

WORLD TELECOMMUNICATION
DEVELOPMENT CONFERENCE



ITUWTDC
BAKU2025

17–28 November 2025
Baku, Azerbaijan

Advancing Monitoring of ICT Sector Climate Impact at National and Industry Levels

Un numérique soutenable au bénéfice du développement durable
23e réunion annuelle de Fratel - 09 et 10 octobre à Luxembourg





ITU Targets and Resolutions

Advancing Green Digital Transformation for a Net-Zero ICT Sector

Imperative

As global connectivity grows, responsible innovation linked to environmental and circular goals is vital in digital technology's lifecycle. With expanding digital society and more electronic devices, e-waste and ICT-related carbon emissions will keep increasing.

Target 2.5 seeks to notably enhance ICTs' role in climate action, focusing on global e-waste recycling rate and telecom/ICTs' impact on global greenhouse gas emissions.

Resolutions

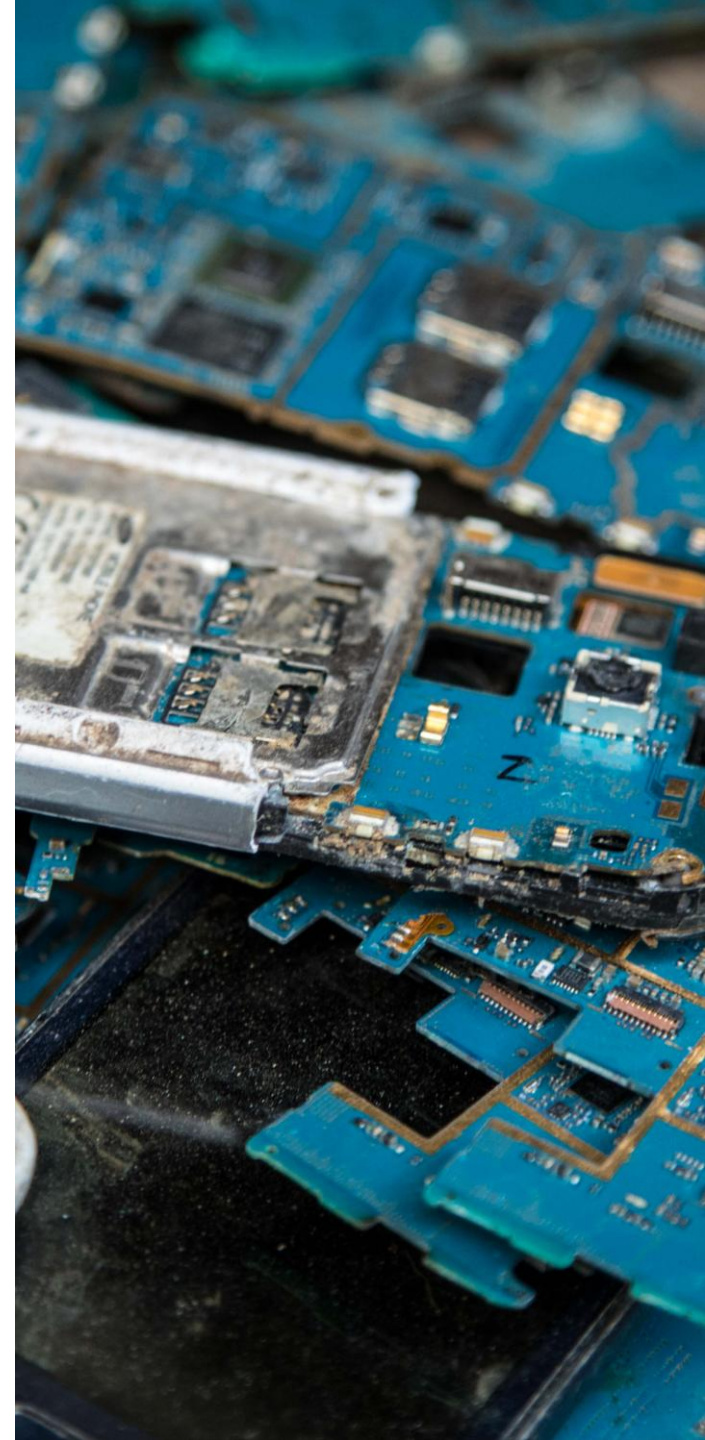
WTDC Resolution 66 (Rev. Kigali, 2022) of the World Telecommunication Development Conference, on information and communication technology, environment, climate change and circular economy.

