

Academic year 2023 – 2024

Research, Innovation and Global Trends

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RGIT:  
intro & agenda  
(Session 0, Feb 19, 2024)

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Sandro Mendonça



**Instituto Superior de Economia e Gestão**

UNIVERSIDADE TÉCNICA DE LISBOA

Masters in Innovation and Research for Sustainability

# Our conversation

## Starting a learning cycle

### 1. Welcome

*what do expect from this masters?*

### 2. Emerging tech

*what do you think this course may bring you?*

### 3. Working together

*our social contract?*



## Critical insight:

*This course addresses the forefront of technical change.*

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■ 1.

before we  
start...

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# Explaining our meeting here

Researching innovation?!

## Motivations

- ...
- ...
- ...
- ...
- ...
- ...
- ...



innovation?!

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■ 2.

research,

innovation, trends ...

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# The path starts with a step

Knowledge and the economy

Major insights

that

**“... strong and motivating connection between scientific activity and economic life...”**

this

**“... value of science in building a continued future for the human species on Earth.”**



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# This course

RGIT

## Learning goals

- presenting definitions and distinctions between “emerging technologies”
- understanding innovation in a systemic/evolutionary perspective
- grasping the rise and socio-economic impacts of key technologies
- mapping the reference literature and sources
- recognising, navigating and engaging major debates



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■ 3.

our set-up...

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# This course

## Lectures

The course is about teaching you contemporary approaches to issue of tech emergence. Our focus in the course will not be on these cases but rather on the common features they share and on frameworks that make them intelligible.

- S1: Introduction, agenda, overview (19 Feb)
  - S2: Innovation processes (19 Feb)
  - S3: Learning and knowledge (26 Feb)
  - S4: Emergence and evolution (26 Feb)
  - S5: Indicators: science (4 Mar)
  - S6: Indicators: technology (4 Mar)
  - S7: Trends and topics (11 Mar)
  - S8: Trends and topics (11 Mar)
  - S9: Presentations and debate (18 Mar)
  - S10: Presentations and debate (18 Mar)
  - S11: Assessment (*8 April\**)
-

# This course

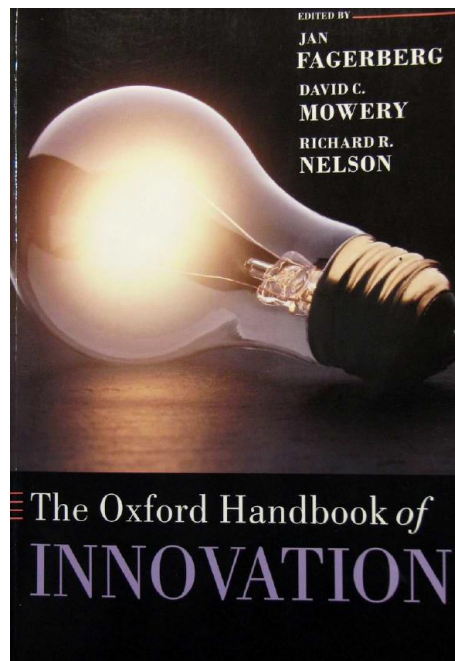
## Readings

There is no existing textbook that matches the content of this relatively new subject and the style in which we want to teach it. We are actively developing and revising ppts and notes. These materials will be rough in places and contain bugs, which we will count on you to help us catch.

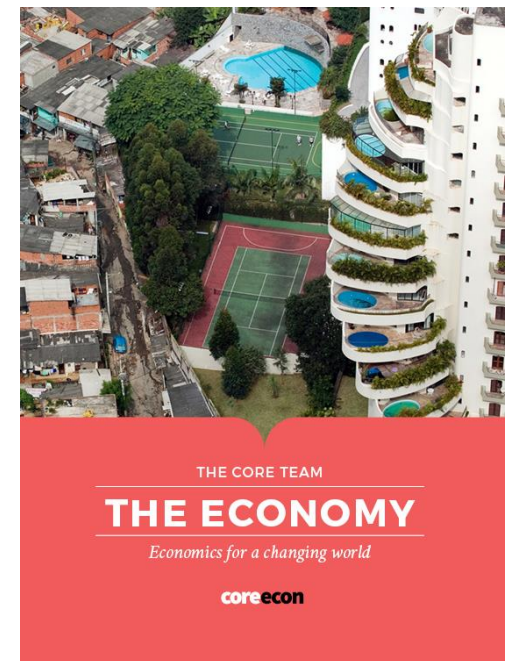
The following books contains sections that are useful. We will put additional references (papers, reports, etc.) on the course's website.



(2003)



(2004)



(2022)

read read read



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# This course

## Assesment

### Grading structure

- Individual mini-exam: 40% (last class!)
- Groupwork: 50% (and includes presentation in class)
- Participation in class: 10%

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## Assesment

### Grading structure

- Individual mini-exam: 40% (last class!)
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- Participation in class: 10%

#### ATTENTION #1:

- > the mini-exam is about one hour, no support notes allowed;
  - > it will include a quizz componente (multiple answers, true/false, etc.)
  - > it will conver concepts but also classes reviewed in class
-

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# This course

## Assesment

### Grading structure

- Individual mini-exam: 40% (last class!)
- Groupwork: 50% (and includes presentation in class)
- Participation in class: 10%

#### **ATTENTION #2:**

- > please validate the topic with me beforehand;
  - > the policy brief (groupwork) has to be submitted before March 18, 6.00pm
  - > it must be sent to this email [smfm.iscte@gmail.com](mailto:smfm.iscte@gmail.com)
-

# This course

## Group work

### “Policy brief” (7pgs)

- is a memorandum, i.e. a concise report that helps readers understand a challenging topic and decision-makers to form their point of view
- It is focused on an agenda issue, it reviews sources, it integrates and synthesizes evidence
- the purpose is to address a problem, to answer strategic or public policy concerns, to consider alternatives and weight options, to provides visibility into potential initiatives, to convey recommendations for action
- *effective* (specific aim, precise terminology, clear language), *elegant* (cohesive format, professional tone, careful aesthetics) and *structured* (sections, bullet points, bolds, visual elements)

### “Policy pitch” (3 ppts, 7mins)

- from situation to position



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# This course

## Themes and topics

### **Wider fields**

1. Semiconductors
2. Big Tech
3. AI
4. Biopharma
5. New Space
6. ...

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# This course

## Themes and topics

### **Narrowing the focus**

1. Semiconductors and industrial strategy
2. Big Tech and antitrust
3. AI and regulation
4. Biopharma and innovation policy
5. New Space and entrepreneurship policy
6. ...

