McKinsey&Company

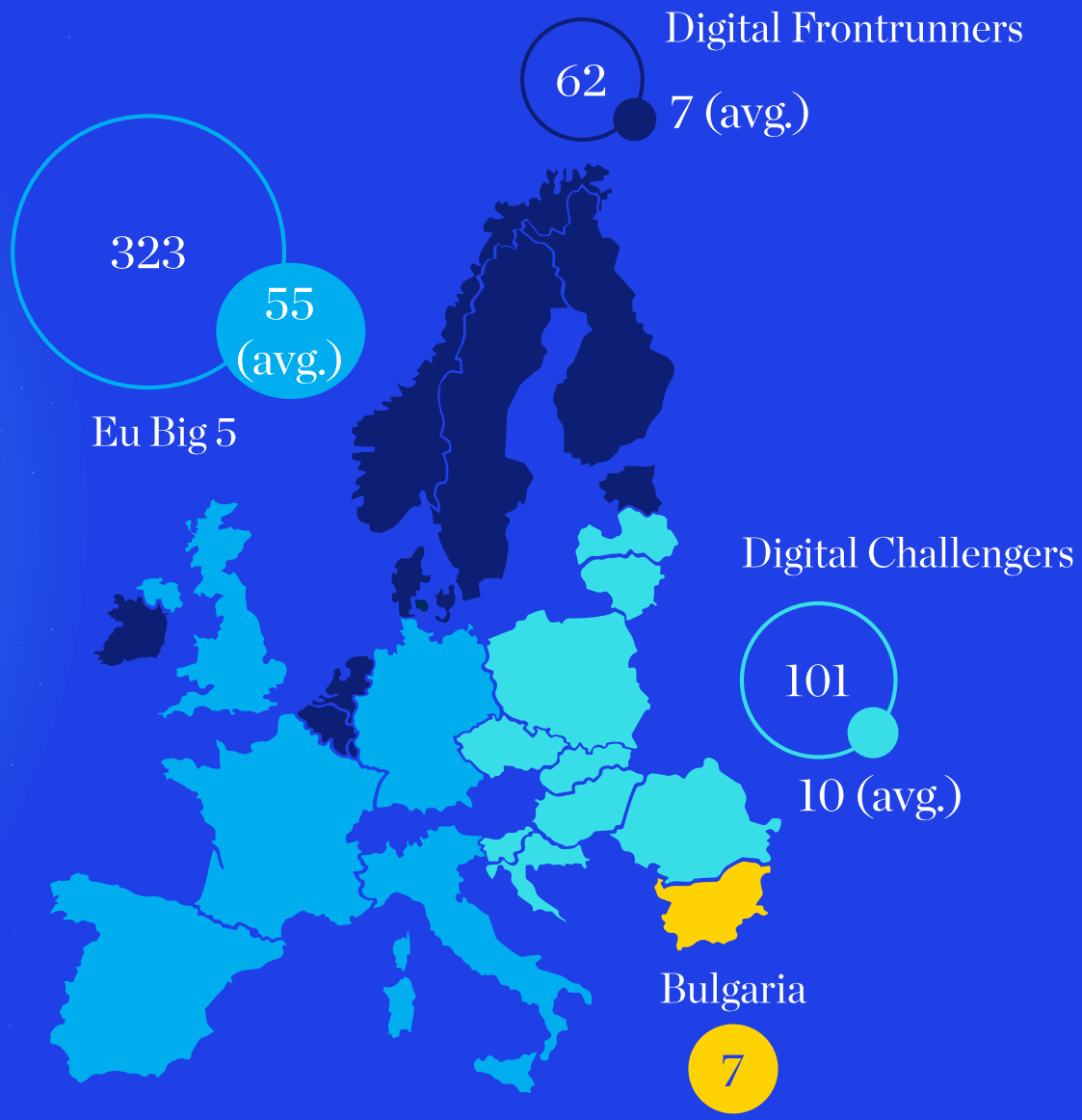
The rise of Digital Challengers

How digitization can become the new growth engine for Bulgaria and Central and Eastern Europe (CEE)

