UNITED NATIONS CONFERENCE ON TRADE AND DEVELOPMENT

2024 Digital economy report

Shaping an environmentally sustainable and inclusive digital future

12 September 2024
Geneva, P166 short course

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UN trade & development
UNCTAD
60 years

Session structure

The *Digital Economy Report* is one of UNCTAD's flagship publications. The 2024 edition focuses on the interface between digitalization and environmental sustainability.

This session will present global trends and discuss the implications for developing countries.

- Introduction to UNCTAD's work on E-commerce and the Digital Economy
- Nexus of digitalization and environmental sustainability
- Environmental impacts along the life cycle of digitalization
- *Health break (15 min)*
- The case of e-commerce
- Policy conclusions and recommendations

Much focus on shaping our digital future

Intergovernmental negotiations on a Global Digital Compact

UNCTAD@60
(June '24)

Summit of the Future and Global Digital Compact
(Sept '24)

WSIS+20
(2025)

IGE on E-commerce and the Digital Economy

G20 Brazil
(2024)

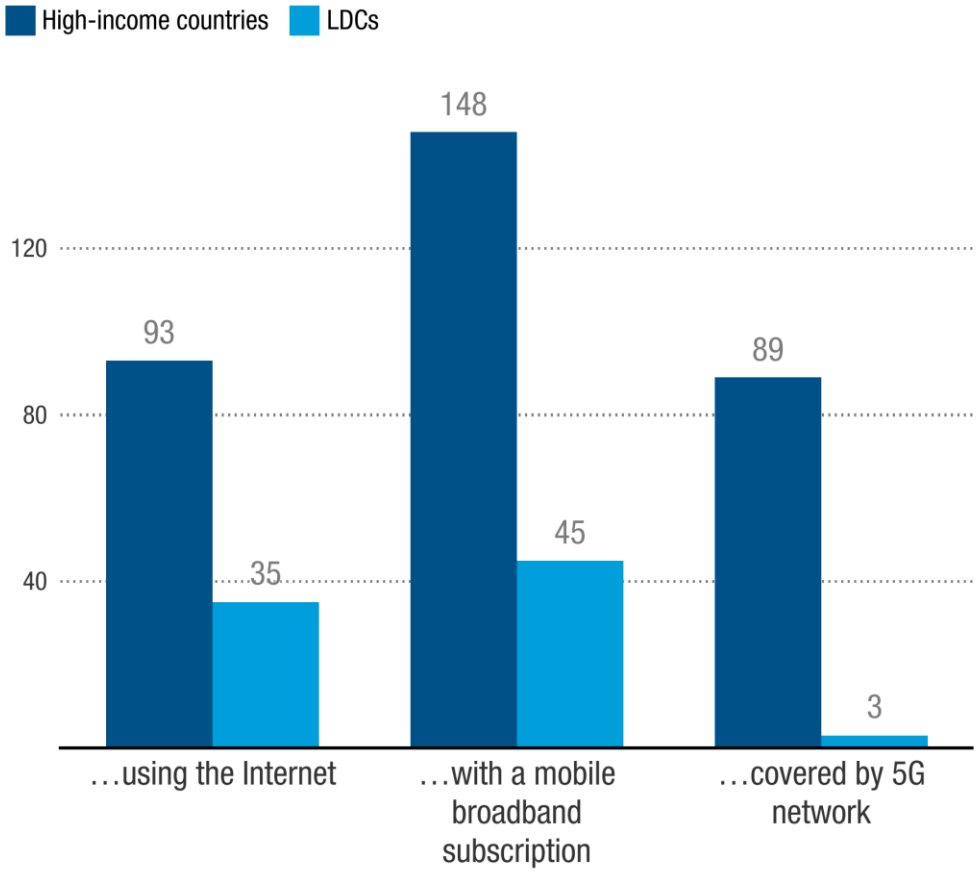
G20 South Africa
(2025)

UNCTAD XVI
(2025)

Gaping digital and e-commerce divides...

Access and use of the Internet varies significantly between country groupings: Share of people...