---

# This course

## Themes and topics

### **Narrowing the focus even more!**

1. Semiconductors and industrial strategy (the cases of Chips/IRA Acts)
2. Big Tech and antitrust (a DMA perspective)
3. AI and regulation (the AI Act)
4. Biopharma and innovation policy (and supplementary protection certificates)
5. New Space and entrepreneurship policy (and ESA)
6. ...

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# This course

## Themes and topics

### **Narrowing the focus even more!**

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6. ...

---

# This course

## Themes and topics

### More examples

1. 6G
  2. LEO PNT
  3. Smart cables
  4. Sodium batteries
  5. PEEK
  6. Drones
  7. Standard essential patents
  8. Blockchain
- 
9. Digital euro ...

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■ 5.

about myself

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# This course

## Lecturer

- Sandro Mendonça
- Office: 413, BJC building
- Office hours: ad-hoc basis
- [sandrofm@iseg.ulisboa.pt](mailto:sandrofm@iseg.ulisboa.pt)
- [x.com/sfm\\_reg](https://x.com/sfm_reg)

## Profile

### University role and academic responsibilities:

- Invited Professor ISEG/ULisbon
- Associate Professor at the Department of Economics, ISCTE – Lisbon University Institute, ex-Director of the Economics degree at ISCTE Business School.

### Other affiliations:

- German Marshall Fund Fellow, USA
- Associate faculty of SPRU, University of Sussex, UK
- Visiting Scholar of King's College London, UK, in 2012
- Science Officer of CYTED – the official Ibero-American program for science and technology for development, from 2014 to 2018
- Member of the consulting committee of the “Cybersecurity watch” of the National Centre for Cybersecurity, Portugal, from 2019
- Expert for the European Commission “Regiostars” prize, 2020
- Visiting Prof. at University of Insubria, Italy, since 2020
- Advisor to Anatel, Brasil, since 2021
- Lead of “The Futures of Big Tech”, DG Research
- Fellow Economist at DG GROW, 2024



Currently:

Former member of the Board of ANACOM - the Portuguese national authority for communications ([www.anacom.pt](http://www.anacom.pt))

