Event highlights

The human future: What's on the horizon?

19-20 September 2024 | In-person event

OECD Global Forum on Technology

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By invitation-only event held in-person on **19-20 September**

- 3 High-impact area panels:
    - Health and the human body;
    - Learning and cognition;
    - Sustainable digitally-augmented spaces.
- Tech talks (robotics, digital twins, quantum for energy optimisation, converging tech for health)
- Anticipatory governance, Learning from the past and Megatrends

Over **200 participants** from **54 countries**, including policymakers, leading technology experts and a wide variety of stakeholders

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Opening remarks

Jens Lundsgaard
Deputy Director
Science, Technology and
Innovation, OECD

Scene-setting:
Technology developments and a shared human future

- Technology (clean energy, smart agriculture, net zero biotechnology, quantum materials, etc.) can be **leveraged** to **address key challenges** and there's an important role for startups.

- The development of technologies should be driven by **values**, with ethical considerations orienting legislation implemented, and requires collaboration between industry, academia, and citizens – seeking a diversity of thought. Create early opportunities to address digital and societal divides.

- Relevant **challenges and barriers** include adapted regulatory mechanisms such as data protection, sustainability concerns such as energy consumption, and issues related to cybersecurity and digital divides.

- **Digital integration** has become critical, with AI and big data offering solutions to tackle poverty, while **inclusivity** ensures that everyone envisions themselves in a future where technology fosters a regenerative culture, creating conditions for nature and communities to thrive, leaving no one behind.

Elizabeth Thomas-Raynaud
Head of Emerging Digital Technologies, OECD

Bitange Ndemo
Kenya's Ambassador to Belgium & EU

Diya Nair
UK Ambassador, Girls in Quantum

Mikko Dufva
Senior lead, foresight, Sitra

Sibashisa Dash
Scientist D, Ministry of Science & Technology

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Megatrends: The forces driving emerging technologies

- **Megatrends help frame discussions on future challenges**, but their assumptions must be critically evaluated to ensure diverse perspectives and effective policymaking.

- To navigate megatrends and fast-paced technological shifts, policy makers can benefit from **systematic, adaptable and capability-based approaches** to foresight.

- Understanding **the assumptions, relationships, and contexts driving megatrends** can lead to more effective and adaptable policymaking.

- **Emerging technologies should be guided by ethical considerations**, prioritising human well-being and equitable outcomes.

- Foresight and policy recommendations should be communicated transparently, **acknowledging uncertainties and avoiding claims of definitive predictions**.

- **The OECD can support anticipatory governance** by promoting dialogue involving varied perspectives, advancing foresight methods and encouraging experimentation with new approaches.

Rafał Kierzenkowski
Head of the Strategic Foresight Unit, OECD

Emily Connolly
Deputy Director
UK Government Office for Science

Mikko Dufva
Senior lead, foresight, Sitra

Riel Miller
Senior Fellow, École des Ponts Business School

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High-impact area 1: Health and the human body

- Precision medicine via immune cell engineering and genomics research, as well as advanced prosthetic technologies, are providing **powerful tools to improve population health** and tackle global challenges like ageing populations.

- **Convergence with AI and robotics** is already delivering groundbreaking solutions, from analysis of big data to human exoskeletons.

- Tackling the ethical, social and legal issues around health tech innovations is paramount, particularly on ensuring widespread **accessibility and affordability to bridge divides** within countries and globally.

- **International and multidisciplinary collaboration** (e.g., public-private partnerships) from early stages of innovation is key and should integrate diversity, equity and inclusion (DEI) principles.

- Need to foster further foundational and applied research, by developing **innovative funding approaches, new business models**, and regulatory and ethical tools that could support the transition to the market.

Francesca Colombo
Head of the Health Division, OECD

Naveed Aziz
Vice President, Research & Innovation, Genome Canada

Sarah de Lagarde
Head of Corporate Affairs, Janus Henderson

Karine Rossignol
CEO and Co-Founder, Smart Immune

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Tech Talk on Neurotechnology

Olivier Ouiller

Co-Founder &

Chief Executive Officer

Inclusive Brains

High-impact area 2: Learning and cognition

- **Human augmentation enabled by neurotechnology** holds many promises (e.g., alleviating neurological disorders or brain-computer interfaces aiding speech recovery).

- **Convergence of neurotechnology with AI, big data and novel materials** is a new frontier for the field, accelerating research for more efficient and accessible products.

- Governance issues remain; responsible development should maintain focus on humans, considering **access, literacy, and preserving autonomy.**

- Need **inclusive ethics debates on society's desirable futures** regarding enhancement and individual freedoms.

- **Rise of consumer products** (as opposed to medical applications) may advance the field but requires appropriate efficacy, ethical and risk evaluations.

- Balancing risks and benefits requires **anticipation**, understanding **application contexts** and **technology maturity**, as well as developing robust methods for **health tech assessment**.

Olivier Ouiller
Co-Founder and Chief Executive Officer
Inclusive Brains

Hervé Chneiweiss
Chairman of Ethics Committee, INSERM

Nataliya Kosmyna
Research Scientist, Massachusetts Institute of Technology

María Lopez Valdés
Co-Founder and Chief Executive Officer
Bitbrain

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Tech Talk on Robotics

Jeremy Hadall

Robotics & Automation Development Lead, Satellite Applications Catapult

Looking back to look forward

- **Case studies** of past technology developments include the Industrial Revolution, the medical and sanitary revolutions, and advancements in computer technology and robotics.

- The **global impact of technologies** has been determined by low costs, high demand and government involvement (e.g. vaccination).

- It is important to factor in the **cost of the infrastructure** needed to develop a given technology.

