


# SUSTAINABLE DIGITAL TRANSFORMATON

**Ilias Iakovidis**
**DG CONNECT**
**European Commission**

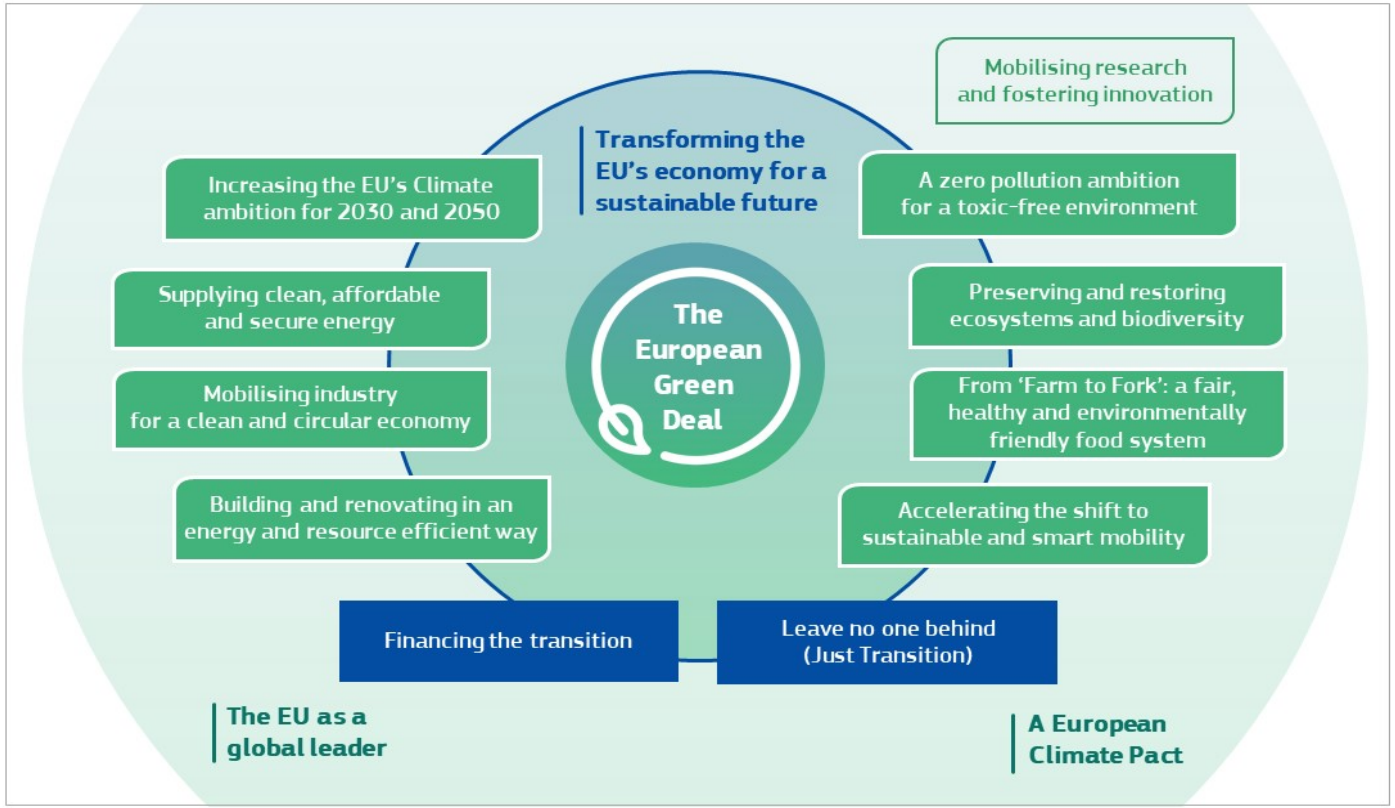
# New Commission Priorities

- *A European Green Deal*
- *A Europe fit for the digital age*
- *An economy that works for people*
- *Protecting our European way of life*
- *A stronger Europe in the world*
- *A new push for European democracy*

*'..a once-in-a-generation opportunity to ensure Europe leads the way on the twin ecological and digital transitions'.*