### Main focus:::

- Spectrum management
- Telecom operators
- Postal sector
- Infrastructure

### Emergent challenges:::

- 5G
- Space and satellites
- Submarine cables and data ports
- Mega-events



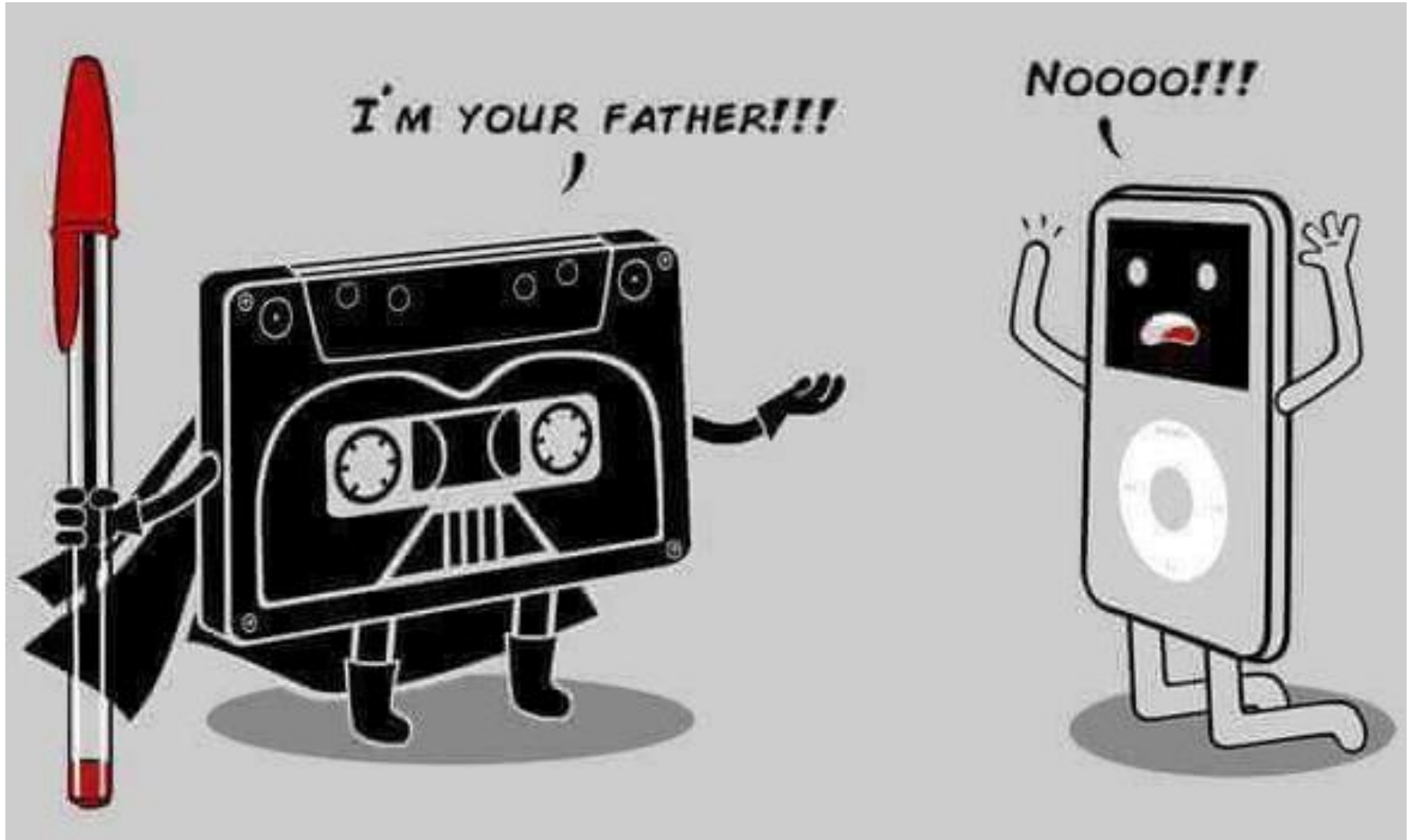


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# Some observations

# Discontinuities

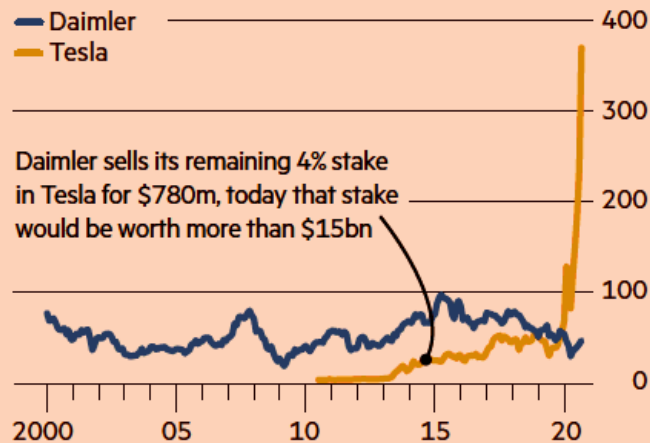


# electrical cars

Market cap (€bn)

— Daimler  
— Tesla

Daimler sells its remaining 4% stake in Tesla for \$780m, today that stake would be worth more than \$15bn



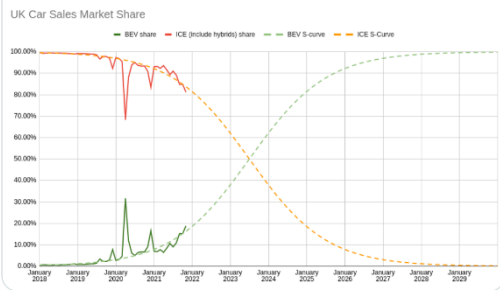
Launched in 2013, the i3 was BMW's first fully electric vehicle

December 12, 2022 at 9:00 AM

## BMW's Discontinued i3 Is Already an EV Cult Classic

As bigger electric cars take precedence, some lightweight models are disappearing from the market -

Robert Osfield @RobertOsfield · 1 h  
Market share for BEV vs all Internal Combustion Engine variants (including hybrids) is actually ahead of the S-Curve that has 50/50 BEV/ICE sales in mid 2023.  
Could we be just 18 months away from BEV being half of all UK car sales? That's what the data is suggesting.  
[Mostrar esta sequência](#)



### COMPANIES & MARKETS

#### Automobiles

# BMW signals i3 electric car is running out of road

No refit for marque's first battery model with focus on electrifying main line

PETER CAMPBELL — FRANKFURT

BMW will not renew the i3, its flagship electric car, spelling the end of one of the most distinctive vehicles on the road.

The German carmaker will focus instead on installing battery and plug-in technology on its other models, while

also planning new pure-electric cars. "There's no specific plan for an i3 successor," Pieter Nota, BMW's sales and marketing chief, told the Financial Times. "We are now bringing electrification more to the mainstream."

However, he added that the company would continue to build the i3.

Released in 2013, the car was BMW's first serious foray into battery vehicles, intended to test the public's appetite for electric cars without tarnishing its mainstream line-up of swish saloons.

Carmakers typically renew their models after seven years of sales to revitalise demand and fit the latest technology, so under normal conditions the i3 would have only a year left to run.

However, the company said it would continue selling it for several more years. "It's not a normal car in that sense," Mr Nota said.

Carmakers are embracing electric technology to reduce CO2 emissions and hit sales targets in Europe and China. BMW is installing plug-in hybrid tech-

nology into its best-selling models, which allows them to run on electric power in cities and conventionally on longer journeys. It also plans 13 battery-only models by 2023, a timeframe that was recently brought forward because of impending emissions targets.

At the Frankfurt Motor Show last week the company unveiled the design for an electric car coming out in 2021, as well as showing the electric Mini that will go on sale next year.

The i3 is now in its fifth iteration, and

BMW has sold more than 150,000 of the cars as the nascent market for electric vehicles has blossomed.

Sales in the first half of this year rose by 21 per cent compared with the same period a year earlier. "The i3 is actually doing extremely well in its sixth year of production already," said Mr Nota.

Sales in August were 30 per cent higher than a year earlier, which is "remarkable" growth for such a comparatively old vehicle, he added.

Designed as a trailblazer for future

technologies, the i3 was always an outlier for BMW, bearing little resemblance to its line-up of saloons or sport utility vehicles and appealing to a different demographic.

BMW's new chief executive, Oliver Zipse, is under pressure to speed up the carmaker's push into electric vehicles. His predecessor Harald Krüger was seen as having slowed the rollout of electric technology — to take on the growing threat from Tesla — into BMW's main models, such as the 3-series.



# Street reaction

PORTUGAL

21 de Novembro, 2023

## Odemira: Antena 5G gera conflito entre população e Vodafone



Featured Documentaries

### The Truth about 5G: What is driving the global anti-5G movement?



TorchStone Global

### International Burn Down a 5G Tower Day - TorchStone Global

As imagens podem estar sujeitas a direitos de autor. Saiba mais

Visitar

### Imagens selecionadas

Ver mais



Cell Tower News: OSHA cites f...

rccwireless.com



Arrests made in cellphone towe...

thesuburban.com



Ensuring a cell tower's safety b...



# Industrial espionage: How China sneaks out America's technology secrets



GETTY IMAGES

GE turbine blades in France

<https://www.bbc.com/news/world-asia-china-64206950>

# US grants licences for civilian drones to operate beyond pilot's sight

PATRICK MCGEE — SAN FRANCISCO

**US regulators have granted the first licences for unmanned aircraft to fly well beyond the sight of a pilot, a move seen by the industry as a catalyst for mainstream commercial drone use.**

Previously, licences capped commercial drone flights to within a pilot's sight, even if the drone could operate autonomously. For longer distances, companies had to have staff on the ground every few miles, looking up and communicating any known obstacles.

The US Federal Aviation Authority issued exemptions to these rules to three companies just before and during the Commercial UAV Expo, which was held this week in Las Vegas.

