



European
Commission

INDUSTRY IN EUROPE

**Facts & figures
on competitiveness
& innovation**

2017



EUROPEAN COMMISSION

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FOREWORD



MANAGING EUROPE'S TRANSITION TO A MODERN, CLEAN AND FAIR ECONOMY

Europe is and always was a project of the people. The industry of Europeans has always been the cornerstone of wealth and prosperity on our continent since well before the European Coal and Steel Community was established in 1951. Europe's society and economy have been transformed almost beyond recognition since then. One thing has not changed: our industry remains a catalyst for progress and a driver for our future.

Today, it provides 50 million direct jobs, or 20% of our workforce, and accounts for over half of our exports. European quality is a stamp of approval

for people across the world, whether produced by local, family-owned companies or large scale industries.

The arena we are operating in, however, is changing. Europe's share of global population and economic weight are decreasing as other regions grow. At the same time, digitisation and decarbonisation are fundamentally changing the way our industry is powered and our economy is designed. That leaves us at a crossroads: the new world brings opportunities that Europe must grasp. But it cannot do so by leaving anyone behind or by compromising on its commitment to fairly distribute the benefits across society.

The truth is that we are still scratching at the surface when it comes to making the most of our new opportunities. Only 19% of EU enterprises used cloud computing in 2014. Two years later, this had only increased to 21%. So while we are moving in the right direction, we are still not moving fast enough. Bold action will be needed if we are to keep pace with new technology and with our global competitors. That means having a common vision and working together at all levels, from local to European, to respond to new industrial challenges and help Europe thrive in the modern world.

We need to **empower** industries to help them create the prosperity and jobs that European citizens expect. This entails a reindustrialisation and modernisation of our economy that must embrace digitisation, decarbonisation and the circular economy. We need to empower the many consumers who could become Europe's next producers and entrepreneurs.

At the same time, the European Union must **defend** its regions, workers and industries most affected by new business models and unfair trading practices. We have to find a common answer to the challenges of globalisation and technological disruptions. We must invest in our people by enabling them to reskill and upskill and make lifelong learning a systematic part of careers. The upcoming European Pillar of Social Rights will also ensure that social rights fit the changing world of work. The Juncker Plan and other EU funds, as well as our smart specialisation strategy, can also help us invest in reindustrialising those regions where factories close and jobs are lost.

We need a Europe that **protects** its leadership role in different industries, its global competitiveness and technological cutting-edge. The EU must cultivate its talent base, just as it must defend its role as a global standard and rule setter.

The European Industry Day is about finding solutions to those challenges. To transition to a modern, clean and fair economy we must be open, inclusive and collaborative. We must rely on those who know best and those who will shape our future: that is you.



Jean-Claude Juncker
President of the European Commission

EXECUTIVE SUMMARY

Industry is undergoing rapid change, which will have a lasting impact on European citizens. Technological developments and an evolving global context are generating new kinds of products and services, and new types of business models for delivering them. The interactions of individuals with industry as workers, investors and consumers are also changing. This is the context of EU initiatives to boost industrial competitiveness.

The challenge is to provide the appropriate framework conditions in which future industries can flourish, balancing the need for regulatory clarity and consistency with space for innovation. The EU has a wide range of policies addressing all aspects of competitiveness, from horizontal pan-EU programmes to sector-specific initiatives. The EU's focus is on flexibility, sustainability and innovation, without creating rigid structures or restrictive requirements. Where can EU-level policies add value? How can EU policies prepare European workers, business and industries to adapt to future challenges and thrive on future opportunities?

The European Commission has sought to integrate consideration of industrial competitiveness across all initiatives (sometimes referred to as 'mainstreaming'). This brochure gives an overview of initiatives

and policies which demonstrate the EU's wide-ranging activities to boost industrial competitiveness for all Europeans. These initiatives focus on building an economy that is circular, sustainable, inclusive – and ready for the future.

Chapter 1 outlines the changing nature and needs of European industry. It describes the critical factors across all European industrial sectors which must be addressed in order to maintain and further strengthen industrial competitiveness. These factors include investment and access to finance, development and uptake of key technologies, including digital solutions, the adoption of more sustainable business models, and reskilling the European workforce. Education is crucial.

Chapter 2 details high-level EU initiatives which address these horizontal issues and create an environment which supports competitiveness. These include improving access to finance for companies; investing in research and development; supporting improvements in resource efficiency and uptake of more circular business models; maximising the scale and ease of access of available market places within and beyond the EU; ensuring high-quality education; and targeting skills development to prepare citizens for future jobs.

Chapter 3 goes into further detail on three examples of sector-specific initiatives: space, defence and steel. These demonstrate how the Commission is tailoring its activities according to the different challenges and strengths of each sector, combining broad policies detailed in Chapter 2 with more targeted tools.

Stakeholders are invited to use this brochure as a point of reference to identify initiatives of use and interest to them, and to help identify gaps still to be addressed to shape the way ahead.

INTRODUCTION

INDUSTRY MATTERS FOR EUROPE: ONE IN FIVE JOBS IS IN INDUSTRY

We recognise that we are living through a new industrial revolution. This revolution is a technological one – breaking down the barriers between supply chains as well as customers and business. Technology has changed the way we live and it is rapidly changing the way we work.

Europe is the global leader in many sectors which supply high-value jobs today, including the automotive, aeronautics, engineering, chemicals and pharmaceutical industries.

European companies also play a leading role in markets for future technologies, which include advanced manufacturing, nanotechnology, biotechnology, micro- and macro-electronics, photonics and advanced materials.

But rapid advances in technology and the need to foster a sustainable, circular and low-carbon economy provide challenges as well as opportunities. Europe must continually innovate to remain competitive in a global market place.

In some sectors, traditional jobs are being replaced with new forms of work or are being automated. At the same time, new high-added-value jobs are

also being created by these changes in work and technology. The overall net effect on jobs in the EU is likely to be positive¹ provided that sizeable re-skilling, upskilling and optimal allocation take place.

CHALLENGES FOR EUROPEAN INDUSTRY

This Commission has taken strong measures to address key challenges for European industry since the beginning of its mandate in 2014. The ambition of the Commission's action is to comprehensively address the challenges identified by social partners and policy-makers.