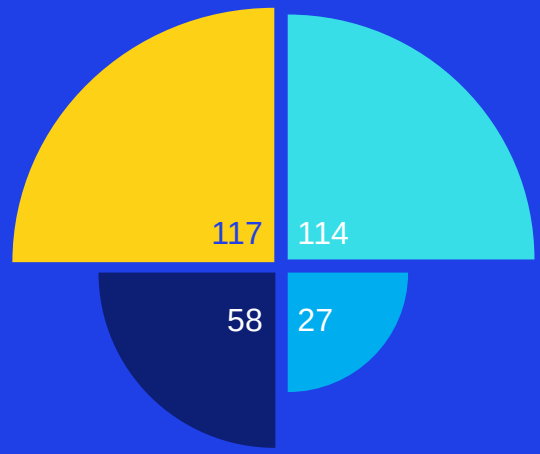
Report insights presentation - perspective on Bulgaria

Looking at Europe from an economic perspective, we can distinguish three regions

Regional total population vs country average, 2017, millions



GDP per capita growth, 1996-2017, %



Bulgaria, similarly to other CEE markets, cannot count on traditional growth levers any more and should look for the next growth engine

Production (GDP) = Productivity A × Labor L^{β} × Capital K^{α}

Productivity lags behind Digital Frontrunners

Bulgaria has limited work capacity reserves – low unemployment rate, with working hours above EU average

Economy in Bulgaria is under-capitalized and the gap is closing slowly

1 EUR current prices and purchasing power parities in current prices
2 Net assets per employee, at prices of 2010
3 Belgium, Denmark, Estonia, Finland, the Netherlands, Ireland, Luxembourg, Norway, Sweden

SOURCE: Eurostat; OECD

Bulgaria can build on its strong digital economy growth dynamic to catch up with Digital Frontrunners

	Bulgaria	CEE *Digital Challengers*	EU Big 5[2]	Digital Frontrunners – Sweden example
Digital GDP per capita, 2016, thousand euro	0.45	0.75	3.27	4.15
Growth of digital economy %, 2012-16	8.2	6.2	3.1	9.9
Growth of non-digital economy %, 2012-16	2.1	2.6	1.2	2.2