"This is a huge deal," said Scott Shtofman, senior manager of government affairs at the Association for Uncrewed Vehicle Systems International, an industry body. "This really improves the ability to scale and speed up access to drone usage. We're getting beyond just testing in a certain area."

The companies are UPS Flight Forward, the drone division of the private mail courier, Phoenix Air Unmanned and uAvionix.

Andreas Raptopoulos, chief executive of Matternet, a dronemaker that supplies UPS, said the exemption would allow a pilot at the company's remote operations centre in Kentucky to fly drones in Florida.

"The military has done this for years, but for civilian space this is the first time this is happening in the US," he said.

The FAA, in approving one of the waivers, said drones had proved they offered a "quieter, cleaner, cheaper option to manned aircraft".

The waivers came as a big relief to the drone industry amid widespread complaints that regulatory developments had lagged technology, as the aviation framework under which drones fall was developed decades before unmanned aircraft existed.

The Commercial Drone Alliance, a non-profit backed by dozens of companies including Amazon, AT&T, drone-

**Flying high: the FAA's move is seen as catalyst for mainstream US commercial drone use**

maker Skydio and Alphabet unit Wing, challenged "regulatory paralysis" in July as it advocated for the exemptions. The alliance said federal bureaucracy's inability to "move nimbly" was inhibiting the commercial drone industry from reaching scale.

"The current regulatory framework severely restricts many of the most promising commercial drone applications," said Lisa Ellman, partner at law firm Hogan Lovells and executive direc-

tor of the CDA. "These approvals mark an important step forward for the broader industry."

The alliance expects the new waivers to create a precedent for others to receive "expedited" approval. A change in the actual law to normalise complex drone operations — as opposed to the exemption-based approach for specific companies — is not likely for two to three years, according to experts.

The one drone operator to apply for an exemption that did not receive one was Zipline, a California-based drone logistics service best known for delivering blood and medicine on round trips of up to 200km in African countries.

FAA rules have constrained Zipline, the world's largest commercial drone operator, from offering similar services in the US, although it does partner with Walmart on short-range trips in Arkansas. Keller Rinaudo Clifton, Zipline chief executive, declined to comment on the company's exemption request, but said he was encouraged by the FAA's other actions this week.





Dilbert.com @DilbertAutismDays



7-11-18 © 2018 Scott Adams, Inc. All Rights Reserved.



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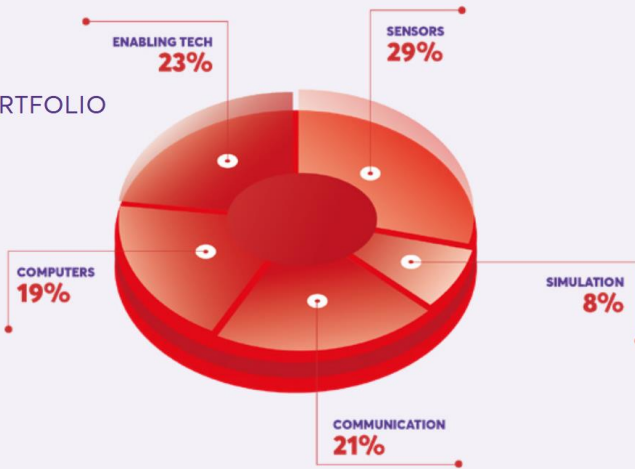
# *What are we talking about?*

## Wordage proliferation

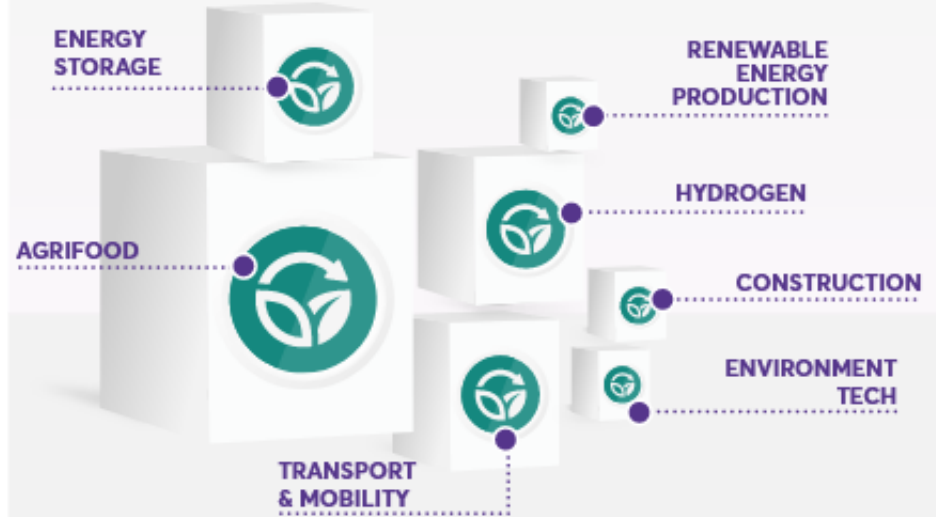
### **More examples**

- Core inputs
  - Radical innovations
  - General purpose technologies
  - Disruptive innovation
  - Emerging (and critical) technologies
  - Breakthrough technologies (and bottleneck resources)
  - Frontier, Essential, Foundational, Elite ... technologies
  - Deep tech
- 
- ...