PP Resolution 182 (Rev. Bucharest, 2022) on the role of telecommunications/information and communication technologies in regard to climate change and the protection of the environment.

Example of regional initiatives

Asia-Pacific (ASP 5): Contributing to a secure and resilient ICT environment.

Sustainable ICT policies are essential to mitigate environmental impact of digital expansion.





Importance of ICT sector climate data

- Increasing production and utilization of digital technologies lead to escalating energy consumption, especially in regions with limited energy resources.
- Precise emission estimates of the ICT sector is elusive compared to other sectors.
 - Estimates range from 1.5 - 4% of global emissions, similar to aviation.
 - High-emitting sectors like transport, energy, and forestry have well-established measurement approaches guiding policy and mitigation efforts.
 - Limited measurement of ICT emissions stems from historical priorities, data complexities, and relatively lower emissions.
- Lack of regulated GHG emissions and energy use tracking and reporting hinders the regulatory environment, policy making, target setting, and progress tracking.
- ITU is spearheading work to collect and disseminate reliable GHG emissions and energy use data from the ICT sector, at the **industry and country level**.



Accurate data is crucial for understanding ICT's environmental impact.



Empowering informed policy decisions and sustainable practices.



Monitoring ICT Industry Climate Impact



Greening Digital Companies report -

Monitors emissions, energy use and climate commitments of 200 digital companies via an annual industry assessment report in partnership with the World Benchmarking Alliance



Greening Digital Dashboard

Provides open data on emissions, energy, and climate targets to drive accountability and progress

<https://greeningdigital.itu.int>

Objectives



Monitor emissions and energy use



Assess and benchmark climate commitments



Strengthen transparency & accelerate action





National ICT Sector Climate Monitoring



ITU assists countries in monitoring ICT sector climate impact, with a particular focus on GHG emissions and energy use through technical support and indicator development.

Objectives

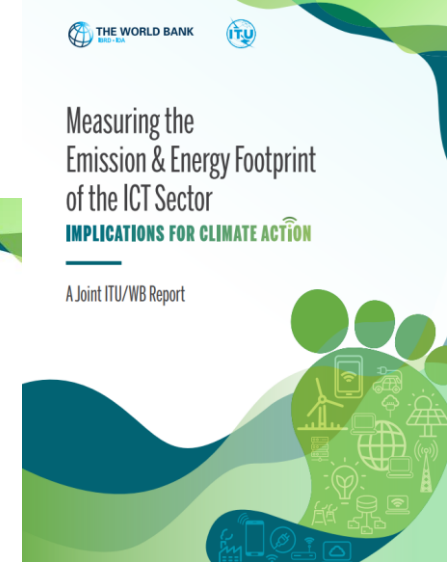
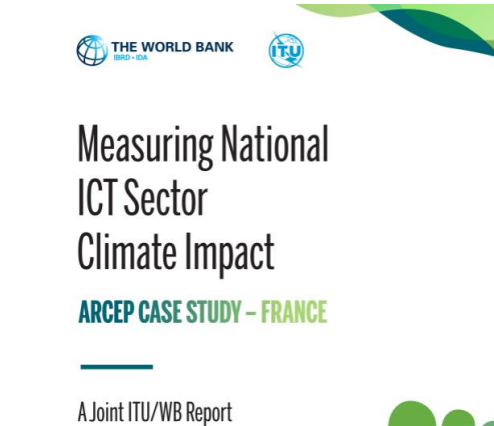


Harmonize climate monitoring indicators that are feasible for countries to collect.

Training ICT regulators & relevant stakeholders in data collection, regulatory roles and target setting.

Develop a comprehensive dashboard for national emission tracking.

Supports drafting of national digital net-zero transition plans and target setting.