1) *The Industry 4.0 transition quantified*, Roland Berger 2016
https://www.rolandberger.com/en/Publications/pub_the_industrie_4_0_transition_quantified.html

CHALLENGES

MEASURES

EXAMPLES



ACCESS TO
FINANCE

INVESTMENT PLAN
CAPITAL MARKETS
UNION

EUR 30 billion from the Investment Fund allocated to projects generated EUR 168 billion of additional investments – EUR 16 billion invested in 9000 research and innovation projects (Horizon 2020) – 200 initiatives to simplify regulation and improve investment climate;
33 actions for an integrated capital market by 2019;



RESOURCE
EFFICIENCY

ENERGY UNION
CIRCULAR
ECONOMY

Clear energy targets for 2030:
40% cut in greenhouse gas emissions
27% market share for renewables
30% energy efficiency improvement;
Legislation to improve waste prevention and reuse could save 8% on annual business turnover in industry;



ACCESS TO
DIGITISATION

DIGITAL SINGLE
MARKET

European Platform to connect national initiatives on digitisation;
Commitment to invest EUR 500 million in digital innovation hubs by 2020 and facilitate free data flow;



ACCESS TO
GLOBAL VALUE
CHAINS

SINGLE MARKET
STRATEGY TRADE
POLICY

Service package: with the European services e-card, service providers can expand their business to other Member States more easily;
Guidance on application of existing rules to the collaborative economy;



SKILLS
DEVELOPMENT

SKILLS AGENDA

Sectoral partnerships for better skills, supported by EUR 30 million in six areas: automotive, maritime technology, space, defence, textiles and tourism;



SUPPORTIVE
REGULATION

BETTER
REGULATION
AGENDA

Regulatory initiatives to help businesses restructure and grow more easily.

CHAPTER 1

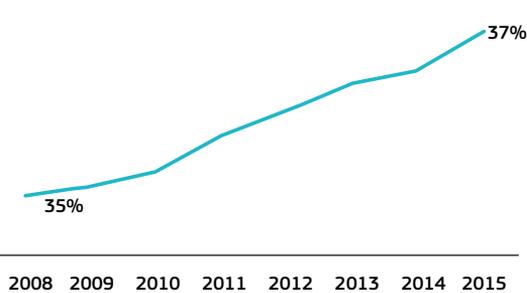
A photograph of two industrial workers, a man and a woman, wearing hard hats and safety glasses. They are crouching on a construction site, looking at a set of plans or documents. The background shows industrial structures and a bright sky. The image has a teal and green color overlay.

THE CHANGING NATURE OF INDUSTRY

THE CHANGING NATURE OF INDUSTRY

Industry is a substantial part of our economy²: it generates 24% of GDP and provides jobs to 50 million people i.e. one in five jobs in the EU. While many jobs have been lost in the last ten years, employment in medium- and high-tech manufacturing is growing.

EU-28 Employment in high- and medium-high-tech manufacturing (of total manufacturing)



Source: Eurostat

Europe is the global leader in many industries which supply high-value jobs, which include the automotive, aeronautics, engineering, chemicals and pharmaceutical industries. The strengths of European technologies in these industries bode well for the future.

However, these European strengths risk being undermined by the need for investments and competitive advantages in the so-called Key Enabling Technologies (KETs), which include advanced manufacturing, nanotechnology, biotechnology, micro- and macro-electronics, photonics and advanced materials.

2) Industry refers to manufacturing as defined in Section C and division 10-33 of NACE, plus broader activities such as mining, construction and energy generation.

New technologies generate new markets. This is especially true of the integrated development of digital technology and advanced manufacturing. These trends define our current industrial revolution – rapid, comprehensive changes in technology are transforming our economy.

This revolution presents challenges but within them lie opportunities. For instance, while adapting to an energy-efficient economy can be challenging, specialised activities based around energy retrofits now account for two-thirds of overall employment in the building sector, mainly in small and medium-sized enterprises (SMEs). This shows that these challenges can be met positively.

NEW TECHNOLOGIES, NEW MARKETS AND BUSINESS MODELS

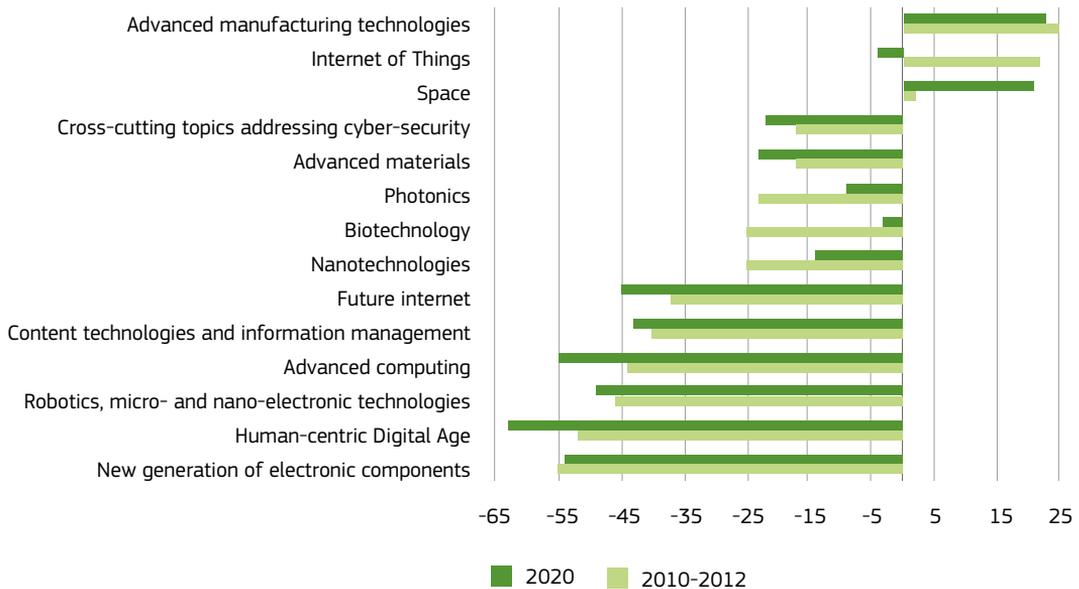
Tomorrow's factories will use highly energy- and material-efficient processes, employ renewable and recycled materials, and adopt increasingly sustainable business models.

Such business models bring together different components of the value chain, including customers, to optimise the use of materials and convert waste, heat or other by-products into useful energy.

The internet has already changed our everyday lives and is now changing the ways industries produce and people consume. The customer is deeply involved in supply chains, products are being customised, industries provide platforms to comprehensively integrate digital technologies into their working methods. Ultimately, companies will have relationships with their end customers who drive demand.

Value chains are increasingly global, bringing significant opportunities to companies of all sizes. These opportunities demand that a business is ready to integrate into chains with international partners. For companies, especially small ones, digital technology is the key to opening this door.

EU patent applications in KETs (Revealed and Expected Technological Advantage)



Source: Patstat database; EC-commissioned study carried out by Fraunhofer ISI, 2016

In this new interconnected, digital world, consumers and business customers increasingly demand a complete package of products and services. The distinction between product and service markets is a thing of the past. Value creation and innovation increasingly take place together. Business-related services are often decisive in making products attractive to the consumer and they generate most of the added value in growth and employment.