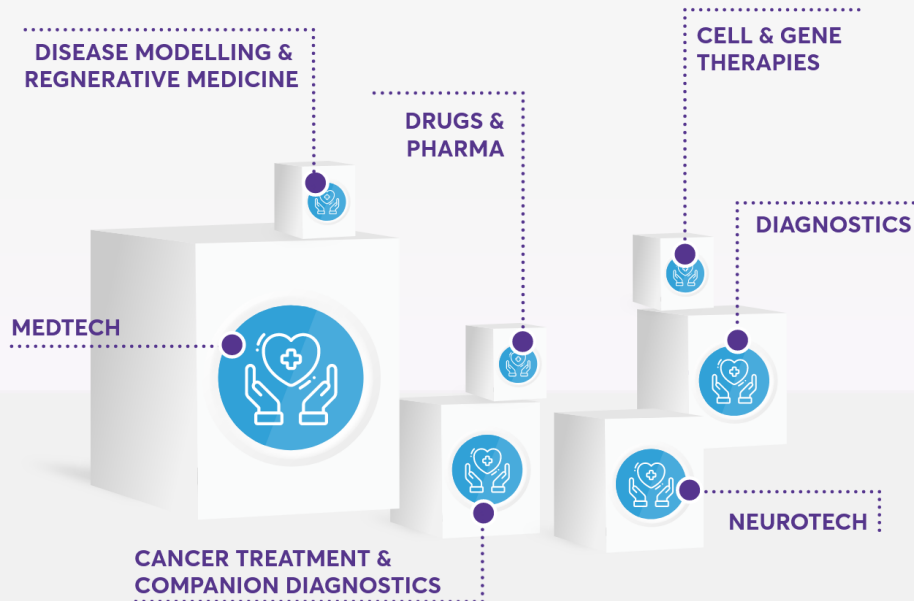
## QUANTUM PORTFOLIO



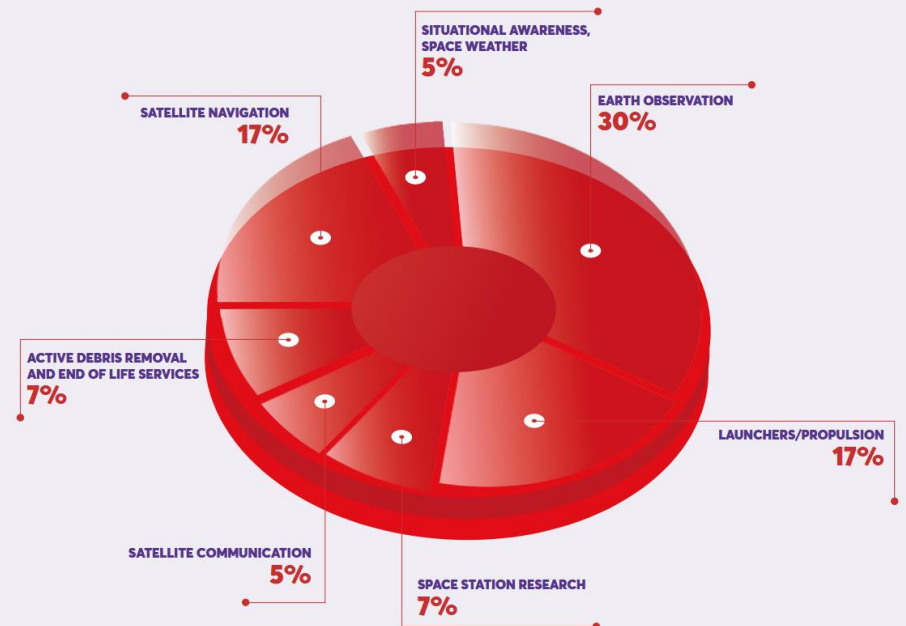
## KEY GREEN TECHNOLOGIES AND RELATIVE SCALE



## KEY TECHNOLOGIES AND RELATIVE SCALE IN HEALTH



## SPACE PORTFOLIO



# Frontier Technologies

- Market predicted to grow to USD 3.2 trillion by 2025
- Significant potential to transform our world for good
- Driven by intellectual property

Frontier technologies are emerging at the intersection of radical scientific breakthrough and real-world implementation. Artificial intelligence. Big data. The Metaverse. Bioprinting. Quantum computing. These technologies are changing our lives. How we communicate, innovate, create and do business. And they hold one of the keys to addressing some of the most pressing global issues we face.

## How important are frontier technologies for the economy?

Frontier technologies already represent a USD 350 billion market, and one that by 2025 could grow to over USD 3.2 trillion.

Artificial Intelligence	Internet of Thing (IoT)	Big data	Blockchain
The AI market is expected to grow from USD 16 billion in 2017 to USD 191 billion in 2024.	The IoT market is expected to grow from USD 130 billion in 2018 to USD 1.5 trillion in 2025.	The big data market is expected to grow from USD 32 billion in 2017 to USD 157 billion in 2026.	The blockchain market is expected to grow from USD 708 million in 2017 to USD 61 billion in 2024.
403,596 publications between 1996 and 2018.	66,467 publications between 1996 and 2018.	73,957 publications between 1996 and 2018.	4,821 publications between 1996 and 2018.

Source: Technology and Innovation Report 2021 (UN Conference on Trade and Development).

## What are the main types of frontier technologies?



**Digital technologies**  
The Metaverse, Internet of things (IoT), blockchain, artificial intelligence (AI), big data, and quantum computing



**Physical technologies**  
Autonomous driving, 3D printing and hardware innovations



**Biological technologies**  
Bioprinting, organoids, genetic engineering, human augmentation and the brain-computer-interface

## How fast are frontier technologies growing?

Growth of technologies as percent of total patents average growth, 2016-2020



**Artificial intelligence**  
+718%



**Big data**  
+699%



**Digital technologies**  
+172%



**Cloud computing**  
+122%



**Autonomous systems**  
+109%



**Internet of Things (IoT)**  
-81%

Source: World Intellectual Property Report, 2022 (WIPO).



# POLICY BRIEF

## No. 109

JUNE 2023

### KEY POINTS

- Frontier technologies have grown significantly in the last two decades and will continue to impact economic and social systems in future
- There is a significant gap between developed and developing countries in terms of preparedness to use, adopt and adapt frontier technologies. Developed countries currently dominate as providers of such technologies and in knowledge generation and trade
- Governments in developing countries need to take proactive action to catch up and close the gap