# European Green Deal

# 11 December 2019



# Green ICT
## Improving energy and **material** efficiency of ICT

***Examples***

- Energy efficiency of datacenters
- Lifespan of electronic equipment
- Transparency on the carbon footprint of ICT infrastructure
- ‘eco-labelling’ and green public procurement

# The environmental footprint of digital

- *ICT: 8-10% of the electricity consumption, 2-4% of total emissions.*
- *e-waste: fastest-growing waste sources in the EU, 12 M tonnes by 2020.*
- *To produce a mobile phone 60 different metals are required, ~ 20 can currently be recycled, only 26 % of all phones are collected*
- *32 kg of raw materials are needed to produce a microchip (2g).*
- *Life of digital devices, has decreased between 1985 and 2015, the useful life of a computer was reduced from 11 to only 4 years.*

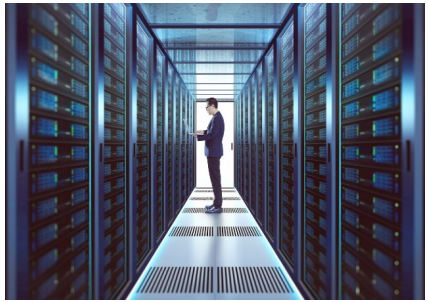
# The environmental footprint of digital

## Digital devices are the main source of ICT environmental impact

| % | Energy | GHG | Water | Elec. | ADP |
|---|---|---|---|---|---|
| User equipment | 60% | 63% | 83% | 44% | 75% |
| Network | 23% | 22% | 9% | 32% | 16% |
| Data centres | 17% | 15% | 7% | 24% | 8% |

# Sustainable Digital Technologies

**Climate Neutral and highly energy efficient datacentres by 2030:** review JRC's CoC, the Energy Efficiency Directive and the Taxonomy Regulation

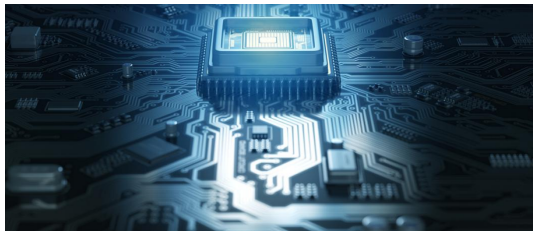


**Climate neutral electronic communications by 2030:**

- Transparency measures
- Administrative incentives for green deployment

**Circular Electronics Initiative:** Better durability, reparability, refurbishment, recycling. "Right to repair" for consumers.

**Low power processors and software/AI:** investing in new ultra-low-power



**ICT carbon footprint:** Currently ICT responsible for ~ 3% of total (CO2e) emissions and rising electronics waste. Worse case scenarios points to 14% of total emissions by 2040. With effective Green ICT measures we can keep under 5%.

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# New EU commitments to Greening ICT

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EC, DG CONNECT

## European Digital Strategy – 19.2.2020

- A circular electronics initiative
- Sustainable data centres by no later than 2030
- Transparency measures for electronic communications

## A European Strategy on Data -19.2.2020

- A Common European Green Deal data space
- EU data space for smart circular applications

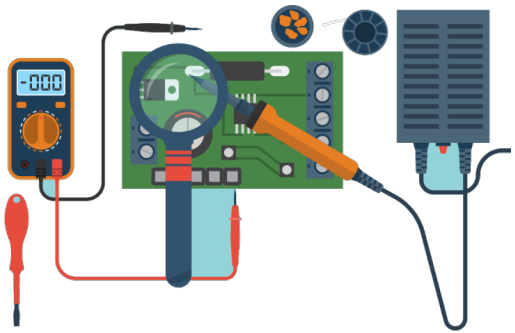
## The European Green Deal


## Circular Economy Action Plan – 11.3.2020

- Regulatory measures for mobiles, tablets, laptops, printers and consumables chargers
- 'right to repair', including a right to update obsolete software
- EU-wide take back scheme to return or sell back old mobile phones, tablets, chargers