SKILLS TRAINING FOR THE FUTURE

One of the most profound impacts of the new industrial revolution will be on what jobs people have and what skills they will need to succeed. This transformation generates uncertainties and anxieties among citizens about their future. People in Europe should not only know what skills they need to work

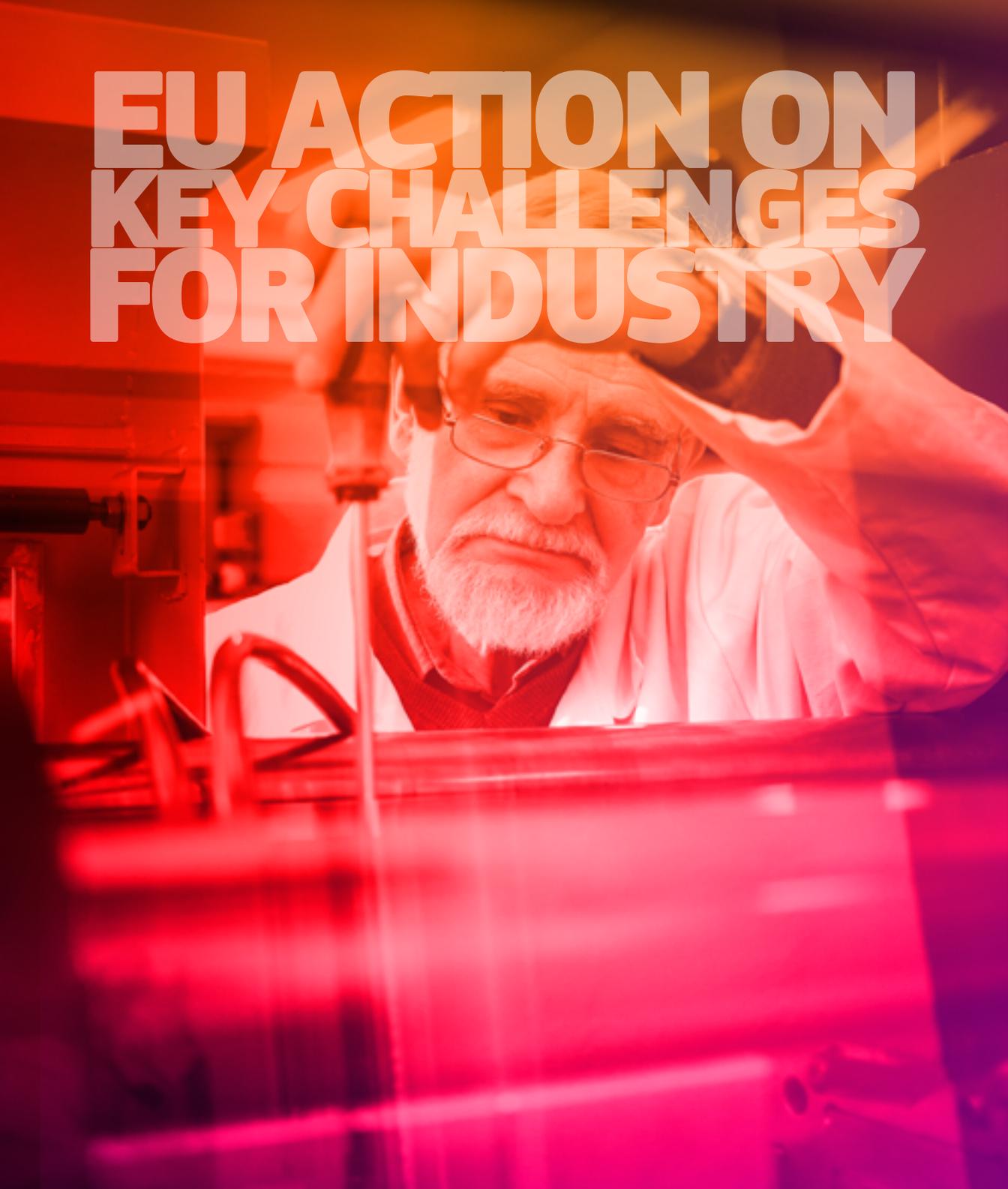
in a given industrial sector, but also where they can actually obtain these skills. This means that businesses need to take an active role in supporting their current workforces through retraining and to consider multi-sector skilling partnerships to leverage the same collaborative models that underpin many of the technology-driven business changes currently under way.

This global industrial transformation is a reality at local, regional, national and European level and there is wide consensus that Europe should embrace this change while making sure it works for everyone.

The EU has made significant progress over the past two years in adopting measures which are essential to strengthen Europe's industrial base. These measures are presented in the next chapter.

CHAPTER 2

EU ACTION ON KEY CHALLENGES FOR INDUSTRY



EU ACTION ON KEY CHALLENGES FOR INDUSTRY

To be innovative, competitive and in a strong position to tackle society's challenges, European industry needs the right framework conditions.

Key stakeholders have emphasised this and, since the beginning of its mandate, this Commission has adopted initiatives which are highly relevant for European industry's current challenges.

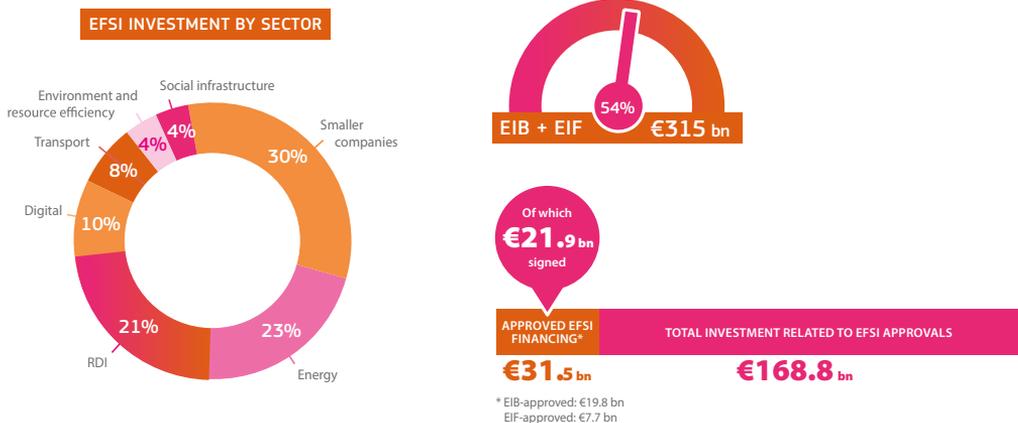
A lot can be done at EU level, but the Commission is also working with Member States to facilitate essential reforms in areas such as labour markets and improving the business environment.

We have chosen to present here a limited number of substantial policy initiatives which stimulate change in areas where Europe can make a real difference.

THE INVESTMENT PLAN FOR EUROPE

Just weeks after taking office, this Commission adopted the framework for its large-scale Investment Plan to reverse the downward trend in investment, following the financial crisis in 2008, and put Europe on the path towards economic recovery. Through its three pillars, the Investment Plan for Europe has proven to be a useful tool in encouraging a sustainable increase from the low investment levels in Europe. It is delivering concrete results while helping Europe to recover.

