Connectivity to accelerate Industry 4.0
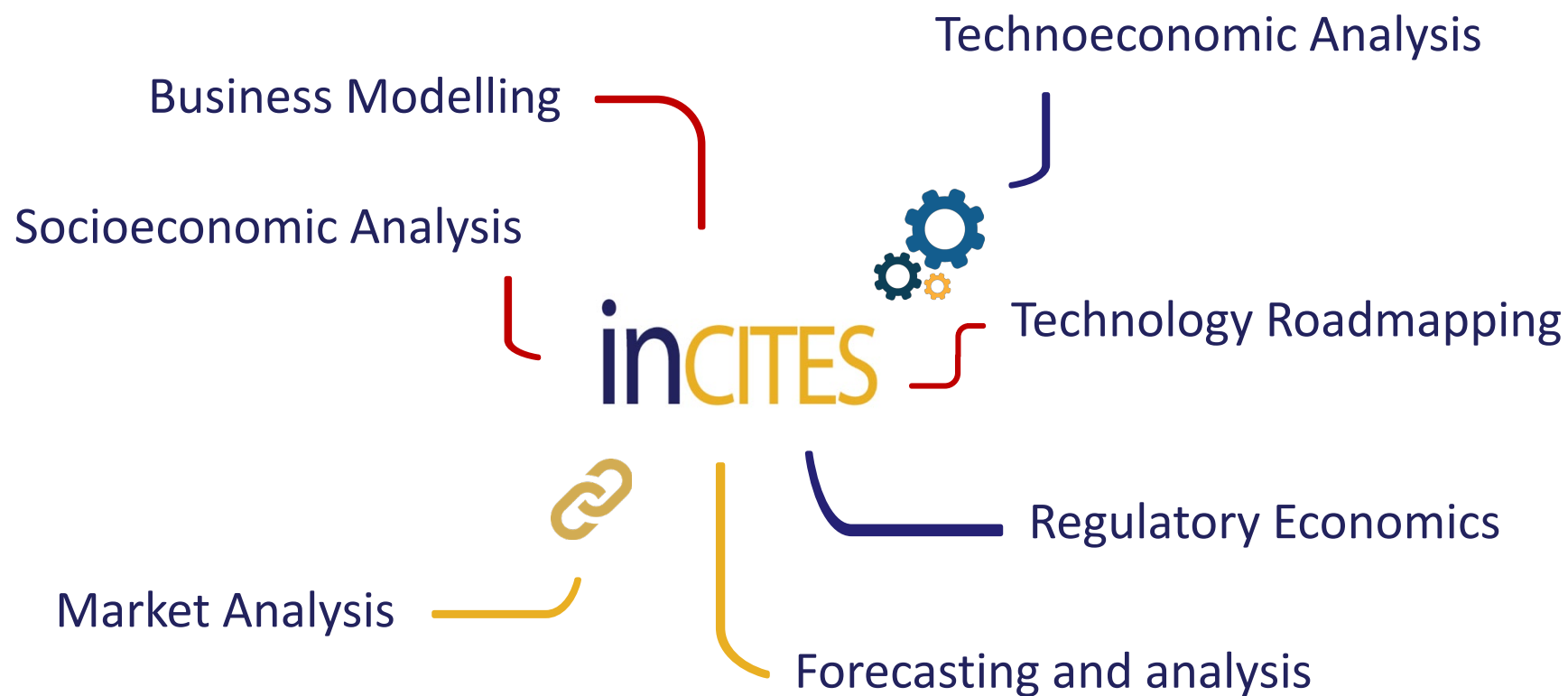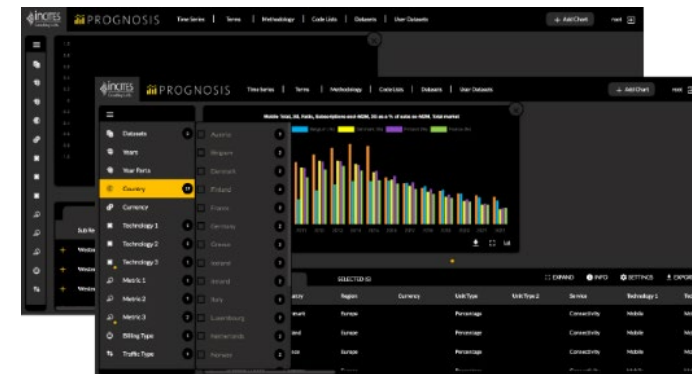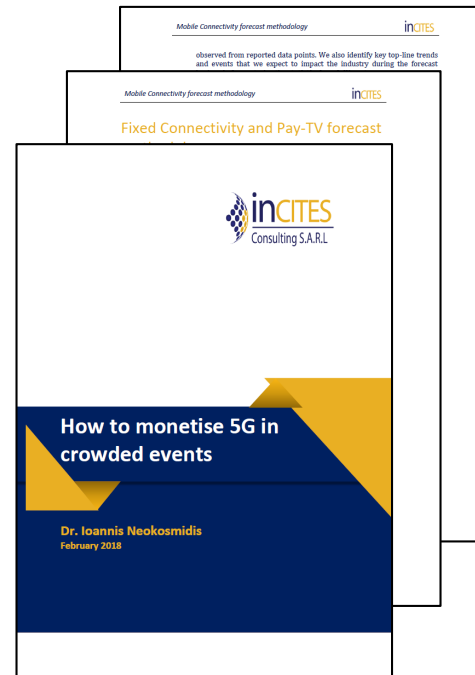
Dr. Theodoros Rokkas, CTO

