



INTERNET OF THINGS & 5G REVOLUTION

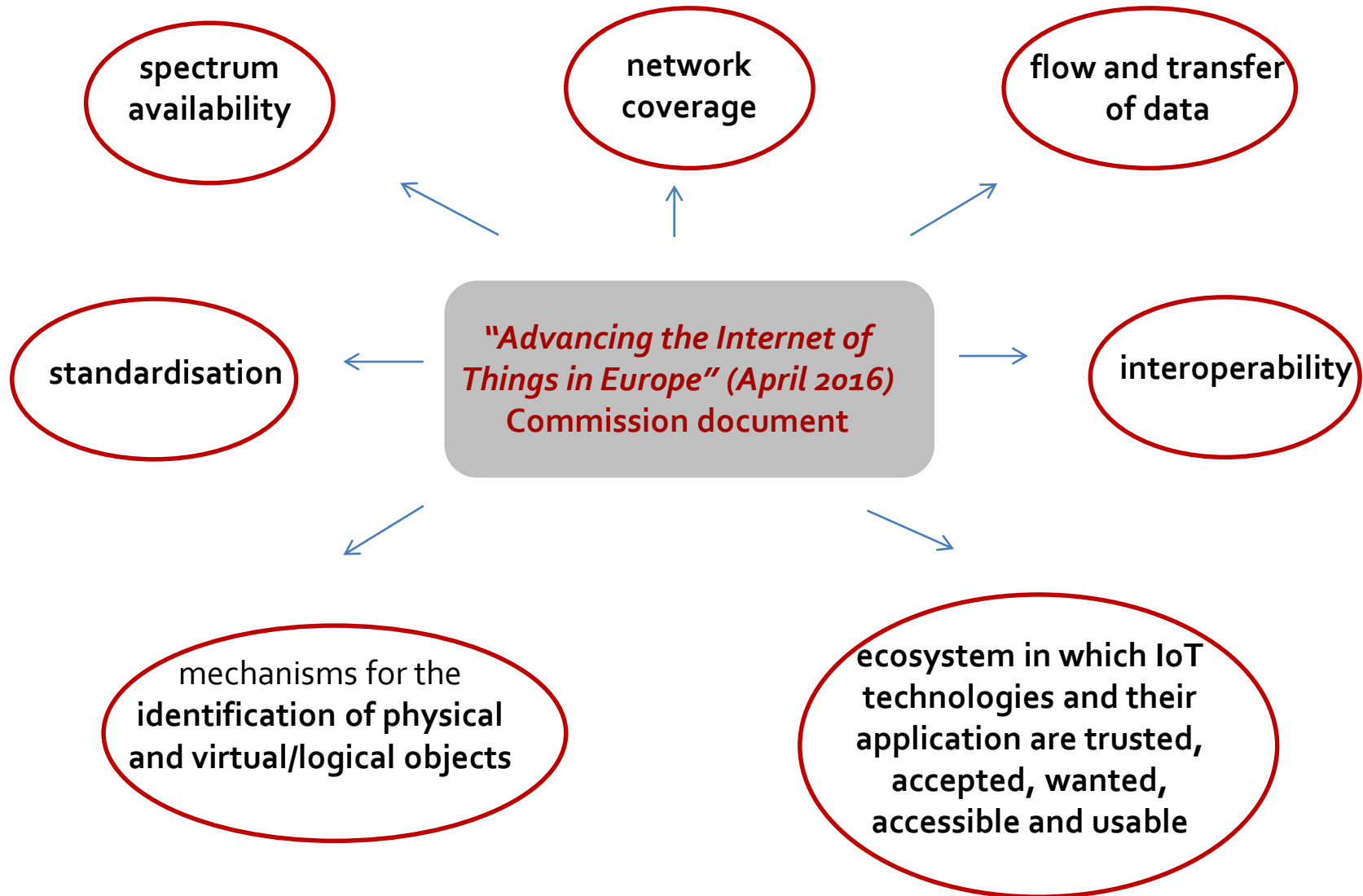
*The highway for the future of EU services & industry:
energy efficiency, eHealth and Industry 4.0*

Brussels, 19 October 2016

European Parliament

Internet of Things and 5G: what is at stake

- ✓ The **Internet of Things (IoT)** has been defined in different ways but, generally speaking, it refers to a global, distributed network (or networks) of physical objects that are capable of sensing or acting on their environment, and able to communicate with each other, other machines or computers
- ✓ Considering the IoT's revolution, the EU Commission concluded that there was a need for policy action in Europe to contribute to R&D investments, stimulate the growth of the stakeholder community and the development of a strong IoT supply industry, open the way for the user industry to adopt this disruptive innovation, and create the main framework conditions needed for the development of the market, including the provision of skills, the building of trust and the removal of regulatory barriers
- ✓ IoT market's expansion in **Europe** with **yearly growth rates over 20% in value between 2013 and 2020**, an increase of the number of IoT connections within the EU28 from approximately **1.8 billion in 2013** (the base year) **to almost 6 billion in 2020** and an increase of **IoT revenues** in the EU28 to more than **€1,181 billion in 2020**, including hardware, software and services.
- ✓ **Worldwide** the IoT will connect **26 billion devices** and IoT product and service suppliers will generate incremental revenues of more than \$300 billion and IDC's more optimistic previsions that the worldwide IoT market will grow from **\$1.9 trillion in 2013** to **\$7.1 trillion by 2020**