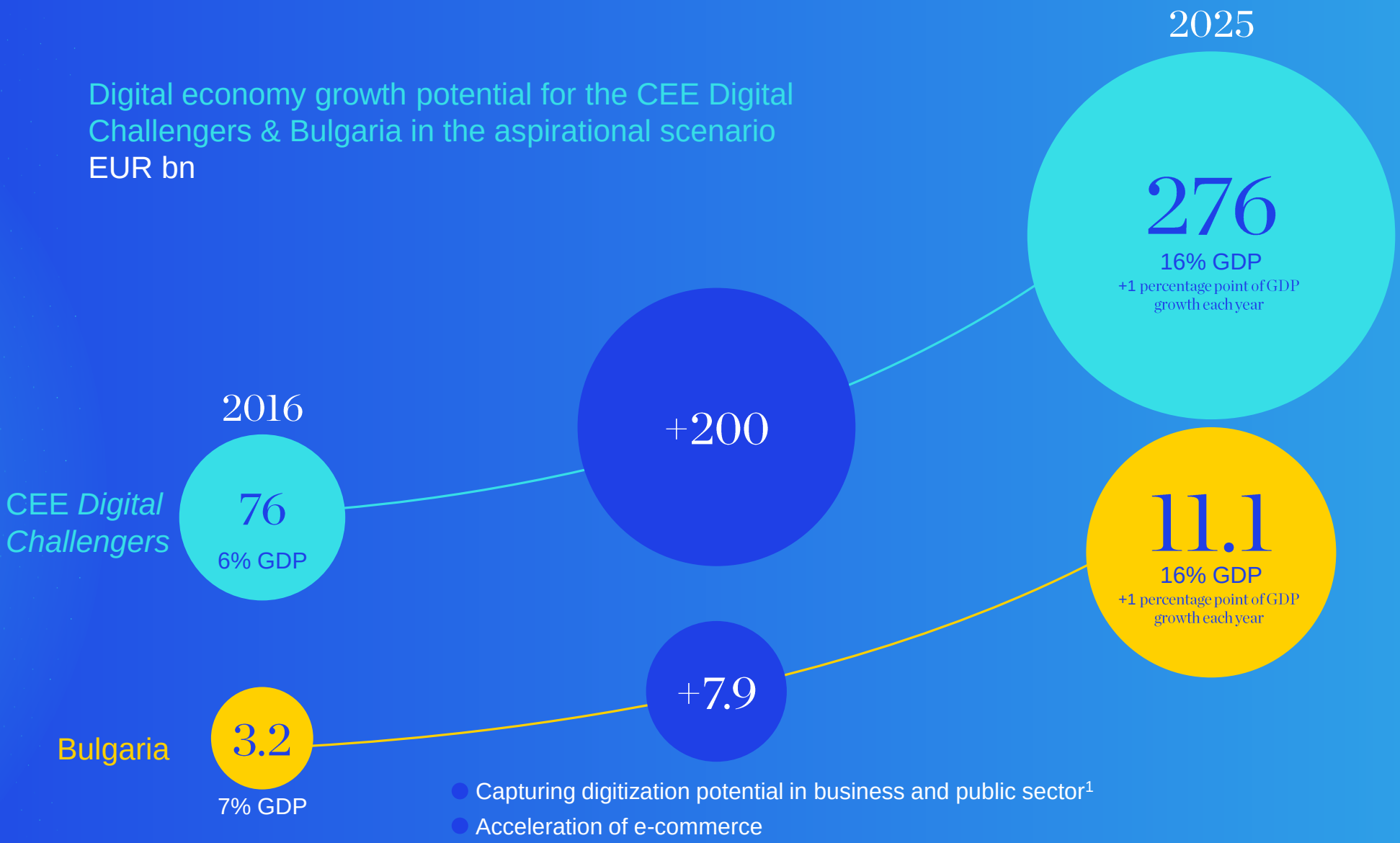
1 Digital economy is calculated as sum of sectors: ICT, e-commerce and consumer spending on digital equipment (e.g., computers, smartphones, smartwatches)
2 Spain, France, Germany, UK, Italy

SOURCE: Eurostat; Local institutes of statistics; McKinsey Global Institute

The digital economy in 2025 can bring up to 200 billion EUR in GDP in CEE and 8 billion in Bulgaria, adding up to 1 p.p. to GDP growth per year

Digital economy growth potential for the CEE Digital Challengers & Bulgaria in the aspirational scenario