## Moving fast with frontier technologies

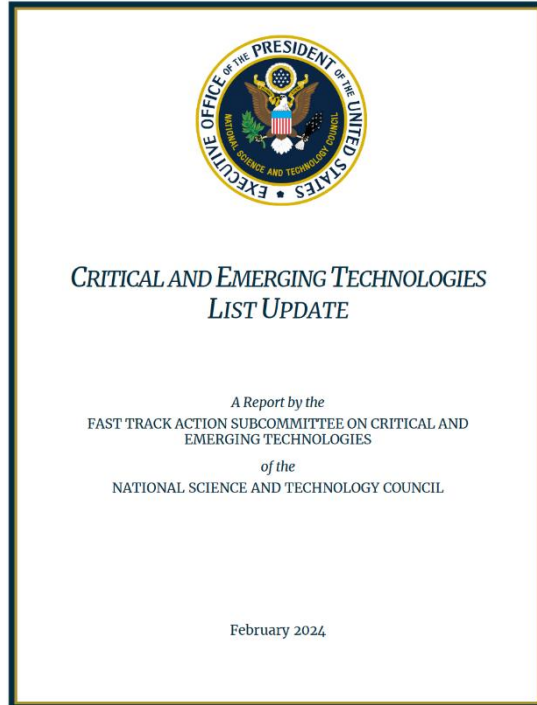
In the last two decades, the use of frontier technologies such as artificial intelligence, the Internet of things and energy from renewable sources has undergone significant growth, and this trend is expected to continue. However, there is still considerable concentration in these markets. The leading frontier technology providers are mostly firms from China, the United States of America and a few other developed countries, with little participation from developing countries. The same pattern is observed with regard to knowledge generation and trade. Governments of developing countries should take proactive action to increase preparedness to use, adopt and adapt such technologies and to take up the economic opportunities linked to them. Some of the challenges associated with the adoption of new technologies in developing countries are addressed in this policy brief, and some policy recommendations are proposed.<sup>1</sup>

<sup>1</sup> For further information on and analysis of the topics discussed in this policy brief, see UNCTAD, 2023, *Technology and Innovation Report 2023: Opening Green Windows – Technological Opportunities for a Low-Carbon World* (United Nations publication, Sales No. E.22.II.D.53, Geneva), available at <https://unctad.org/publication/technology-and-innovation-report-2023>.



*The critical and emerging technology areas in the 2024 update are:*

- Advanced Computing
- Advanced Engineering Materials
- Advanced Gas Turbine Engine Technologies
- Advanced and Networked Sensing and Signature Management
- Advanced Manufacturing
- Artificial Intelligence
- Biotechnologies
- Clean Energy Generation and Storage
- Data Privacy, Data Security, and Cybersecurity Technologies
- Directed Energy
- Highly Automated, Autonomous, and Uncrewed Systems, and Robotics
- Human-Machine Interfaces
- Hypersonics
- Integrated Communication and Networking Technologies
- Positioning, Navigation, and Timing Technologies
- Quantum Information and Enabling Technologies
- Semiconductors and Microelectronics
- Space Technologies and Systems



*More on this update:* The [National Security Strategy](#) notes that technology is central to today's geopolitical competition and to the future of our national security, economy and democracy.





# Emerging and disruptive technologies

Last updated: 22 Jun. 2023 12:27

## The strategic context – Why does NATO care about EDTs?

Emerging and disruptive technologies are increasingly touching all aspects of life – from electronics like phones and computers, to everyday activities like shopping for food in the grocery store and managing money in the bank. These technologies are also having a profound impact on security. Innovative technologies are providing new opportunities for NATO militaries, helping them become more effective, resilient, cost-efficient and sustainable. These technologies, however, also represent new threats from state and non-state actors, both militarily and to civilian society.

NATO's [2022 Strategic Concept](#), which defines the key challenges facing the Alliance and outlines how NATO will address them, reflects this changing context. It affirms that EDTs bring both opportunities and risks, and that they are altering the character of conflict, acquiring greater strategic importance and becoming key arenas of global competition. As a result, Allies agreed in the Strategic Concept to promote innovation and increase investments in EDTs to retain NATO's interoperability and military edge. Allies will work together to adopt and integrate new technologies, cooperate with the private sector, protect their innovation ecosystems, shape standards and commit to principles of responsible use that reflect the Alliance's democratic values and human rights. EDTs were also included among the issues of common interest for increased cooperation between NATO and the European Union (EU).

To embrace these opportunities and at the same time counter threats enabled by EDTs, NATO is working with Allies to develop responsible, innovative and agile EDT policies that can be implemented through real, meaningful activities. By working more closely with relevant partners in academia and the private sector, NATO aims to maintain its technological edge and military superiority, helping deter aggression and defend Allied countries.

Emerging and disruptive technologies are also a key facet of the [NATO 2030 agenda](#), an initiative to strengthen NATO both militarily and politically and to adopt a more global approach for the Alliance. NATO 2030 is about making sure that the Alliance remains ready to face tomorrow's challenges.

## S&T Development

How can NATO explore, develop and exploit the best, cutting-edge technology able to deliver disruptive military effects for the Alliance? What do we mean by *emerging* or *disruptive* S&T. What are these emerging or disruptive technologies or scientific insights? What do they mean for an agile and innovative Alliance? To answer these questions, this chapter provides a summary of the modern technology landscape.

For purposes of this report, we narrowly define technologies as:

- **Emerging:** Those technologies or scientific discoveries that are expected to reach maturity in the period 2020-2040; and, are not widely in use currently or whose effects on Alliance defence, security and enterprise functions are not entirely clear.
- **Disruptive:** Those technologies or scientific discoveries that are expected to have a major, or perhaps revolutionary, effect on NATO defence, security or enterprise functions in the period 2020-2040.
- **Convergent:** A combination of technologies that are combined in a novel manner to create a disruptive effect.

## Innovation policy – What is NATO's EDT strategy?

In February 2021, NATO Defence Ministers endorsed "Foster and Protect: NATO's Coherent Implementation Strategy on Emerging and Disruptive Technologies." This is NATO's overarching strategy to guide its relationship to EDTs. It has two main areas of focus: fostering a coherent approach to the development and adoption of dual-use technologies (i.e., technologies that are focused on commercial markets and uses, but may also have defence and security applications) that will strengthen the Alliance's edge, and creating a forum for Allies to help protect their EDTs from being used against them by potential adversaries and competitors. These goals are key to ensuring NATO retains its strategic and effective dominance.

NATO's innovation activities currently focus on nine priority technology areas:

- artificial intelligence (AI)
- autonomy
- quantum
- biotechnologies and human enhancement
- hypersonic systems
- space
- novel materials and manufacturing
- energy and propulsion
- next-generation communications networks

The Alliance is developing specific plans for each of these key technology areas. These strategies are laying the groundwork for NATO to accelerate responsible innovation and the rapid adoption of modern technologies, in order to improve decision-making and steer transatlantic innovation for defence and security in accordance with Allied values, norms and international law.



