March 2022. Technology snapshot

ACCIÓ Technology Trends Analysis

2022-2025

ACCIÓ Catalonia Trade & Investment

Generalitat de Catalunya
Government of Catalonia

CataloniaConnects

ACCIÓ technology trends target 2022-2025

ACCIÓ
Government of Catalonia (Generalitat de Catalunya)

Execution
ACCIÓ Strategic and Competitive Intelligence Unit

Collaboration
Anthesis Lavola
Biocat
Eurecat

Barcelona, March 2022

ACCIÓ technology trends target 2022- 2025

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1. Global megatrends

10 global megatrends with greatest impact over the coming years

Demographic growth

- Diversified inequalities
- Growing migration
- Demographic imbalances
- Change in demographic dynamics: ageing

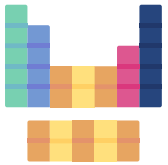
Urbanisation

- Continued urbanisation
- Mega-urbanisations
- Smart cities
- Private cities
- Rethinking of physical space

Climate change

- Green infrastructure
- Social transformation
- Blue economy
- Health and food from the land
- Environmental degradation
- Loss of biodiversity

Scarcity of resources



- Growing consumerism
- Geographic concentration of supply
- Ecological overshot

Technological advances

- Global knowledge society
- Scientific innovation as a vector of productivity

Digitisation

- Quantum technologies
- Empathic AI
- Hyperconnected planet
- Cyberattacks
- Shortage of digital talent

Reindustrialisation

- Industrial resilience
- Sustainable responsibility
- Technological innovation
- Changes in the nature of work and the office

Health

- Psychedelic medicine
- Personalised medicine
- Wellbeing/mental health
- Hospital at home
- NCD and cancer
- COVID-19 pandemic

Changes in global economic power

- New systems of governance
- More influence from the east and the south
- Multipolar globalisation
- Geopolitics of technology

Consumer behaviour

- Product personalisation
- Demand for speed and agility in services
- Phygital reality
- Change in the social model

2. Technological investments and patents around the world

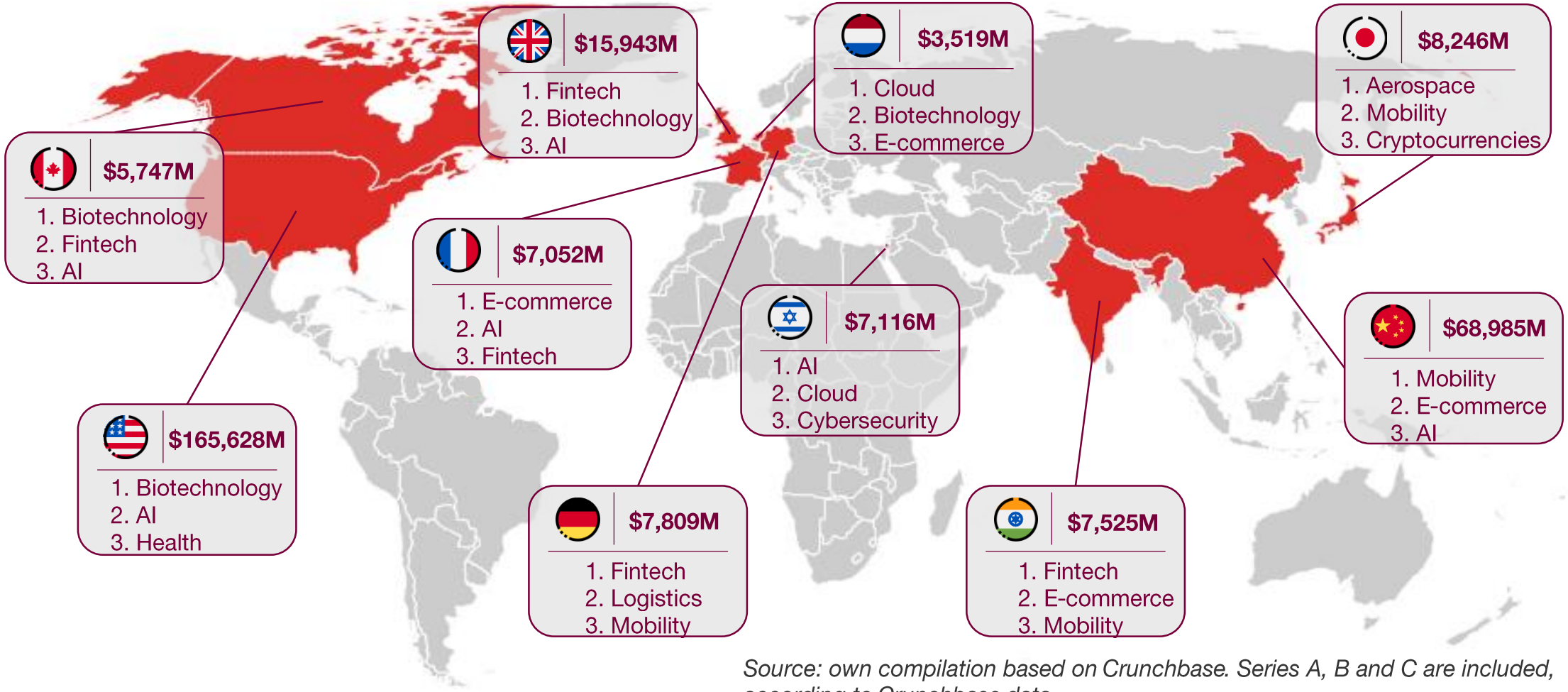
Main companies by nationality with Foreign Direct Investment (FDI) technology projects

50 main companies leading FDI technology products
(2016-2020)

Source: own compilation based on fDi Markets (2016-2020)

