Recommendation of the Council on Digital Technologies and the Environment

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Background Information

The Recommendation on Information and Communication Technologies and the Environment was adopted by the OECD Council on 8 April 2010 ('2010 version of the Recommendation') on the proposal of the Committee for Information, Computer and Communications Policy (now called Digital Policy Committee, DPC). In view of the technological and policy advances in the years following its adoption, the Recommendation was revised by the Council meeting at Ministerial level on 4 June 2025 and renamed the Recommendation on Digital Technologies and the Environment.

The Recommendation aims to support countries in leveraging digital technologies and their underlying infrastructure for environmental sustainability goals while mitigating their environmental footprint. It provides a comprehensive analytical framework to assess the environmental impact of digital technologies across their life cycle, including their direct, enabling and systemic effects.

The OECD's work on digital technologies and the environment

Advances in digital technologies – such as artificial intelligence (AI), cloud computing, and the Internet of Things (IoTs) – underscore their growing role in advancing climate resilience, including by increasing energy efficiency, managing scarce resources, monitoring environmental standards and empowering consumers to make environmentally sustainable choices. At the same time, digital transformation, including growing data generation and use, can carry an environmental footprint that must be managed. The OECD's work on digital technologies, notably AI and broadband connectivity, underscores the dual nature of digital technologies' impact on the environment, including in the two OECD Recommendations in these areas – the Recommendation on Artificial Intelligence [OECD/LEGAL/0449] and the Recommendation on Broadband Connectivity [OECD/LEGAL/0322].

The process for revising the Recommendation (2023-2025)

The Recommendation is the product of a thorough multistakeholder revision process that started in 2023, with the initiation of the Recommendation's 2024 review of relevance. The process was supported by an informal expert drafting group and entailed iterative consultations across the OECD Secretariat and the IEA Secretariat, targeted consultations with experts from the OECD Expert Group on AI Compute and the Environment and consultations with relevant committees across the OECD.

Scope of the Recommendation

The Recommendation consists of eight principles: a foundational principle on comprehensive assessment of environmental impact throughout the digital technology life cycle; five operational principles (innovation, skills and public awareness, leveraging digital technologies to advance environmental sustainability, reducing their environmental footprint, advancing a harmonised measurement approach), and two policy principles (whole-of-government and multi-stakeholder approach, international co-operation).

Next steps and plan for disseminating and supporting implementation

The DPC serves as a forum to exchange information and good practices with respect to the implementation and dissemination of the Recommendation, monitor developments and emerging trends affecting implementation efforts, advance measurement and develop implementation guidance.

For further information please consult: https://www.oecd.org/en/topics/digitalisation-and-the-environment.html.
Contact information: digitalpolicycommittee@oecd.org.

Implementation

2018 Report to Council

The 2018 Report on the dissemination, implementation, and continued relevance of the Recommendation concluded that the Recommendation was still relevant and progress had been made by Adherents in the sharing of best practices and the incorporation of environmental sustainability criteria in public procurement. However, the report also pointed to potential areas of improvement. For instance, policies across Adherents focused mostly on the ICT industry and direct ICT use, particularly on energy efficiency and reducing CO2 emissions, rather than on enabling "smart" applications and life cycle approaches. In addition, environmental criteria were widely used in ICT goods and services procurement, but could be applied more rigorously, and relatively little information was provided on ICT-related skills, education and training. Finally, targets, indicators, assessment and evaluation were not yet systematically used and there was yet to be a widespread "evaluation culture" across Adherents.

The next reporting to Council is scheduled to take place in 2030.

2024 Review of Relevance

The Recommendation's 2024 review of relevance confirmed that the Recommendation remains relevant and that its content is instrumental. At the same time, the review identifies technological and policy developments that provide direction for revisions and point to specific gaps. The areas identified for revision cover terminology and scope, including a proposal to update the title of the Recommendation to "digital technologies" instead of "information and communication technologies"; developing a more holistic approach to measurement; introducing new elements to account for the role of the private sector and international cooperation; and streamlining and updating specific principles.

