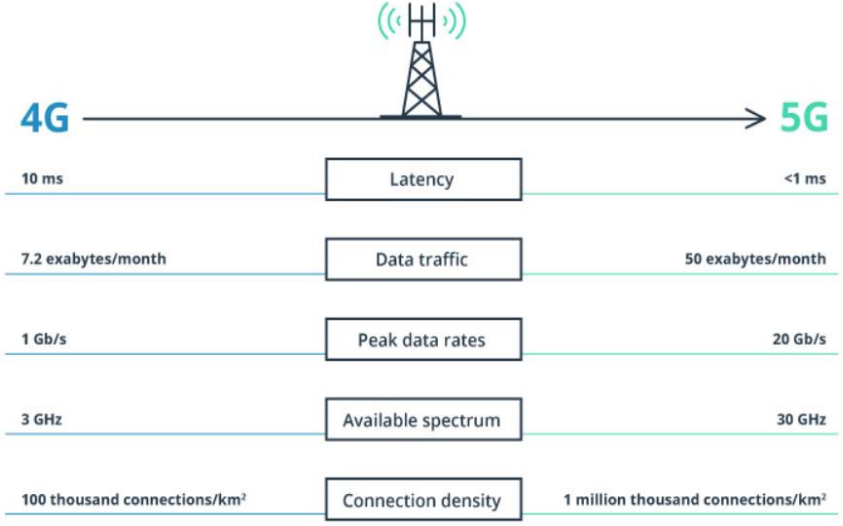


Source: Based on analysis by Ericsson of Ookla® Speedtest Intelligence® data for October 2021 to April 2022.
Note: Samples include iOS and Android smartphones connecting to a 5G SA network. Sample density varies across markets, reflecting differences between markets with more extensive commercially launched 5G SA or markets with mainly trials/tests.

5G main performance characteristics

- The 5th generation of mobile networking technology, working on the same principles as 4G , however it comes with **improved performance characteristics** and an **extensive functionality 'over and above'** just mobile internet**, providing a higher level of scalability and flexibility.**