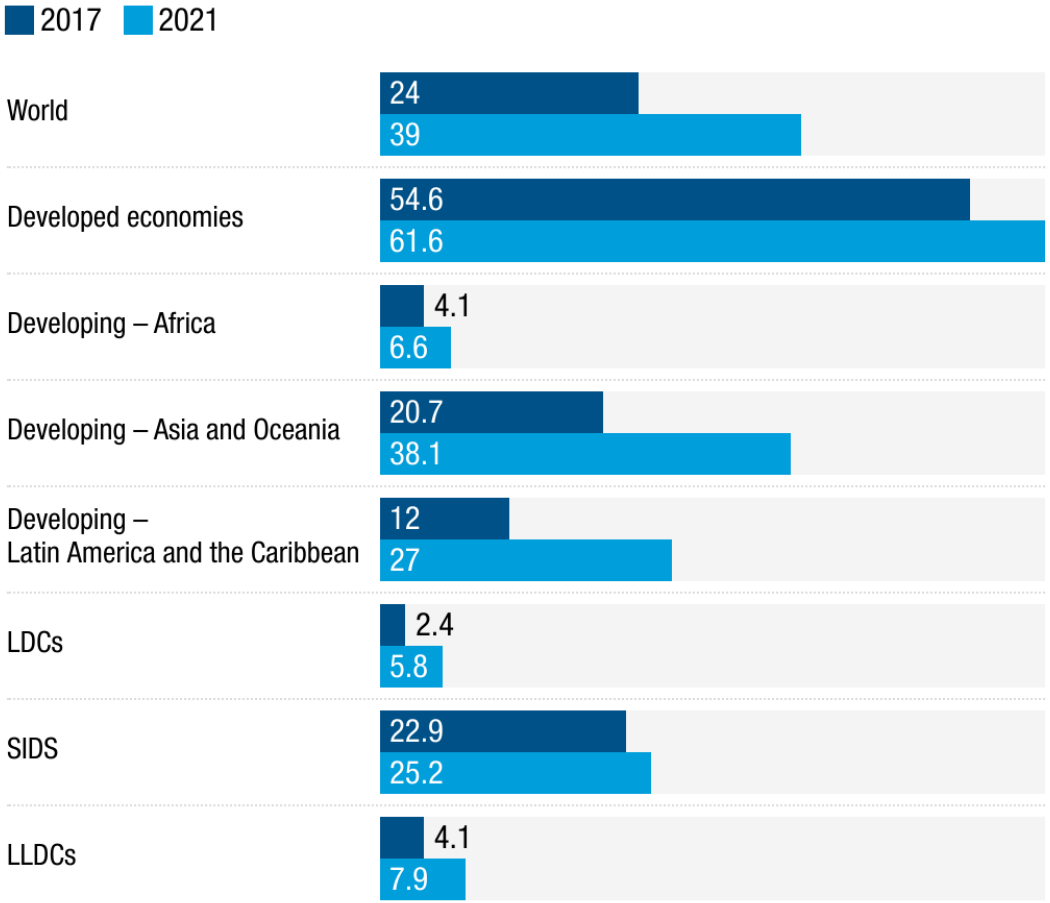
(in %)



Source: UN Trade and Development (UNCTAD), based on ITU (2023).

Uneven increases in e-commerce adoption across regions

Share of population (aged 15+) shopping online, by regions and country groupings (in %)



Source: UN Trade and Development (UNCTAD), based on World Bank Global Findex 2021.

Addressing two major challenges to harness digital

Limited readiness of developing countries to engage in and benefit from e-commerce and the digital economy

Limited effectiveness and scale of international support to address issues of the digital economy

Even more urgent since COVID-19

The digital economy is evolving fast, but at very different speeds. It brings both **opportunities** and **risks.** Global efforts are needed to mitigate the **widening income inequalities.**

Limited awareness among countries about opportunities and risks brought about the digital economy

Limited interactions among stakeholders to address e-commerce and digital economy issues

Lack of national strategies on the digital economy and limited reliable statistics

Inadequate access and limited ownership of relevant **ICT infrastructure**

Inadequate payment facilities for online transactions

Trade logistics and facilitation poorly adapted to e-commerce and the digital economy

Weak legal and regulatory frameworks and limited institutional capacity

Limited skills to harness the digital era

Insufficient financing for digital enterprise

Digitalization has major implications for the implementation of the **2030 Agenda for Sustainable Development**.