Philippines Tanzania

Advancing Green Digital Action Towards a Net-Zero Digital Sector in the Philippines and Tanzania

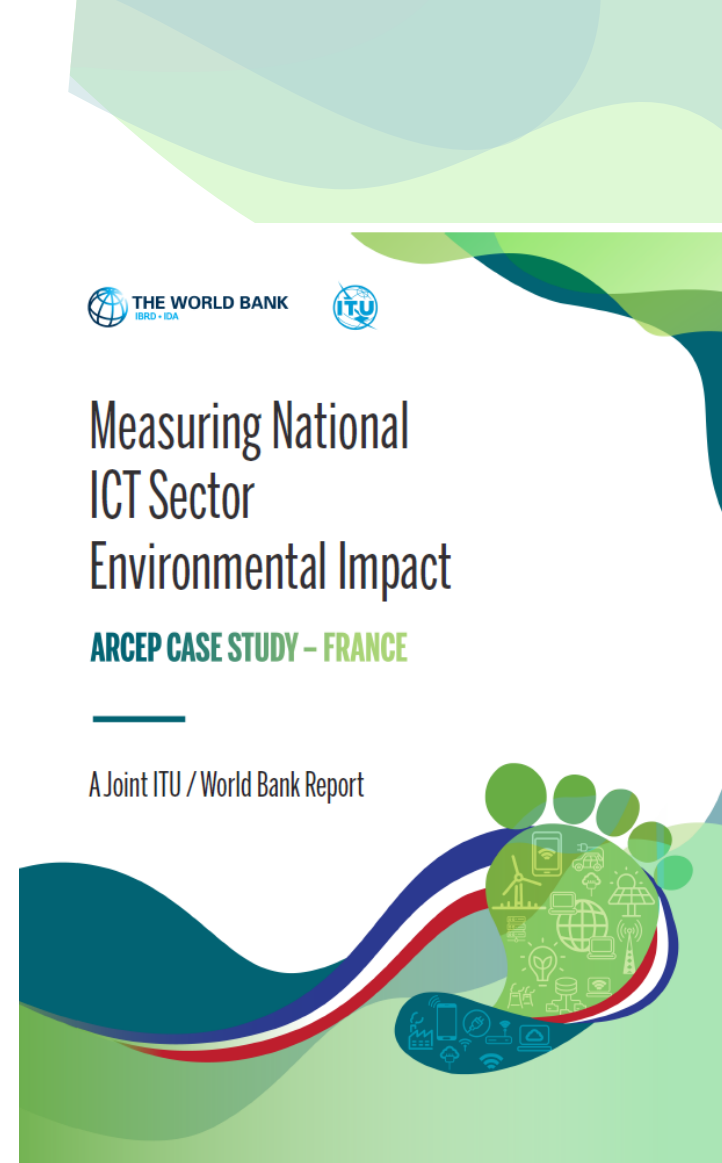
Government of Republic of Korea (Ministry of Science
and ICT, MSIT) and ITU Project
2025 - 2026

| Arcep Case Study - France

A joint case study by the World Bank and the International Telecommunication Union (ITU) builds on previous reports, focusing on key lessons from Arcep's approach to environmental data collection.

- ✓ Initiating Sustainability Data Collection – How Arcep started the process
- ✓ Legal Framework – Required legal adaptations to enable data collection
- ✓ Industry & Sector Coverage – Which companies and sectors are surveyed
- ✓ Data Outputs & Insights – Results and impact of Arcep's efforts

Highlights Arcep's key strategies and the impact of its data-driven approach, showcasing how it can serve as a model for effective regulatory practices worldwide.



EGTI Sub-group on National GHG Emission Monitoring Indicators Members

Agreed at the 15th EGTI Meeting (Sep 2024) to form a sub-group on environmental ICT sector indicators.

Focus: Monitoring national ICT sector greenhouse gas (GHG) emissions and energy use.

Supports ITU's Strategic Plan 2024-2027, specifically Target 2.5: "Boosting the role of ICT in climate and environmental action, measured by indicators such as the contribution of telecommunications/ICTs to global GHG emissions."

Current challenge: Lack of reliable and harmonized environmental data in the ICT sector, unlike energy and transport sectors with established frameworks, which limits national reporting and monitoring.

Impact: Data gaps hinder informed policymaking and regulatory actions. Few countries currently monitor the climate impact of their national ICT sector.

