European Commission

# SHAPING EUROPE'S DIGITAL FUTURE

February 2020
#DigitalEU

Everyone is experiencing the digital transformation in their life. The EU digital strategy will make it work for people, businesses and the planet, in line with EU values.

## Who will benefit from the EU's digital strategy?

### EVERY EUROPEAN

Technology improves every citizen's daily life.

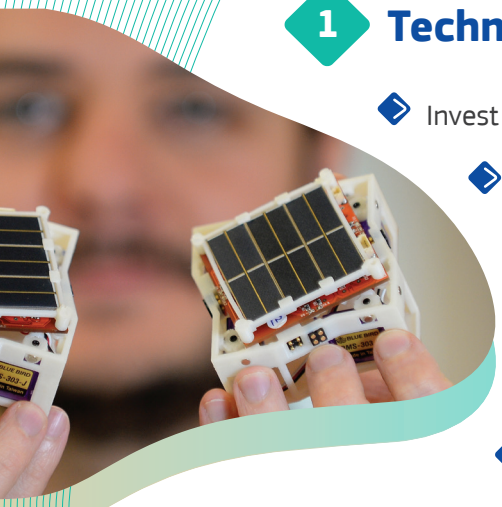
### BUSINESSES

Businesses start, grow, innovate and compete on fair terms.

### THE PLANET

Digital technologies help the EU reach climate neutrality.

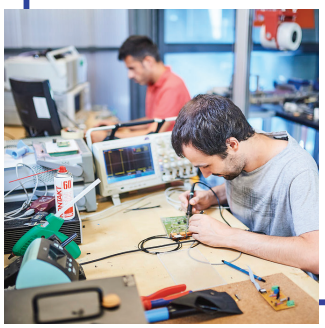
## What will we do?



## 1 Technology that works for people

- Invest in digital competences for all Europeans;
- Protect people from cyber threats (hacking, ransomware, identity theft);
- Ensure Artificial Intelligence is developed in ways that respect people's rights and earn their trust;
- Accelerate the roll-out of ultra-fast broadband for homes, schools and hospitals throughout the EU;
- Expand Europe's super-computing capacity to develop innovative solutions for medicine, transport and the environment.

## 2 A fair and competitive digital economy



- Enable a vibrant community of innovative and fast-growing start-ups and SMEs to access finance and to expand;
- Propose a Digital Services Act to strengthen the responsibility of online platforms and clarify rules for online services;
- Make sure that EU rules are fit for purpose in the digital economy;
- Ensure that all companies compete in Europe on fair terms;
- Increase access to high-quality data while ensuring that personal and sensitive data is safeguarded.

## 3 An open, democratic and sustainable society

- Use technology to help Europe become climate-neutral by 2050;
- Reduce the digital sector's carbon emissions;
- Empower citizens with better control and protection of their data;
- Create a European health data space to foster targeted research, diagnosis and treatment;
- Fight disinformation online and foster diverse and reliable media content.

## Europe as a global leader

### The EU will:

- aim to become a **global role model** for the digital economy;
- **support developing economies** in going digital;
- develop **digital standards** and promote them internationally.



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# EXCELLENCE AND TRUST IN ARTIFICIAL INTELLIGENCE

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The EU's approach to Artificial Intelligence (AI), based on trust and excellence, will give citizens the confidence to embrace these technologies while encouraging businesses to develop them.

### Citizens

Better healthcare, safer and cleaner transport and improved public services.

### Businesses

Innovative products and services, for example in energy, security, healthcare; higher productivity and more efficient manufacturing.

### Governments

Cheaper and more sustainable services such as transport, energy and waste management.

## How to achieve EXCELLENCE:

- Set-up a new public-private partnership in AI and robotics;
- Strengthen and connect AI research excellence centres;
- Have at least one digital innovation hub per Member State specialised in AI;
- Provide more equity financing for development and use of AI, with the help of the European Investment Fund;
- Use AI to make public procurement processes more efficient;
- Support the procurement of AI systems by public bodies.

## And TRUST:

- New legislation on AI should be adapted to the risks, it should be effective but not limit innovation;
- Require high-risk AI systems to be transparent, traceable and under human control;
- Authorities must be able to check AI systems, just as they check cosmetics, cars or toys;
- Ensure unbiased data sets;
- Launch an EU-wide debate on the use of remote biometric identification (e.g. facial recognition).