The extraordinary diffusion of Internet and mobile devices and the prospects of development of the IoT call for a reflection on the need to promote technological progress and, in particular, **5G implementation**

5G opportunities

- **data rates** up to 100 times faster (more than 10 Gbps)
- **network latency** lowered by a factor of five
- **mobile data volumes** 1,000 times greater than today's
- **battery life** of remote cellular devices stretched to 10 years or more
- increase of the **number of devices connected** to the network (1 mln per 1 sq km)
- possibility of use of **several bands** from 400 MHz to 100 GHz

- ✓ With regards to the timeline, many operators have predicted **5G commercial availability** starting from **2020**

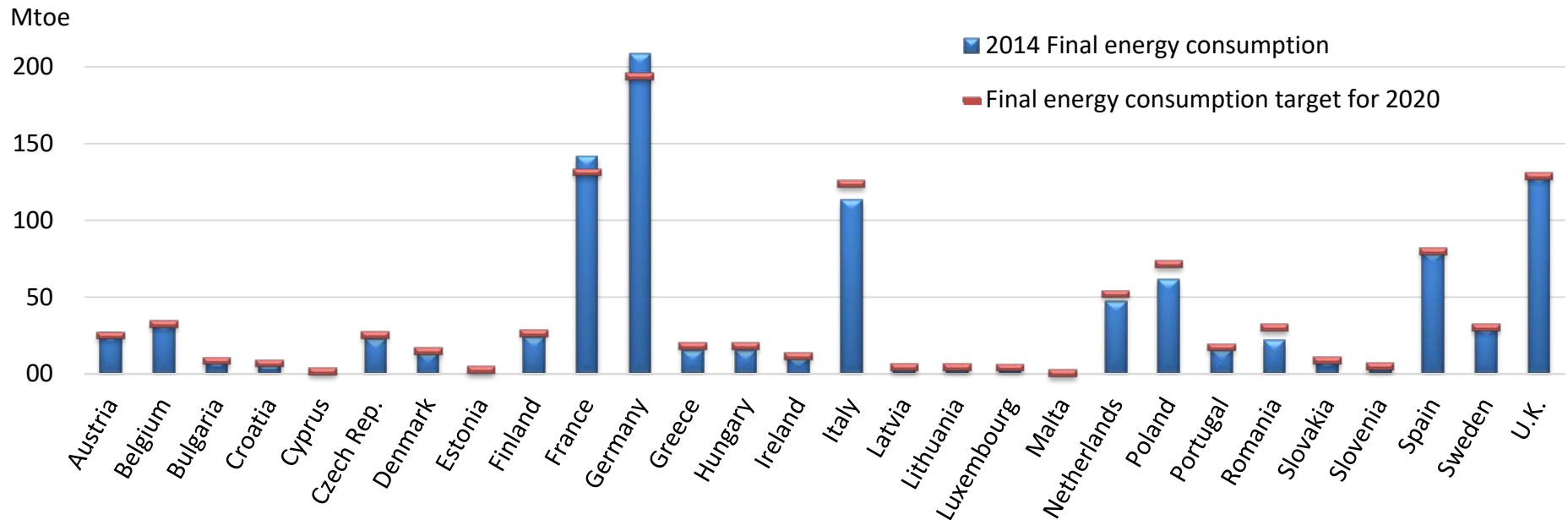
Energy efficiency

Energy efficiency EU target by 2020

20% of Energy efficiency target by 2020 compared to 1990



27% of energy savings by 2030, probably going to rise to 30%



Source: EEA, Eurostat 2015

-11% of consumption in 2014 from 2006 peak

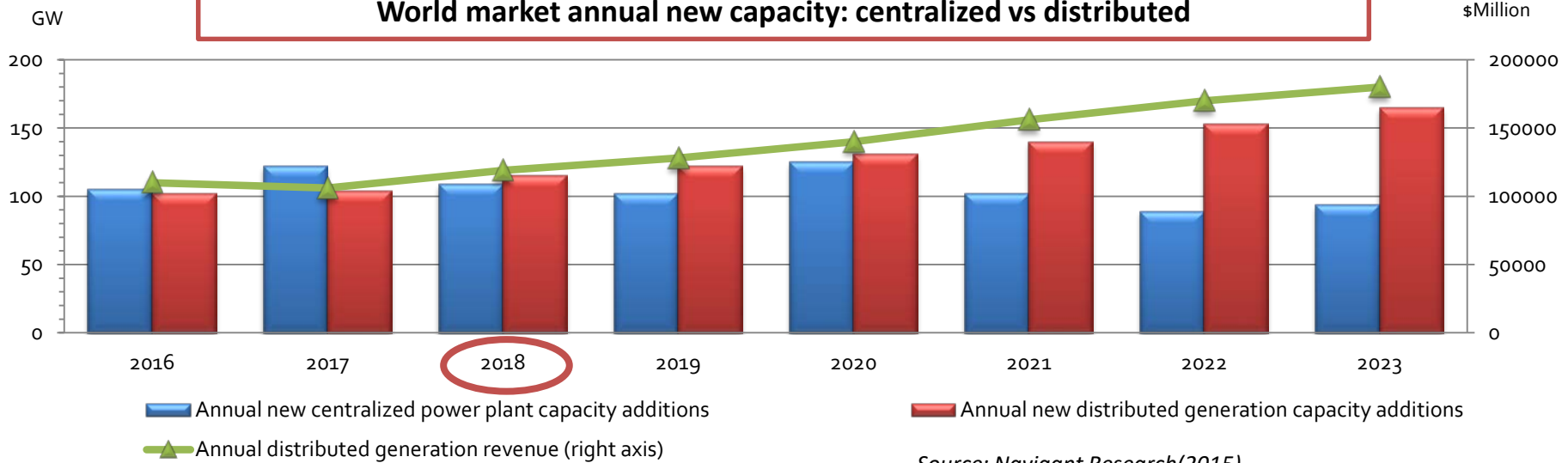
Final energy consumption (2006-2014)