# WHAT

- **The Circular Electronics Initiative aims to (by 2021):**
  - Extend the lifespan of electronic devices
  - Prevent premature obsolescence
  - Promote repair, recycling and efficient use of resources



- **This will be achieved through:**
  - Design requirements (e.g. durability, modularity, repairability, recyclability)
  - Information requirements (e.g. repair manuals, source code, components/materials, availability of spare parts, tools, environmental footprint)
  - Requirements on spare parts (e.g. production/supply, licensing)
  - A Right to Repair (for consumers and 3rd party repairers)
  - Take-back schemes and common charger standards

# Digital & 17 Sustainable Development Goals (SDGs)

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European Commission

**11 SDGs have positive link with digital**

Examples of SDGs with strongest positive links:

- **SDG 9 - Infrastructure, industry and innovation**
- **SDG 8 - Decent work and economic growth**
- **SDG 3 - Health and well-being**


**5 SDGs with unclear link: e.g. SDG 13 - Climate action**

**1 SDG with negative link: SDG 12 - Responsible consumption and production**

- **ICT has significant environmental impacts, more emissions than aviation ( before crisis)**
- **E-waste = material inefficiency, non-circularity of devices: strongest negative link**
- **Progress is needed on energy and material efficiency (durability, reparability, recyclability)**

Digital Access Index (https://digitalaccessindex-sdg.gesi.org/)

# Dual role of ICT in sustainability

## ICT for Environment & Climate

ICT can reduce 15-20% of total Greenhouse Gases

7-10x more GHGs than it's own footprint

- Digitalisation for stable decarbonized energy grids
- Precision farming, digital for agri-food
- Climate smart cities & communities
- Smart mobility, energy efficiency of buildings
- Sustainable manufacturing and waste treatment
- Extreme weather and climate impact modelling

# Digital matters for SDGs and the Green Deal

Digital Europe Programme

1. **Supplying clean affordable and secure energy** – *Digitisation of decarbonised (smart) grids*

2. **Mobilizing industry for clean and circular economy** - Digital is a key enabler for circular economy (sharing, servitisation, virtualisation). ICT sector needs to improve energy and material efficiency- extending the lifetime of all smartphones in the EU by 1 year would be equivalent of taking a million cars off the roads.

3. **Building and renovating** in energy and resource efficient ways – ICT can improve energy efficiency of buildings by 15-25%

4. **Accelerating the shift to sustainable and smart mobility** – digitally enabled Mobility as a Service, CAD, shared mobility

5. **From 'Farm to Fork'** – Precision agriculture can lead to 25% savings in Fuel, 15% reduction in seeds and fertilisers. Enabling crop protection service leading to significant reduction of pesticides & fertilisers

# Digitally enabled new businesses
## *'Product as a service'*

## From quantity driven to user needs driven business models

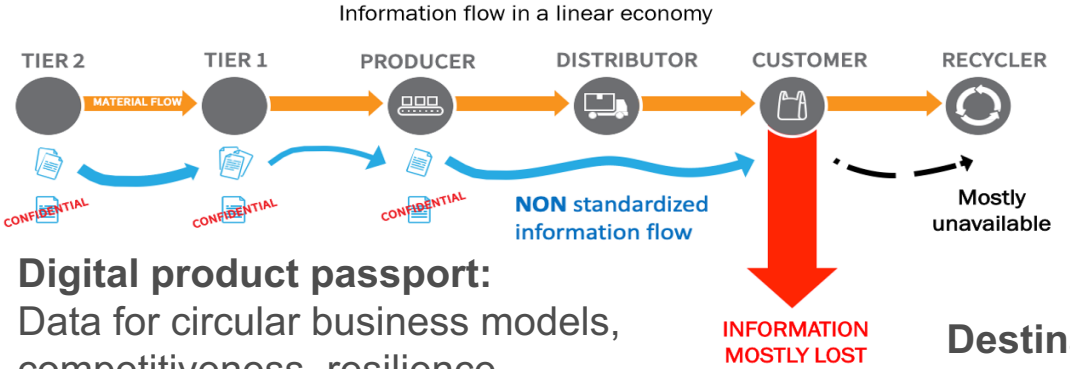
**Precision farming** is delivers benefits already, but producers of pesticides and fertilisers are still quantity based driven.