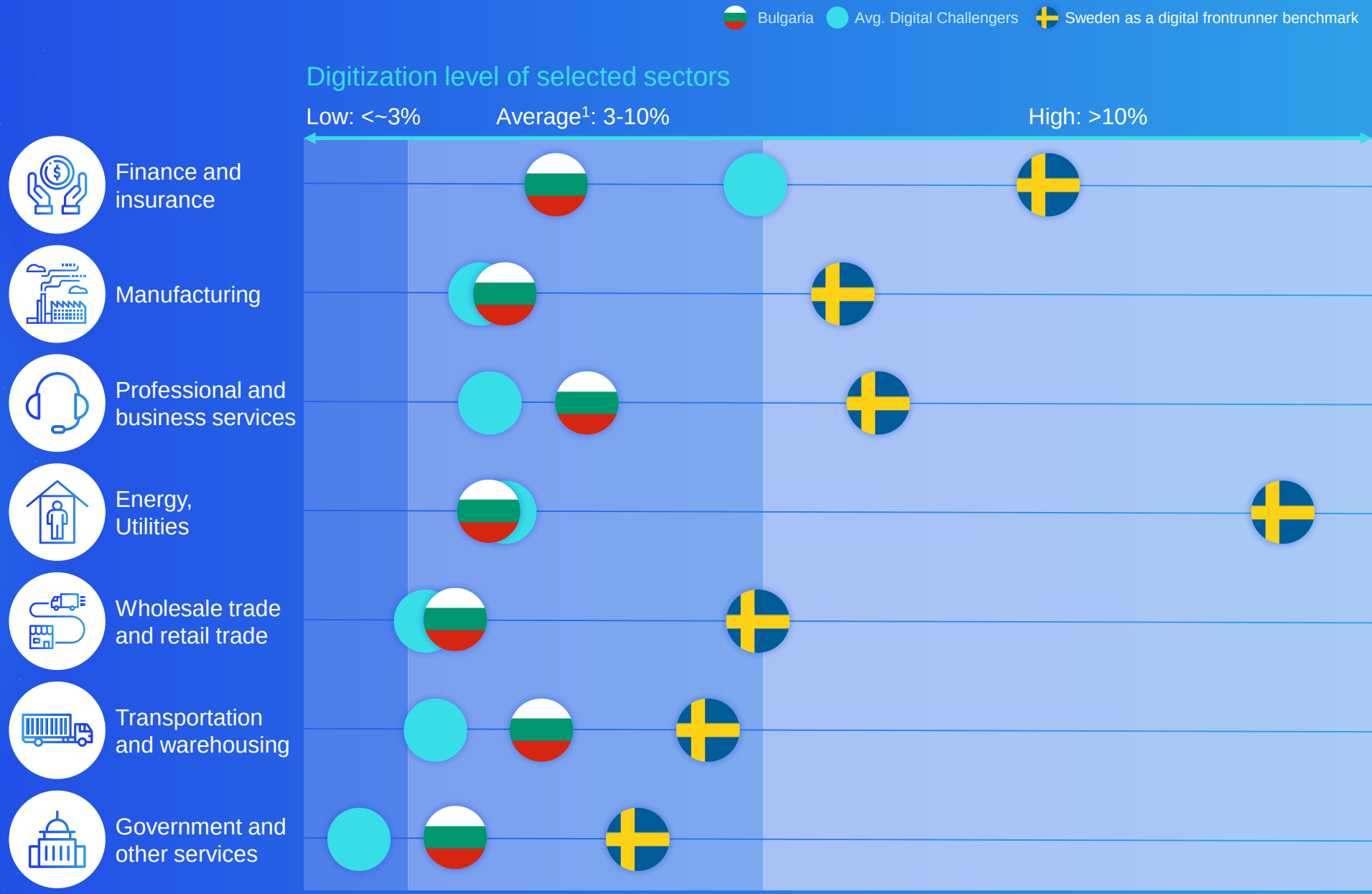
EUR bn



1 Productivity growth captured by increase of traditional ICT usage (software, hardware, telecommunications) to the level of Sweden – representation of Digital Frontrunners

SOURCE: Eurostat; Local statistical offices; IHS; McKinsey Global Institute

Bulgaria's digital potential can only be achieved if public and private sector leaders act to address digitization gaps to Digital Frontrunner benchmarks



1 Average level of all sectors (excluding the most advanced ICT sector and finance)

SOURCE: Eurostat; Local institutes of statistics, McKinsey Global Institute

Detailed on the following pages

To strengthen Bulgaria's Digital Challenger status, further efforts need to be channeled in 5 key areas