Contact eetmail@itu.int to find out more & join the subgroup



MEMBERS

Chair: Arcep, France



Africa

Uganda
South Africa
Zambia

Americas

Brazil
British Virgin Islands

Arab States

Comoros
Egypt

Asia and the Pacific

Malaysia
Philippines

CIS

Azerbaijan

Europe

Cyprus, France,
Norway, Portugal,
Greece, BEREC

EGTI Subgroup National-Level ICT Environmental Indicators

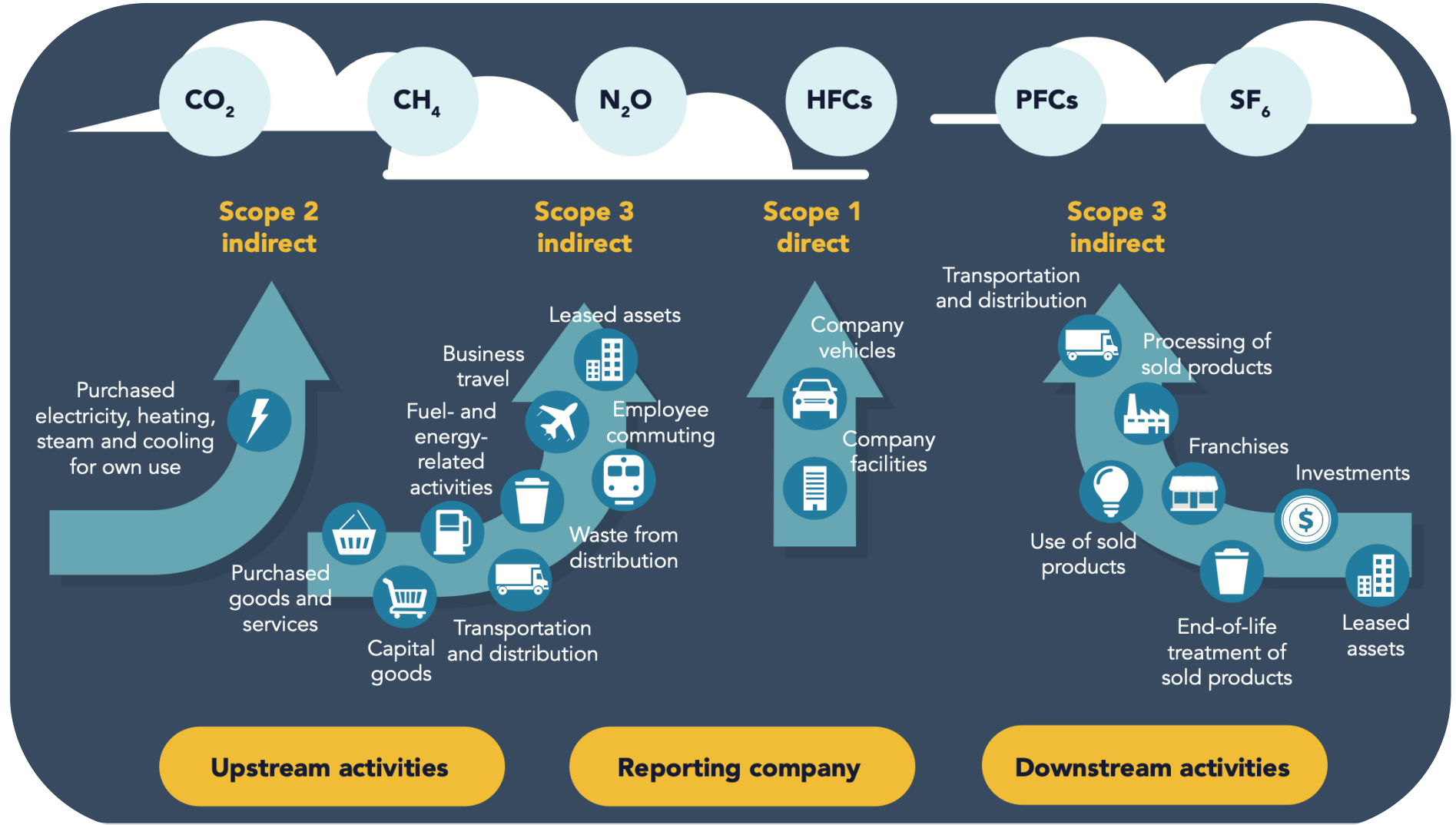
Player concerned	Category	Indicator
All	Carbon	Scope 1 GHG emissions (tCO ₂ e)
	Carbon	Scope 2 GHG emissions (location-based)
	Carbon	Scope 2 GHG emissions (market-based)
	Carbon	Scope 3 GHG emissions
	Energy	Total renewable/low-carbon energy consumption
	Energy	Breakdown of total renewable energy consumption by source (PPAs, guarantees of origin, on-site)
	Energy	Total electricity consumption (MWh)
	Energy	Total renewable electricity consumption (MWh)
Telecom operators	Energy	Total energy consumption of telecom networks
	Energy	Breakdown of total network energy consumption between fixed and mobile networks
	Energy	Breakdown of the fixed and mobile network energy consumption by technology (fiber/ADSL or 2G/3G/4G/5G)
	Energy	Total electricity consumption of the set-top boxes and internet boxes used by operators' customers
Data center operators	Energy	Power Use Effectiveness (national mean)
	Other	Number of data centres operating nationally