Industry:		-15.0 %
Transport:		-6.4 %
Domestic:		-13.8 %
Services:		+4.3 %

Source: JRC, 2016

Energy cloud & demand side management

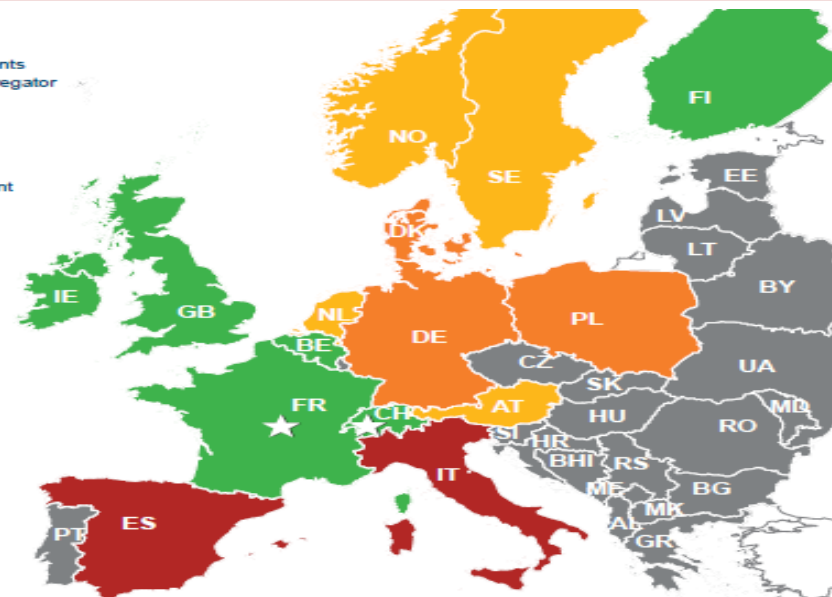
World market annual new capacity: centralized vs distributed



Source: Navigant Research(2015)

Explicit demand response in Europe - 2015

- ★ Commercially active, standardised arrangements between BRP and aggregator in place
- Commercially active
- Partial opening
- Preliminary development
- Closed
- Not assessed