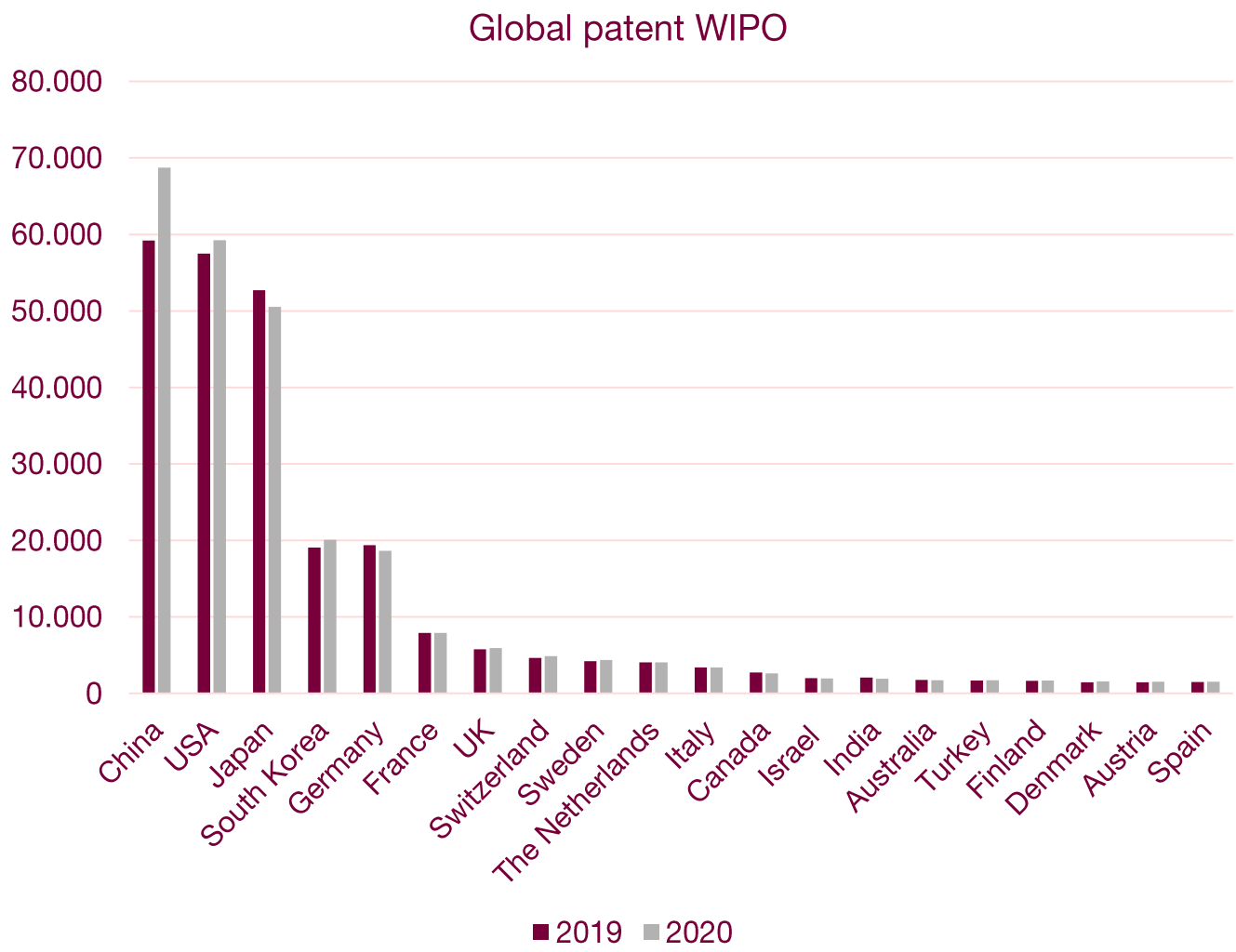
Areas of technology by country with most investment received by startups

10 main countries of origin of startups with most investment received and main areas of technology
(January 2019-March 2021)



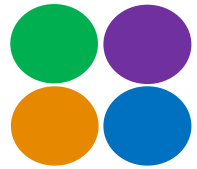
Source: own compilation based on Crunchbase. Series A, B and C are included, according to Crunchbase data

- According to the study by the World Intellectual Property Organization (WIPO), the number of patents continued to grow in 2020 (by 4%), despite the pandemic.
- Long-term trends point to the globalisation of innovation, as Asia accounts for 53.7% of all patent applications, ahead of the 35.7% of ten years ago.
- Spain, with 1,502 patents in 2020, stands 20th in this world ranking.

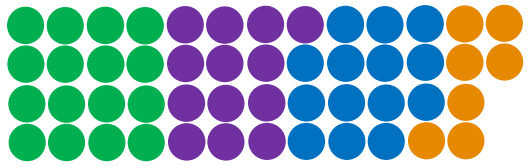


Source: WIPO

3. ACCIÓ Technology Trends Analysis

4 cornerstones 

13 areas 

50 technology trends 

50 technology trends

Digital society

Digitisation
- IoT/sensors
- Big data + artificial intelligence
- DLT/blockchain
- AR/VR and metaverse H
- Cloud/edge
- Cybersecurity
- Connectivity
- Supercomputing
- Photonics/quantum

New digital economy
- Fintech H
- New space H
- E-commerce H
- Insurtech H

Industrial resilience

Advanced industry
- Robotics and collaborative robotics H
- Additive manufacturing
- Digital simulation/twin H
- Automation H

Mobility of the future
- Electric vehicle/micromobility H
- Connected/autonomous vehicle H
- Drones H

Processes
- Catalysis and biocatalysis
- Continuous processes
- Chemical recycling

Materials
- Microelectronics and nanoelectronics
- Semiconductors
- Frontier materials
- Sustainable materials

Green transformation

Water
- Water cycle technologies

Energy
- Hydrogen
- Batteries and storage
- Clean energy H
- Energy harvesting H
- Smart grid/distributed networks H
- Smart building H

Circularity
- Capture, storage and reuse of CO_2
- Urban mining
- Recycling and recovery H
- Smart city H

Climate resilience
- NBS (nature-based solutions)
- Bioeconomics
- Blue economy H

Food of the future
- Foodtech H
- Agritech H

Health

Emerging therapies
- Bioengineering and regenerative medicine H
- Omics
- New biological design H
- Vaccines