An integrated and comprehensive approach to build knowledge, capacity and consensus

ECDE Programme

Research & analysis

Digital Economy Report

Policy briefs and technical notes

Statistics on e-commerce and the digital economy

Technical assistance

E-commerce and law reform

eTrade readiness assessments
- Implementation support

E-commerce strategies

Measuring e-commerce and the digital economy

eTrade for Women

Consensus building & dialogue

IGE on Ecommerce and the Digital Economy

WG on Measuring E-commerce and the Digital Economy

eWeeks

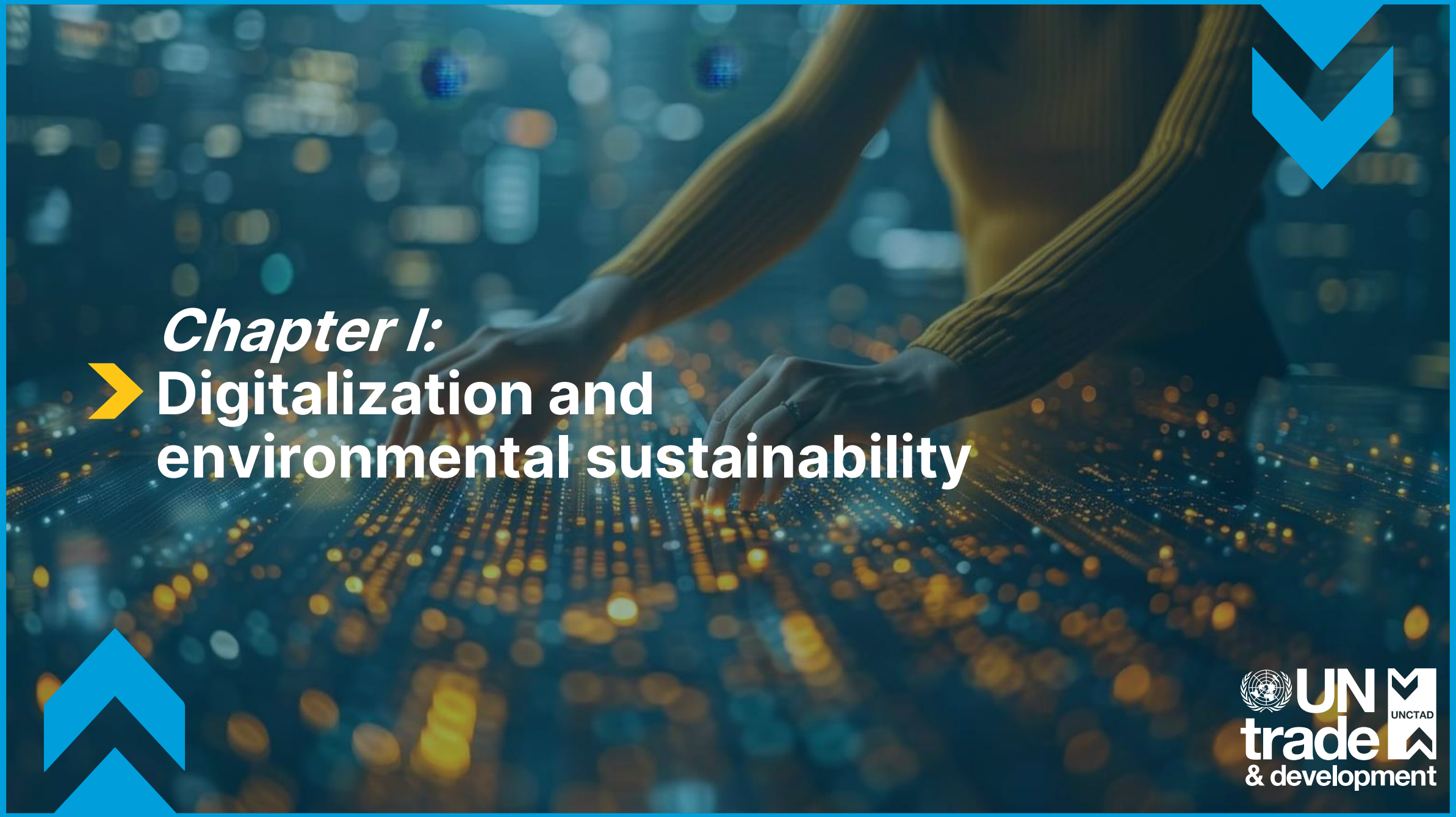
eTrade for all

...to harness e-commerce and the digital economy for inclusive and sustainable development

Kick-off poll

We must harness the power of digitalization
to advance inclusive and sustainable development, while mitigating its negative environmental impacts