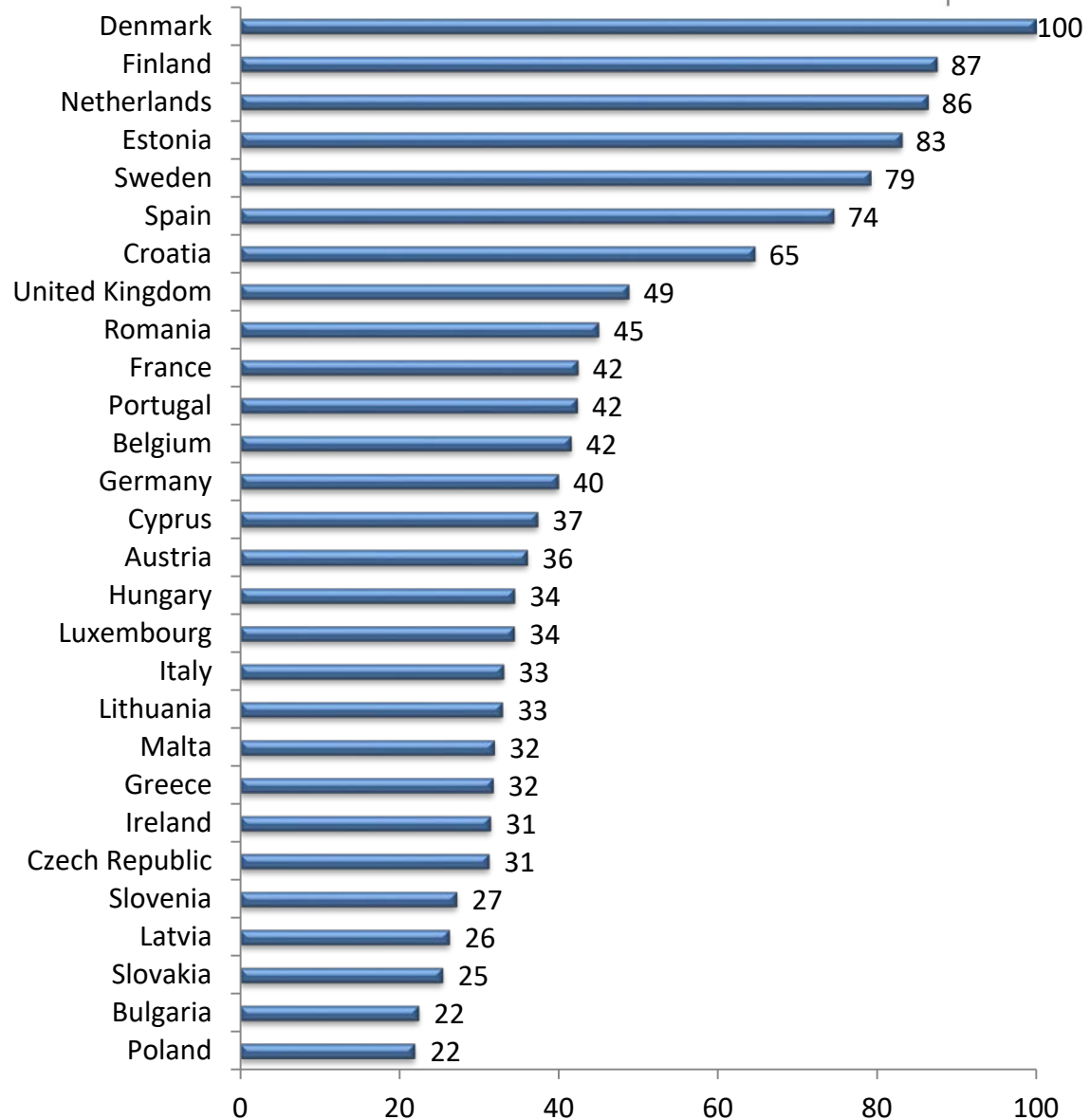
Energy efficiency, distributed energy sources, demand response, energy storage, advance software/hardware and emerging energy cloud are key components of the ongoing transformation.

Digital Healthcare

Level of eHealth in European countries

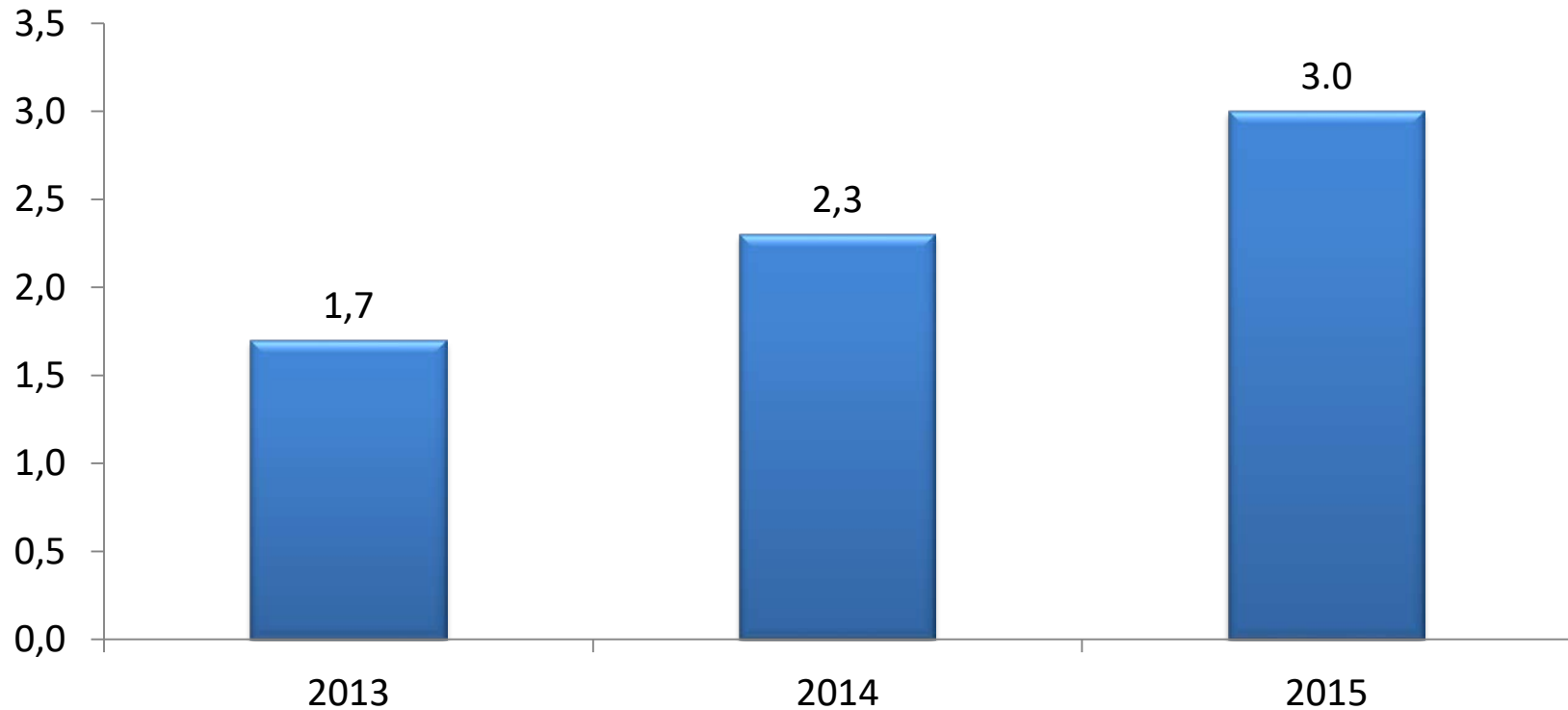
According to the synthetic index, which is based on the four *eHealth key indicators of European Commission* and describes the level of eHealth in European countries, the most advanced country is Denmark, followed by Finland, Netherlands, Estonia and Sweden.