inCITES Consulting

Technoeconomic Analysis

Business Modelling

Socioeconomic Analysis

Technology Roadmapping

Regulatory Economics

Market Analysis

Forecasting and analysis

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What we do

Consulting

Research

Prognosis

Luxembourg 5G Strategy

5G

Expert Report

September 2018

How to monetise 5G in crowded events

Dr. Ioannis Neokosmidis
February 2018

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Industry 4.0
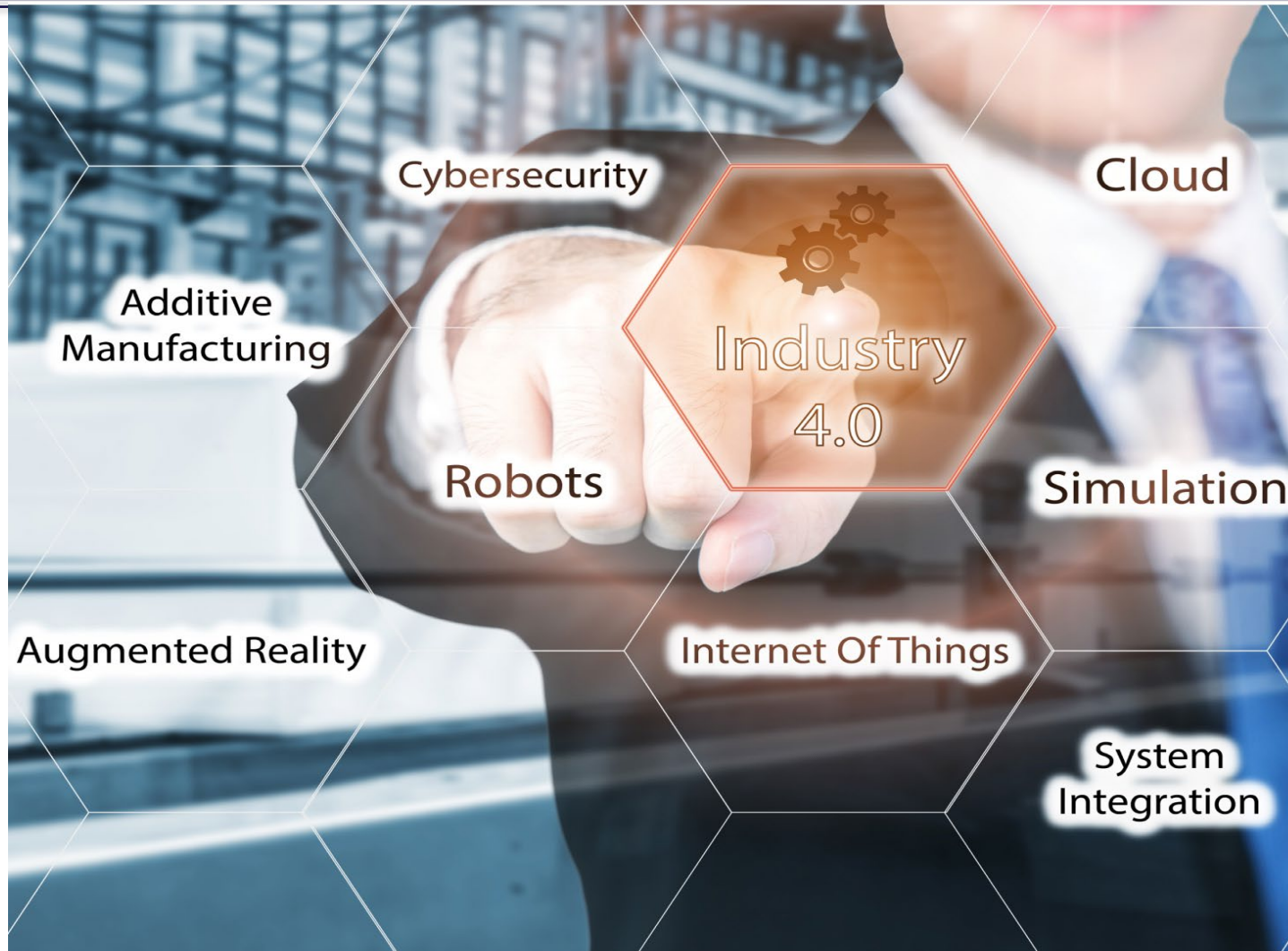
Requirements

Connectivity → Policy / Regulation → Digital Skills → Ecosystem → Connectivity

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Connectivity

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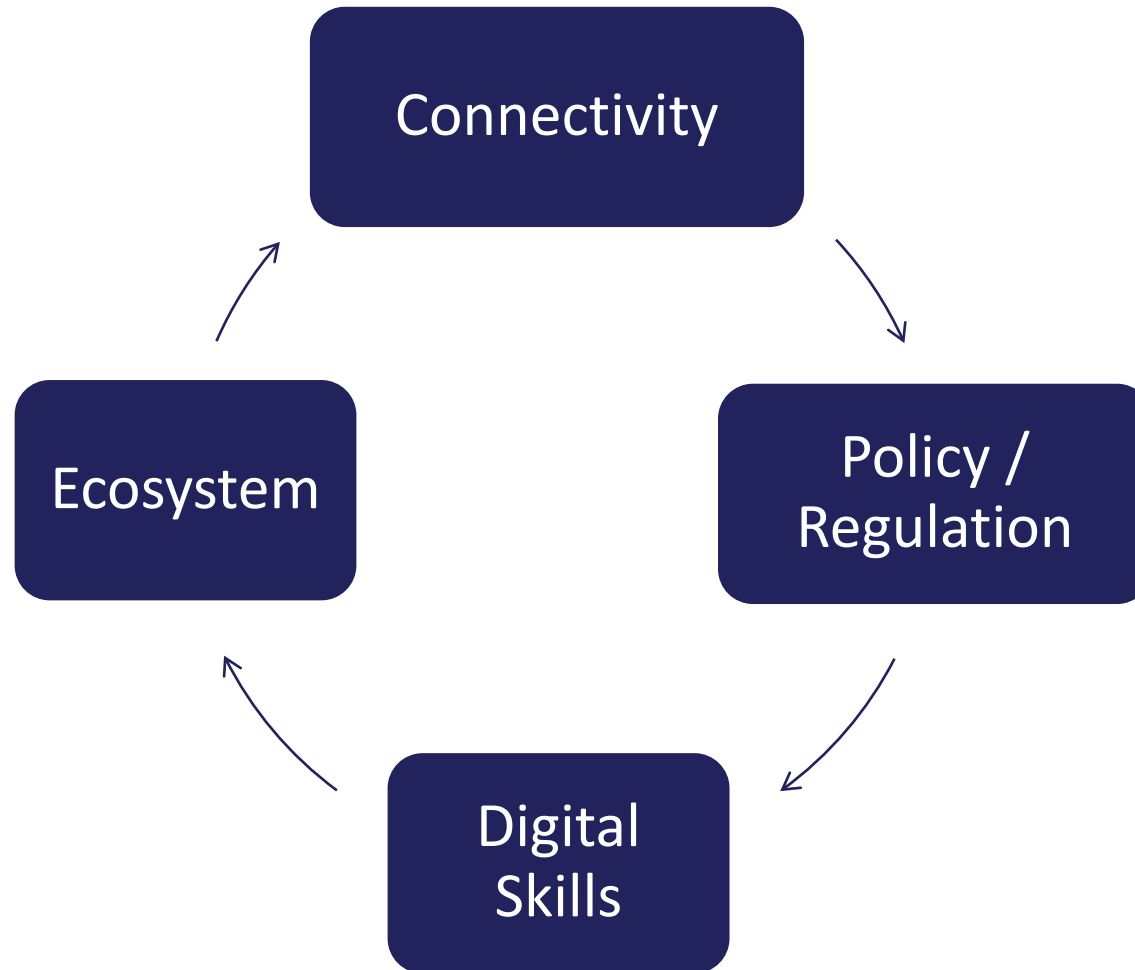
Connectivity Requirements