Player concerned	Category	Indicator
Network equipment manufacturers	Energy	Total energy consumption of plants for the manufacture of equipment and breakdown by plant
	Others	Total water consumption of plants for the manufacture of equipment and breakdown by plant
	Others	Total potable water consumption of plants for the manufacture of equipment
	Others	Location of plants
	Others	Volume of precious metals and rare earth elements used to manufacture equipment
Data center operators	Energy	Total energy consumption of all the data centers in operation and the breakdown by site
	Energy	Total electricity consumption of IT equipment in all data centres in operation and breakdown by site
	Others	Total water consumption of data centers in operation and breakdown by site
	Others	Total potable water consumption of data centers in operation and breakdown by site
	Others	Location of data centers
End-user devices manufacturers	Energy	Total energy consumption of plants for the manufacture of end-user devices and breakdown by plant
	Others	Total water consumption of plants for the manufacture of end-user devices and breakdown by plant
	Others	Total potable water consumption of plants for the manufacture of end-user devices
	Others	Location of plants
	Others	Volume of precious metals and rare earth elements used to manufacture end-user devices

| What are emission Scopes?

The report helps track companies targets and progress to reduce emissions and energy use.

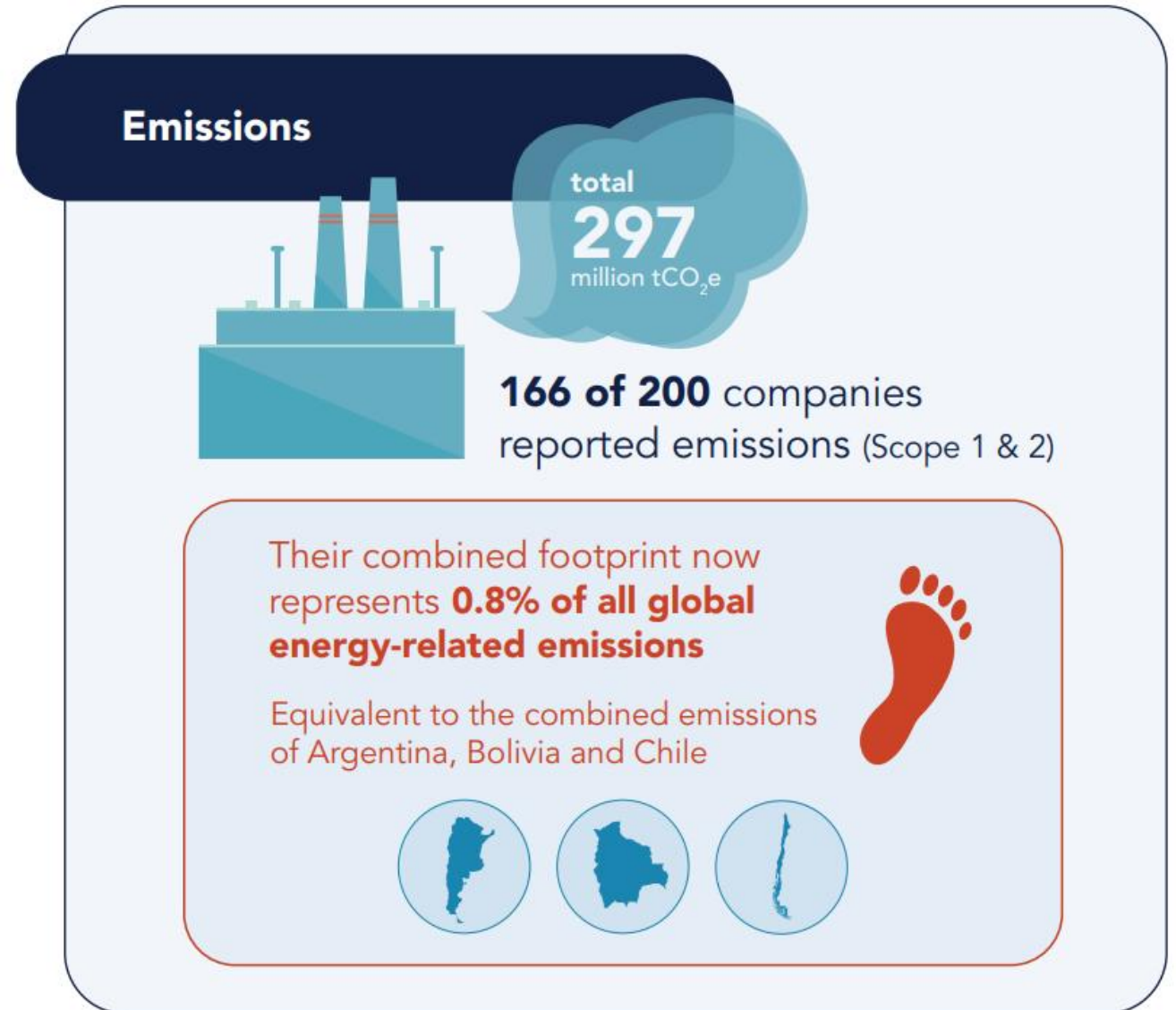
Covers Scope 1, 2 and 3 emissions.