JANUARY 31, 2024

## Readout of U.S.-EU Trade and Technology Council Fifth Ministerial Meeting

[BRIEFING ROOM](#) • [STATEMENTS AND RELEASES](#)

# The Fifth Ministerial of the U.S.-EU Trade and Technology Council



On Tuesday, January 30, 2024, the U.S.-EU Trade and Technology Council (TTC) held its fifth ministerial meeting in Washington, D.C. Secretary of State Antony Blinken, Secretary of Commerce Gina Raimondo, U.S. Trade Representative Katherine Tai, and senior National Security Council Staff were joined by EU TTC co-chairs European Commission Executive Vice Presidents Margrethe Vestager and Valdis Dombrovskis. European Commissioner for Internal Market Thierry Breton also joined the discussions.

Building on the progress from the May 2023 TTC ministerial meeting in Lulea, Sweden, the U.S. co-chairs stressed the importance of fortifying our collective economic security, including by **further de-risking and diversifying of our economies, building resilient supply chains, employing outbound investment mechanisms to safeguard national security-related technologies, enhancing and better coordinating our export control regimes to prevent the exploitation of dual-use technologies, and jointly countering the use of economic coercion and non-market policies and practices by authoritarian actors.** They also discussed **expanding collaboration to counter the misuse of technology, including countering foreign information manipulation and interference (FIMI) and attacks against human rights defenders online while safeguarding freedom of expression.**

The U.S. co-chairs also discussed the importance of expanding transatlantic cooperation in **critical and emerging technologies, including artificial intelligence (AI), and jointly promoting innovation, security, and trustworthiness across digital ecosystems, including for maintenance and repair of network components.** They noted progress made through the TTC Joint Roadmap on Trustworthy AI and Risk Management and resolved to continue to promote interoperability in our emerging approaches to AI governance. They also noted **the quickening pace of technological innovation and the essential role the TTC plays in developing responsible rules of the road for critical and emerging technologies, including creating compatible and interoperable standards that reinforce the work of international standards development organizations.**

The United States and EU also hosted two stakeholder events on the margins of the TTC: a “Roundtable on the Legacy Semiconductor Supply Chain,” where U.S. and EU industry leaders discussed the current state of the **industry, how companies can improve supply chain resilience and transparency, and how governments can help address non-market policies and practices that lead to excessive dependency on any one producing country for legacy semiconductors**; and a Transatlantic initiative for Sustainable Trade (TIST) Stakeholder Event on “Crafting the Transatlantic Green Marketplace,” where participants discussed how to strengthen the transatlantic marketplace as a key factor in the development of sustainable and net-zero economies on both sides of the Atlantic.

The TIST stakeholder event also included a workshop on the “Promotion of Good Quality jobs for a Successful, Just and Inclusive Green Transition,” which focused on labor and business stakeholders exchanging best practices and discussion on ensuring good jobs are outcomes of climate policy and investments. In addition, the United States and European Union received a **briefing by the 6G Smart Networks and Services Industry Association and the Next G Alliance on their U.S.-EU Beyond 5G/6G Roadmap**, which will **inform efforts by U.S. and EU governments to develop common vision on 6G.** The United States and EU also welcomed the signing of the **U.S.-EU Joint CyberSafe Products Action Plan on the margins of this TTC. With this Action Plan, the two partners look to create a transatlantic marketplace that sets a standard for the cybersecurity of Internet-connected products, ensuring the devices our citizens use in their homes and offices are secure.**

The co-chairs intend to convene the sixth TTC ministerial meeting in Belgium in the spring of 2024 to review progress to inform priorities, identify new areas for collaboration, and further deepen the transatlantic partnership on shared priorities.

<https://video.state.gov/detail/videos/secretary-of-state/video/6345879278112/secretary-blinken-host-the-european-trade-and-technology-council-ministerial-meeting?autoStart=true>

<https://www.csis.org/analysis/fifth-ministerial-us-eu-trade-and-technology-council>

# NEW 'COUNCIL ON THE FUTURE' ENDORSED AT MUNICH SECURITY CONFERENCE



16-18  
Feb  
2024



## Council on the Future *Thoughtful Stewardship of Technology*

The rapid pace of technological development is increasingly outpacing society's traditional mechanisms to adapt to both the challenges and opportunities it presents.

Addressing emerging technologies like Artificial Intelligence will require a dedicated forum to help facilitate deepened collaboration and understanding between the public sector, private sector, academia, and civil society.

**Therefore, we hereby call for the formation of a 'Council on the Future'. The Council will help ensure technological developments remain a driving force of social good, progress and innovation; and that we mitigate the potential challenges they may pose to our societies.**

The Council will help bridge the collaboration gap between different sectors and actors in the technology field. The Council's mission is to foster the thoughtful stewardship of technology, in line with our shared democratic values. It will provide long-term strategic foresight on emerging topics, which in turn will enable an efficient and effective response in pivotal moments.

It would do so by fostering topic-specific dialogues and creating a long-standing platform that regularly convenes leading actors from industry, government, academia and civil society to discuss practical and concrete recommendations that improve social trust in technologies and reduce their harm, whilst being minimalist so as to continue to encourage innovation.

The initiative will draw inspiration from the *Pugwash Council on Science & World Affairs*, established during the Cold War by 11 Nobel Prize winning scientists from both sides of the Iron Curtain to recognize and address the dangers of nuclear war.

The 'Council on the Future' will complement existing and ongoing global efforts by government and stakeholders - such as regulation, policy proposals, and voluntary initiatives - and serve to consolidate and elevate ongoing work.

The Council will comprise of high-level thought leaders, including respected experts from industry, politics, sociology, psychology, law, and ethics. Topic-specific experts will be invited on an ad hoc basis. We have seen that technological development is outpacing society's traditional mechanisms to adapt to any challenges it brings.

We need a Pugwash of the Digital Age to rapidly respond to the societal challenges that digital technology can bring.

Therefore, on the occasion of the Munich Security Conference 60th anniversary, we hereby endorse the need for a Council on the Future.