- Sharing of huge amounts of data
- Very high speed
- High number of connected devices
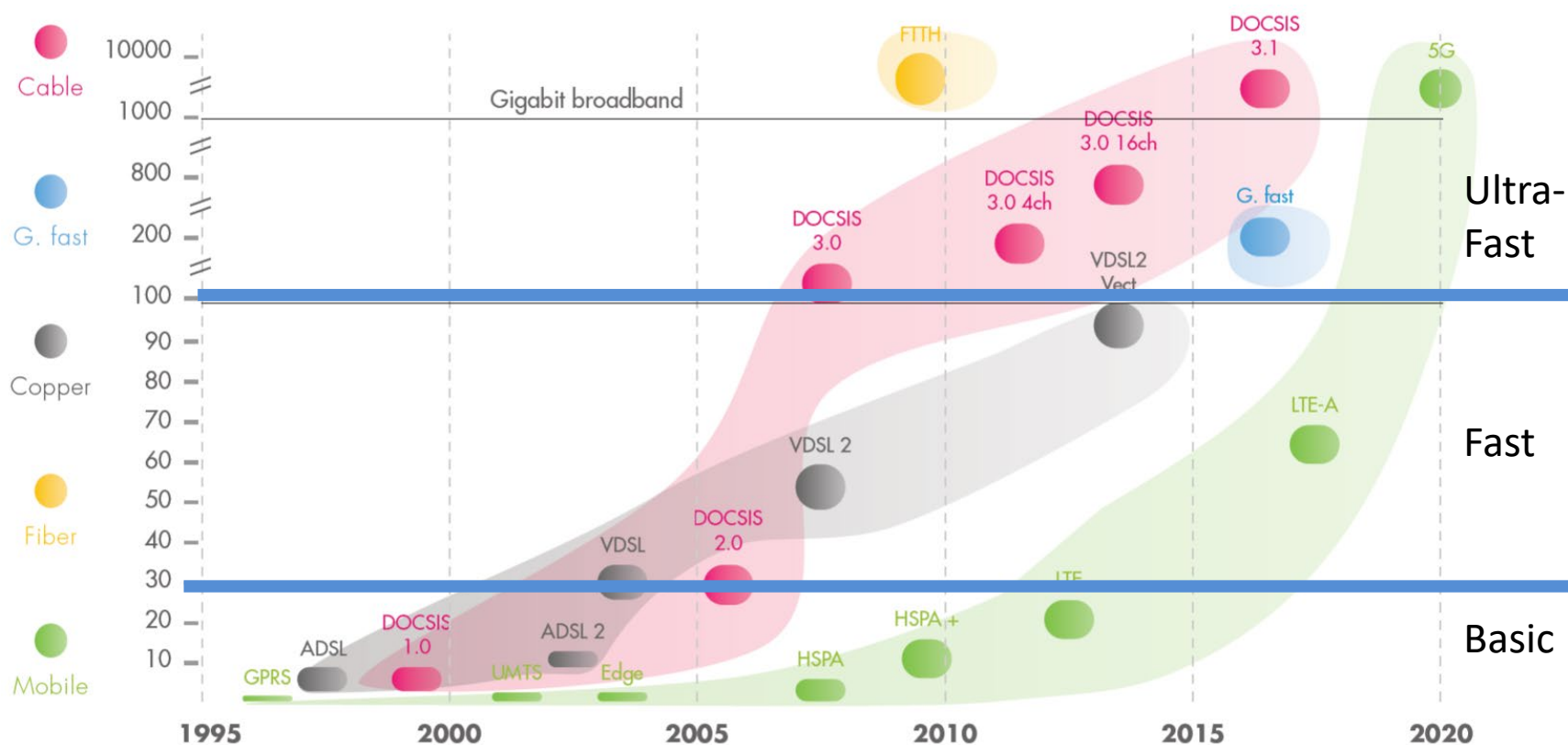- Security