Adapted from: <https://ghgprotocol.org/standards/scope-3-standard>

| Scope 1 & 2 emissions

- 166 companies reported 297 million tCO₂e in Scope 1 and 2 emissions in 2023, a 1.4% increase from 2022.
- This represents 0.8% of global energy-related emissions, equal to the combined annual emissions of Argentina, Bolivia, and Chile.
- The emissions from the sector represents 0.8% of global energy-related emissions.
- Emissions are highly concentrated - the top 10 emitting companies are responsible for 53% of all direct emissions.



| Scope 3 emissions

Scope 3 accounts for most emissions, 106 out of 200 provide a complete Scope 3 inventory



Note: When available, market-based Scope 2 emissions, which reflect purchased renewable energy and contractual agreements, were used. If market-based data were not reported, location-based Scope 2 emissions, which reflect the average emission intensity of the local grid, were used instead. This distinction is important, as market-based emissions can appear lower owing to renewable energy credits and power purchase agreements, whereas location-based emissions provide a clearer picture of actual grid dependency.

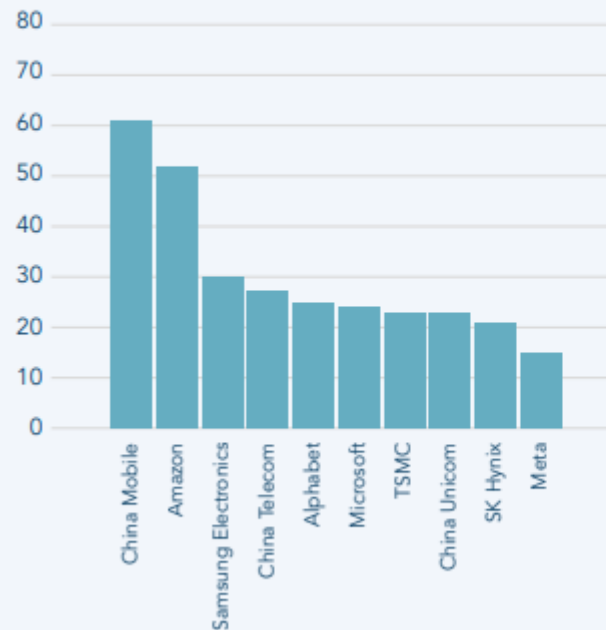
- Scope 3 emissions - indirect emissions across the value chain - account for the majority of digital companies' climate footprint.
- In 2023, 106 of 200 companies disclosed all relevant Scope 3 categories – up from 75 in 2022.
- Scope 3 emissions were over 5× higher than Scope 1 and 2 combined.
- Challenges remain:
 - Limited full disclosure, inconsistent methodologies, incomplete supplier data and category coverage.
 - Hinders transparency and accountability.