New business model: protection of crop services enabled by IoT, Satellite services images, GPS, drones, robotics.

Chemical companies can increase profits by minimising the use of pesticides and fertilisers to only if/when needed

Janez Potocnik

# Digital contribution to environment & climate

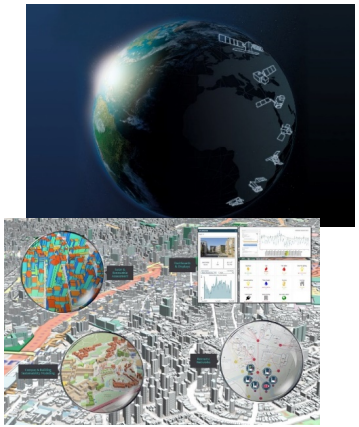



**Digital contribution:** reduction by 15%-20% of total emissions (CO2e) with deployment of current technology. New, low-power digital technologies and innovations will contribute further.

**Digital product passport:**
Data for circular business models, competitiveness, resilience

**Smart mobility:** reduction of transport emissions up to 37%; **smart buildings** with emissions reduction by 17%;

**Destination Earth / digital twins:** High Performance Computing, AI for better anticipation of extreme events prediction, climate modelling.



**Green Digital Coalition** to be launched in March at DD4, Porto.
Committed ICT stakeholders + NGOs to develop jointly consistent and comparable calculators of digital enablement.

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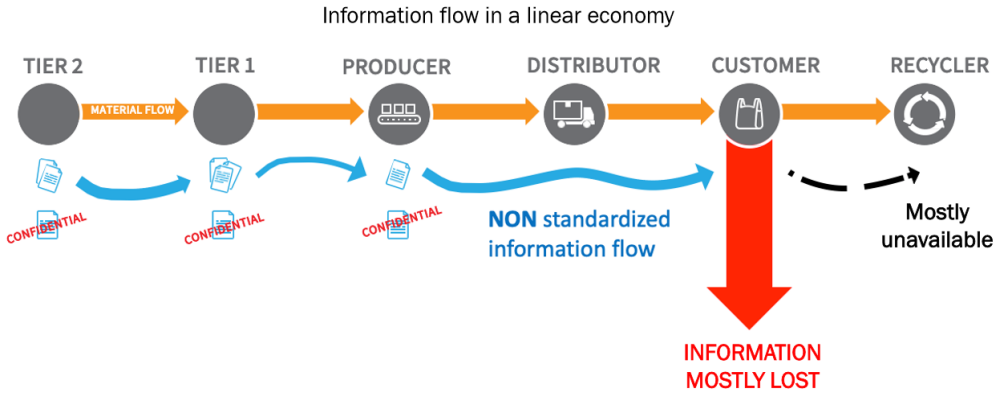
# The Digital Product Passport (DPP)


**WHAT**

*A structured collection of product related data with predefined scope and agreed data ownership and access rights conveyed through an* ***unique identifier***

**HOW**

***Decentralised*** *system linked with the Europeand Dataspace for Smart Circular Applications (EDSCA).*

**SCOPE**

*Information related to sustainability, circularity, value retention for re-use/remanufacturing/recycling.*

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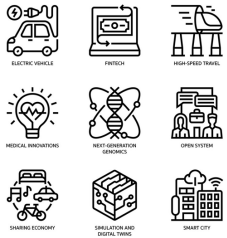
# The DPP business case

Tracking of **raw materials extraction/production**, supporting due diligence effc



Enable **manufacturers** to create products **digital twins**, embedding all the information required either by or by customers in B2B transactions


Tracking the life story of a product, enabling services related to its **remanufacturing**, **reparability, second-life, recyclability**, new business models


Benefit **market surveillance authorities and customs authorities**, by making available information they would need to carry out their tasks

Make available to **public authorities and policy makers** reliable information. Enable to link **incentives** to **sustainability performance**