### What are the consequences of biased datasets?

Datasets where certain groups of the population are under-represented can lead to discrimination. Embedded in artificial intelligence systems, such biases can have significant negative effects that can discriminate against many people. For example:

- Datasets from clinical trials often include much more data from men than from women. If such bias is not corrected, it can lead to wrong conclusions and to negative consequences for the treatment of women;
- Studies have shown biases against job applicants who have a migration background. Such biases must be eliminated so every candidate has a fair chance.

## What is a high-risk AI application?

- When it concerns a critical use in a critical sector

**CRITICAL SECTORS**

- healthcare
- transport
- police
- legal system

**CRITICAL USE**

- legal effects
- risks of death
- damage or injury

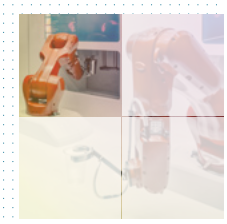
- For example: medical equipment, automated driving, decisions on social security payments;
- Some uses are critical in all sectors, for example use of AI in recruitment processes.

## How to enforce trustworthy AI in practice?

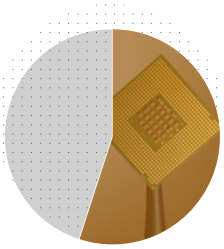
- High-risk AI will be subject to strict rules (compliance tests, controls, sanctions);
- Other AI applications can use voluntary labelling.

## AI & EU

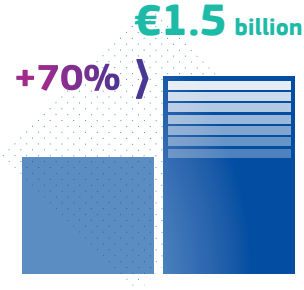
**Europe's excellent researchers** publish the most scientific articles on AI globally.



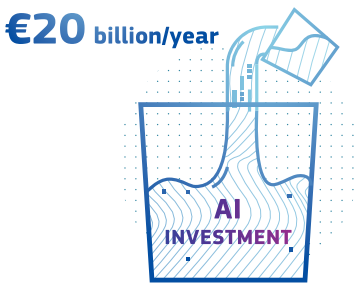
Europe produces **over 25%** of industrial and professional service robots.



Over **50%** of top European manufacturers use AI.




Over the past 3 years, EU funding for AI research and innovation has risen to **€1.5 billion, a 70% increase** on the previous period.




But it is not enough: the aim is to attract more than **€20 billion** of investment per year (EU, national, business) over the next decade, against €3.2 billion in 2016.



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# THE EUROPEAN DATA STRATEGY

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## Creating a single market for data will make the EU more competitive globally and will enable innovative processes, products and services.

Industrial and commercial data are key drivers of the digital economy. The European Data Strategy will make more data available for use in the economy and society, while keeping those who generate the data in control.

### Examples of industrial and commercial data use

Jet engines filled with **thousands of sensors** collect and transmit data back to ensure **efficient operation**.

Wind farms use industrial data to **reduce visual impact and optimise wind power**.

Real-time traffic avoidance navigation can save up to **730 million hours.** This represents up to **€20 billion** in labour costs.

Real-time notification of delayed trains can save **27 million working hours.** This amounts to **€740 million** in labour costs.

Better allocation of resources to fight malaria could save up to **€5 billion in healthcare costs globally**.

## The EU will create a single market for data where:

- Data can flow within the EU and across sectors, for the benefit of all;
- European rules, in particular privacy and data protection, as well as competition law, are fully respected;
- The rules for access and use of data are fair, practical and clear.

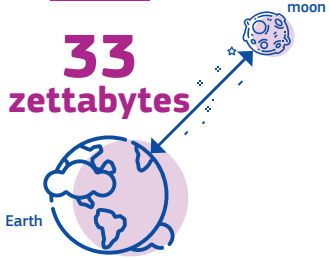
© Carlos Muza


# The EU will become an attractive, secure and dynamic data economy by:

- Setting clear and fair rules on access and re-use of data;
- Investing in next generation standards, tools and infrastructures to store and process data;
- Joining forces in European cloud capacity;
- Pooling European data in key sectors, with EU-wide common and interoperable data spaces;
- Giving users rights, tools and skills to stay in full control of their data.

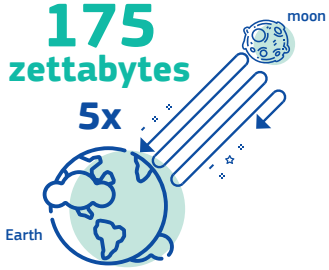
## Global data volume will grow:

**2018**




Stored on 512 GB tablets, it would form a tower that reaches the moon.

**2025**




Enough to make the journey to the moon and back five times.