Rebeca Grynspan, Secretary-General, UNCTAD



Chapter I: Digitalization and environmental sustainability

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Rapid transformation of the digital economy amidst challenges to planetary boundaries

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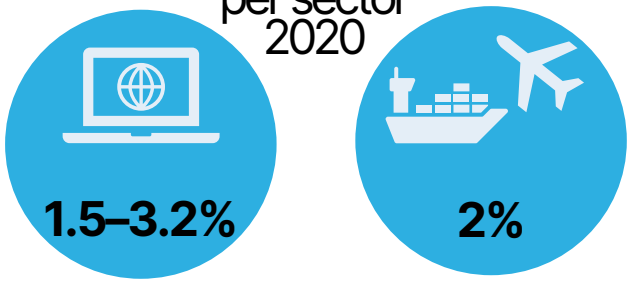
- Higher speed
- Cloud computing
- Platformization
- Exponential data growth
- Growing virtuality

Planetary boundaries
6/9 breeched

Digital divides
2.6 billion offline

Share of global greenhouse gas emissions per sector 2020



Average fixed Internet speed

Developed economies
LDCs
4.7x

Use of Internet

90%
Developed economies

36%
LDCs

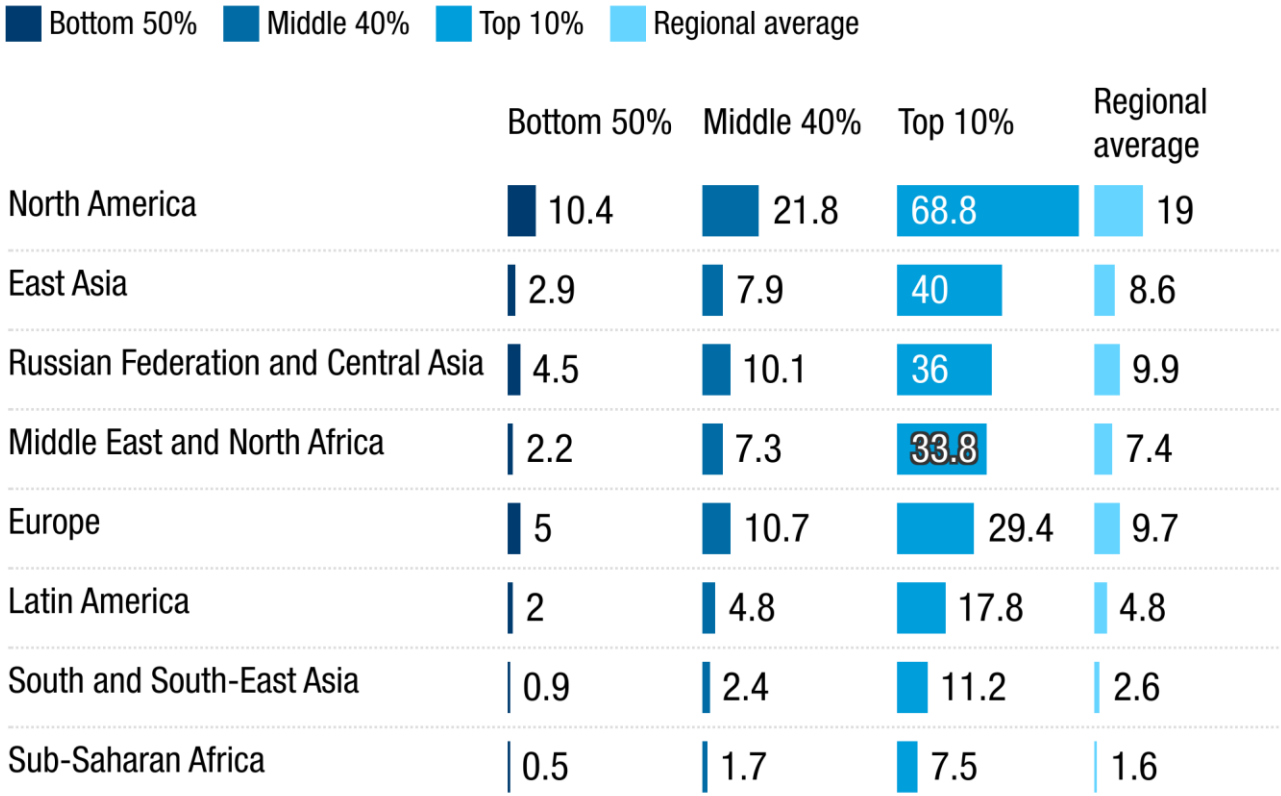
Sources: Richardson et al. (2023), ITU (2023), IPCC (2023), Ookla (2024).