The first pillar in the Investment Plan is the European Fund for Strategic Investments (EFSI), which has been in place since July 2015. As of the end of January 2017, 420 transactions supported by the EFSI had been approved by the European Investment Bank Group for a total investment value of EUR 168.8 billion (54% of the overall objective of EUR 315 billion by mid-2018). These transactions cover all 28 Member States and are expected to benefit over 388 000 SMEs and mid-caps.



Source: EIB

INVESTMENT AND INDUSTRIAL INNOVATION PROGRAMME FOR DAHER

Daher is a French equipment manufacturer which develops integrated industrial systems for aerospace and advanced technologies. It has a turnover of more than EUR 1 billion and employs over 8 000 people worldwide.

Daher received a EUR 60-million loan in October 2016 to modernise its industrial plants in France and upgrade and automate its industrial processes. This investment is fully consistent with Industry 4.0. It will foster competitiveness as the company digitalises its industrial sites in France and supports customer-base development.

The overall investment for this project will be EUR 120 million.



In September 2016, the Commission tabled a legislative proposal for a reinforced EFSI to continue beyond the foreseen three-year period. It will continue to mobilise private-sector financing, with a particular emphasis on market gaps and cross-border infrastructure projects.

The second pillar of the Investment Plan comprises the European Investment Advisory Hub (EIAH)³ and the European Investment Project Portal (EIPP). These help to create a stable pipeline of bankable projects and attract potential investors worldwide.

In addition to the Investment Plan, the EU is investing in measures to support industry through:

- ▶ Horizon 2020, with EUR 16 billion invested in more than 9 000 projects, including support for industrial leadership and the European Institute of Innovation and Technology.
- ▶ The European Structural and Investment (ESI) Funds, with a budget of EUR 454 billion for the period 2014-2020, contribute directly to creating jobs and growth. This contribution includes over EUR 120 billion which will be strategically invested in research and innovation and provide support for small businesses and digital technologies. The ESI Funds will directly support 2 million enterprises throughout Europe to increase their competitiveness, and help them develop innovative products and create new jobs.

CAPITAL MARKETS UNION

The Capital Markets Union (CMU) aims to create an investment-friendly environment in Europe by building more profound and better integrated capital markets.

Strong capital markets are the key to sustained higher levels of long-term investment. They provide new sources of funding for business, help to increase the options for savers and investors, and connect finance to the wider economy. The CMU will foster a more resilient financial system with more competition.

Since the publication of the Action Plan in September 2015⁴, rapid progress has been made to deliver the promised actions to build a CMU. The Commission has adopted more than half of the measures foreseen and several more are in the pipeline.

3) <http://www.eib.org/infocentre/videotheque/introducing-the-european-investment-advisory-hub.htm>

4) COM(2015) 468

WHO BENEFITS FROM CMU



Thanks to good cooperation with the Council and the European Parliament, progress has also been made on the first set of legislative proposals:

- ▶ From 2016, insurance companies benefit from more facilities for investing in infrastructure assets, enabling them to better tap into these significant private capital resources and increase investment in relevant infrastructure.
- ▶ A political agreement was reached at the end of 2016 on the modernisation of the Prospectus rules for companies which raise capital on public markets. It will bring industry closer to better access to finance from stock markets.
- ▶ Progress has been made on the review of the legislative framework for venture capital – a key source of funding for EU start-ups.
- ▶ New rules may also be agreed very soon on simple, transparent and standardised securitisation. These will provide an enhanced framework to allow for the sustainable development of securitisation instruments, giving financial institutions the possibility of providing additional lending to business.

- ▶ The EU will invest up to EUR 400 million in one or more independently managed Venture Capital Fund-of-Funds to be set up in 2017. As the EU investment is capped at 25%, this means additional investments in innovative firms of around €1.6 billion.

ENERGY UNION

The EU is the largest energy importer in the world: 53% of all energy consumed is imported at an annual cost of around EUR 400 billion. Many EU Member States rely heavily on a limited number of suppliers – especially for their natural gas, which leaves their industry and citizens vulnerable to disruptions in energy supply.

In addition, Europe's ageing energy infrastructure, poorly integrated energy markets – particularly across borders – and uncoordinated national energy policies means that EU consumers and businesses often do not benefit from enough choice or competitive energy prices.

Better energy connections between Member States, modernised infrastructure and completing the internal energy market will enable easier access to energy markets across national borders and make energy more affordable.

The recently reviewed Regulation on the internal market for electricity proposes to give priority to:

- ▶ installations that use renewable energy sources;
- ▶ high-efficiency cogeneration from small generating installations;
- ▶ demonstration projects for innovative technologies.

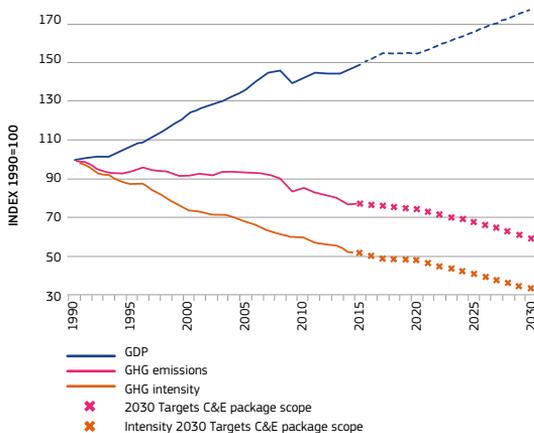
The Energy Union Framework Strategy aims to ensure that affordable, secure and sustainable energy is available for Europe and its citizens.

The strategy covers five areas:

- ▶ energy security;
- ▶ internal market;
- ▶ energy efficiency;
- ▶ decarbonisation;
- ▶ research, innovation and competitiveness.

This Strategy also supports the transition to a low-carbon economy. It will help EU companies keen to lead this transition and help decouple economic growth from greenhouse gas emissions.

EU-28 primary energy consumption and GDP developments



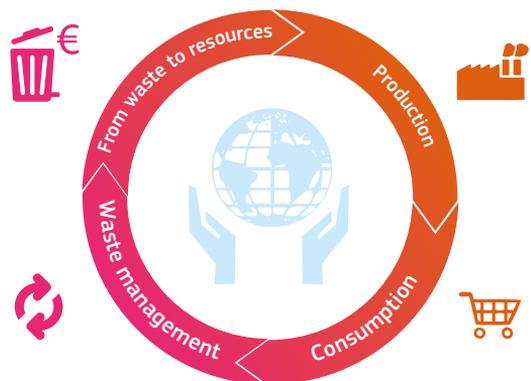
Source: Eurostat

THE CIRCULAR ECONOMY

Transitioning to a circular economy makes good business sense. Companies can make substantial economic gains and become more competitive. Businesses can save money on energy and the environmental benefits are positive for all. Local jobs are created leading to better social integration.

To stimulate Europe's transition to a circular economy, the Commission has adopted the Circular Economy Action Plan⁵. The plan includes regulatory and non-regulatory measures covering the whole product cycle from production and consumption to waste management and the market for secondary raw materials.