## COUNCIL ON THE FUTURE Endorsements

- Eva Maydell**  
Member of the European Parliament
- Will Marshall**  
Founder & CEO of Planet
- Ambassador Heusgen**  
Chairman of the Munich Security Conference
- Kaja Kallas**  
Prime Minister of Estonia
- Maria Ressa**  
Nobel Prize Winner, CEO of Rappler
- Karoline Edtstadler**  
Federal Minister for the EU and Constitution, Austria
- Audrey Tang**  
Minister of Digital Affairs, Taiwan
- Sviatlana Tsikhanouskaya**  
Belarus Opposition Leader
- Carl Bildt**  
Former Prime Minister of Sweden
- Cecilia Malmström**  
Former European Commissioner for Trade
- Eric Schmidt**  
Former CEO of Google
- Brad Smith**  
President and Vice-Chair Microsoft
- Mustafa Suleyman**  
CEO InflectionAI
- Jack Clark**  
Co-founder of Anthropic
- Ian Bremmer**  
Political scientist & author
- Jared Cohen**  
Co-head of the Office of Applied Innovation, Goldman Sachs
- Geoffrey Hinton**  
Computer scientist, cognitive psychologist 'Godfather of AI'
- Stuart Russell**  
Computer Scientist at U.C. Berkeley
- Yoshua Bengio**  
Computer Scientist and leading expert in AI
- Meghan O'Sullivan**  
Director of the Belfer Center, Harvard Kennedy School
- Ngaire Woods**  
Dean of the Blavatnik School of Government
- Patrick P. Gelsinger**  
CEO of Intel
- Frank Heemskerck**  
EVP Global Public Affairs & Countries, ASML
- Allison Duettmann**  
CEO Foresight Institute
- Nicholas Berggruen**  
Founder and Chairman Berggruen Institute
- Yili Bajraktari**  
President and CEO of the Special Competitive Studies Project
- Michael Chertoff**  
Former US Sec of Homeland Security
- Sir Alex Younger**  
Former head of MI6
- The Rt. Hon. Lord Rees of Ludlow**  
Member of the House of Lords of the United Kingdom
- Fadi Chehadé**  
Former president and CEO of ICANN (2012-16)
- Sabastian Niles**  
President and Chief Legal Officer, Salesforce

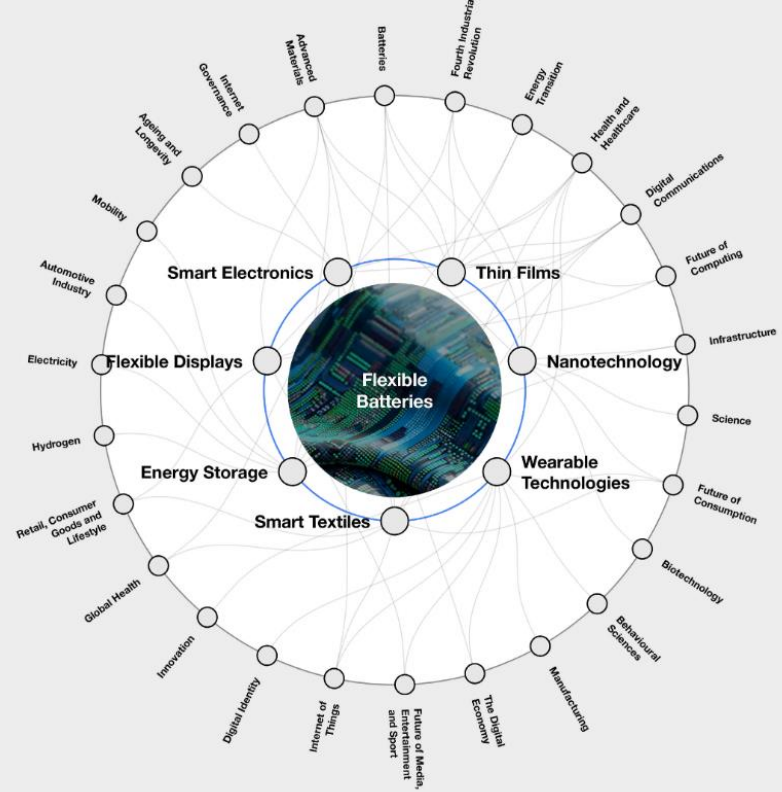
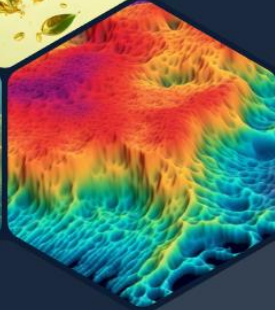
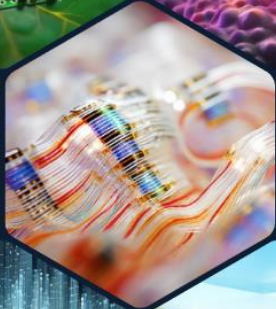
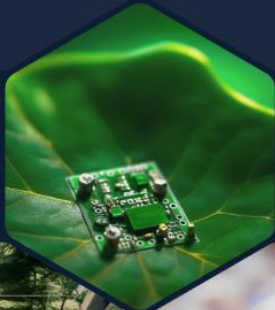
Centre for the Fourth Industrial Revolution



In collaboration with Frontiers Media

# Top 10 Emerging Technologies of 2023

FLAGSHIP REPORT  
JUNE 2023



## "Impact fingerprint" radar chart

**A. People**

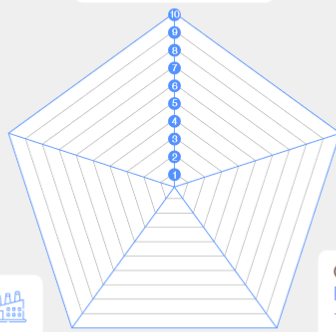
- Security and dignity such as food security
- Access to clean water
- Improved healthcare outcomes

**E. Equity**

- Democratize access to healthcare, energy, materials, internet etc.

**B. Planet**

- Protect and restore the planet, such as restoring biodiversity
- Limiting waste
- Reducing greenhouse gases



**D. Industry**

- Disrupt existing industries
- Create new markets

**C. Prosperity**

- Quality of people's lives, such as creating new jobs
- Providing greater connectivity between people
- Increasing leisure time