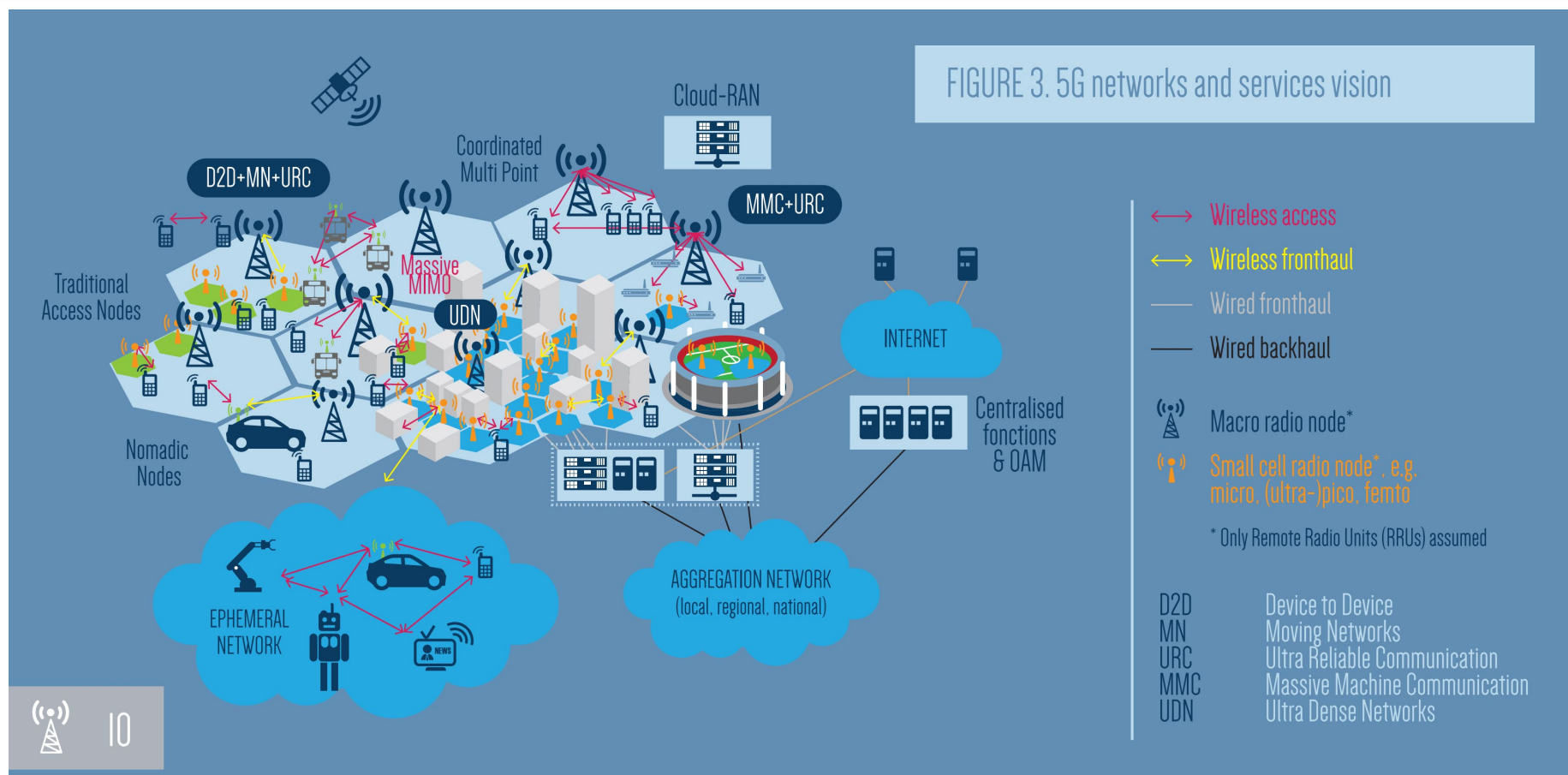
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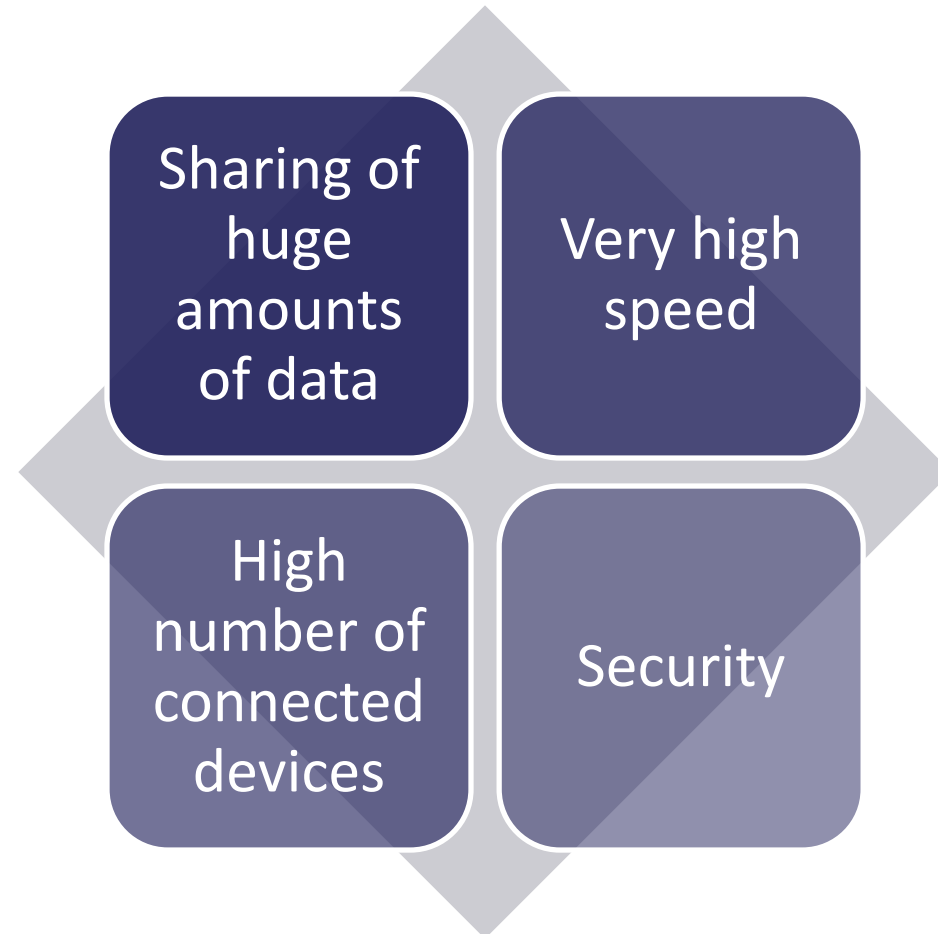
Gbps access for all by 2025