The development of markets for resource-efficient technologies in Europe will help European industry to compete globally, foster sustainable economic growth and generate new jobs. It will also lead to net savings on the cost of raw materials.



5) COM(2015) 614

As part of the action plan, the Commission adopted a proposal for a revised fertiliser regulation and new waste legislation and updated the guidance on unfair commercial practices in order to tackle fraudulent environmental claims. The Commission is also working to offer consumers the best available information regarding recyclability, durability and the impact their choices have on the environment.

In January 2017, a first implementation report⁶ showed that the circular economy package has created significant momentum behind the transition towards a more circular economy in the EU.

The circular economy, a win-win situation:

- ▶ Installations that use renewable energy sources;
- ▶ Savings of EUR 600 billion for EU businesses, equivalent to 8% of their annual turnover;
- ▶ Creation of 580 000 jobs;
- ▶ Reduction of EU carbon emissions by 450 million tonnes by 2030.

DIGITISATION

DIGITAL SINGLE MARKET

Digital technologies are transforming the business world with digital value chains, new business models and ever-increasing online sales. In today's digital economy, investment in information and communications technologies (ICT) is the leading contributor to growth in productivity. However, existing regulatory barriers and a lack of support for companies limit industry's potential to take advantage of this strong lever for growth.

The Digital Single Market strategy aims to create a seamless area where people and businesses can trade digitally, innovate and interact legally, safely, securely, and at an affordable cost.

The strategy creates opportunities for new start-ups and allows existing companies to grow and profit within a market of over 500 million people.

The Digitising European Industry⁷ initiative, adopted in April 2016 as part of the Digital Single Market Strategy, put a coordination framework in place called the European Platform of National Initiatives on Digitisation. The framework provides a platform for sharing experiences across 13 national initiatives now, triggering joint investments, exploring common approaches to regulatory problems related to the emerging data economy and exchanging methods of reskilling the workforce. To kick off this framework initiative, the Commission organised a round table on digitising European industry with high-level representatives of governments and industry, in Brussels in September 2016.

As part of its overall strategy, the Commission supports the deployment of Digital Innovation Hubs, notably through the Horizon 2020 research and innovation funding programme, aiming to offer better, more coordinated services to EU businesses.



6) http://ec.europa.eu/environment/circular-economy/implementation_report.pdf

7) COM(2016) 180

These hubs are one-stop shops to serve companies within their local region and help them digitise their business. Moreover, combined investments from the EU, Member States and industry across several Public-Private Partnerships aim to mobilise EUR 50 billion in private and public investments to secure leadership in key industrial value chains⁸.

Evidence suggests that only one in five EU companies is highly digitised. To address this, the Commission launched WATIFY in December 2016. WATIFY is a pan-European awareness campaign to help foster the technological transformation of European SMEs and support regions and cities in their digitisation efforts.

Finally, the e-commerce package⁹, adopted in May 2016, aims to develop measures to allow consumers and companies to buy and sell products and services online more easily and confidently across the EU.

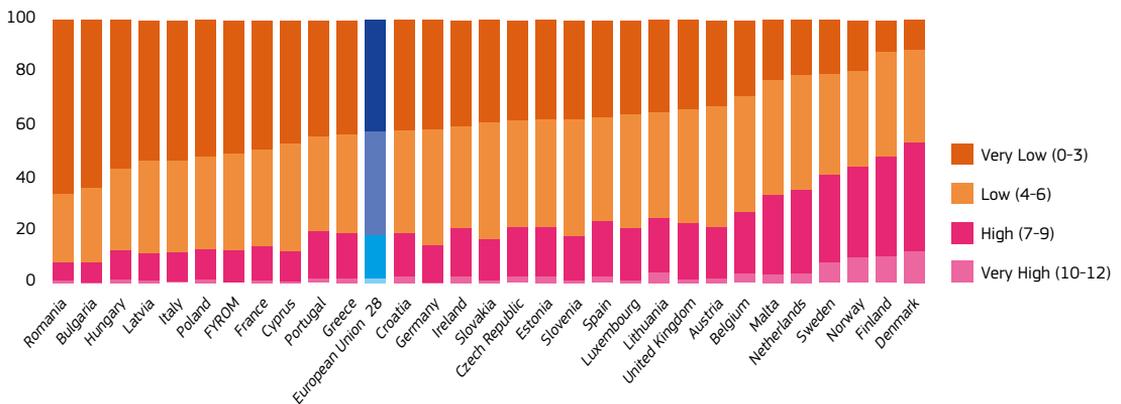
ACCESS TO GLOBAL VALUE CHAINS

THE SINGLE MARKET STRATEGY

The Single Market is one of Europe's major achievements and its best asset in times of increasing globalisation. By allowing people, goods, services and capital to move freely, new opportunities for citizens, workers, businesses and consumers are being opened up – creating jobs and growth in Europe.

However, these opportunities do not always materialise, either because Single Market rules are not known, or not implemented or are simply jeopardised by unjustified barriers – notably in the services sector. The Commission has adopted a number of initiatives in this area to make the Single Market work better for all its citizens.

Digital intensity score for enterprises, by level of digital intensity (2016)



Source: European Commission, Digital Scoreboard

8) <http://ec.europa.eu/programmes/horizon2020/en/area/partnerships-industry-and-member-states>

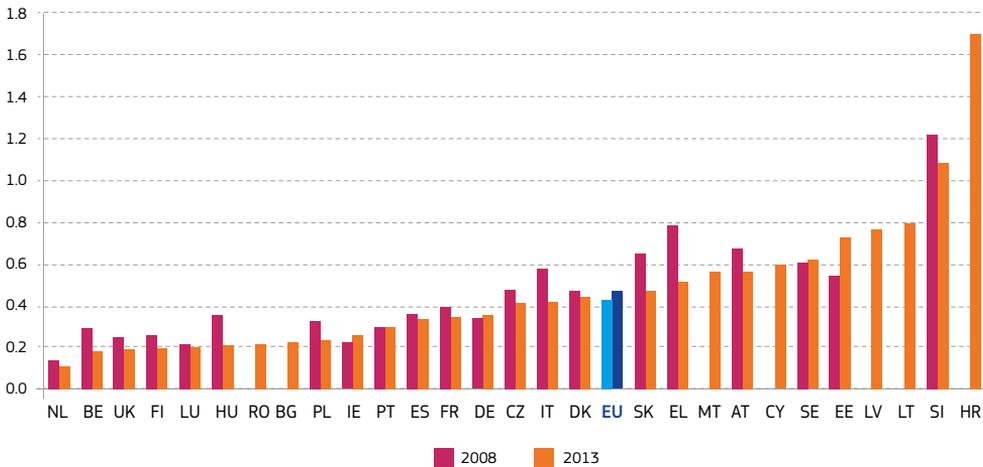
9) COM(2016) 320

The Commission presented its Single Market Strategy, ‘Upgrading the Single Market: more opportunities for people and business’¹⁰ in October 2015. The strategy seeks to deliver a deeper and fairer Single Market that will benefit both consumers and businesses. It focuses on practical measures to help SMEs and start-ups to grow by promoting innovation, unlocking investments and empowering consumers. All the actions proposed in the Strategy will be put in place before the end of 2017.