Environmental impacts mirror development and digital divides

- **Unequal impacts of climate change**
  Hotter countries face reduced output, while wealthier, cooler ones benefit
- **Vulnerable populations hit harder**
  The bottom 40% and marginalized groups suffer greater losses from extreme weather
- **Biodiversity and natural resources**
  Low-income countries lose natural wealth; richer countries boost conservation

Environmental footprints between and within regions vary sizeably

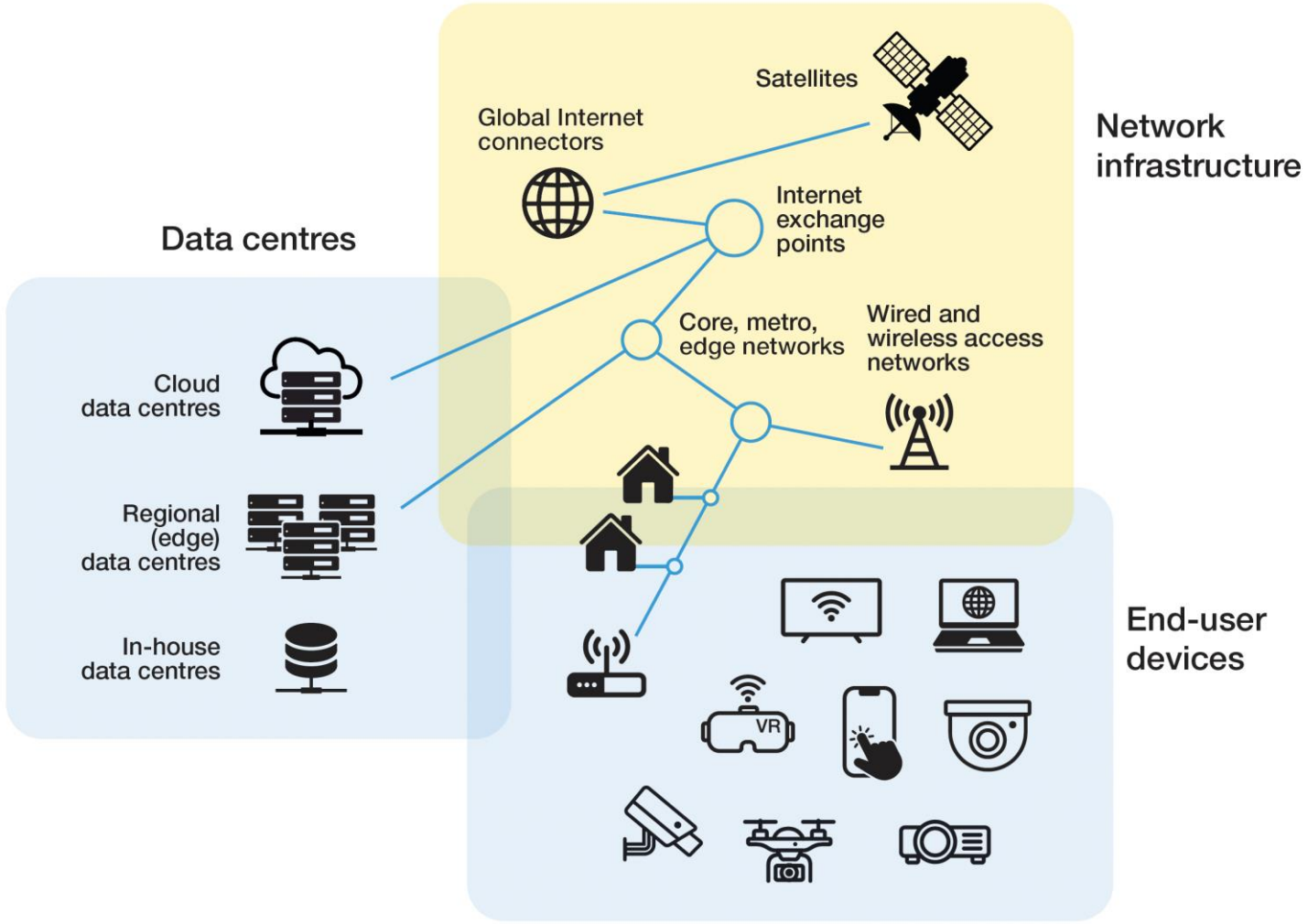
Tons of CO2 equivalents per capita and year