Medical technologies
- Digital health H
- POCT H
- Wearables H

H : hybrid technologies

See Annex 3 Technological Report for further information

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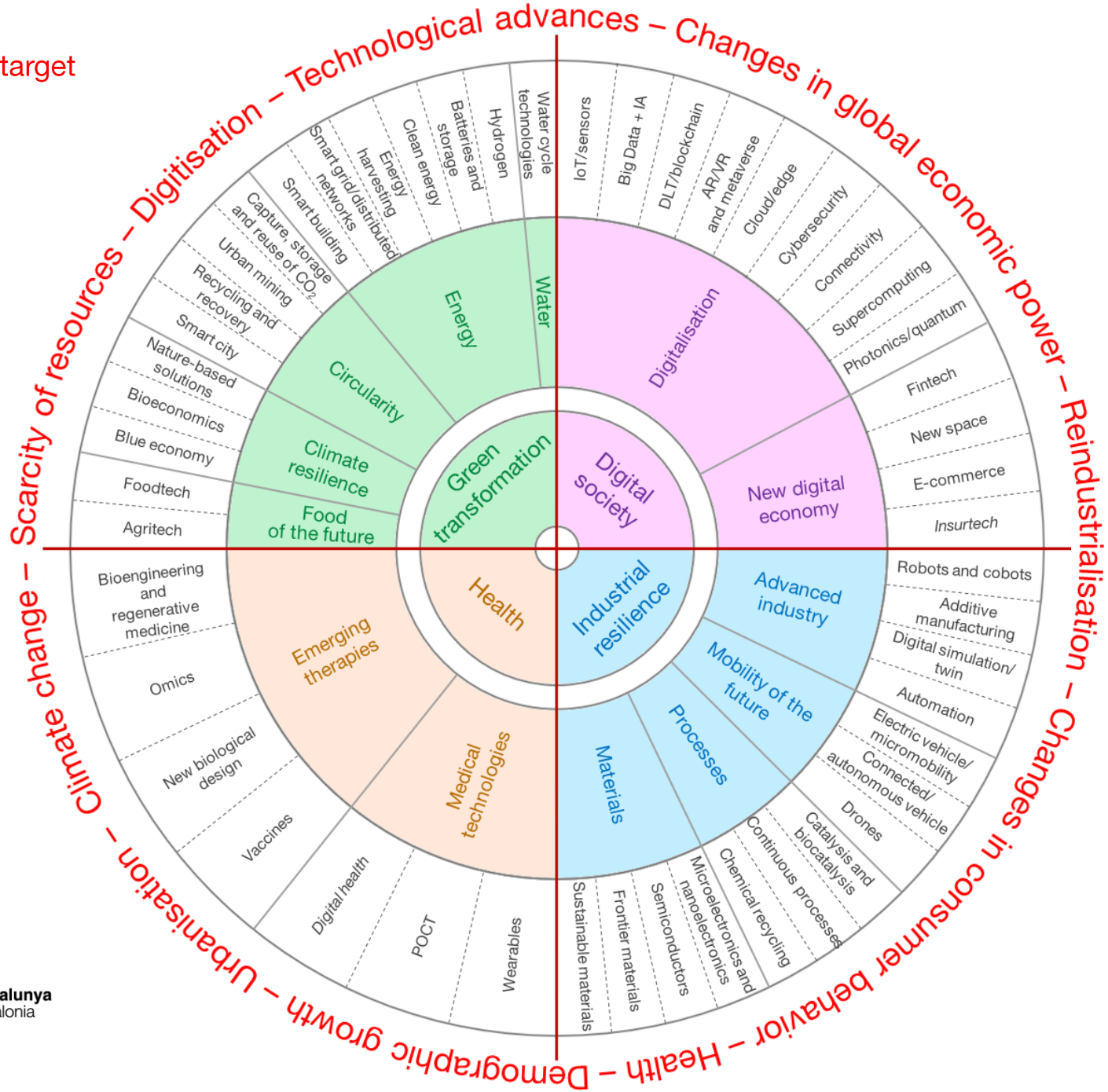
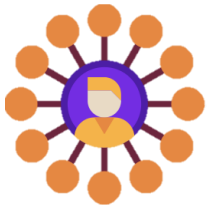
ACCIÓ technology trends target





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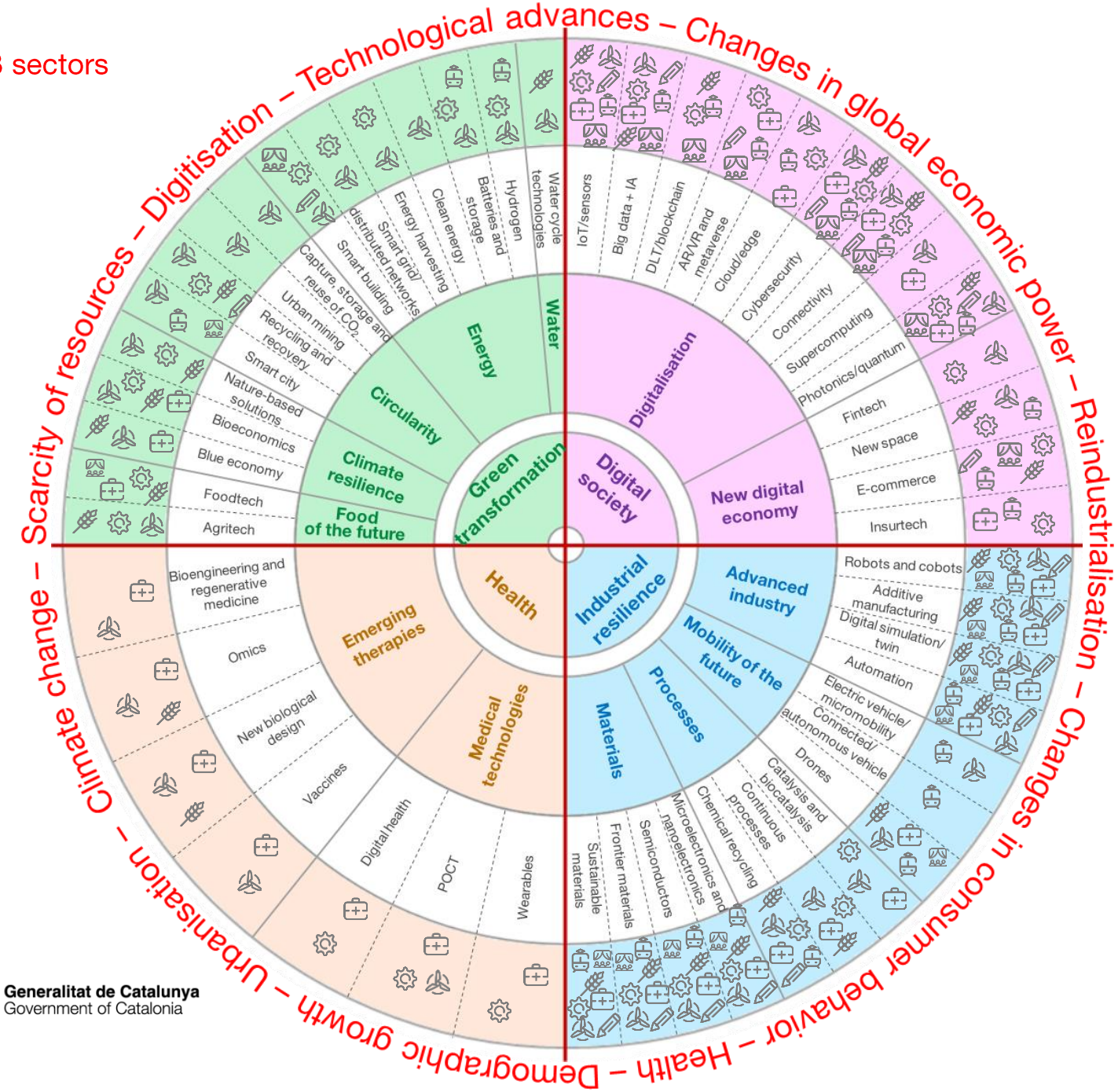
4. Impact on sectors