These countries have in common a high level of digitalization in doctor's offices and a high number of patients who use mobile and internet technologies for searching health information and making appointments online with doctors.



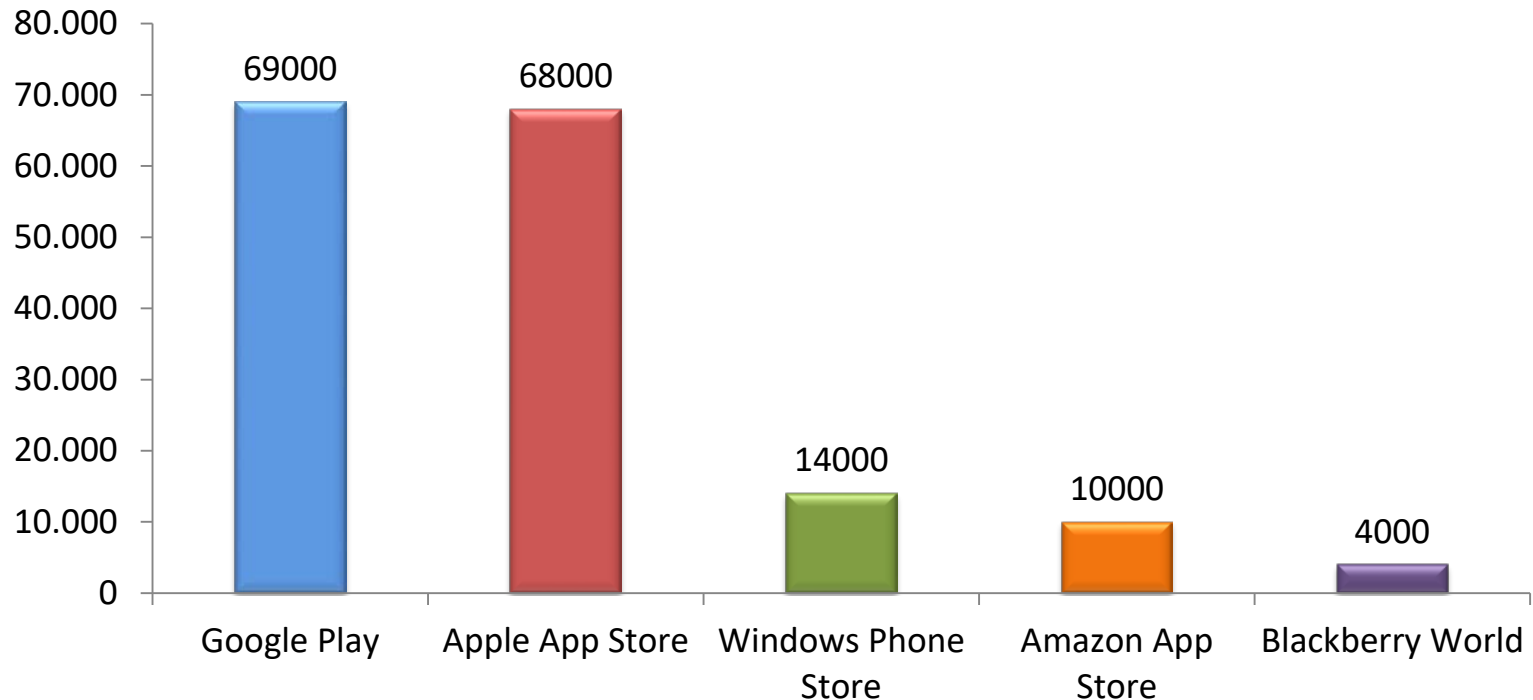
The demand for mHealth apps is increasing every year. In 2015, the total number of mHealth app downloads worldwide reached 3 billion from 165,000 app solutions on the market.

Total downloads of mHealth apps (billions)



The market for mobile apps has developed very rapidly in recent years to become a key driver of mHealth deployment facilitated by smartphone penetration. According to recent estimations, the number of mHealth apps available to consumers now exceeds 165,000. Most of the apps are published in Google Play or Apple App Store.