## Data processing will change:

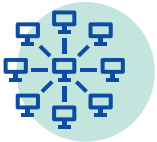
**2018**

**80%** Centralised computing facilities

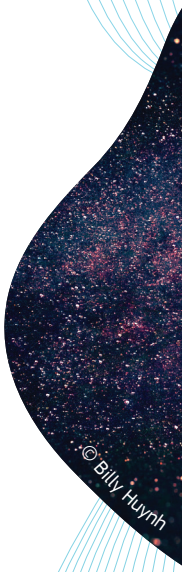
**20%** Smart connected objects

**2025**

**20%** Centralised computing facilities



**80%** Smart connected objects




With the right policies and adequate investment from the Commission, Member States and businesses, Europe can seize the opportunities associated with this paradigm shift and become a leader in data:

**€4-6 billion to be invested in total**

in common European data spaces and a European federation of cloud infrastructure and services

## The value of the data economy (EU27)

2018

**€301 billion**
(2.4% of EU GDP)

2025

2.8x

**€829 billion**
(5.8% of EU GDP)


## The number of data professionals (EU27)

2018

**5.7 million**

2025

2x

**10.9 million**

## Percentage of EU population with basic digital skills

2018

**57%**

2025

1.2x

**65%**

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# WHAT'S IN IT FOR ME

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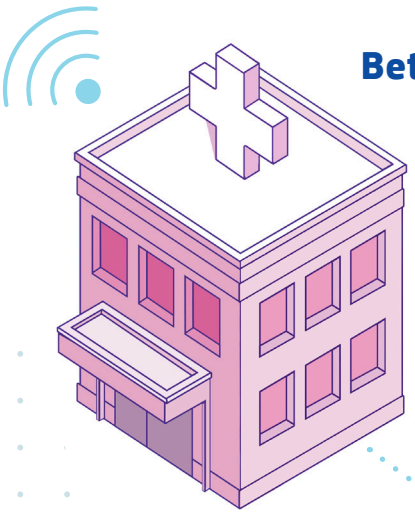
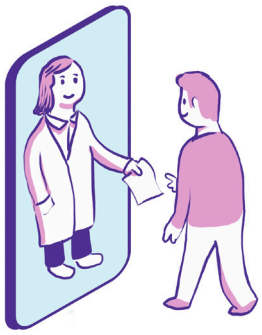
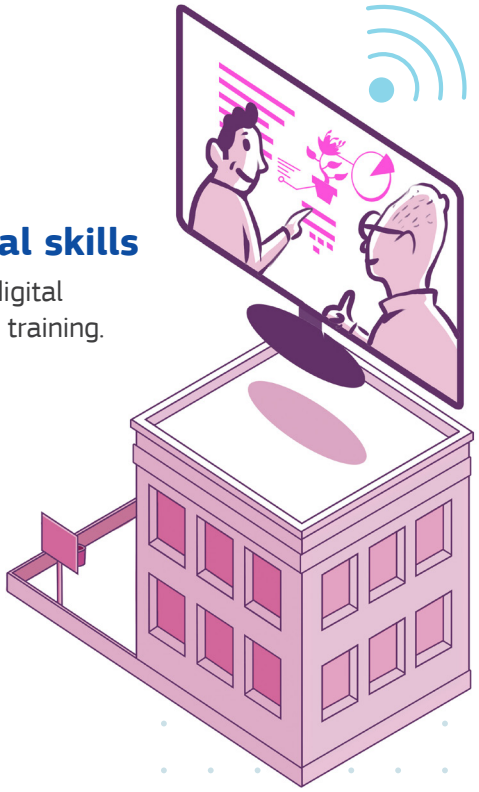
## All Europeans can thrive in a digitalised society



### Better medical diagnosis and treatment

- Secure remote access to personal health records for targeted and faster research, diagnosis and treatment.



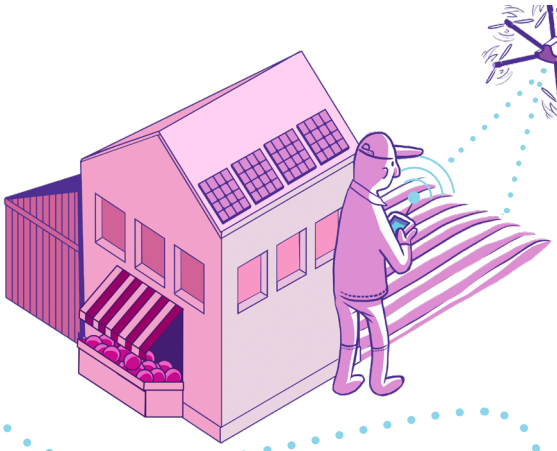


### Stronger digital skills

- Lifelong access to digital technology and skills training.