Impact on RIS3 sectors



- Food
- Chemical, energy and resources
- Industrial systems
- Design-based industries
- Health industries
- Sustainable mobility
- Cultural and experience-based industries

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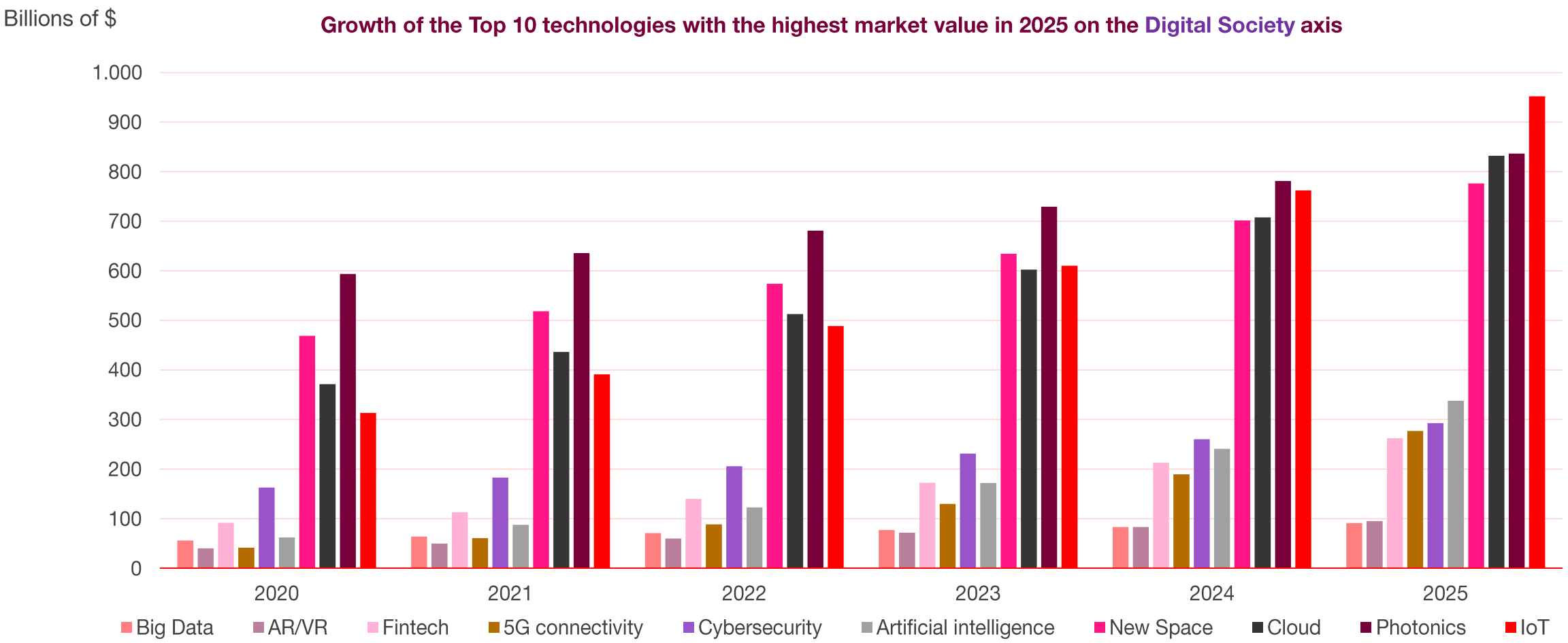
5. Analysis and estimate of technological evolution

The Internet of Things will be one of the most valuable technologies by 2025

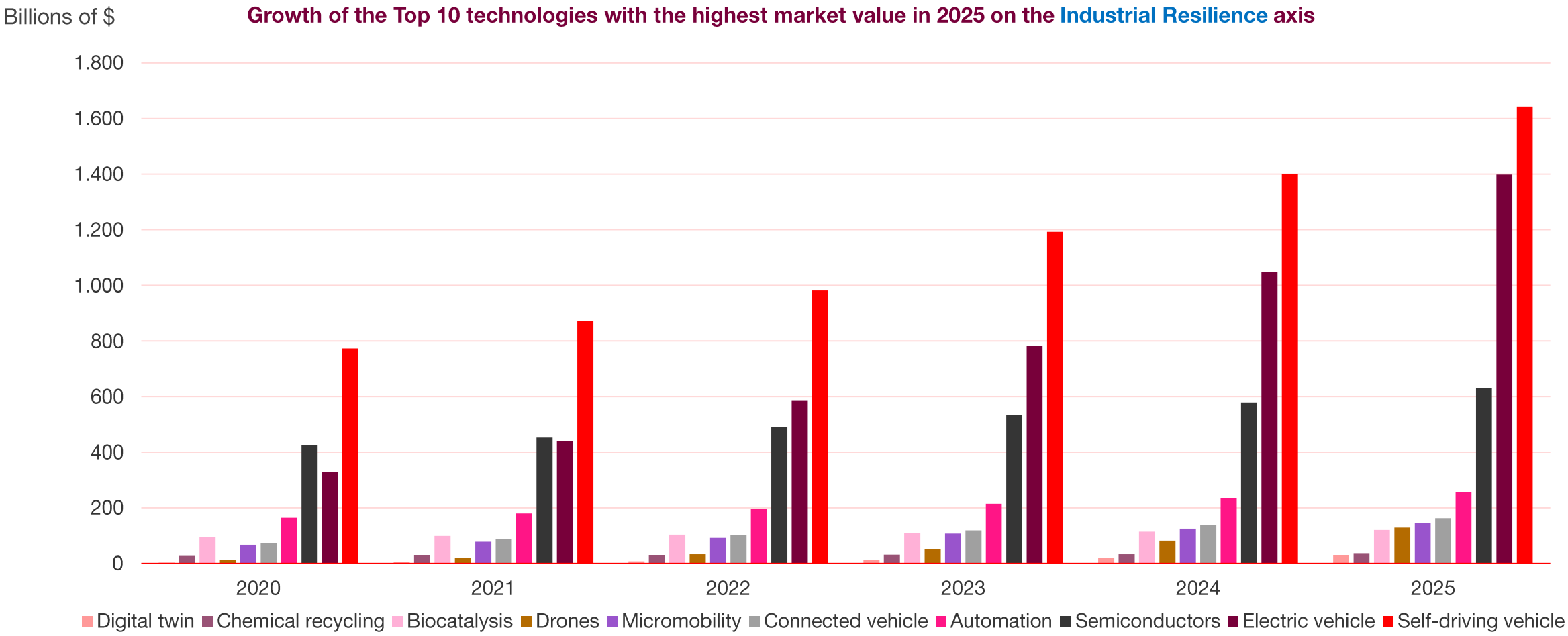


Note: E-commerce is not included so as not to distort the graph; it is foreseen that its market value will exceed 5,800 million USD by 2025 (with a CAGR of 11%)