- Understanding impact on labour is essential to determine **how technology can be implemented** successfully in the workplace, while avoiding misuse and ensuring that wage negotiations are linked to productivity gains.

- **Technologies that enhance rather than automate** should be incentivized through tax policies and job training, and mechanisms should be designed to create jobs and improve inclusion to counterbalance job loss caused by technology.

- Projections of **job losses and productivity increases** are sometimes exaggerated as can be seen in retrospective analysis. A new political economy would need to be established if wages are not the means for people support themselves in future.

Benjamin Brake
Director General Federal for Digital and Transport, Germany

Christy Hoffman
General Secretary, UNI Global Union

Ahmed N. Tantawy
Ministry of Communications and Information Technology, Egypt

Wendell Wallach
Carnegie/Uehiro Fellow Carnegie Council for Ethics in International Affairs

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Shaping technology development through anticipation and governance

- **Trust and social acceptance** of emerging technologies and the institutions governing them is critical to support development, yet is in decline.

- Technologies often exacerbate inequalities or even have **inequity baked in**, which degrades public trust.

- **Building legitimacy requires stakeholder engagement to align innovation with citizen values**, although challenging to integrate into the decision-making processes.

- Technology for good is everyone's responsibility: Innovators, government and the public.

- Should not just discuss risks but also the desirable visions and applications for technology, **leveraging past experiences to anticipate futures**.

- Good methods to identify technical risks exist, but are more limited for social and ethical risks. Need to build capacity and promote multidisciplinary approaches. **OECD Framework for Governance of Emerging Technologies** is a useful tool to support such efforts.

David Winickoff
Head of the Responsible Innovation Unit, OECD

Justine Lacey
Director, CSIRO

Shobita Parthasarathy
Professor and Director, University of Michigan

Brice Laurent
Researcher, Social Sciences Department Director Mines Paris & ANSES

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Tech Talk on Quantum technologies

Joseph Mikael

Head of Quantum Computation & Quantum Information project, EDF

High-impact area 3: Sustainable digitally-augmented spaces

- The **environmental impact from the manufacturing** of digital devices is underappreciated relative to the impact of operating those devices; **encouraging durability and longer-term use of devices** can work as a complement to clean energy initiatives.

- **Regional inequality** in terms of both access to connectivity and renewable energy resources for powering online activities remains substantial and may even be growing.

- Latin America is among the **areas that could benefit most from advanced digital technologies but has the least access** due to costs and connectivity.

- **Broad access to data** has the potential to strengthen democracies and help people find common ground, but technologies need to be designed right to facilitate these results.

- Energy demand from data infrastructure is extremely geographically concentrated and policy can benefit from **focusing on targeted localities**.

- **"Trust in technology** arrives on foot but leaves on horseback"; one approach to achieving trust in technology is to deploy technologies whose default is to trust its users and feature transparency.

Clara Neppel
Senior Director, IEEE European Business Operations

José Juan Haro
Chief Wholesale & Public Affairs Officer, Telefónica Hispam

George Kamiya
Senior Manager, Climate Action, GSMA

Takayo Takamuro
Managing Director & European Chief Executive, KDDI Europe

Rudy van Belkom
Executive Director, The Netherlands Study Centre for Technology Trends

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Tech Talk on the European Commission's Destination Earth digital twin initiative

Liina Munari

Deputy Head of Unit, High Performance Computing and Applications, European Commission - DG CONNECT

Roundtable discussion: Focus groups rapporteurs

Co-Chair Benjamin Brake
Director General "Digital- and Data-Policy", Federal Ministry for Digital and Transport, Germany

Co-Chair Yongsuk Jang
Senior Researcher, Science and Technology Policy Institute

Souichirou Kozuka
Professor, Tokyo Gakusyuin University

- **Immersive technologies** offer appealing opportunities for education and training but also raise concerns about being used to spread mis/disinformation or propaganda. While immersive technologies could deliver benefits facilitating remote healthcare in support of inclusion and an ageing society, data collection required to serve those benefits raises questions about protecting sensitive or personal data. Spatial computing can be used for collaborative industry or creation and virtual worlds could be used to connect people but there is a risk of deepening divides if they lack interoperability and contain users in fragmented spaces.

David Hutchinson
Professor of Physics, University of Otago

- **Quantum technologies** hold promise for advancing healthcare through improved diagnostics, drug development, and deeper insights into brain functions, while also enhancing environmental monitoring to address societal goals. However, challenges such as workforce shortages, security risks, and geopolitical competition threaten progress, making international collaboration essential for scientific breakthroughs and responsible development.

Nina Youssoufou
Policy Advisor for Healthcare Innovation and Synthetic Biology, French Ministry for Europe and Foreign Affairs

- **Synthetic biology** could lead to transformative change in many sectors, from healthcare and food security to manufacturing and environmental sustainability. The convergence with AI, automation and robotics is further accelerating the pace of this innovation. To ensure it develops responsibly, considerations around equitable access, biosafety/biosecurity, and fostering resilient innovation ecosystems should be top of mind in global conversations.

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Roundtable discussion: High impact panel rapporteurs

Co-Chair Benjamin Brake
Director General "Digital- and
Data-Policy", Federal Ministry
for Digital and Transport,
Germany

Co-Chair Yongsuk Jang
Senior Researcher,
Science and Technology
Policy Institute

Francesca Colombo
Head of the Health Division
OECD

Health and the human body

Nataliya Kosmyna
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Massachusetts Institute of Technology

Learning and cognition

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Senior Director
IEEE European Business Operations

Sustainable digitally-augmented spaces

Closing remarks

Jerry Sheehan

Director

Science, Technology and Innovation, OECD