The Standardisation Package¹¹, adopted in June 2016, provides the framework for the Joint Initiative on Standardisation. This initiative will bring together European and national standardisation organisations, SMEs, consumer associations, trade unions, environmental organisations, Member States and the Commission. The aim is to help modernise, prioritise and accelerate the delivery of standards which facilitate intra-EU and global trade for European industry.

The Start-Up and Scale-Up Initiative creates a better framework to allow start-ups to grow and do business across Europe¹². It facilitates their access to venture capital through the Pan-European Venture Capital Fund-of-Funds and gives entrepreneurs a second chance by means of a new proposal on insolvency law. It also makes tax filings simpler by including the recent proposal for a Common Consolidated Corporate Tax Base (CCCTB), which proposes supporting small and innovative companies that want to expand their business across borders.

Barriers to trade and investments



Source: OECD (aggregate index ranging from 0 (no barriers) to 6)

10) COM(2015) 550

12) COM(2016) 733

11) COM(2016) 358



From the beginning of 2017, the Services Package should provide new momentum for the internal market on services. Industrial clients are a major source of income for several service sectors. Strengthening links between industry and services is indicative of the trend towards blurring borders between the two areas.

To enable further integration of service markets, the Services Package proposes practical tools: first, a European services e-card to make it easier for service providers, such as engineering or IT firms, to complete the administrative formalities required to expand business to other Member States. Secondly, the package intends to boost the enforcement and

implementation of existing EU rules – as with goods, where Member States should notify draft regulations for a check-up at the European level. In professional services, Member States should pursue a more thorough proportionality assessment when new rules are introduced.

Responding to the reality of new and disruptive business models in Europe, the Commission has issued guidance on the application of existing rules to the collaborative economy. This guidance has been well received by Member States and should help strike a sound balance between safeguarding adequate social protection and providing better access for consumers and businesses to online goods and services across Europe.

As to intellectual property rights, the Commission will push through the final steps required to make the unitary patent a reality, and will clarify how it will interact with national patents and national supplementary protection certificates. As announced in the Digital Single Market Strategy, the Commission will review the enforcement of EU intellectual property rules in line with the ‘follow the money’ approach, to deprive commercial-scale infringers of their revenue flows.

TRADE POLICY AND INTERNATIONALISATION OF EUROPEAN BUSINESSES

During the recession, when the EU's domestic demand was weak, international trade softened the blow by channelling demand from growing economies back to Europe. Since the beginning of the century, exports of European goods have almost tripled. The EU's share of world goods exports remains stable above 15 % of the total, while China's share grew from 5 % to more than 15 %, with the USA declining to 11 %.

Our trade relations give industry easier and cheaper access to raw materials and other production inputs for European industry. Most importantly, sales to the rest of the world have become an increasingly significant source of jobs for Europeans. More than 30 million jobs are now supported by exports outside the EU – two-thirds higher than 15 years ago.

This means exports now support almost one in seven jobs in Europe. These jobs are highly skilled and better paid than average. They are spread across all EU Member States and are both directly and indirectly linked to exports outside the EU.

200 000 jobs in Poland, 140 000 in Italy and 130 000 in the United Kingdom are linked to German exports outside the EU. French exports outside the EU support 150 000 jobs in Germany, 50 000 in Spain and 30 000 in Belgium. As a result, the benefits of trade are spread much more widely than is often realised.

Based on the Commission's 'Trade for All' strategy¹³, it is currently working on enhancing the Market Access Partnership to strengthen the focus on the effective implementation of EU free trade agreements. This will be done while increasing the involvement of EU Member States, the European Parliament, business and other stakeholders in the process.

Belief in open trade should not mean tolerating unfair practices, such as subsidies or dumping. The Commission uses all of its trade policy instruments to ensure a level playing field for EU companies in global markets and to remove trade barriers. This includes a new approach to anti-dumping and strengthened trade defence instruments, which are fully deployed when European industry is confronted by unfair competition from third countries, as the example in the steel sector shows (see chapter 3).

SKILLS DEVELOPMENT

Education and training methods must be modernised to equip Europeans with the skills needed for the jobs of the future. It is vital that the workforce is able to keep up with the increasingly rapid changes in technology by continuously upskilling.

The 'New Skills Agenda for Europe'¹⁴, adopted by the Commission in June 2016, calls on EU Member States and stakeholders to improve the quality and relevance of skills for the labour market. It includes 'A Blueprint¹⁵ for Sectoral Cooperation on Skills' to help mobilise and coordinate key players, encourage private investment and promote the strategic use of relevant EU and national funding programmes. In 2017, several sectoral skills

13) http://trade.ec.europa.eu/doclib/docs/2015/october/tradoc_153846.pdf

14) COM(2016) 381

15) http://ec.europa.eu/growth/tools-databases/news-room/cf/itemdetail.cfm?item_id=8848



partnerships, with a total budget of EUR 28 million, will be set up at EU level then rolled out at national or regional level.

The competitiveness of industry in Europe is increasingly dependent on the knowledge, skills and creativity of its workforce and citizens. A large and diverse talent pool combined with skills shortages and mismatches, negatively impacts innovation, growth and employment. People will increasingly need to work across a variety of complex subject areas with ease and confidence.

Initially, the Blueprint will be piloted in six sectors: automotive, maritime technology, space, defence, textile-clothing-leather-footwear and tourism. Additional sectors (construction, steel, paper industries, additive manufacturing, green technologies and renewable energies) will be assessed in a second wave starting in October 2017. In addition, the existing Digital Skills and Jobs Coalition¹⁶ will also help to develop a large digital talent pool and ensure that the labour force is equipped with digital skills.

16) <https://ec.europa.eu/digital-single-market/en/get-involved-digital-coalition>

THE AUTOMOTIVE INDUSTRY

The automotive industry is experiencing a growing need for suitable workers with approximately 100 000 additional jobs needing to be filled annually for at least the next eight years. This is mainly due to an ageing workforce and the forecasted growth of production in the sector. In addition, it is expected that a significant number of assembly-line jobs will disappear, partly due to the introduction of new production technologies and 'clean' vehicles. Therefore, future job profiles will require both high- and medium-level qualifications.

Member States have been invited to develop national digital skills strategies by mid-2017 to build on the results of the Grand Coalition for Digital Jobs, which was founded under the same initiative as the Digital Skills and Jobs Coalition (mentioned above), and the EU e-skills strategy in coordination with the work under Education and Training 2020.