Only FTTH, DOCSIS 3.0/3.1 and 5G are capable of delivering speeds above 1Gbps
broadband access technology roadmap – downstream speed range

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5G Architecture

FIGURE 3. 5G networks and services vision

The Future

Current status in Greece

Digital Economy and Society Index (DESI)
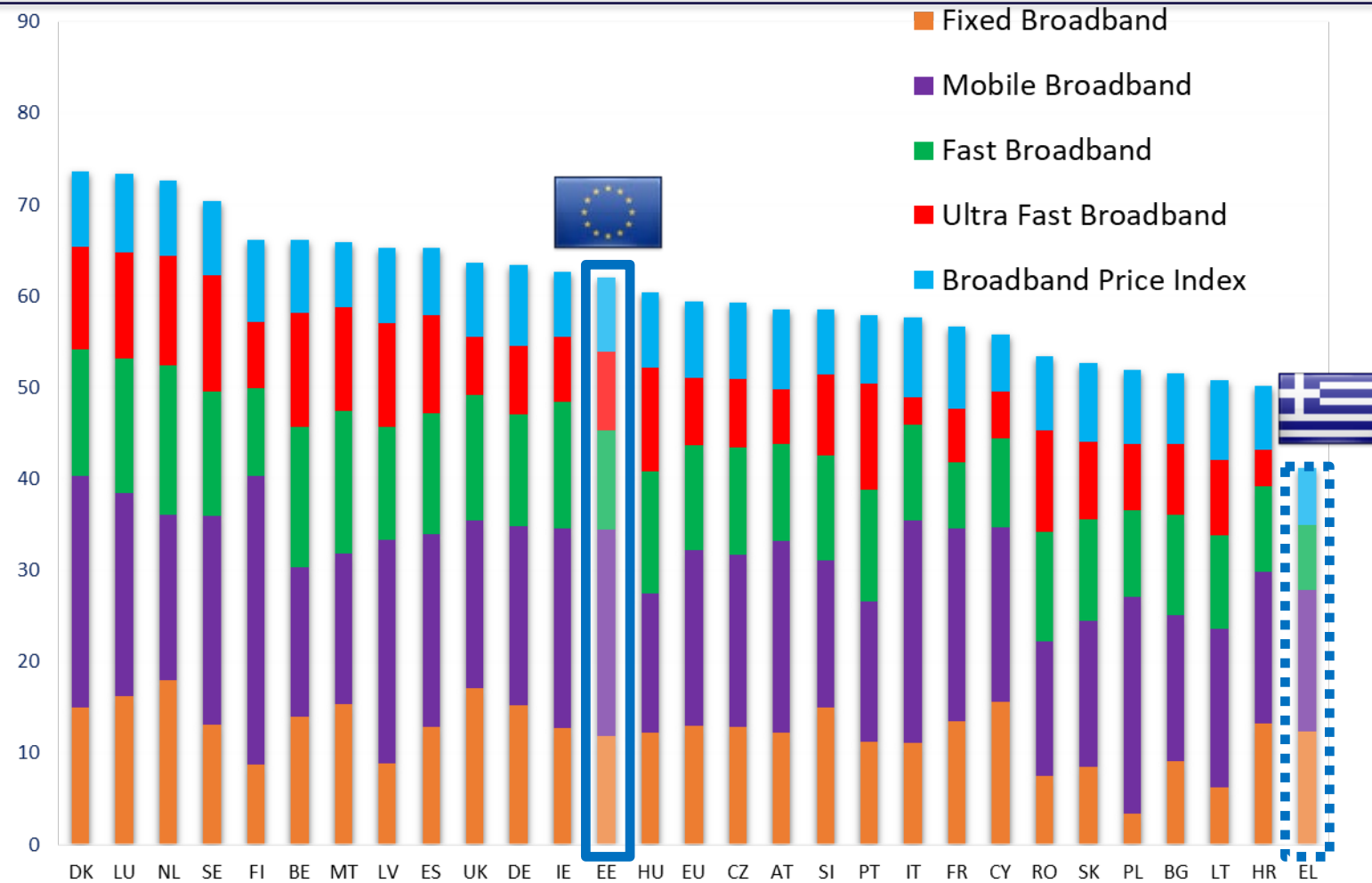
EUROPEAN COMMISSION, DIGITAL SCOREBOARD

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Connectivity

EUROPEAN COMMISSION, DIGITAL SCOREBOARD

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NGA Coverage in Greece

NGA coverage (% of homes), mid-2018

Source: IHS and Point Topic

DESI Report 2019 – Connectivity

7

European Commission

14

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Ultrafast Coverage

Ultrafast coverage (FTTP and Docsis 3.0., % of homes), mid-2018

Legend: ■ Total ■ Rural
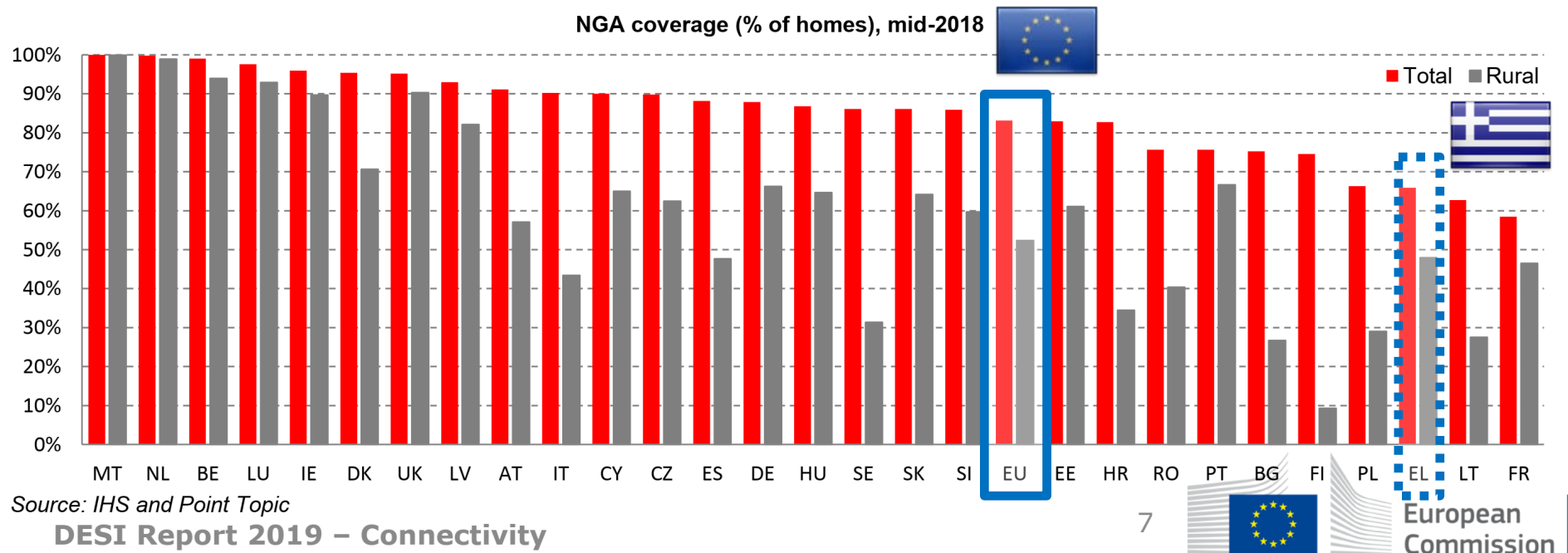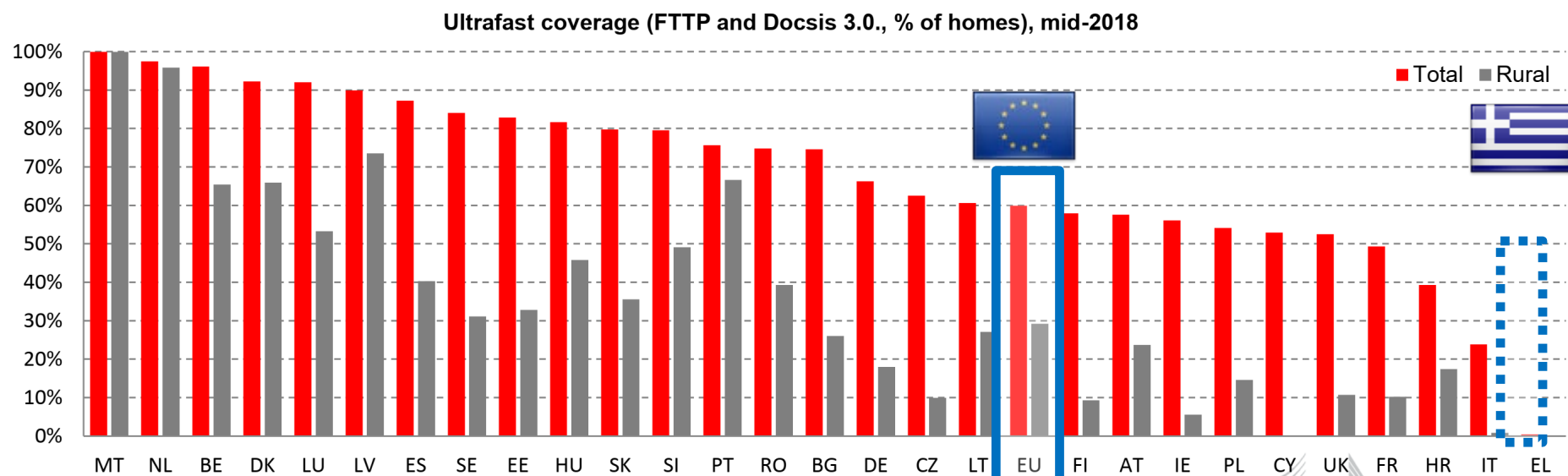
Source: IHS and Point Topic