	Bottom 50%	Middle 40%	Top 10%	Regional average
North America	10.4	21.8	68.8	19
East Asia	2.9	7.9	40	8.6
Russian Federation and Central Asia	4.5	10.1	36	9.9
Middle East and North Africa	2.2	7.3	33.8	7.4
Europe	5	10.7	29.4	9.7
Latin America	2	4.8	17.8	4.8
South and South-East Asia	0.9	2.4	11.2	2.6
Sub-Saharan Africa	0.5	1.7	7.5	1.6

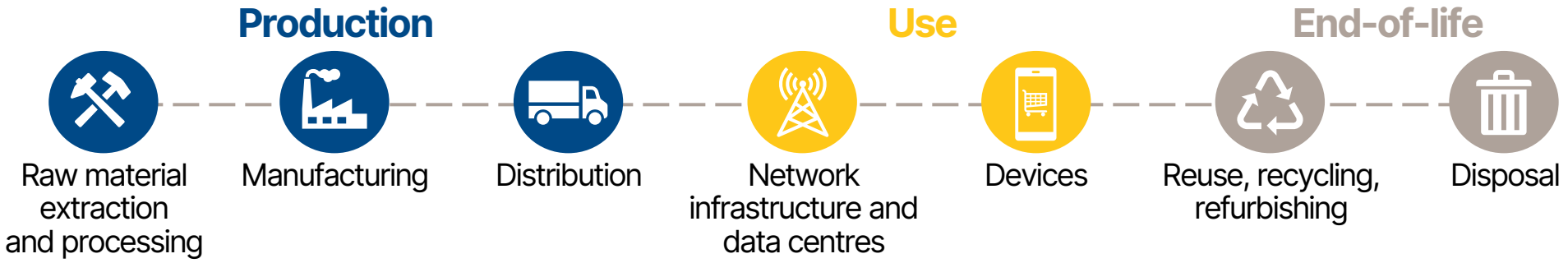
Source: UN Trade and Development (UNCTAD), based on Chancel et al. (2023).
Note: Regions as defined by the source.

ICT sector definitions remain a challenge in addressing environmental risk and opportunities



Source: UNCTAD, based on Pohl and Hinterholzer (2023).

Environmental impacts are generated along the whole digitalization life cycle



Direct effects

Natural resource depletion
Energy use
Water use
Greenhouse gas emissions
Pollution
...