Improve the quality and coverage of digital infrastructure

Strengthen both primary and secondary education quality

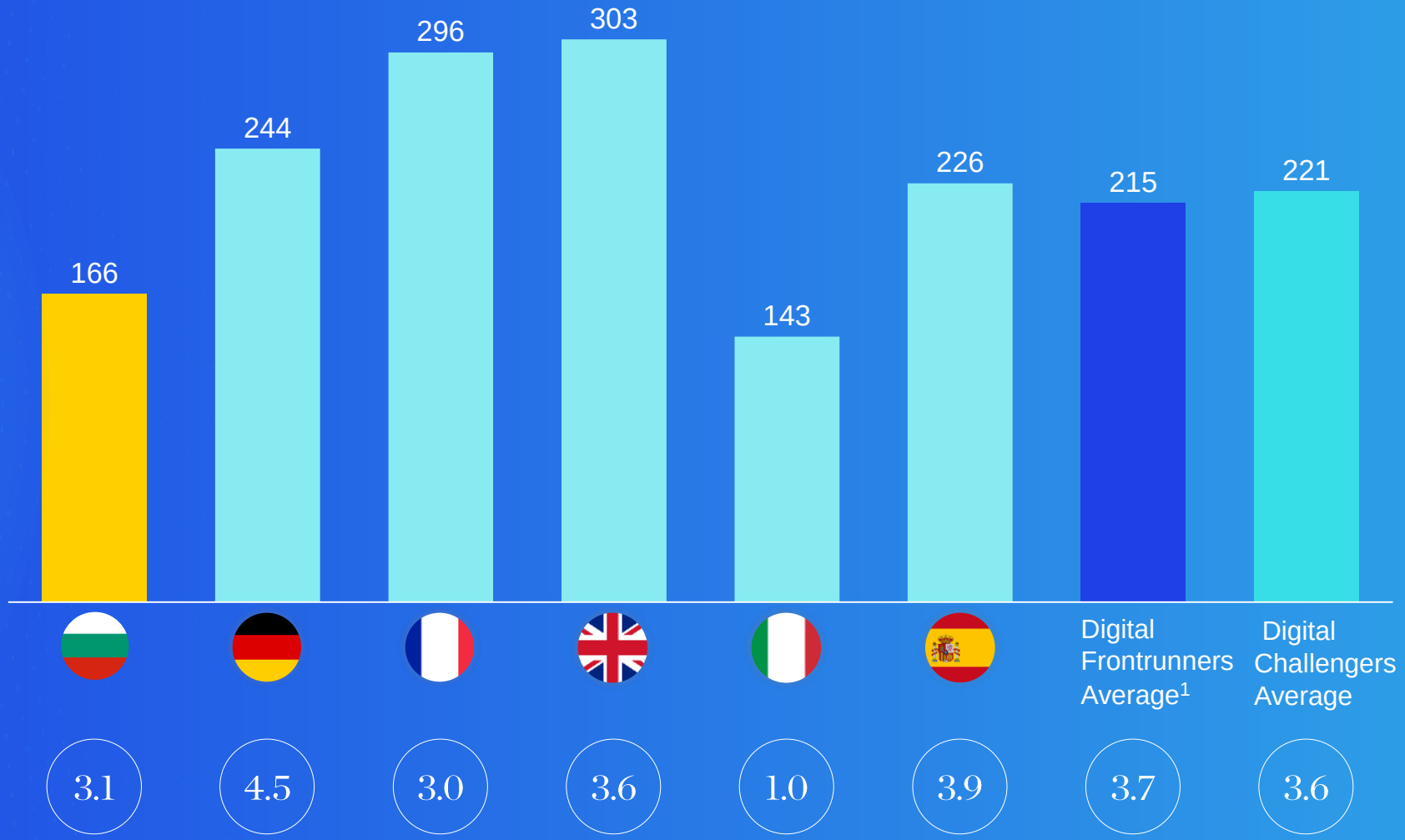
Invest in digital and soft skills for the general population

Increase the adoption of digital tools in the public and private sectors

Support the development of a thriving innovation and entrepreneurship ecosystem and the environment to run a digital business

Bulgaria lags behind Europe in terms of the relative size of its STEM and ICT talent pool