Number of mHealth apps displayed in app stores

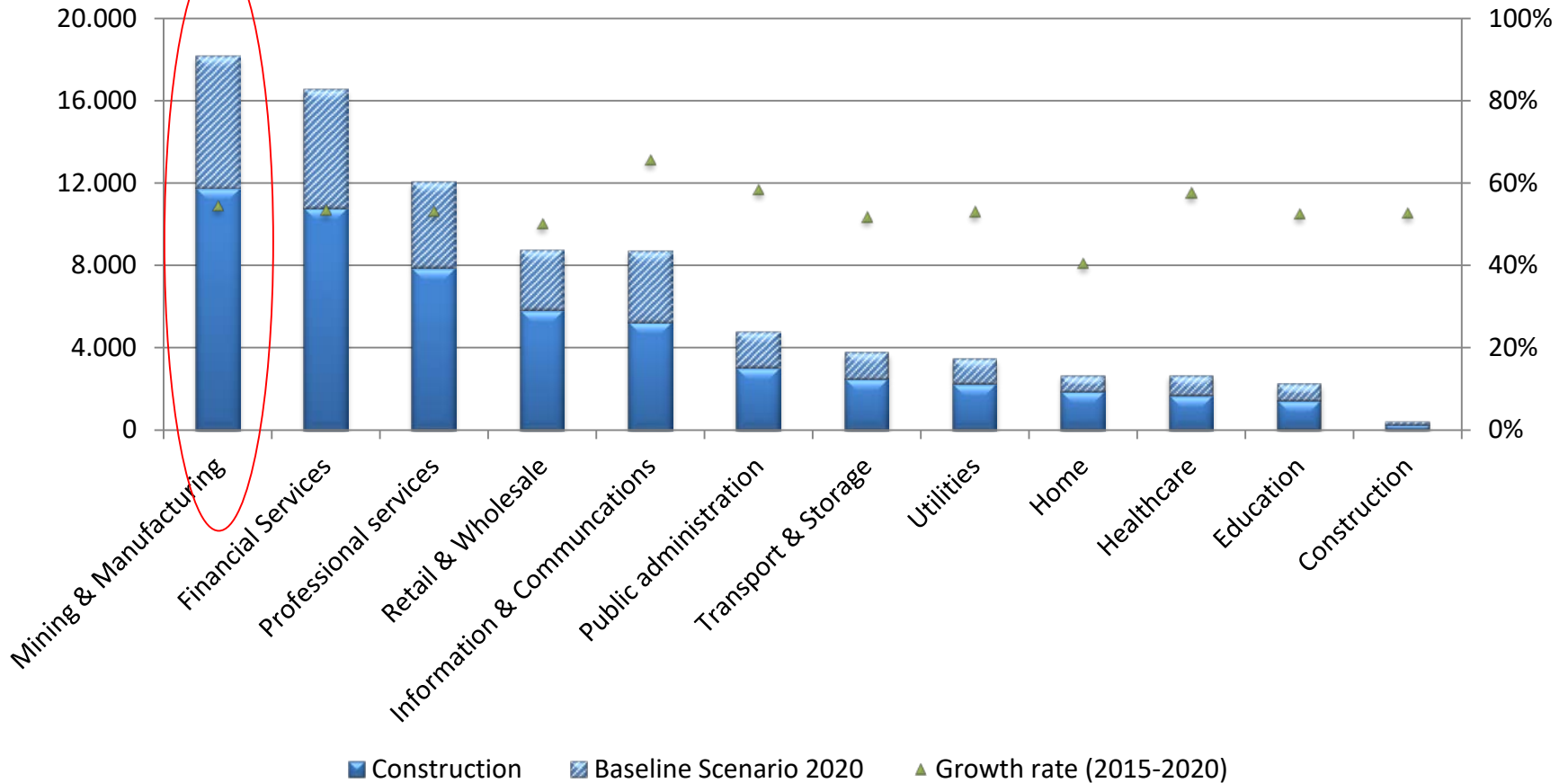


Industry 4.0

Data market value

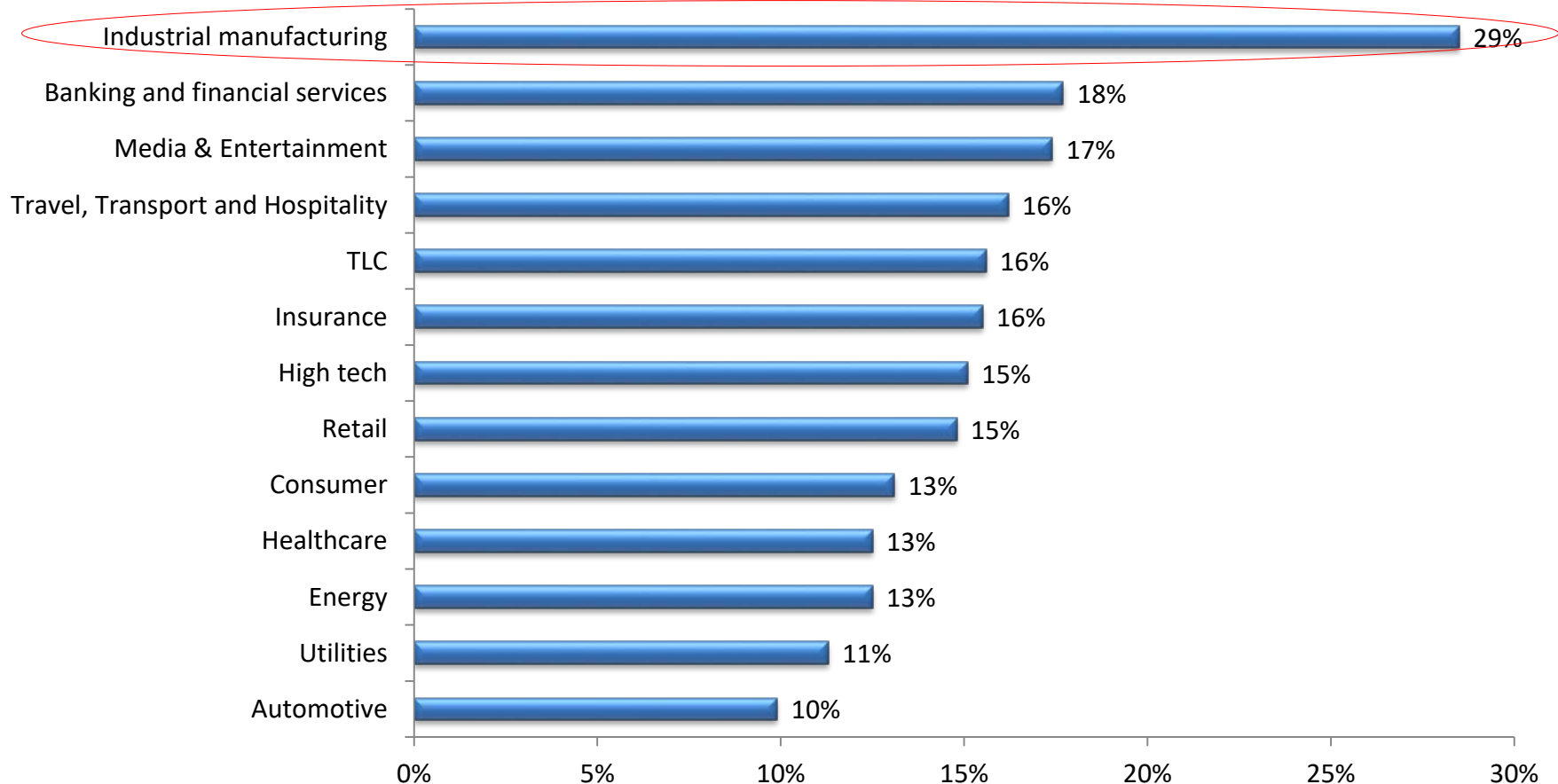
The data market value in the manufacturing industry expected to grow by 54% to over 18 billion euro in 2020