The Commission will bring together Member States and stakeholders, including social partners, to pledge action and share best practices so that they can be easily replicated and scaled up. It will improve the dissemination of information about available EU funds and explore other possible funding opportunities, e.g. voucher mechanisms. The Commission will monitor progress annually through its 'Europe's Digital Progress Report'.

SUPPORTIVE REGULATION

A key concern for industry is over-regulation. This creates complexity and red tape at regional, national and European levels. Ensuring that EU laws achieve their objectives with the lowest costs and burdens possible is the purpose of the Commission's policy for the Better Regulation Agenda¹⁷. Some 200 initiatives have been withdrawn for simplification and to reduce the burdens, benefitting also from the insights gathered under the REFIT Platform which brings together the Commission, national authorities and other stakeholders.

A Commission working document¹⁸ analysed how the regulatory environment at EU level can either hamper or stimulate innovation. The examples identified include energy-efficient buildings, low-carbon hydrogen in transport, electrified vehicles, road vehicle automation, health technology assessments and nanomaterials.

The third pillar of the Investment Plan encompasses all initiatives that aim to improve the regulatory environment at the national level by making it more predictable, reducing red tape and encouraging investment. These efforts at the EU level go hand-in-hand with Member States' commitment to reform in the specific areas the Commission has identified. This has been agreed in the context of the European Semester¹⁹, which is the economic policy review cycle between Member States and the European Commission.

Better regulation examples:

- ▶ New **digital tachographs** in road transport increased road safety, reduced red tape and are expected to save businesses more than EUR 400 million a year;
- ▶ **Fees up to 95% lower paid by SMEs** in relation to EU chemicals legislation.

17) http://ec.europa.eu/info/files/better-regulation-delivering-better-results-stronger-union_en

18) https://ec.europa.eu/research/innovation-union/pdf/innovrefit_staff_working_document.pdf

19) https://ec.europa.eu/info/strategy/european-semester_en

CHAPTER 3

EU POLICIES ON SPACE, DEFENCE AND STEEL



EU POLICIES ON SPACE, DEFENCE AND STEEL

In 2016, the EU formulated dedicated policies on space, defence and steel, three areas which are highly relevant for industry. This chapter explains the policies and the sector in more detail.

Key figures

	IRON AND STEEL	SPACE	DEFENCE
EU – total employment 2015	326 000	400 000	88 000
EU – world share of exports (%), 2015	13.8	39.6	25.3

Source: Eurostat

SPACE

Space applications and services are essential for life on Earth. Space solutions can help Europe to respond better to new global and societal challenges: climate change, disaster management, security threats, migration, farming, transport energy and many more.

Investments in space can boost innovation, growth and competitiveness in Europe. The European space economy employs over 230 000 professionals and in 2014 its value was estimated at between EUR 46 and EUR 54 billion. The EU is investing over EUR 12 billion in space for the period 2014-2020. The return on this investment is very high (one euro invested generates seven euro return) and can bring considerable benefits to the European economy and society.

EU flagship programmes in the space sector are:

- 1) Copernicus, a leading provider of Earth observation data across the globe in six thematic areas: land monitoring, marine monitoring, atmosphere monitoring, climate change, emergency management response, and security;
- 2) Galileo, Europe's own global satellite navigation system: 'the European GPS';
- 3) EGNOS, the European Geostationary Navigation Overlay Service, providing 'safety of life' navigation services to aviation, maritime and land-based users over most of Europe.



Source: EU

The EU conducts other space-related activities, such as funding research and development through the Horizon 2020 programme. This has already yielded significant results in the form of projects which use space-generated data for such activities as the monitoring of agricultural sustainability (SIGMA and AGRICAB projects), analysis of the chemical composition of our oceans (OSS2015), and providing support to urban planners coordinating city resources (DECUMANOS), to name but a few. In addition, the EU contributes to the Space Surveillance and Tracking Support Framework (SST). Operational since July 2016, the SST services detect and warn against possible collisions in space and monitor the re-entry of space debris into the Earth's atmosphere.

The Commission presented its new Space Strategy for Europe²⁰ in October 2016 to foster new services and promote Europe's leadership in space. The

strategy proposes a range of measures to allow Europeans to fully seize the benefits offered by space, create the right ecosystem for space start-ups to grow, and increase Europe's share of world space markets.

Now that the infrastructure for the EU's space programmes is well advanced, the strategy is focusing on ensuring a strong market uptake of space data and services by both the public and private sector. It will do this by generating more services which respond to people's needs and to economic opportunities.

The strategy also takes into account growing global competition, increasing private-sector involvement and major technological shifts that stimulate investment and provide a strong research base.

20) COM(2016) 705

DEFENCE

The European defence industry makes a significant contribution to the security of EU citizens. It is also a major industrial sector, highly innovative and centred on high-end engineering and technologies. These include a variety of industrial fields such as aeronautics, land and naval systems, and electronics.

The European Commission's defence industrial policy is designed to promote competition and innovation, support SMEs and provide a strong industrial base for the EU's Common Security and Defence Policy (CSDP).

In his 2016 State of the Union speech, President Jean-Claude Juncker highlighted the importance of a strong Europe that can defend and protect its citizens at home and abroad. This is an ambition which cannot be achieved without innovation and pooling of resources in the European defence industry.

In November 2016, the Commission presented the European Defence Action Plan²¹, setting out concrete proposals to support a strong and innovative European defence industry and facilitate the joint procurement of defence capabilities based on priorities agreed by Member States.

THE BUSINESS CASE FOR DEFENCE SPENDING AND GREATER DEFENCE COOPERATION



The lack of cooperation between Member States in the field of defence and security is estimated to cost annually between **EUR 25 billion and EUR 100 billion**. This is because of inefficiencies, lack of competition and lack of economies of scale for industry and production.



Around **80% of defence** procurement is run on a purely national basis to a **costly duplication of military capabilities**.

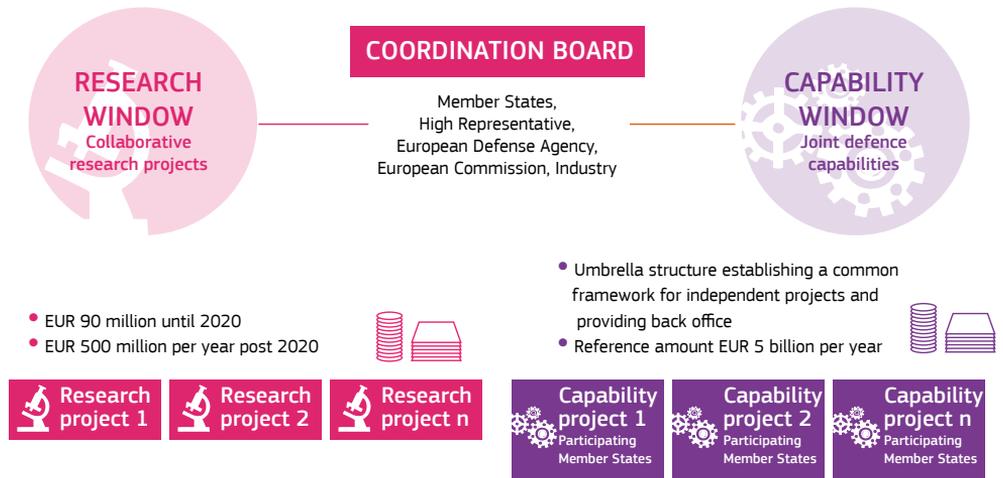


In 2015, **the US invested more than twice** as much as the total spending of EU Member States on defence. China has increased its defence budget by 150% over the past decade.