Number of STEM graduates
per 100.000 inhabitants, 2016



Information and Communication technology graduates, % of all graduates

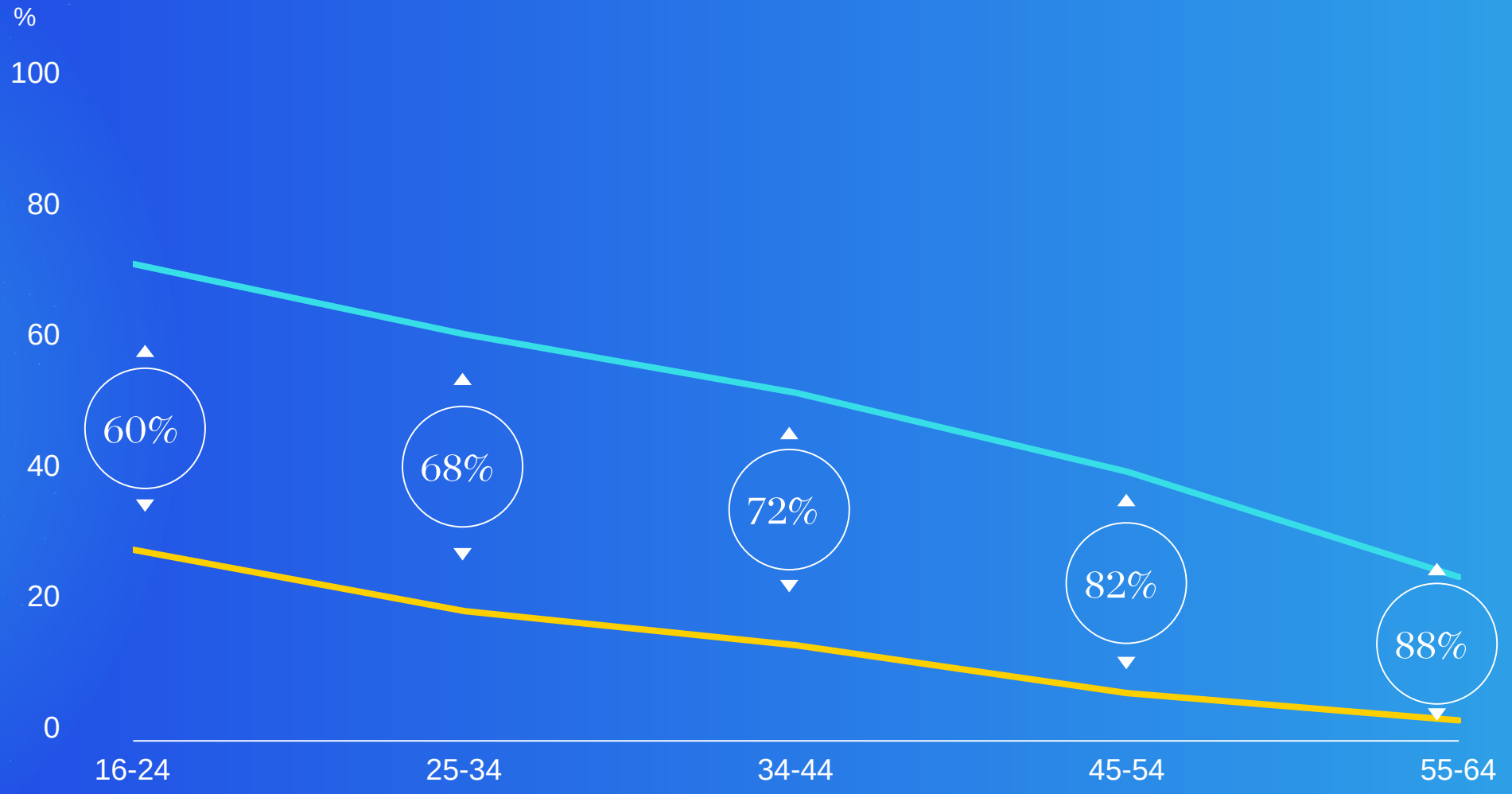
3.1	4.5	3.0	3.6	1.0	3.9	3.7	3.6

1 Digital Frontrunners: Belgium, Denmark, Estonia, Finland, Holland (data for 2015 assumed), Ireland, Norway, Luxemburg, Sweden

SOURCE: Eurostat, Unesco Institute for Statistics

Across all age groups in Bulgaria, the percentage of people with advanced digital skills is far below Digital Frontrunner benchmarks

Citizens with advanced digital skills[1] by age groups, Bulgaria vs. Digital Frontrunners[2]