THE COUNCIL,

HAVING REGARD to Article 5 b) of the Convention on the Organisation for Economic Co-operation and Development (OECD) of 14 December 1960;

HAVING REGARD to the standards developed by the OECD in the areas of digital policy, including data governance and privacy, digital security, broadband connectivity, and artificial intelligence, science, technology and innovation policies, consumer policy and environmental sustainability;

HAVING REGARD to the Sustainable Development Goals set out in the 2030 Agenda for Sustainable Development adopted by the United Nations General Assembly (A/RES/70/1) and the resolutions by the United Nations Human Rights Council (A/HRC/RES/48/13) and the United Nations General Assembly (A/RES/76/300) on a human right to a clean, healthy and sustainable environment;

RECOGNISING the interlinkages between the digital and green transitions and their potential synergies, as well as their benefits and challenges;

CONSIDERING that digital technologies and their underlying infrastructure can help advance environmental sustainability and combat climate change across sectors, including by increasing energy efficiency, managing scarce resources, monitoring environmental standards and fostering systemic behavioural change, such as empowering consumers to make environmentally sustainable choices;

CONSIDERING that, at the same time, digital technologies and their underlying infrastructure, including increasing data generation and use, can negatively affect the environment, such as through greenhouse gas emissions, energy demand increases, raw material extraction, land and water use and pollution, biodiversity disruption, electronic waste and rebound effects leading to increased resource use despite efficiency improvements;

RECOGNISING the rapid pace of digital technological development and its impact on the relevance and effectiveness of digital policies and guidance in the medium- to long-term;

RECOGNISING the limited availability of comprehensive data and the methodological challenges in measuring the environmental impact of digital technologies, as well as the importance of appropriate safeguards, including on data protection, digital security and consumer protection;

RECOGNISING that the digital and green transitions are inherently global issues with varying impact across countries that require co-ordinated, international and multistakeholder collaboration;

RECOGNISING that Members and non-Members having adhered to this Recommendation (hereafter the “Adherents”) have different legal and institutional frameworks through which they will implement this Recommendation, as well as different regional and national contexts.

On the proposal of the Digital Policy Committee:

I. **AGREES** that, for the purpose of the present Recommendation, the following definitions are used:

- ‘**Digital technologies**’ refers to different types of communication networks and systems, including information processing and compute capacity and the technologies used in them. This entails both the underlying “physical layer” (e.g. communication infrastructures and devices, including semiconductors, network equipment, data centres, servers, smart sensors, Internet exchange points) and the “digital layer” (e.g. cloud and edge computing, software) of technologies, goods and services that enable the digital technology ecosystem. The digital

technology ecosystem encompasses all forms of communication, information and computing technologies such as the Internet of Things, artificial intelligence systems, immersive technologies, online platforms and distributed ledger technologies, among others.

- '**Life cycle**' refers to the following stages of digital technologies: design, production (including raw material extraction), transportation, deployment, operation and maintenance, and end-of-life (including electronic waste management).

II. **RECOMMENDS** that Adherents put in place policies that enhance the contribution of digital technologies to improving environmental sustainability and mitigating their environmental footprint. To this effect, Adherents should:

1. **Apply a comprehensive life cycle perspective** by:

   a) Considering the positive and negative impact of digital technologies on the environment, taking into account: i) their direct effects, ii) the enabling effects of their application across sectors, and iii) their systemic effects (e.g. behavioural changes induced by their use, rebound effects).

   b) Assessing the environmental impact of digital technologies, encompassing effects occurring throughout their life cycle, including energy mix and consumption, greenhouse gas emissions and natural resources such as water and rare earth materials.

2. **Foster innovation in digital technologies for environmental sustainability** by:

   a) Supporting fundamental research and research and development for leveraging digital technologies to improve environmental sustainability and mitigate their environmental footprint, including through appropriate regulations and policy measures to promote investment (e.g. tax incentives, grants) and by fostering open-source and multi-stakeholder research collaboration.

   b) Promoting co-operation, knowledge exchange, and efficient and responsible data generation, storage, access and sharing, including between and within the private sector, research institutions, governments, civil society and other stakeholders on the environmental impact of digital technologies.

   c) Facilitating rapid deployment, diffusion and scale-up of environmentally sustainable digital technologies and solutions.

3. **Promote skills and public awareness for the digital and green transitions** by:

   a) Advancing interdisciplinary education, training and skill development, including re-skilling and up-skilling programmes, to equip individuals, including developers of digital technologies, with the skills to harness digital technologies for environmental sustainability and mitigate their footprint, thereby fostering digital inclusion.

   b) Providing information, training and technical assistance to promote capacity building in environmental sustainability and digital skills in the public sector.

   c) Communicating accurate and accessible information on the impact of digital technologies on the environment and promoting good practices to empower the public and private sectors, civil society, and individuals, including consumers, to mitigate the environmental footprint of digital technologies.