Sources: own compilation based on data from Fortune Business Insights, Markets and Markets, Grand View Research, Statista, Quince Market Insights, Market Data Forecast and CNBC

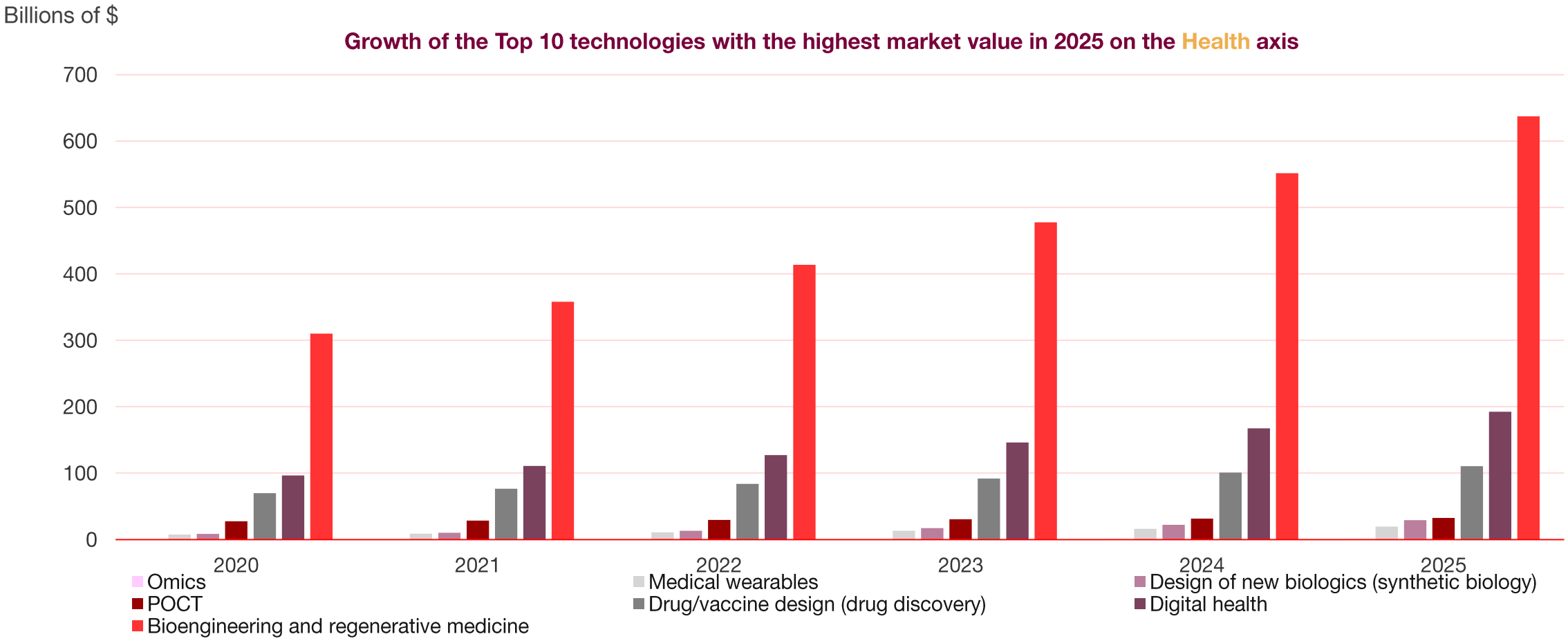
The vehicles of the future will be one of the most important sectors worldwide

Growth of the Top 10 technologies with the highest market value in 2025 on the Industrial Resilience axis



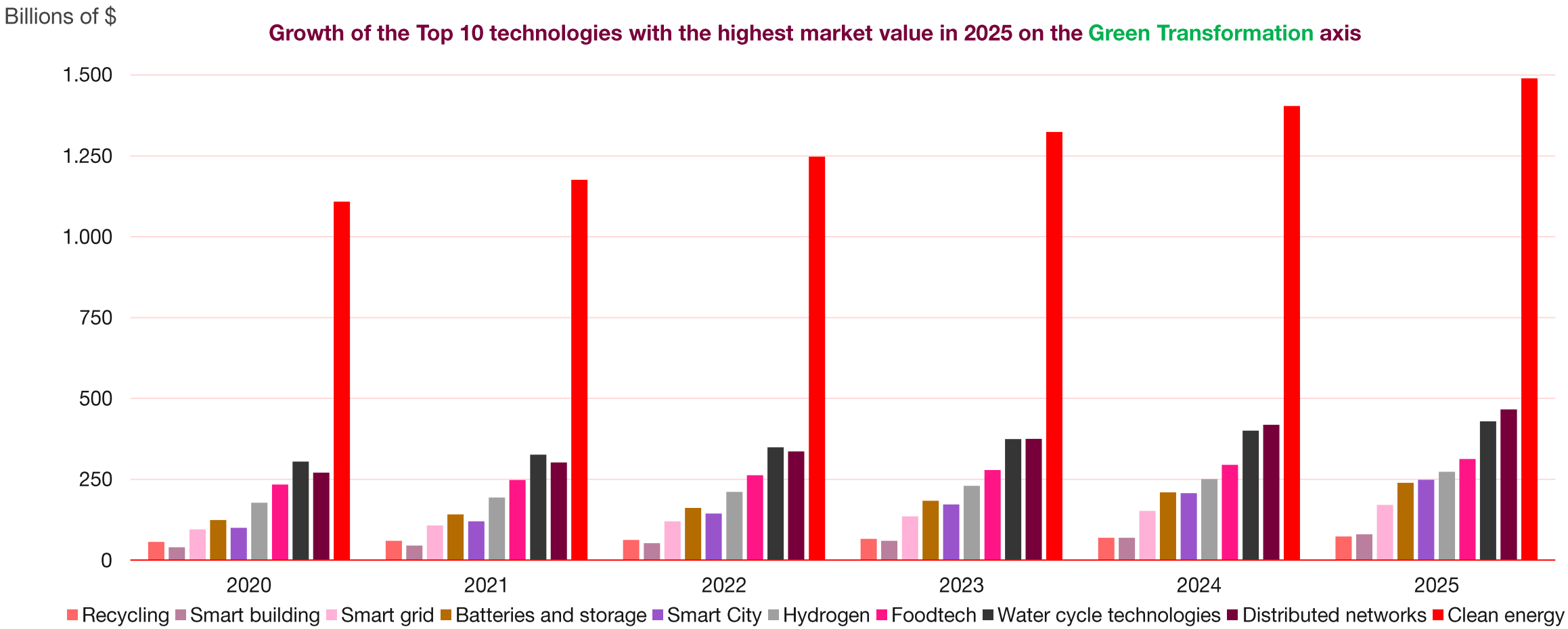
Sources: own compilation based on data from Allied Market Research, Grand View Research, Research and Markets, ReportLinker, Fortune Business Insights, Industry ARC, Global Market Insights, Lux Research, Markets and Markets, Meticulous Research and Market Research Future