1 Advanced digital skills - analysis and data collection using digital tools, the use of online tools such as banking or e-commerce, use of online communication
2 Belgium, Denmark, Estonia, Finland, the Netherlands, Ireland, Luxembourg, Norway, Sweden

SOURCE: Eurostat, McKinsey & Company analysis

The private sector in Bulgaria is less advanced in the use of digital tools than Digital Frontrunners; SMEs do not fully use the potential of digitization

S SME L Large Corporates

Selected digital tools
% of enterprises using the tool, 2016

1 Belgium, Denmark, Estonia, Finland, Netherlands, Ireland, Luxembourg, Norway, Sweden

SOURCE: Eurostat

10 recommendations to digitize Bulgaria

Examples on following pages

Public sector

1. **Build skillset for the future** by developing a wide-ranging reskilling strategy, updating youth education for the future and actively counteracting brain drain
2. **Support technology adoption in the public sector** (e.g. speeding up the development of online public services and its adoption)
3. **Support technology adoption among businesses** (e.g. promote digitization benefits and digital transformation)
4. **Strengthen regional cross-border digital collaboration (**e.g. create a strong digital pillar within regional collaboration platforms)
5. **Further stimulate the startup eco-system** through e.g. improving entrepreneurial talent pool and increasing access to capital)

Private sector

6. **Actively adopt technology and innovation** (e.g. adapt your business model to meet the demands of the digital economy)
7. **Embrace a pro-digital organizational culture**
8. **Invest in human capital** (e.g. prepare your talent strategy for the digital economy)

Individuals

9. **Prepare for the digital economy –** invest in life-long learning
10. **Take advantage of digital tools** in all aspects of your life

1. Example:
Multiple examples seen of measures undertaken by policy-makers across Europe to build skillsets for the future

Czechitas in Czech Republic

- The Digital Academy is a project that educates and inspires women and girls to pursue opportunities in tech and computing fields. It is a requalification course and a mentoring program for future data analysts with no requirements on previous experience/knowledge.
- The goal is to find jobs for the participants in cooperation with local companies. The main target groups are elderly people over 65 year and immigrants from nonwestern countries.

Skills Norway

- Skills Norway is a national agency focusing on (among others) improving basic skills in the adult population in the areas of literacy, numeracy, oral communication, and the use of ICT.
- As part of its Digidel 2017 program, it supported groups that do not use ICT as part of their everyday life, and help them acquire the skills needed to master these technologies.

Rails Girls Sofia in Bulgaria

- Rails Girls Sofia is a project making technology more approachable for women in Bulgaria. The organization provides a community, free workshops and study groups where women and girls can learn the basics of web programming and develop their projects.
- Since the project started in 2013, around 1000 women have been trained through 14 weekend workshops and over 300 study group meetups.

1 Polish: Fundacja Platforma Przemysłu Przyszłości

1. Example:

Shkolo is a case-in-point of an organization supporting the digitization of the school system in Bulgaria

SHKOLO

- Created in 2016
- Awarded ‘Best Startup’ Prize by Invest Bulgaria Agency

Challenge (mission of company)

- Minimize bureaucracy
- Engage students
- Engage parents

Solutions

- Optimize back-office administrative tasks at schools
- Release time of teachers for more value-adding tasks
- Allow parents tracking progress of their children and involve them in kids’ achievements and issues
- Engage children utilizing new technology

SOURCE: Press search, company statements

3. Examples:
A number of Bulgarian companies are active in the space of digitizing traditional business activities

Transmetrics

- Provides big data and advanced analytics solutions for the traditional cargo transport industry
- Supports demand forecasting and predictive operations optimization

analytics 4everyone

- Offers AI-as-a-service to various traditional industries
- Provides solutions supporting and automating demand forecasting, risk management and decision making

Telerik® Develop experiences

- Offers software tools for web, mobile and desktop applications development
- Supports fast development of apps by offering a platform allowing organizations to leverage pre-design UI components

SOURCE: Press search, company statements

4. Close cooperation with the countries of Central and Eastern Europe can help accelerate the development of the digital economy in Bulgaria

The CEE region in numbers

€1.4 trillion GDP

101 million citizens

12th economy in the world

Four arguments for the benefit of collaboration between Digital Challengers:

I

As the CEE region, Digital Challengers represent €1.4 trillion in GDP. Enabling Bulgarian enterprises to seamlessly tap into this potential can reap significant benefits.