4. **Leverage digital technologies to advance environmental sustainability goals** by:

a) Harnessing digital technologies to improve environmental performance and enhance sustainability, including by optimising water, energy and transportation usage, minimising electronic waste, enhancing resilience to climate-driven extreme events and enabling remote participation in economic and social activities.

b) Promoting the use of digital technologies for environmental modelling and monitoring (e.g. earth and ocean observation) to help understand and forecast environmental effects to inform policy measures, including to track, collect and analyse data on climate patterns, biodiversity, pollution and environmental conditions in real-time and to respond to environmental challenges.

c) Developing and adopting standards and guidelines and exchanging information and good practices with respect to personal data protection, intellectual property protection, digital security and consumer protection in the use of digital technologies for this purpose.

5. **Reduce the environmental footprint of digital technologies** by:

a) Supporting environmentally sustainable by design approaches, including relating to the production process, efficient energy use, data management, infrastructure sharing and network management, and software development, as well as through practices that empower consumers such as environmental information instruments (e.g. labelling).

b) Encouraging the adoption of environmentally sustainable practices by all relevant stakeholders throughout the life cycle and decommissioning of digital technologies, including through circular economy considerations such as the extension of digital technologies' lifespan, the re-use, repair, refurbishment, remanufacturing, recycling and sharing of products and components that minimise electronic waste.

c) Leading by example through the adoption of environmentally sustainable digital approaches, applications and services in the public sector, including the consideration of environmental criteria in the public procurement and use of digital technologies.

6. **Advance a harmonised measurement approach** by:

a) Furthering the development, adoption and implementation of internationally harmonised definitions, common standards, frameworks, indicators and methodologies for measuring, anticipating and reporting on the impact of digital technologies on the environment throughout their life cycle, and sharing good practices for measurement.

b) Encouraging all relevant actors in the digital technology ecosystem to measure, collect data, report periodically and foster transparency on the environmental impact of their activities.

7. **Adopt a whole-of-government and multi-stakeholder approach** by:

a) Co-ordinating digital, environmental, energy and other related policies, including through integrated national strategies and regulatory frameworks, where appropriate, to harness the potential of digital technologies to advance environmental sustainability goals while mitigating their environmental footprint.

b) Developing and regularly reviewing such strategies and policies and fostering the development of common frameworks by other actors (e.g. industry codes of practice) through a multi-disciplinary and multistakeholder approach to encourage all relevant actors in the digital technology ecosystem to consider the environmental impact of digital technologies, including through technology- and sector-specific guidance.

c) Including transparent, clear, and measurable policy objectives, performance targets and mechanisms in national strategies to monitor compliance and improve accountability, including self-reporting where appropriate.

8. **Co-operate at the international level** by leveraging the OECD and other global and regional fora to advance an integrated approach to digital technologies and the environment, including by bolstering the evidence base through the collection and exchange of data, knowledge and information on national policies and good practices, in particular with regard to measurement, across countries including developing countries, stakeholders and sectors.

III. **ENCOURAGES** relevant stakeholders in the digital technology ecosystem to disseminate and follow this Recommendation.

IV. **INVITES** the Secretary-General and Adherents to disseminate this Recommendation.

V. **INVITES** non-Adherents to take account of and adhere to this Recommendation.

VI. **INSTRUCTS** the Digital Policy Committee to:

a) serve as a forum to exchange information and good practices with respect to the implementation of this Recommendation;

b) monitor developments and emerging trends affecting the implementation of this Recommendation;

c) advance measurement and develop guidance to support the implementation of this Recommendation; and

d) report to Council on the implementation, dissemination and continued relevance of this Recommendation five years following its revision and at least every ten years thereafter.

About the OECD

The OECD is a unique forum where governments work together to address the economic, social and environmental challenges of globalisation. The OECD is also at the forefront of efforts to understand and to help governments respond to new developments and concerns, such as corporate governance, the information economy and the challenges of an ageing population. The Organisation provides a setting where governments can compare policy experiences, seek answers to common problems, identify good practice and work to co-ordinate domestic and international policies.

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- **Substantive Outcome Documents** are adopted by the individual listed Adherents rather than by an OECD body, as the outcome of a ministerial, high-level or other meeting within the framework of the Organisation. They usually set general principles or long-term goals and have a solemn character.

- **International Agreements** are negotiated and concluded within the framework of the Organisation. They are legally binding on the Parties.

- **Arrangement, Understanding and Others**: several other types of substantive legal instruments have been developed within the OECD framework over time, such as the Arrangement on Officially Supported Export Credits, the International Understanding on Maritime Transport Principles and the Development Assistance Committee (DAC) Recommendations.