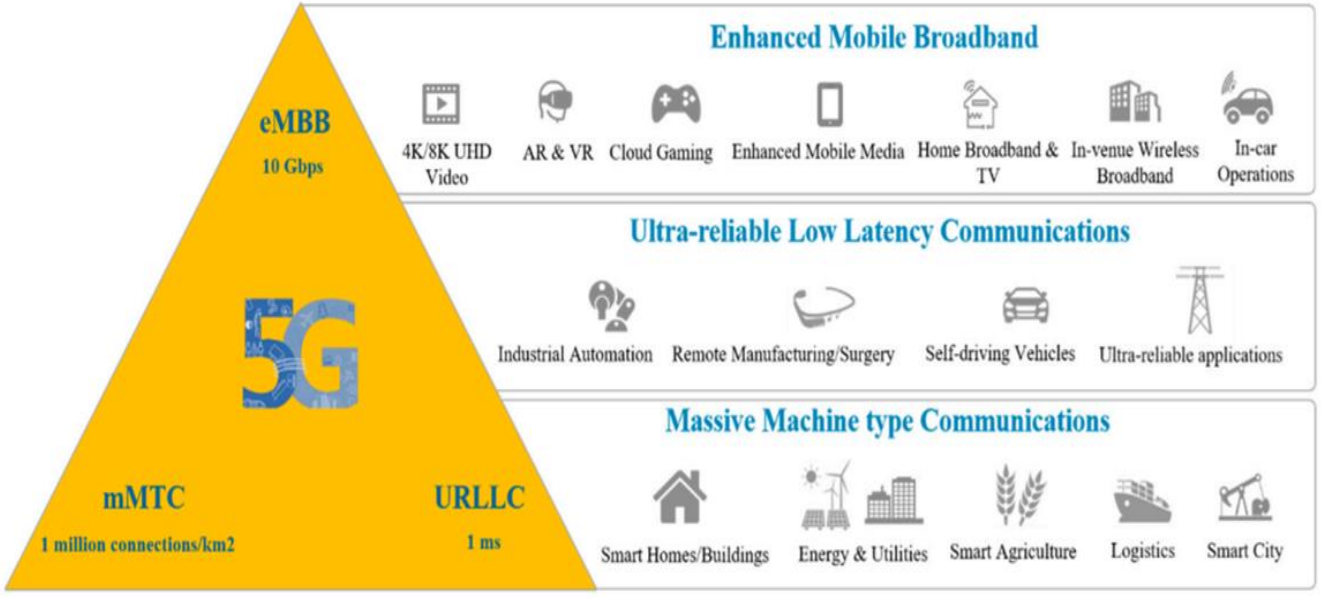
Comparison of key 4G and 5G parameters



Source: Qorvo – Getting to 5G : Comparing 4G & 5G System Requirements

5G types of services and main applications

5G Use cases categorization into three main types of connected services



Characteristics & Requirements

- Extension of the existing 4G value proposition
- Extend Cellular coverage
- Improve network Capacity

- Applications requiring high reliability and low latency connectivity e.g., mission critical services
- Strong security and availability requirements

- Adoption and utilization across different sectors on a massive scale
- Uptake of mobile technologies to address mIoT applications

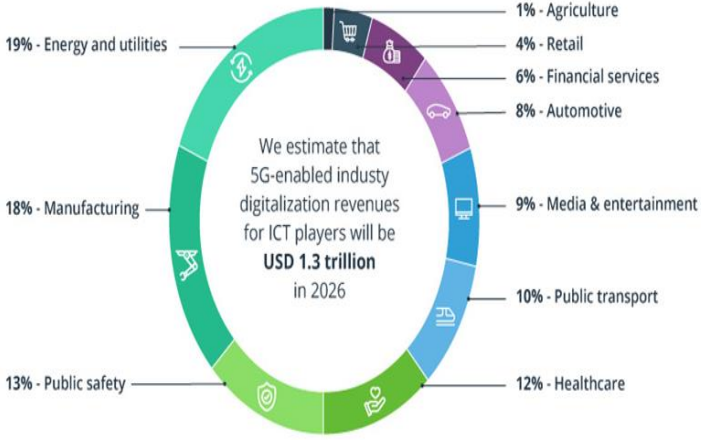
Sources:

- *PWC, The Global Economic impact of 5G*
- *O'Connell, Moore, Newe, 'Challenges associated with Implementing 5G in Manufacturing', 2020*

5G expected to ‘recharge’ the energy and utilities sector

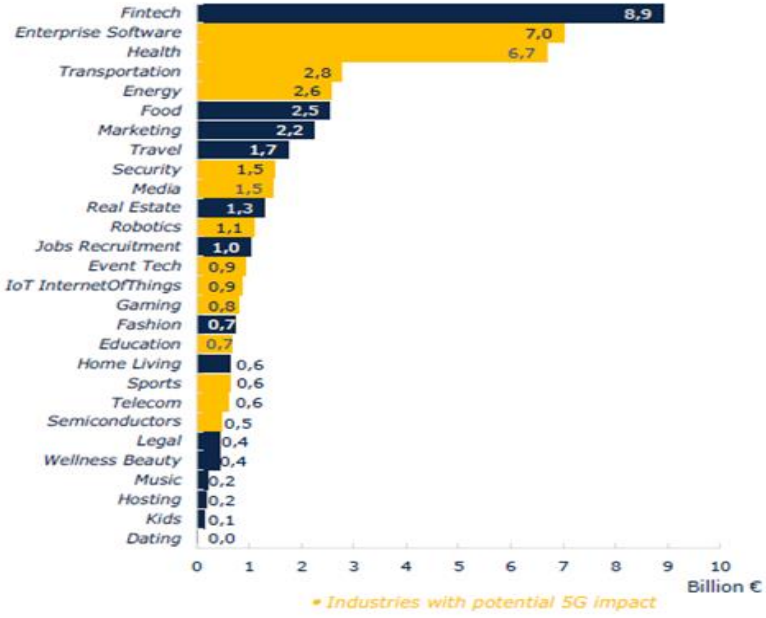
- **Technology and capital enablers highlight energy sector as an area of high gains from the realization of 5G**

Industries that win the most from 5G



Source: Ericsson Report – the 5G Business Potential , 2nd edition

European VC investments by industry in 2019



Source: European Commission, European Investment Bank – Accelerating the 5G transition in Europe; AXON

Main challenges of the energy and utilities sector

Global and local energy sector facing a series of different challenges.