II

Bulgaria, like other CEE markets, exhibits high levels of market openness and comparable levels of digitization. This adds relevance to the shared experiences on what has worked well in digital investments and regulatory policy between the countries in the region.

III

Bulgaria faces the same challenges as many other CEE markets, importantly the “brain drain” and need to reskill the workforce in the long term. Joint efforts across the region can help in finding and implementing the most effective solutions.

IV

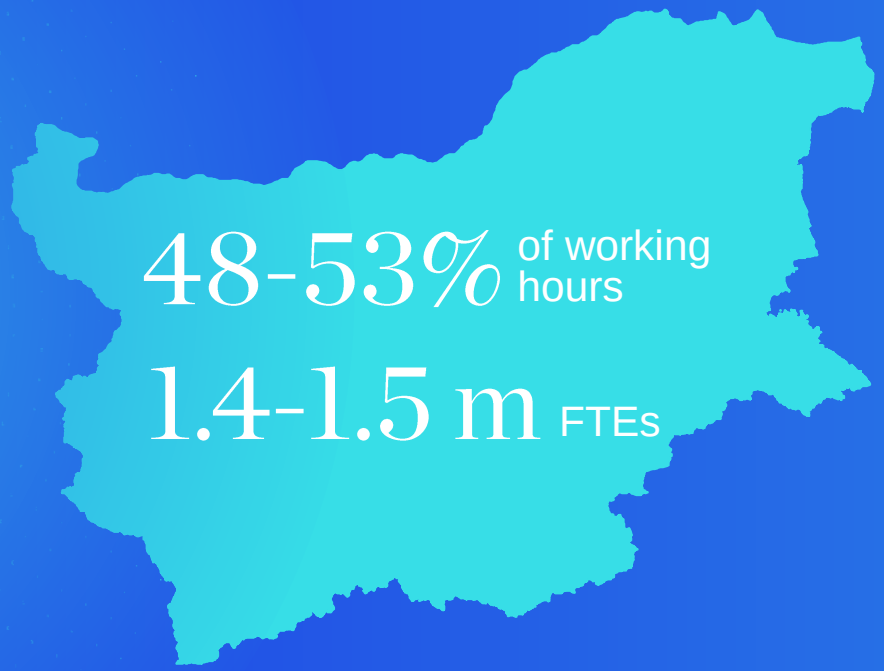
Bulgaria has developed different strengths related to the digital economy than other CEE markets. Sharing best practices can accelerate digitization.

1 Np. “Digital North Initiative” w ramach “Nordic Council” czy Inicjatywa “Digital 9”

Automation potential in Bulgaria is estimated at 48-53%, translating into ca. 1.4 - 1.5 m FTE

Which would require re-skilling of the Bulgarian labor force

Time to act is now as automation will impact the labor market in Bulgaria...



Change in working hours 2016-2030, %

Basic cognitive skills	▼ 17
Physical and manual skills	▼ 16
Social and emotional skills	▲ 22
Technology skills	▲ 52

Direction of skill shift

Note: Skill change for Western Europe

SOURCE: McKinsey Global Institute

Bulgaria as a Digital Challenger

~2%

The growth rate of the non-digital economy in Bulgaria in 2012-2016

8%

The rate of growth of the digital economy in Bulgaria in 2012-2016

10%

The rate of growth of the digital economy in Sweden – Bulgaria may aspire to such a growth rate in the future

3.2 bn euro

Value of the digital economy in Bulgaria today

7.9 bn euro

Potential additional GDP generated by 2025 in Bulgaria due to the acceleration of digitization

7% → 16%

Digital economy share of GDP today and potentially in 2025

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The Rise of Digital Challengers:
How digitization can become the next growth engine in Central and Eastern Europe

Available at DigitalChallengers.McKinsey.com

Thank you