Allow **citizens** to have access to **relevant and verified information**

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# Cloud, Common European Data Spaces and AI


Health


Industrial & Manufacturing


Agriculture


Culture


Mobility


Green Deal


Security


Public Administration


Media

High Value Datasets From public sector

- Driven by stakeholders
- Rich pool of data of varying degree of openness
- Sectoral data governance (contracts, licenses, access rights, usage rights)
- Technical tools for data pooling and sharing

**Marketplace for Cloud to Edge based Services** Cloud services meeting high requirements for data protection, security, portability, interoperability, energy efficiency

**Federation of Cloud & HPC Infrastructure & Services**
*Cloud stack management and multi-cloud / hybrid cloud, cloud governance*

**Edge Infrastructure & Services**

**SaaS (Software as a Service)**
*Software, ERP, CRM, data analytics*

**PaaS (Platforms as a Service)**
***Smart Interoperability Middleware***

**IaaS (Infrastructure as a Service)**
*Servers, computing, OS, storage, network*

**High-Performance Computing**

**AI on demand platform**

**AI Testing and Experimentation Facilities**

# DIGITAL EUROPE PROGRAMME
## Artificial intelligence, data and cloud

### Data spaces

- Green Deal
- Manufacturing
- Health
- Agriculture
- Mobility
- Security (law enforcement)
- Cultural Heritage
- Media

### Horizontal actions in support to data spaces

- support centre
- open data portal
- high value data sets

### Cloud federation

- Market place
- Cloud to Edge based services
- Middleware platforms, building blocks, cross cutting software…

### AI on demand platform

- Central access point to AI resources

### Testing & Experimentation Facilities

- Manufacturing
- Health
- Agriculture
- Smart Communities
- Edge AI HW

Digital Europe Programme and it's Work-programme has not been adopted yet

# DIGITAL EUROPE PROGRAMME
## Advanced digital skills

- Design and implementation of specialized education programmes and modules in key capacity areas (master classes)
- Traineeships in key capacity areas
- Short term trainings in advanced technologies (contribution to SME strategy)
- Digital skills platform
- Digital transformation of Education

Digital Europe Programme and it's Work-programme has not been adopted yet

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# DIGITAL EUROPE PROGRAMME

## Accelerating the best use of digital technologies

### EDIH

European Digital Innovation Hubs:

one per region

### Green Deal

- Destination Earth
- Data ecosystem for climate-neutral and smart communities
- Digital Product Passport

### Blockchain

European Blockchain Service Infrastructure

### European Digital Government Eco System

- Basic services from CEF and ISA2
- eInvoicing eProcurement
- Interoperability framework
- Once only Principle
- Justice and consumer protection
- Law enforcement