Bioengineering and digital health will head the health market mid term



Sources: own compilation based on data from Allied Market Research, Grand View Research, Fortune Business Insights, Markets and Markets, BCC Research, Precedence Research, Acumen Research and Consulting and Market Data Forecast

Clean energies will strengthen their position to account for a market value of almost 1.5 billion dollars



Sources: Own compilation based on data from Allied Market Research, Grand View Research, Power Engineering International, Research and Markets, ReportLinker, Fortune Business Insights, Emergen Research, VinZ Research, Facts & Factors and The Courier

6. Technology with shared values

Deep tech refers to companies based on a **scientific discovery** or significant **engineering innovation** that aim to solve major problems that have a negative impact on the world around them

Examples

- Medical or technical devices to fight cancer.
- Data analysis to help farmers grow more food sustainably.
- Clean energy solutions to decrease human impact on climate change.

Deep tech companies generally operate in sectors such as agriculture, life sciences, chemical, aerospace, and green energy to provide **innovation solutions based on fields of technology related to the ACCIÓ technology trends target technologies**.

Advanced materials

Quantum computing

Drones and robots

Blockchain

Photonics and electronics

Artificial intelligence

Biotechnology

Source: Swati Chaturvedi, Propel(x)

Technology has a huge potential to make the world a better place

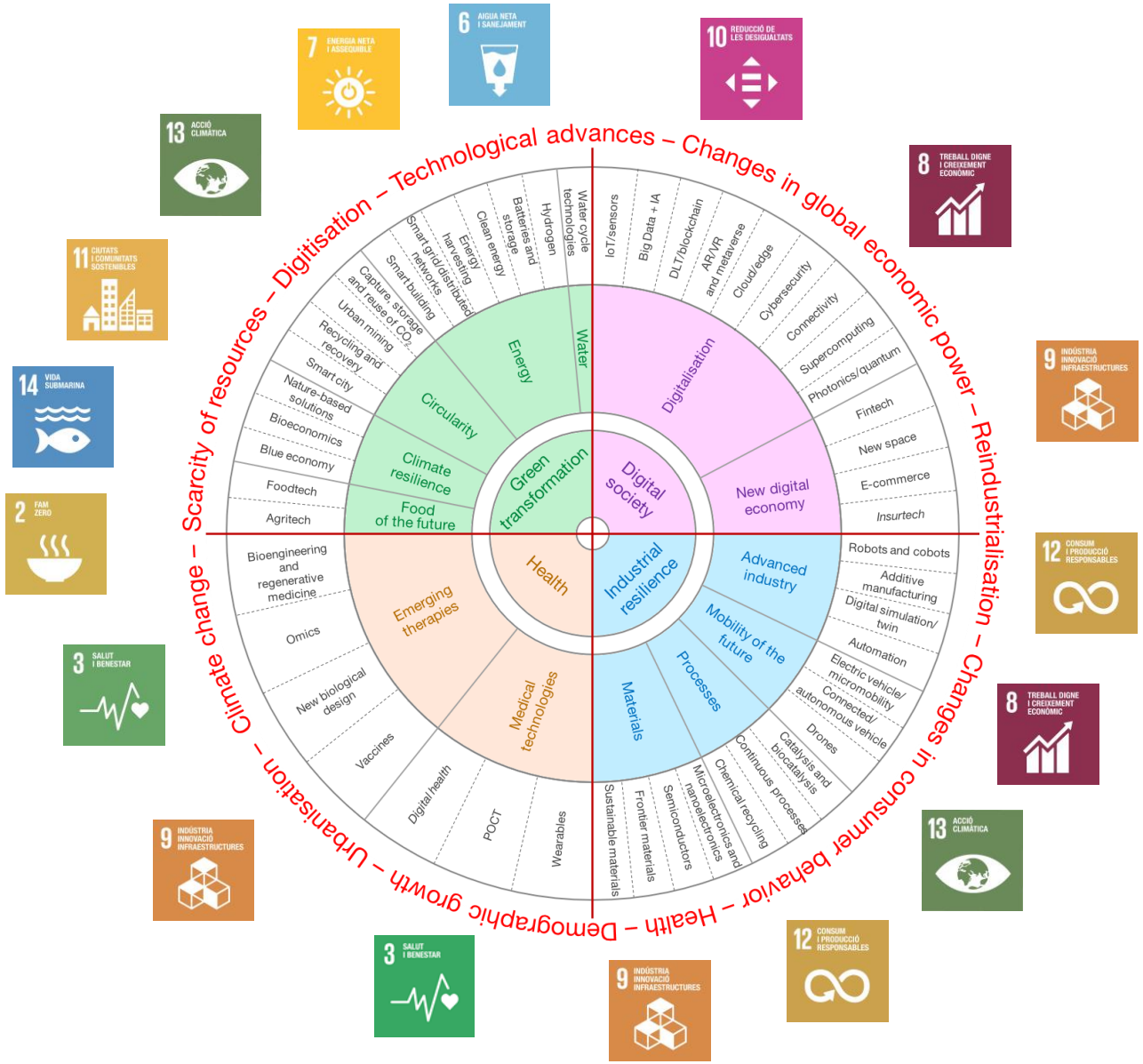
It can help people live longer and healthier, and provide solutions to face challenges such as climate change, transformation towards a clean energy system, health or the scarcity of resources.

Investors are beginning to notice the companies and technologies that provide value, beyond the novelty of their products.

In Europe, the main focus is on finding solutions to fight climate change.

Technologies as a vector to meet the Sustainable Development Goals

Technology offers innovative and disruptive solutions to tackle social and global challenges.