DESI Report 2019 – Connectivity

8

European Commission

4G Coverage

4G coverage (% of homes), mid-2018

Source: IHS and Point Topic

* This indicator measures the average of mobile telecom operators' coverage within each country.
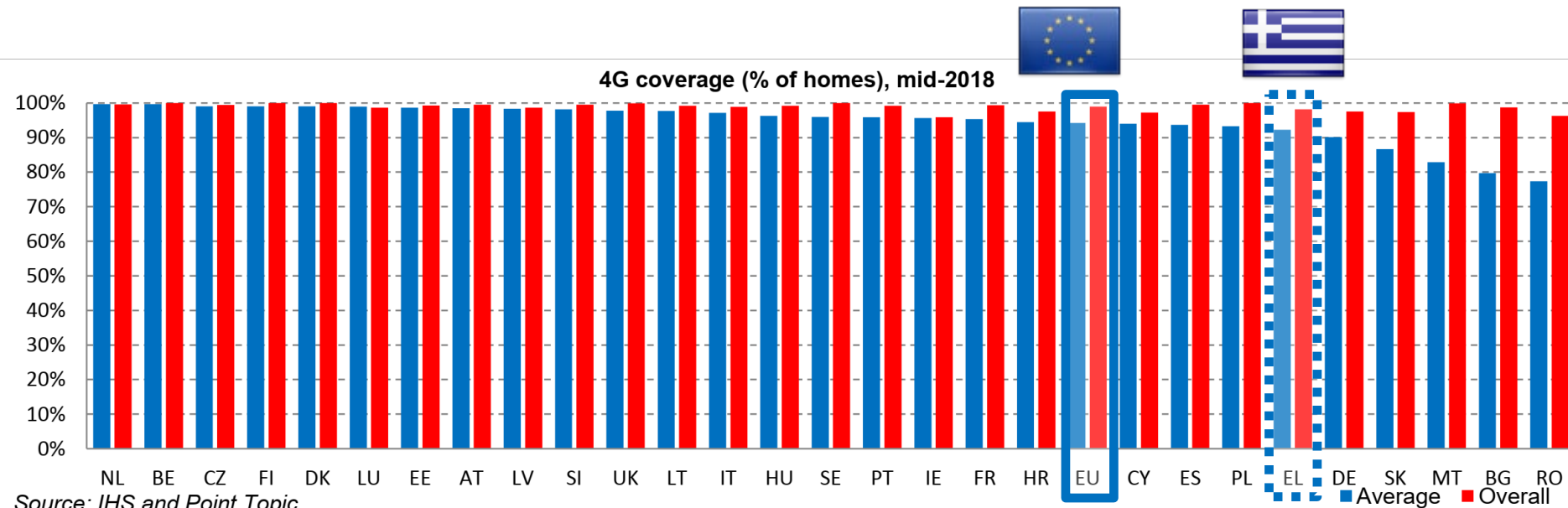
DESI Report 2019 – Connectivity

11 European Commission

16

Households with only mobile broadband

Households using only mobile broadband at home (% of households), 2018

Source: Eurostat

DESI Report 2019 – Connectivity

24

European Commission

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The next day

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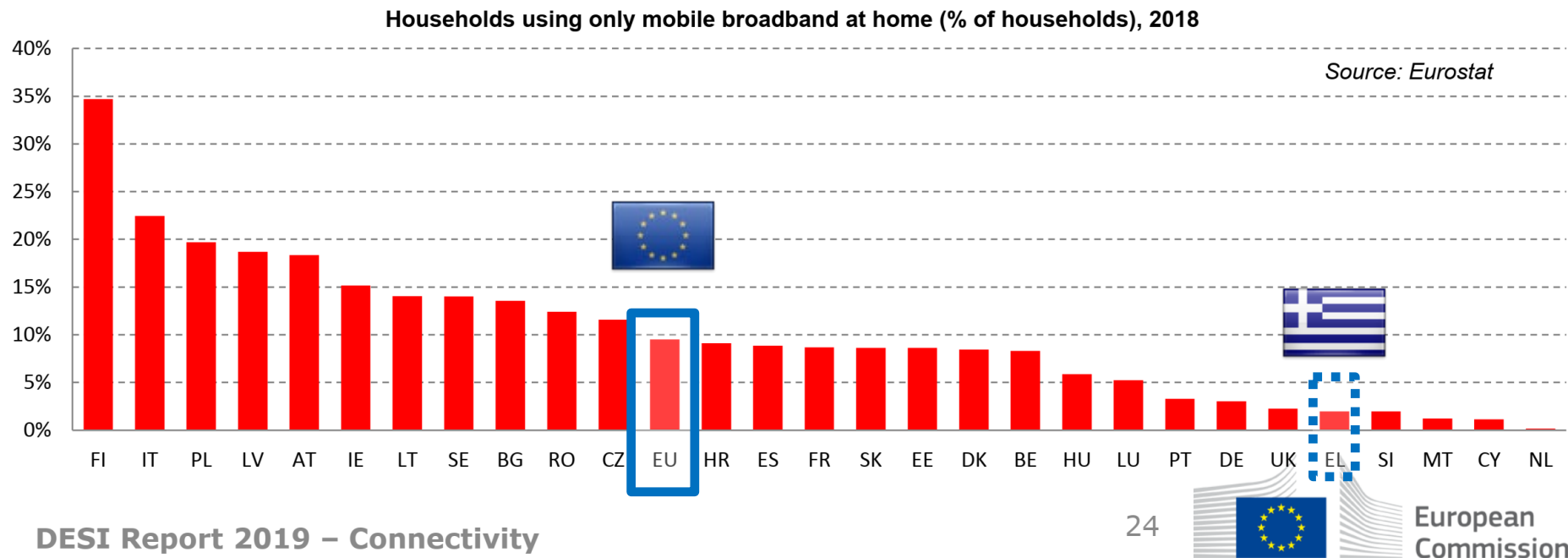
NGA Deployments