Data market value, by industry (2015 vs. 2020)

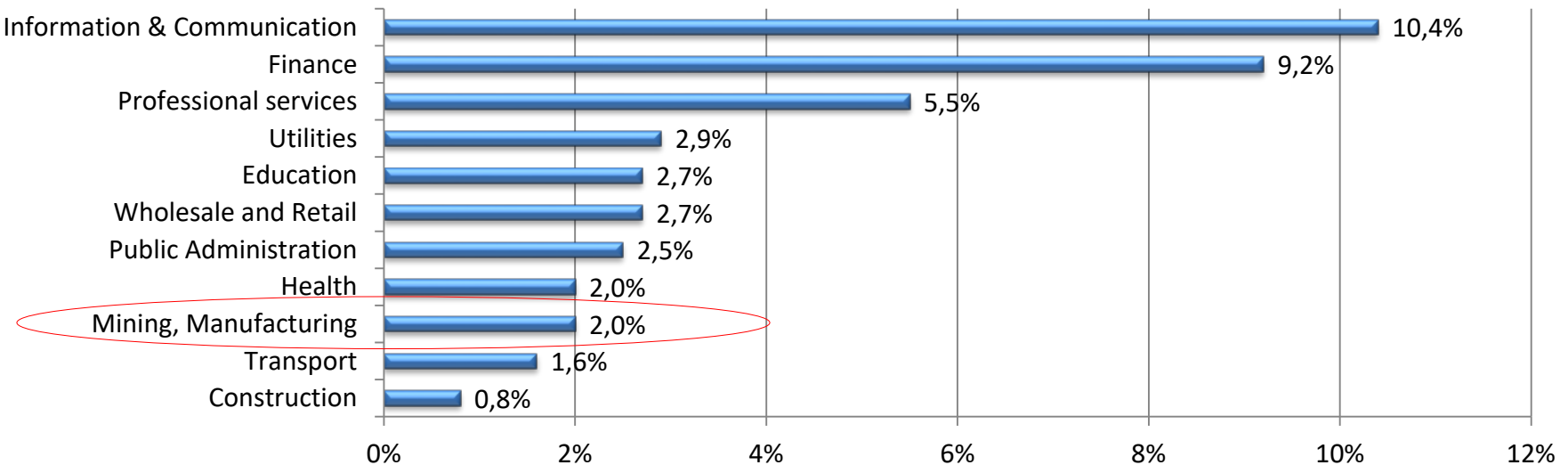


In the industrial manufacturing industry, revenues grew on average by 29% between 2013 and 2014, thanks to IoT investments

IoT investments' impact on revenues (2014 vs. 2013)