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Source: ACCIÓ
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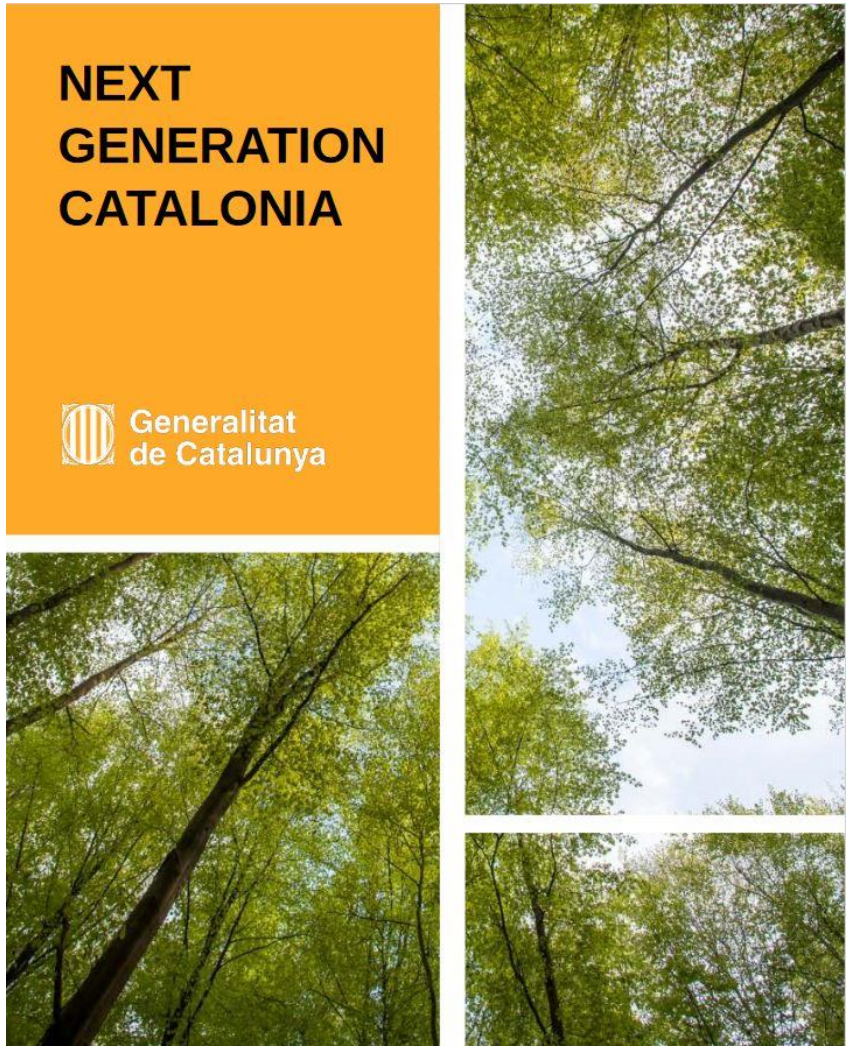
7. Technological potential in Catalonia

The Next Generation EU programme provides a **unique opportunity for Catalonia to implement the necessary transformations** to adapt to the new times and new trends, such as **the energy transition**, the **digitisation** of companies and the Authorities, and **reindustrialisation**.

The Next Generation Catalonia document presents **27 emblematic projects** that the Regional Government of the Generalitat has identified with the collaboration with experts and economic and social players in the country.

Among the 27 projects included in the Next Generation Catalonia document, **18 are directly related to technologies of the ACCIÓ technology trends target**.



Source: Next Generation Catalonia, Generalitat de Catalunya

The DIH4CAT is a **system for connection with innovative international ecosystems** aimed at promoting **digitisation in Catalonia,** which remains the model of the Digital Innovation Hubs established by the European Commission.

It is a connected network of assets, infrastructure and knowledge in Catalonia, which can be accessed by industry and public institutions to obtain **technological and non-technological solutions and to speed up the digital transformation of Catalan industry**.

The DIH connects with **7 areas of technology that are significant in Catalonia and a significant critical mass in terms of capacities and the technology supply available**:

1. Artificial intelligence
2. Supercomputing
3. Cybersecurity
4. *Smart connectivity*
5. Additive/3D manufacturing
6. Advanced robotics/manufacturing
7. Photonics

DIH4CAT Digital Innovation Hub de Catalunya

Strategies in Catalonia

Green transformation

ECONOMIA VERDA .CAT i CIRCULAR

Estratègia catalana d'ecodisseny per a una economia circular i ecoinnovadora

Pacte nacional per a la transició energètica de Catalunya

Generalitat de Catalunya

Llei 16/2017, de l'1 d'agost del Canvi Climàtic

2C30 #Catalunya2030

ESCACC Adaptació 2021-2030

Digital society

Health

Pla de Salut de Catalunya 2016-2020

UN SISTEMA CENTRAT EN LA PERSONA: PÚBLIC, UNIVERSAL I JUST

Estratègia nacional d'atenció primària i salut comunitària ENAPISC

EBC2030 ESTRATÈGIA DE LA BIOECONOMIA DE CATALUNYA 2030

The Catalan Information Systems Master Plan

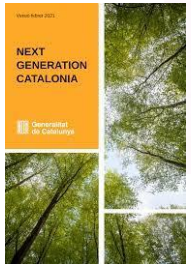
paiss

pla d'atenció integrada social i sanitària

Model català d'atenció integrada social i sanitària a l'entorn domiciliari

Industrial resilience

RIS3CAT



4.0 PROACCIÓ

Pacte nacional per a la indústria

PACTE NACIONAL PER A LA SOCIETAT DEL CONEIXEMENT

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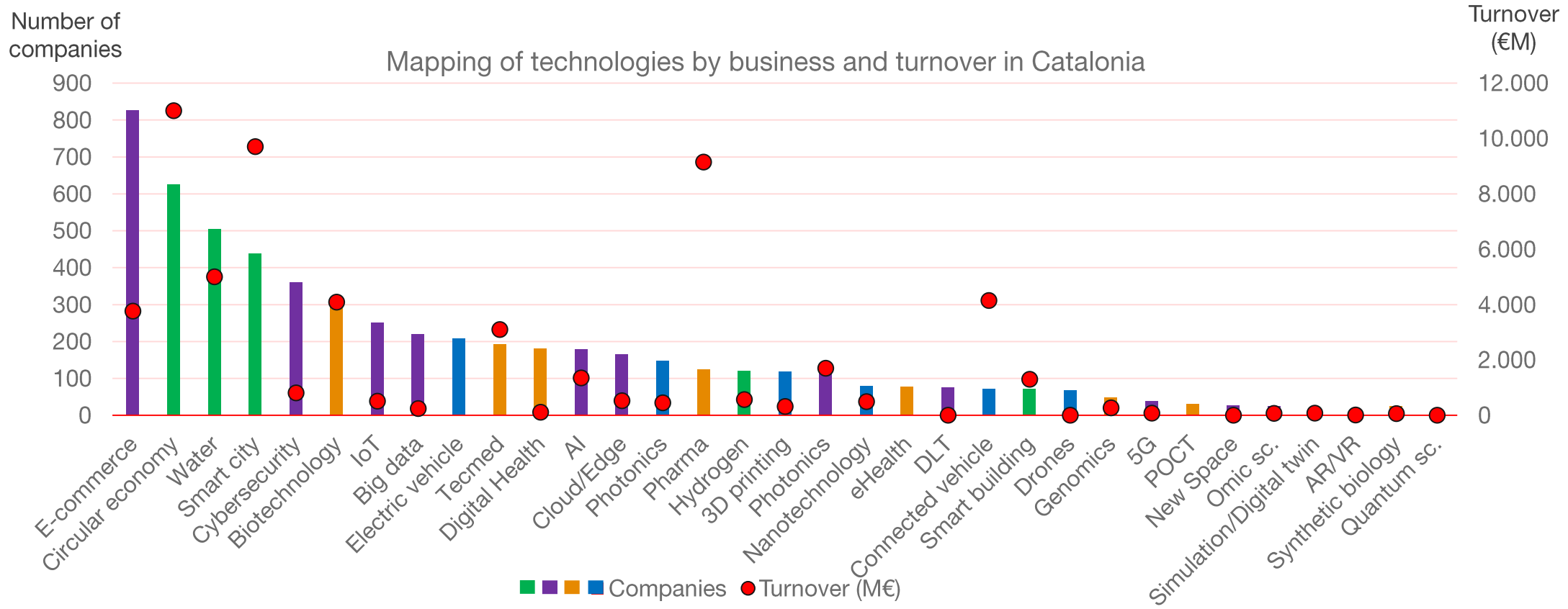
Catalonia has a strong critical mass in many of the technology trends identified, and emerging trends are detected in which the ecosystem must be strengthened