Limited natural resources for the traditional energy production (fossil fuels)	**Energy waste and storage limitations**
Unstable cost of production, driving market turmoil in a global scale	**New uses of electricity power high on the global agenda (i.e., smart cars)**
Overpopulation and growing demand in existing electricity production sources	**Green energy targets towards a carbon neutral world**
Poor and outdated infrastructures (lack of visibility and control)	**Unexplored renewable energy options and the energy transition**
Poor distribution system (lack of visibility and control)	**Public policy and regulatory framework at a changing environment**

Source:

- *Market insights*
- *Accenture : Fuel for Innovation: Greece's race to 5G*

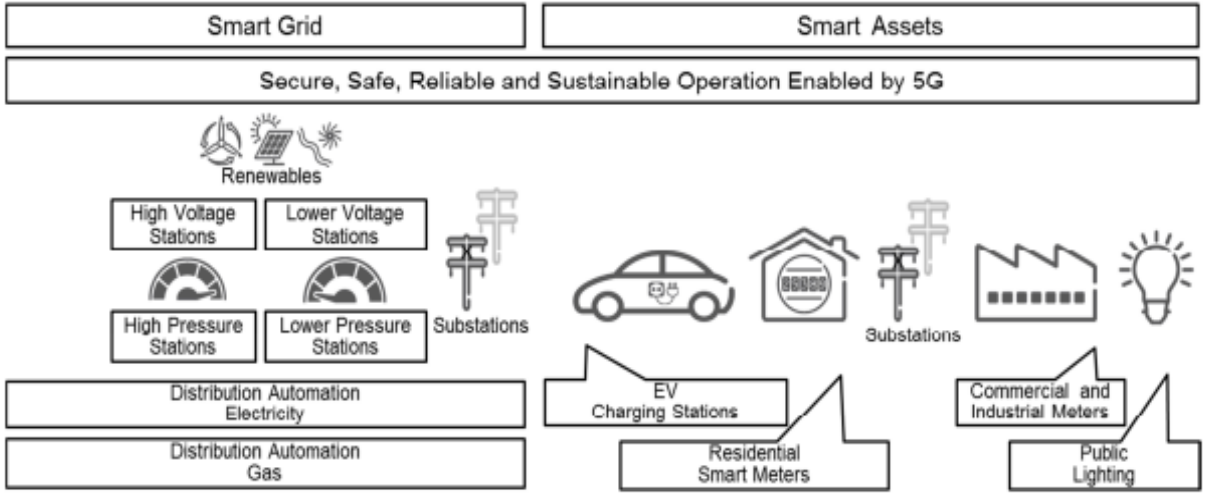
Use cases for energy and utilities powered by 5G

- **5G technology** has the capability to **connect a massive number of devices** and **provide visibility and control over a diverge and dynamic landscape on energy sources**.

Smart grid 5G enabled technology	Smart meters for private or industrial properties	Remote monitoring of energy sites	Digital asset management
•Energy management-monitoring and **forecasting of demand** •**Reduction of production cost** by efficiently balancing the required energy load • **Optimization of investments**	•**Real-time monitoring** of energy consumption •**Efficient planning and control of energy costs** of consumer or corporate energy spending	•Monitor the health and **readiness of the equipment** •Detect parameters deviation in a large-scale • **Remote control and configuration of equipment** •Reducing system faults and **optimizing restorations**	•Eliminate different data formats across the network •Unification of energy data statistics and advanced analytics requirements •Enhance the data management and utilization process