More Europe in defence will have a positive spill-over effect on the European economy. The European defence industry generates a total turnover of **EUR 100 billion per year** and **1.4 million highly skilled people** employed in Europe. **Each euro** invested in defence generates a **return of 1.6**, in particular in skilled employment, research and technology and exports.

THE EUROPEAN DEFENCE FUND



Source: EU

21) COM(2016) 950

Under this Action Plan, the Commission proposes to set up a European Defence Fund. This will support investment in joint research and the joint development of defence equipment and technologies, foster investments in SMEs, start-ups, mid-caps and other suppliers to the defence industry, and strengthen the Single Market for Defence.

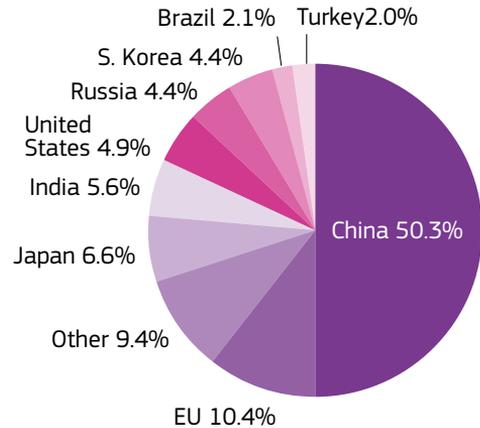
2016²², the European Commission addressed these challenges and called for a comprehensive, accelerated response by industry, Member States and EU institutions.

STEEL

With some 500 production sites across 23 Member States, employing around 330 000 workers, steel is not just a truly European industry but is also the basis of most major EU industries, notably construction and automobile. The EU is the second largest producer of steel in the world, although far behind China.

The sustainability of the EU's steel industry rests on three pillars: economy, ecology and human resources. For it to continue playing its role and to ensure security of supply, the EU steel industry faces critical challenges in the wake of economic crises and the global economic slowdown. In its Communication of March

Overview of world crude steel production in 2015



Source: World Steel Association



22) COM(2016) 155

With global overcapacity in steel, the major short-term economic challenge for the industry is to address distortive trade practices. The Commission has strengthened its defences against these practices.

While the EU steel sector has reduced its CO₂ emissions by 50% over the last 50 years, breakthrough technologies are required to make the transition to a low-carbon economy. Research into different potential breakthrough technologies for competitive clean steel was launched under the EU co-funded ULCOS initiative (Ultra Low CO₂ Steelmaking) which includes most major European companies²³. Most of the proposed technologies rely on capture, storage and/or utilisation of the carbon that is emitted from steel-making. An alternative would be to remove carbon entirely from the production process by replacing it with hydrogen.

Applied research and development in the steel sector is supported both by the Horizon 2020 funding programme and by the Research Fund for Coal and Steel (RFCS). Furthermore, the European Fund for Strategic Investments (EFSI) is already helping to bring innovation to the steel sector, by de-risking innovative projects – for example, a first EIB loan of EUR 100 million is currently supporting a mid-sized Italian steel producer. Under the European Structural and Investment Funds (ESIF), regions in the Czech Republic, Slovakia, Spain, Finland and Sweden have provided research and innovation support to their steel industries.

The EU steel industry's capacity to develop new, special properties of steel and provide high-quality steel products gives it a competitive edge globally. Some good examples can be found in recent developments of very high-strength steel grades for the construction sector. Other examples include the evolution of lightweight steels in the automotive sector or additive manufacturing (3D printing) with steel alloys.

23) <http://ulcos.org/en/index.php>

CONCLUSIONS

From energy-intensive industries to the agro-food sector, from the space industry to bio-based industries, and from the defence industry to the construction sector, Europe's industries are vital for sustained economic performance and employment across our continent.

Manufacturers in Europe represent 77% of private research and development investments. In other words, if we lose manufacturing, we lose our capacity to shape the future for the better.

The new industrial revolution is redesigning the foundations of many industries, tearing down the walls between industrial sectors as borders between producers, suppliers and consumers shift. There are great opportunities for innovators, industry and investors to deploy the technologies of this industrial revolution. Some examples include advanced materials for reducing heat absorption in buildings, 3D printing for local production reducing transportation costs, and delivering solutions that benefit people and the planet while, at the same time, creating commercial advantage.

OPPORTUNITIES WITHIN CHANGE

While previous industrial revolutions prompted greater demand for resources and put a strain on the climate, biodiversity and water, this revolution is about sustainability. This will mean clean power, circular economy models for industrial waste management, advanced materials for health technology and construction, and 3D printing for local production. However, as in the past, the current transformations require investments in skill development and actions to counter rising inequalities which come with technological development.

The EU has made significant progress over the past three years in adopting measures which are essential to strengthening Europe's industrial base. In a joint effort with Member States and the European Parliament, investment levels have increased, key enabling and emerging technologies have been developed, the internal market extended in areas which matter to European industry, such as capital, energy, digitisation and skills development, and new rules have been set for growth markets like resource efficiency.

PROSPECTS FOR THE FUTURE

The transformation of global industry is a reality at every level – local, regional, national and European. We must embrace this transformation and make it work both for Europe's industry and citizens. Tackling these challenges positively and seizing the opportunities generated by new technologies and environmental imperatives will ensure that industry in Europe is successful.

The development of Europe and the EU is based on industry. We have undergone industrial revolutions before and have come out stronger. This is happening now and, as before, with preparation and readiness to adapt, Europe's industry and its citizens will emerge better off.



Jyrki Katainen

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Elzbieta Bieńkowska

European Commissioner for Internal Market, Industry, Entrepreneurship and SMEs



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Industry matters – one in five jobs is in industry. New technologies bring rapid changes and are breaking down the barriers between supply chains, customers and business.

Europe must continually innovate to remain competitive in a global market place.

The EU must cultivate its talent base, just as it must defend its role as a global standard and rule setter.

This publication provides an overview of the European Union's wide-ranging activities that will boost industrial competitiveness for the benefit of all Europeans.

The initiatives focus on building an economy that is circular, sustainable, inclusive – and ready for the future.

Stakeholders are invited to use this publication as a point of reference to identify initiatives of use and interest to them, and to identify gaps that need to be addressed to shape the way ahead.

Research and Innovation policy