** The technologies for which data is available have been included. The latest data available for each technology has been used. Some of the technologies represented in the graph are not included in the Target, but are linked directly to its areas.*

Sources: ACCIÓ mapping, Biocat, Clúster de l'Energia Eficient and CWP

8. Prioritisation of ACCIÓ technology trends 2022- 2025

ACCIÓ prioritises **20 technology trends** that will have a relevant impact on Catalonia until 2025

Digital society

- Digitalisation
  - Big data + artificial intelligence
  - DLT/blockchain
  - Cloud/edge
  - Cybersecurity
  - Connectivity
  - Supercomputing
  - Photonics/quantum

Industrial resilience

- Industry industry
  - Robotics and collaborative robotics H
  - Additive manufacturing
- Mobility of the future
  - Electric vehicle/micromobility H
  - Connected/autonomous vehicle H
- Materials
  - Semiconductors

Green transformation

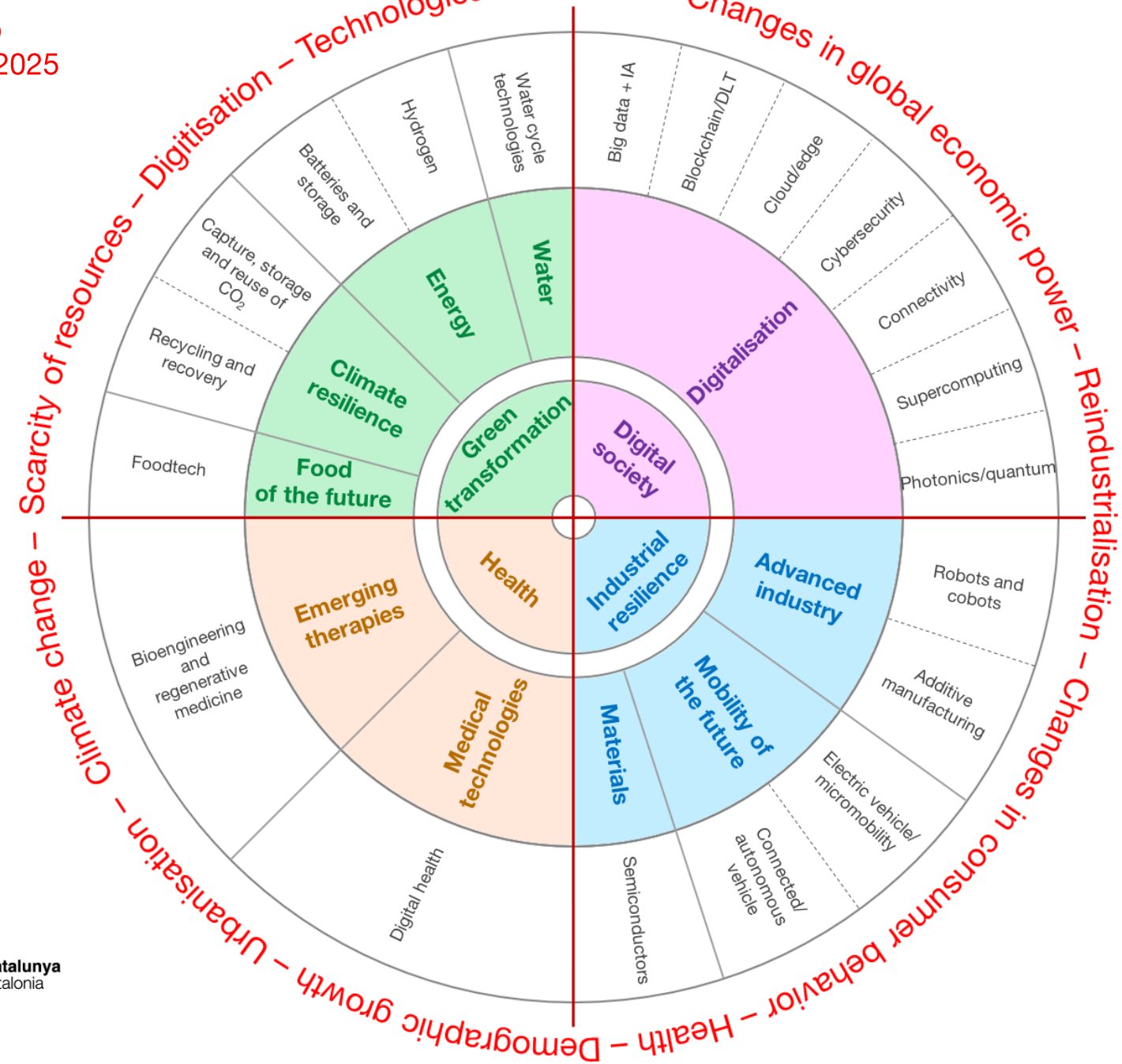
- Water
  - Water cycle technologies
- Energy
  - Hydrogen
  - Batteries and storage
- Circularity
  - Capture, storage and reuse of CO_2
  - Recycling and recovery H
- Food of the future
  - Foodtech H

Health

- Emerging therapies
  - Bioengineering and regenerative medicine H
- Medical technologies
  - Digital health H

Prioritisation criteria: in line with initiatives of the Government of Catalonia (Generalitat de Catalunya), critical mass and potential, preparation of future ecosystems, and expected growth

Prioritisation of 20 ACCIÓ technology trends, 2022-2025



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Thank you

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Generalitat de Catalunya

Fem avui l'**empresa** del demà