Electricity & energy consumption

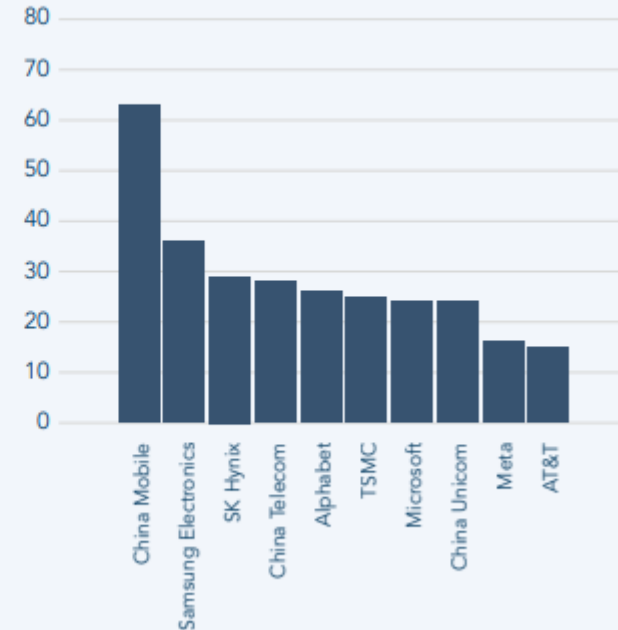
- 164 digital companies reported electricity consumption in 2023, accounting for 581 TWh of electricity (2.1% of the global total). This is a 12.2% increase from 2022 data.
- 173 companies reported data on energy consumption, reaching 681 TWh.
- Electricity demand is highly concentrated, with 10 companies responsible for 51.9 % of total electricity use.



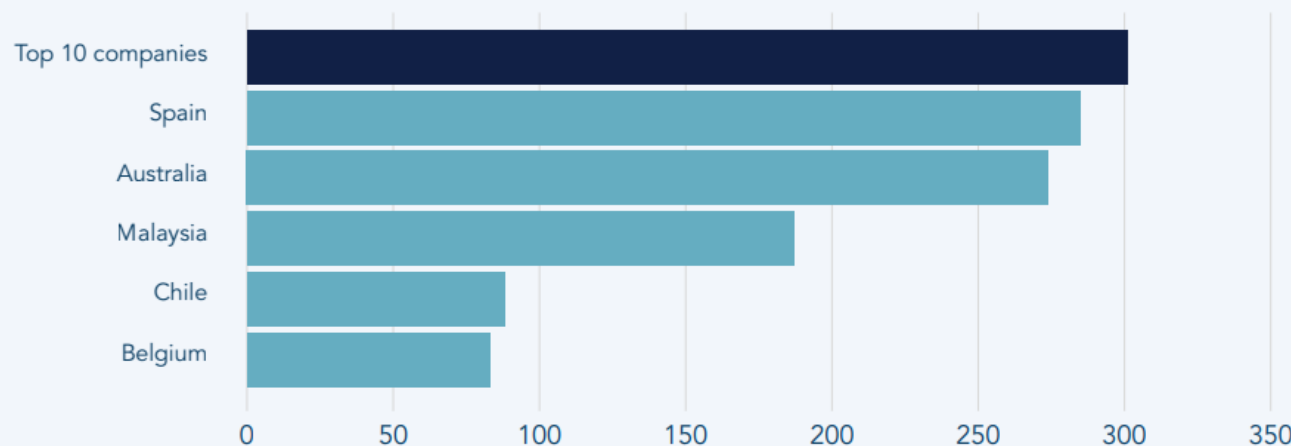
Total electricity consumption (TWh)



Total energy consumption (TWh)