### Enhancing Confidence in Digital Transformation

- Safer Internet
- European Digital Media Observatory

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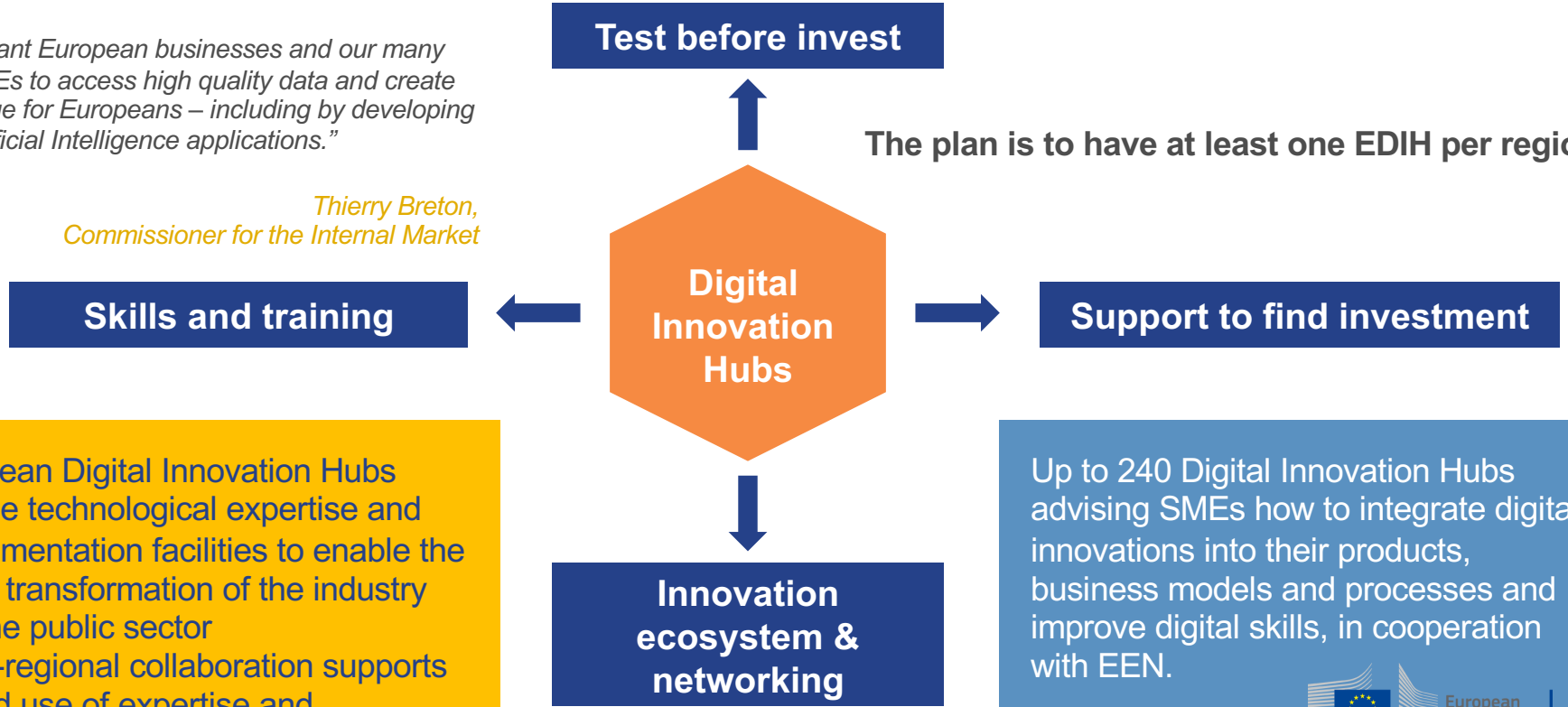
# EDIH rollout

## Upgraded DIH help SMEs to become more digital

*"I want European businesses and our many SMEs to access high quality data and create value for Europeans – including by developing Artificial Intelligence applications."*

*Thierry Breton,*
*Commissioner for the Internal Market*




**The plan is to have at least one EDIH per region**

European Digital Innovation Hubs provide technological expertise and experimentation facilities to enable the digital transformation of the industry and the public sector
Trans-regional collaboration supports shared use of expertise and strengthens Pan-EU value chains

Up to 240 Digital Innovation Hubs advising SMEs how to integrate digital innovations into their products, business models and processes and improve digital skills, in cooperation with EEN.

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# Horizon Europe Draft Work Programme - Cluster 4

| EXPECTED IMPACT (STRATEGIC PLAN) | DESTINATION (WORK PROGRAMME 2021-22) |
|---|---|
| **Global leadership in clean and climate-neutral industrial value chains, circular economy and climate-neutral digital systems and infrastructures (networks, data centres)** | **Climate neutral, circular and digitised production** |
| Industrial leadership and increased autonomy in key strategic value chains with security of supply in raw materials | **A digitised, resource-efficient and resilient industry** |
| Globally attractive, secure and dynamic data-agile economy | **World leading data and computing technologies** |
| Open Strategic autonomy in digital technologies and in future emerging enabling technologies | **Digital and emerging technologies for competitiveness and fit for the green deal** |
| Open strategic autonomy in developing, deploying and using global space-based infrastructures, services, applications and data | **Strategic autonomy in developing, deploying and using global space-based infrastructures** |
| A human-centred and ethical development of digital and industrial technologies | **A human-centred and ethical development of digital and industrial technologies** |

# Horizon Europe - Five Mission Areas