### Trusted digital identity

- More personal privacy, less fraud and quicker interactions with government and business.

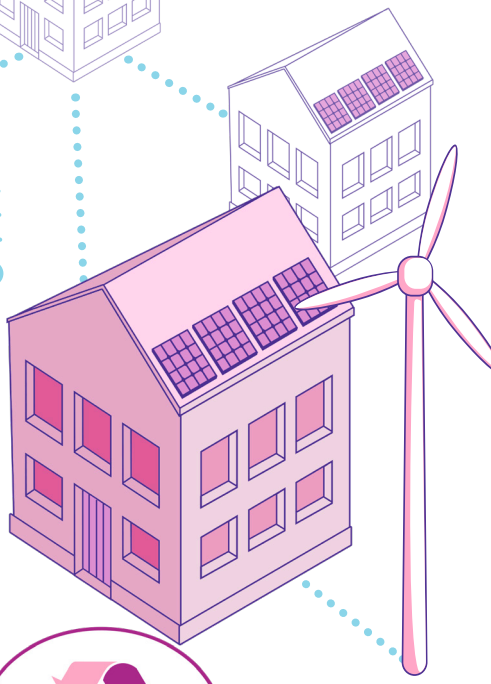


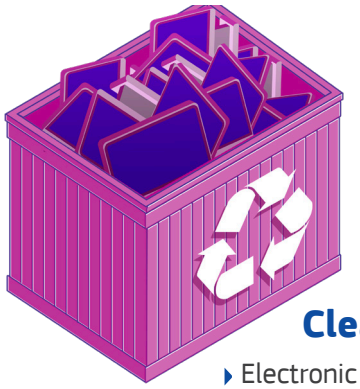
## More environmentally friendly agriculture

- Better food with fewer pesticides, fertilisers, fuel and water thanks to AI, data and 5G.

## Lower climate impact and money saved

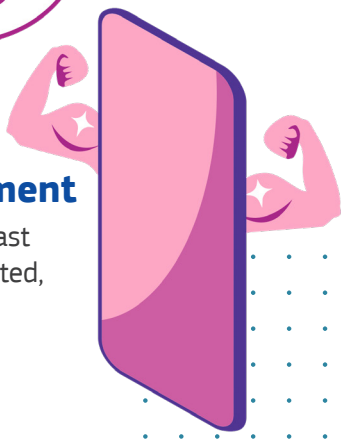
- Individual energy production and storage and lower energy bills, thanks to intelligent heating and cooling and smart grids.





## Cleaner environment

- Electronic waste contains scarce resources and precious metals, but only about 35% of electronics are currently recycled.



## Longer lasting electronic equipment

- Electronic devices that last longer can easily be updated, repaired and recycled.

## Digitalised transport

- Better and safer mobility thanks to interactions between cars and with road infrastructures.

## Fight against online disinformation

- Access to diverse and reliable media content.



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# WHAT'S IN IT FOR BUSINESSES

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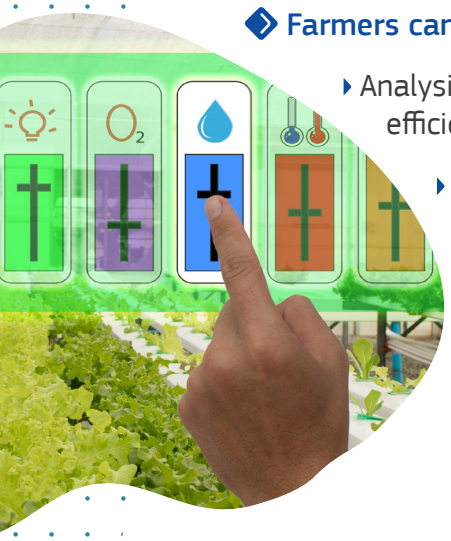
## New opportunities for businesses in a digitalised society

### 1 Access to high-quality industrial data

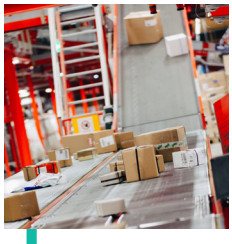


#### Farmers can produce more food at lower cost

- Analysing data on harvests, seeds, and use of fertilisers can make farming more efficient. Farmers could earn **€225 more per hectare**.
- The EU-funded Data Driven Bioeconomy project cut spraying and irrigation costs by **30%**.

#### Manufacturers can optimise production

- Data-based optimisation alone can save **€90 billion in the manufacturing sector, worldwide**.