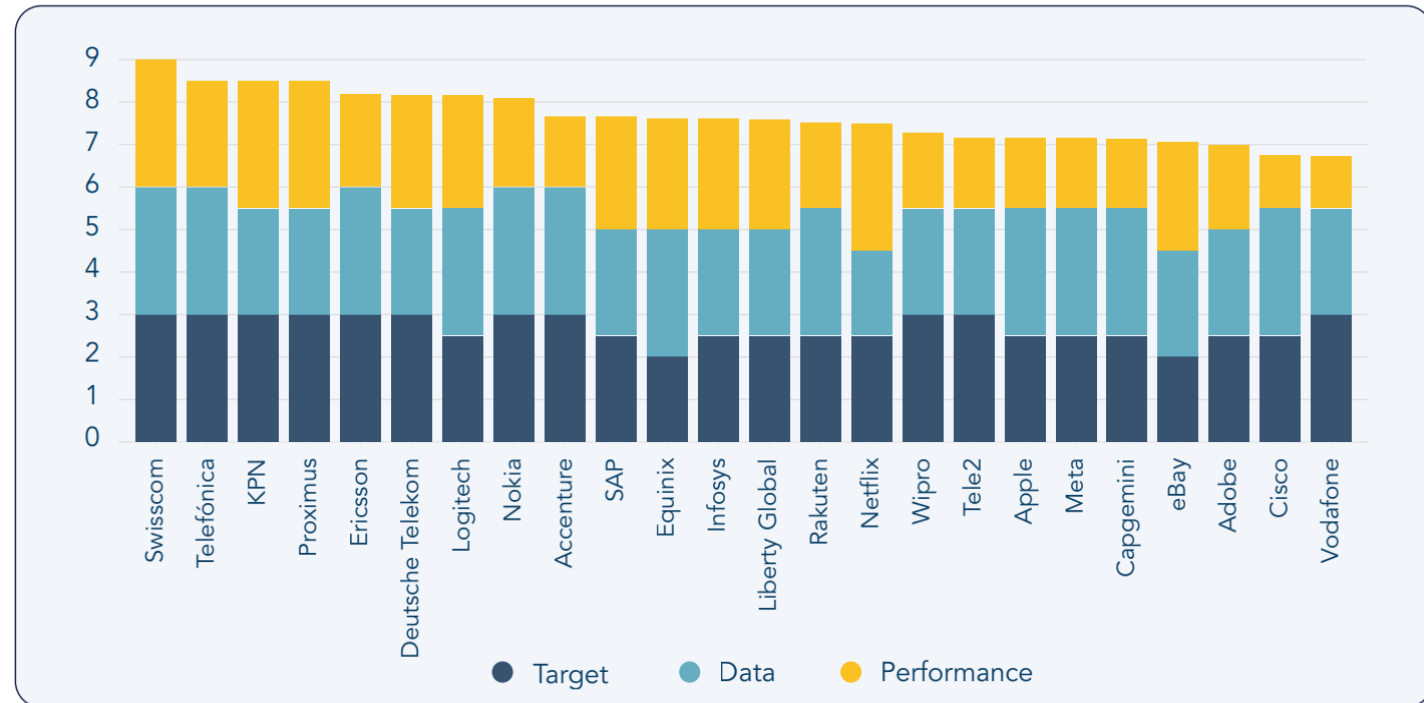
Total electricity consumption (TWh), total by 10 companies with the greatest consumption, compared to selected economies



Climate Assessment

- 94 companies scored $\geq 50\%$ in the assessment, up from 70 in the previous year.
- 24 companies scored $\geq 75\%$ (2 fewer than last year).
- 8 companies scored 90% or higher, up from 3 in the previous year.
- These top performers are mostly headquartered in Europe or the United States.

Companies scoring at least 75% on the climate assessment (n=24)



Note: After the assessment, VMWare was acquired by Broadcom in late 2023.

| AI, energy use and GHG emissions

- The rapid rise of AI is increasing electricity demand and GHG emissions.
- AI workloads, particularly generative AI models, require massive compute resources.
- AI-driven companies saw a 150% rise in operational emissions since 2020, driven by expanding data infrastructure and energy use.
- Data centre electricity consumption has been growing at 12% per year since 2017, outpacing total electricity consumption by a factor of four according to IEA.



| Conclusions and recommendations

ITU research shows that the ICT sector holds the innovation and influence to drive climate action, but ambition must be matched by credible, science-aligned efforts.

Operational emissions and energy use continue to rise despite stronger climate commitments – especially due to AI-driven demands.

For Regulators:

- Secure mandate for data collection
- Engage stakeholders early
- Start with standardized indicators & telecom data
- Expand to ICT subsectors (data centers, devices)
- Build internal expertise
- Collaborate with ICT industry & environmental agencies

For ICT Industry

- Strengthen reporting & publish transition plans
- Disclose AI's environmental footprint
- Collaborate across sectors for decarbonization
- Accelerate renewable energy adoption

**Improve data
reporting and
transparency**



**Advance
Scope 3
strategies and
cross-sector
collaboration**



**Accelerate
renewable
energy
adoption**





Thank you

Contact:

Sofie Maddens
Chief, Digital Knowledge Society Department,
Telecommunication Development Bureau (BDT),
International Telecommunication Union

sofie.maddens@itu.int