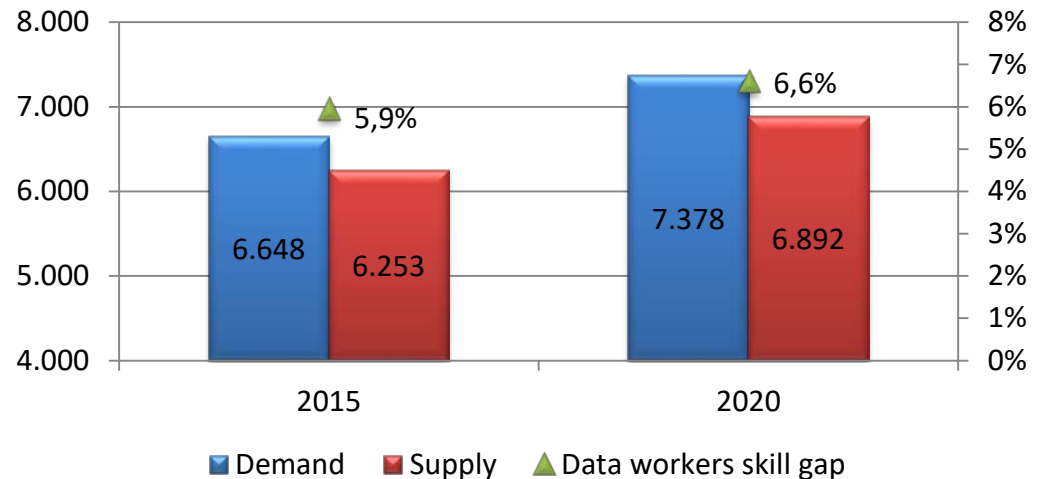
Share of data workers on total employment, by industry (2015)



Manufacturing is evolving towards digital transformation but the presence of data workers is still too low (2%) in terms of the share on total employment.

According to current data and estimates for the future, there is (and there will be) a substantial skill gap, Equal, in 2015, to 396,000 unfilled data worker positions in EU (corresponding to 5.9% of total demand) and is expected to grow to 486,000 (6.6% of total demand)

Data workers skill gap in EU28 (in thousands)



UNITED STATES



Networks of institutes and excellence labs, for the diffusion of technologies and skills, composed of large private ICT companies and universities, promoted by the Government and financed through public-private partnership.

Public funding: ~0.5 bln \$, aimed at supporting research projects

GERMANY

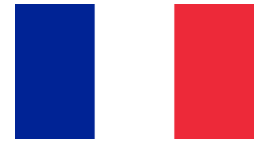


Federal action plan involving large industrial and technological players.

Public funding: ~ 1 bln €, in the form of:

- Fiscal incentives for investments in technological start-ups
- Funding of business projects and applied research projects

FRANCE



Re-industrialization plan for the investment in technologies 4.0, mainly guided by the Government.

Public funding: > 10 bln €, in the form of:

- Fiscal incentives for private investments
- Subsidized loans
- Tax credit for research
- Funding of projects 4.0

ITALY



Action plan, involving research centers, universities, large companies and labor unions.

Public funding: ~ 13 bln € (cumulative on the 2017-2020 period), in the form of:

- Tax credit for research
- Fiscal incentives for investments in innovative start-ups and SMEs
- Support to investments in machinery

Key questions

- 1.** Will the level of the 2020 targets set by all countries be ambitious enough to ensure to decouple energy consumption from economic growth, taking into account the forecast GDP development to 2020? Should 2030 energy efficiency targets be mandatory and, more in general, how should the general EU framework be set?
- 2.** How may policies help improve investment conditions in some Member States in order to accelerate transition to higher energy efficiency levels in different sectors? How to ensure financial suitability, especially for SMEs and families?
- 3.** What are the main opportunities arising from the digitalization of the energy sector?
- 4.** What are the main concerns in terms of privacy and cyber security? How may critical aspects be solved in the short term?
- 5.** With regard to the Energy cloud, what is the real interest of companies and consumers?

- 1.** In your opinion, can eHealth really offer opportunities to take on several of the challenges of health systems (chronic disease and multi-morbidity, sustainability and efficiency of health systems, cross-border healthcare)?
- 2.** How to promote international cooperation in order to achieve wider interoperability between eHealth solutions?
- 3.** How to safeguard the privacy and the security of health data? On the other side, how to take advantage of the opportunities provided by the big data in order to develop personalized medicine?
- 4.** Is there a need to make the current EU legal framework applicable to mHealth more clear?
- 5.** How to inform citizens on the safe use of mHealth apps and how to mitigate the risks connected to the use of mHealth solutions?

- 1.** Which role should be played respectively by governments and business sectors and how to coordinate efforts in a coherent and effective governance framework at EU and national level?
- 2.** How may best practices from some countries be replicated in Member States lagging behind?
- 3.** New business designs are needed to successfully put the concept of “Industry 4.0” into practice. In your opinion, what should they be?
- 4.** Which policies for interoperability and standards are underway? How to remove possible barriers between countries and sectors? What role should EU institutions and business/technical associations play in this sense?
- 5.** Which labor market policies to be aimed at filling the existing skill gap?

Thank you!

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