On going

- VDSL Vectoring (~2.8M lines)
- FTTH (~140K lines)

Future

- Initial interest for UFBB
- Mapping of infrastructures
- Next phase: Competitive Dialogue

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5G initiatives in Greece

- Cities:
  - Kalamata, Patra, Trikala, Zografou
- Corridor:
  - Thessaloniki, Sofia-Belgrade: Letter of Intent
- Spectrum auctions
  - Trial licenses (3.6 / 28 GHz)
  - 3.4-3.8GHz Q42019
  - 700MHz End 2020
  - 26GHz 2019-2020
- National plan (12/2019)

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5G initiatives
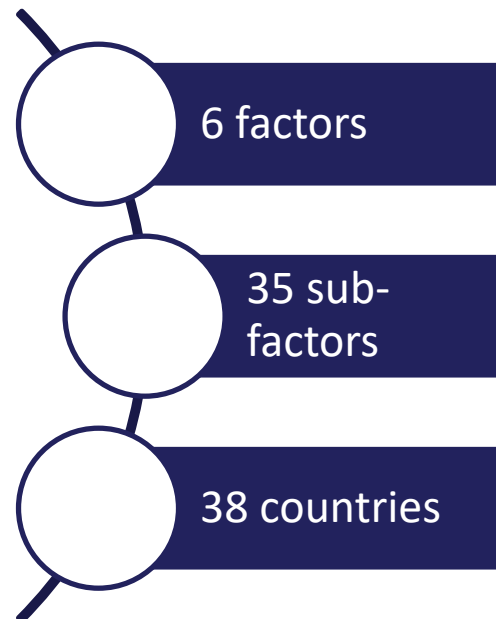
- Commercial networks (Europe)
  - Finland (4 cities)
  - Switzerland (54 cities)
  - UK (Parts of 15 cities)
  - Austria (17 Rural – 2 Urban municipalities)
  - Italy (Part of cities)
  - Spain (15 cities, 50% coverage)
  - Romania (Part of 3 cities)
  - Germany (Part of 15 cities)
  - Ireland (Part of 5 cities)
  - Estonia (Tallinn)
- Commercial networks (Asia)
  - South Korea (1,5M subscribers)
  - China (previous month, plan to cover 50 cities by end of year)
    - Sharing infrastructure agreement between operators
    - Three operators co-own China Tower Corp.
- Live tests in five cross-border corridors
- National Strategies (10 countries)
  - Austria, Estonia, Finland, France, Germany, Luxembourg, Spain, Sweden, Netherlands, UK

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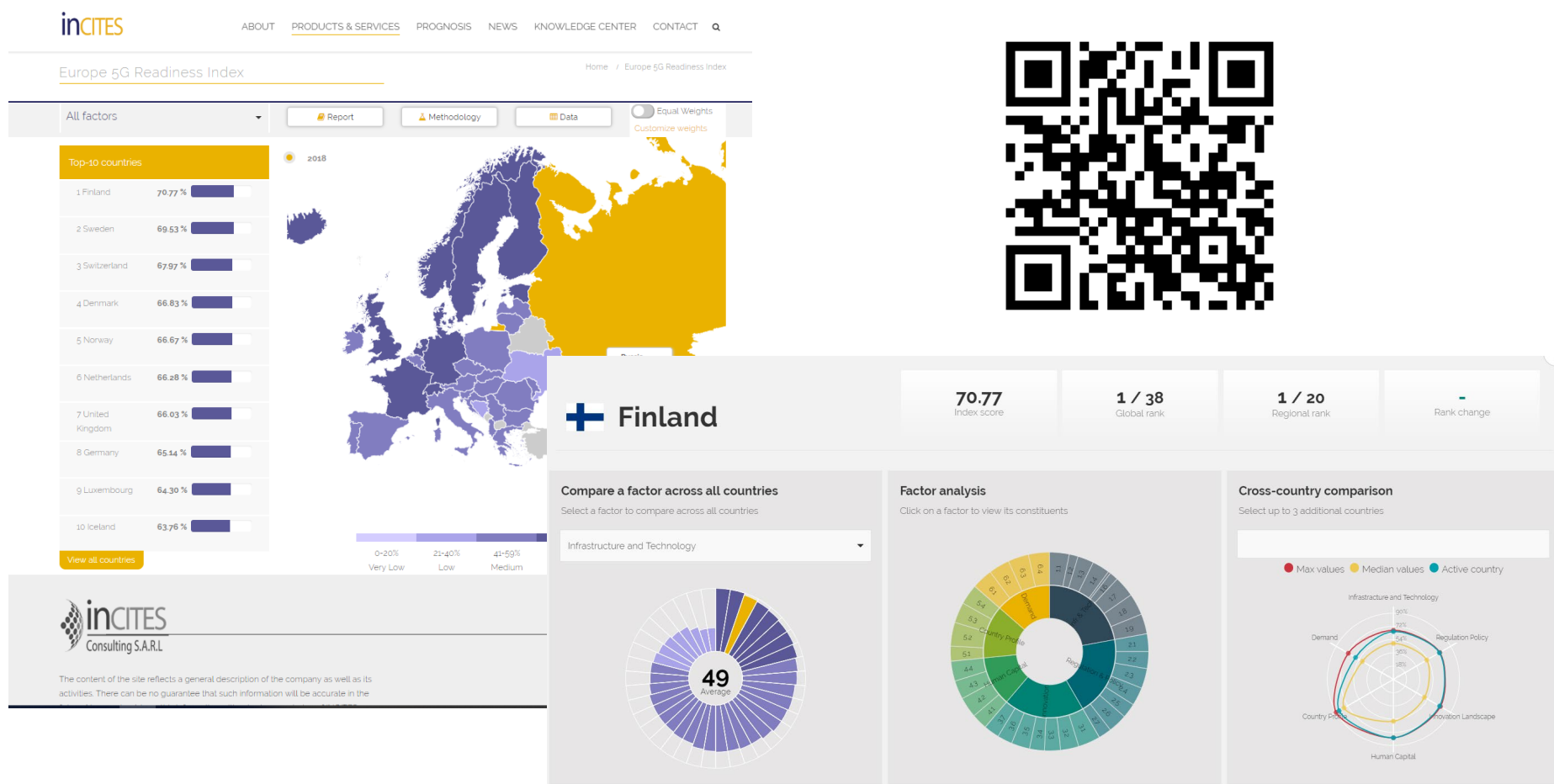# How ready we are for 5G?