## 2 Better framework for doing business online

**Fair access to markets to start up, scale up, innovate and compete on fair terms.**

- The **Digital Services Act** package will establish clear rules for access to the Single Market and to strengthen the responsibility of online platforms.

## 3 Competition rules fit for purpose

**Ensure EU rules are right for digital businesses, big and small, as well as for traditional industries.**

## 4 Investing in people and infrastructure

- **More workers with digital skills** will fill the 1 million vacancies that constrain business growth;
- EU and national funding to kick-start **advanced connectivity** and **secure European data clouds.**

## 5 Supporting SMEs to use Artificial Intelligence

- **Develop a new SME Strategy** to strengthen innovative and fast-growing start-ups and SMEs;
- **Set up specialised Digital Innovation Hubs** on Artificial Intelligence;
- **Improve access to finance**.



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# SUPPORTING THE GREEN TRANSITION

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Digital technologies are crucial for the EU to become climate neutral by 2050, the goal set in the European Green Deal.

**Energy networks**

**Precision farming**

**Mobility and transport**

**Smart buildings**

**Green data spaces**

**The power of data**

## Reducing the carbon footprint of the ICT sector

### Today the ICT sector accounts for:

**5-9%**
**of electricity use**

more than **2% of global greenhouse gas emissions** (as much as all air traffic).

If unchecked, the ICT footprint could **increase to 14% of global emissions by 2040.**

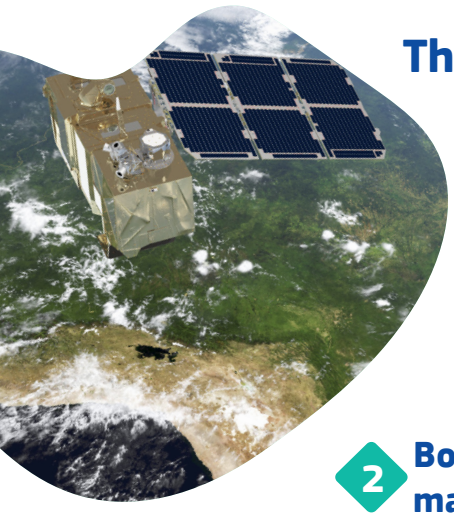
2040

### But at the same time technologies could help:

**reduce emission by 7 times**
more than the amount created by the ICT sector;

**reduce** global emissions by **up to 15%.**

Artificial Intelligence, supercomputing and pooled data will allow better analysis and decision-making on climate crisis and the environment. This will lead to better policy making.



# The digital strategy will help the European Green Deal make the EU climate neutral

## 1 Launch a new EU industrial strategy

**In March 2020**, the Commission will adopt an **EU industrial strategy** to support the green and digital transformation of the EU economy.

## 2 Boost the EU's ability to predict and manage environmental disasters

The **"Destination Earth" initiative** will develop a high precision digital model (a 'digital twin') of the Earth that will radically improve Europe's ability to predict extreme weather patterns, gauge the impact of climate change and manage natural and environmental disasters.

## 3 Support the circular economy


Take measures to improve the **energy efficiency** and **circular economy** performance of the ICT sector from broadband networks to data centres and ICT devices;

Introduce new "**product passports**" to tell consumers and industry about the origin, composition (including hazardous and rare materials), end-of-life handling and recycling of products.

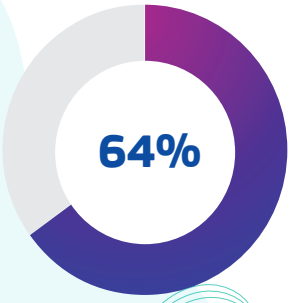
## 4 Launch a circular electronics initiative

Improve rules to make devices last longer and make them easier to repair and recycle.

**Extending the lifetime** of all smartphones in the EU by one year would save **2.1 million tonnes of $CO_2$ per year by 2030**, the equivalent of taking a million cars off the roads.

**Consumer support** is strong.

A recent Eurobarometer survey shows that **64%** of users would like to keep their digital devices for **5-10 years**.



## 5 Make data centres and ICT infrastructures climate-neutral by 2030

Ensure they become more energy efficient and use more renewable energy sources.


## 6 Take advantage of Artificial Intelligence, 5G, cloud and edge computing, and the Internet of Things

Make sure we use digital technologies better to deal with climate change and **protect the environment**.


## 7 Support automated and connected transport

**Develop smart systems** to reduce traffic congestion and improve mobility.

## 8 Make public procurement more sustainable

Ensure that EU rules on **green public procurement** cover all ICT products and services.



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