5G powered smart grid, a requisite for the energy transition

- Energy and Utility sector are at the forefront of a sweeping energy transition that will radically alter existing business models and customer interactions.
- **Besides optimization of existing power networks, 5G enabled grids are essential for the transition to renewable sources:**



Source: 5G Infrastructure Public Private Partnership

A Zoom-in Renewable production requirements:

- **Production is uncertain and variable daily** based on weather conditions per location (i.e., sun, wind)
- **Production is much more distributed** in the landscape than traditional power plants (i.e., fossil fuel or hydroelectric or nuclear)
- **Real-time dynamic routing of electricity flows needed to support optimized use of renewables** and black-outs prevention
- **New electrical equipment and continuous (remote) supervision** and configuration needed
- Advanced data processing
- Advanced security

‘In market’ use cases of energy and telco bundling

- **Advanced utilities offered to the retail market merging economy, convenience and piece of mind**

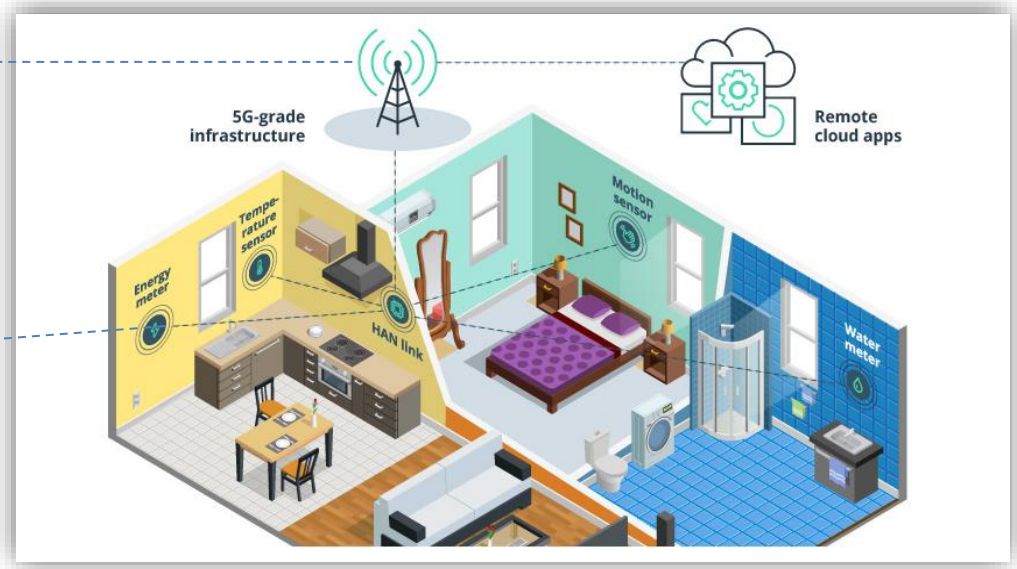
Customer layer:

Telco subscription

Energy Subscription -Smart Meter

- Data Collection
- Usage -Charges monitoring
- Alerts and Remote actions
- Consumer Interface (Self-Care)

In House Deployment of Smart Meters



Service Provider layer:

- Advanced customer profile data
- ‘Bundling’ Telco and Energy
- Improved value proposition
- Improved CEX
- Improved Customer Lifetime Value
- Portfolio margin optimization

Volton Group of Companies

Milestones and highlights

- **2016: licensed** for **Electricity Supply**
- **2017: commenced** the Supply of Electricity to consumers
- **2019: acquired "KEN" energy company,** commenced activities in the **Natural Gas** sector
- **2021**: Licenced for Telecomunications

- **350+** experienced executives
- Modern network of **30 stores**
- **150,000+ customers**

Dynamic Infrastructure investments

- **Renewable 'Green' Energy Sources** and Guarantees of origin targeting production capacity of **~ 560+ MW**

- **Full xVNO development plan** in progress for **mobile** and **fixed telephony and Broadband**

Our Vision

- **'Green' & Environmentally- Friendly**
- **Multiservice** provider:
    - **Customer Experience**
    - **Economy**


Thank You

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