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Europe 5G Readiness Index

www.incites.eu/europe-5g-readiness-index

Europe 5G Readiness Index

Assessing Europe's readiness to deploy 5G

inCITES Consulting S.A.R.L

- 6 factors
- 35 sub-factors
- 38 countries

- Factor Selection
- Data handling
- Weight allocation
- Scenario analysis

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Europe 5G Readiness Index

Main Factors

|	
Infrastructure and technology	• Existing fixed and mobile infrastructure that will be used in 5G networks as well as preparatory steps such as spectrum auctions and trials
Regulation and Policy	• Relate to the regulatory and policy framework
Innovation Landscape	• Potential contributors to the development of the new technology from a research and financial perspective
Human Capital	• Quality of the education system and lifelong learning initiatives
Country profile	• Existing economic state of a country, existing ICT industry competition and the government's reception of new technologies.
Demand	• Reception of new fixed and mobile technologies as well as the use of the Internet

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Top-Bottom performers

Rank	Country
1	Finland
2	Sweden
3	Switzerland
4	Denmark
5	Norway
6	Netherlands
7	United Kingdom
8	Germany
9	Luxembourg
10	Iceland

Rank	Country
29	Cyprus
30	Greece
31	Croatia
32	Georgia
33	Bulgaria
34	Serbia
35	Moldova
36	Albania
37	Ukraine
38	Bosnia & Herzegovina

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Greece's 5G Readiness

Score:
44.34

Rank:
30/38

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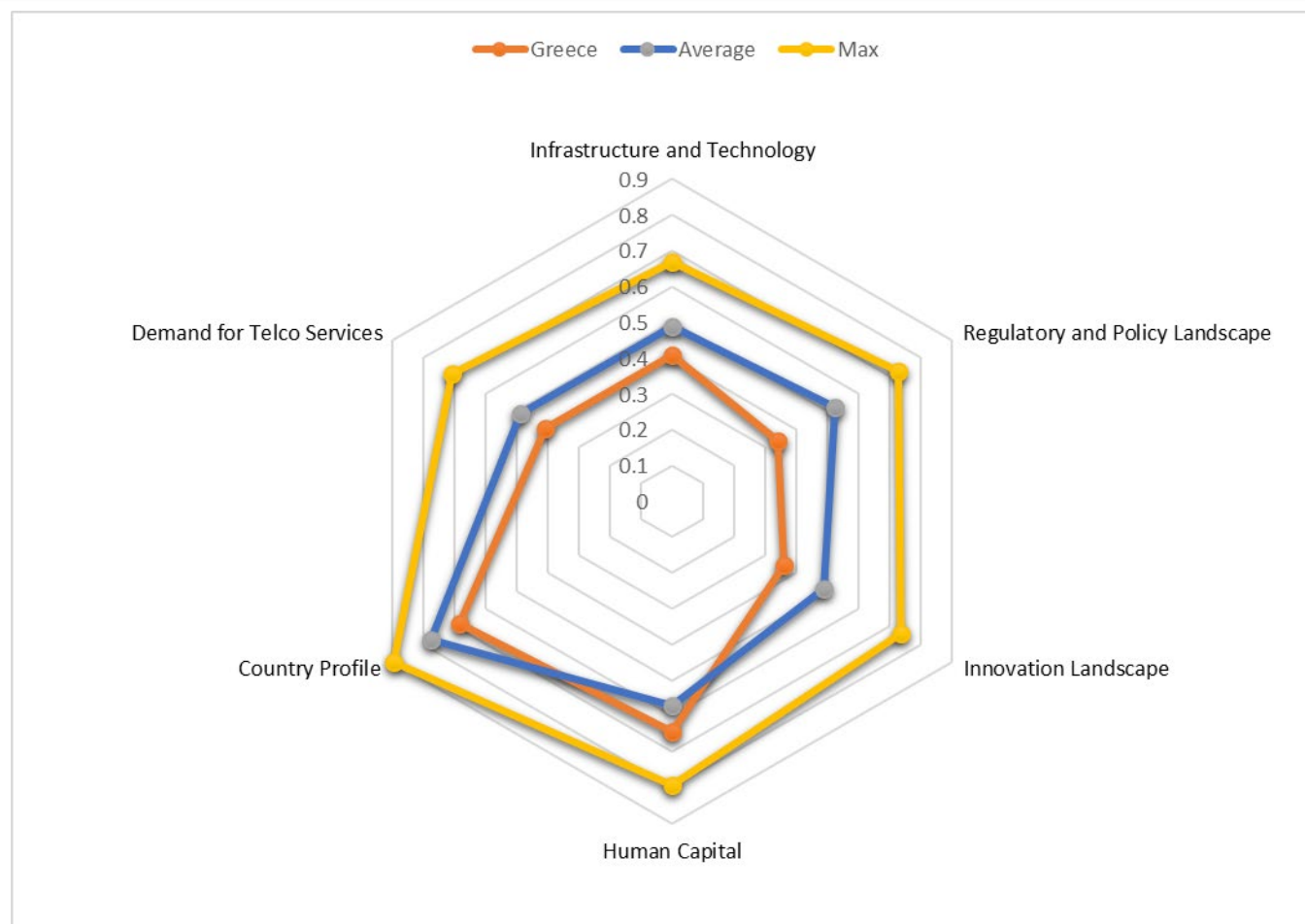
Individual factor ranking

Factor	Rank
Infrastructure and Technology	30
Regulatory and Policy	37
Innovation Landscape	29
Human Capital	9
Country Profile	36
Demand for Telco Services	29

Infrastructure and Technology
- Fiber Coverage
- Spectrum auctions

Regulatory and Policy
- Effectiveness of law bodies
- Legal system in setting disputes

Innovation Landscape
- R&D expenditure
- University – Industry collaboration

Human Capital
- Tertiary
- Availability of scientists and engineers

Country Profile
- GDP
- Importance of ICT to government's vision

Demand
- NGA penetration

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Key points

- Connectivity is key element for Industry 4.0 and digital transformation
- Ongoing NGA deployments but still behind EU
- Improve our digital (5G) readiness
    - Create ecosystem and build relations
    - FTTX deployments to consider 5G requirements
    - Exploit assets (Human capital)
    - Develop applications and services in our Verticals

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Thank you!

trokkas@incites.eu

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