Indirect effects

Substitution
Optimization
Induced consumption
Rebound
Societal effects
Systemic transformations

Environmental footprint of ICT

Assessing the overall footprint of digitalization remains challenging

Stronger evidence base needed

- Differing scope of ICT sector definition
- Lack of timely, comparable and accessible data
- Limited standardized reporting standards
- Limited disclosure on non-standard environmental impacts
- Variation in definition of life-cycle phases
- Non-harmonized assumptions and models for estimation
- Limited research on local impacts

Multi-criteria life-cycle assessments

Production phase most polluting

Mineral and metal depletion

GHG emissions

Water use

Biodiversity impacts

Air quality

Even the carbon footprint of the ICT sector remains imprecise

Global energy use

1–2%

Global electricity use

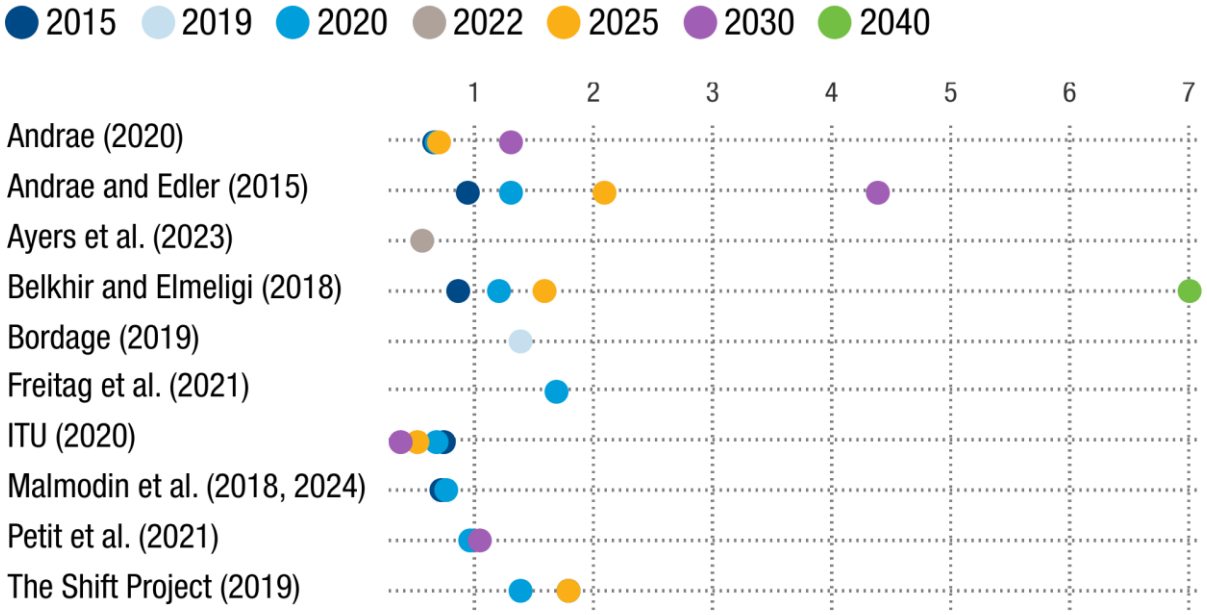
6–12%

Global GHG emissions

2015	2020
1.4–2.2%	1.5–3.2%

Projections of ICT sector's carbon footprint vary widely

Selected estimates of ICT sector greenhouse gas emissions, gigatons of CO2 equivalent emissions



Source: UN Trade and Development (UNCTAD).
Note: Some projections are estimate ranges: Belkhir and Elmeligi (2018) estimate 1.1–1.3 for 2018 and 1.4–1.8 for 2023; Freitag et al. (2021) estimate range is 1.2–2.2; Petit et al. (2021) estimate 0.89–1.2 for 2030.

An unequal ecological exchange marks digitalization, limiting development gains

Research remains scarce on environmental impacts of the digital economy on developing countries

Local environmental impacts, incl. on indigenous peoples and gender, are often overlooked

Negative impacts from device production and waste often affect regions located far from the principal location of use

Developing countries are less able to afford and harness digital technologies to mitigate environmental impacts

> At present, the world is not on track for achieving either inclusivity or sustainability

Chapter II:
Digitalization trends and the material footprint

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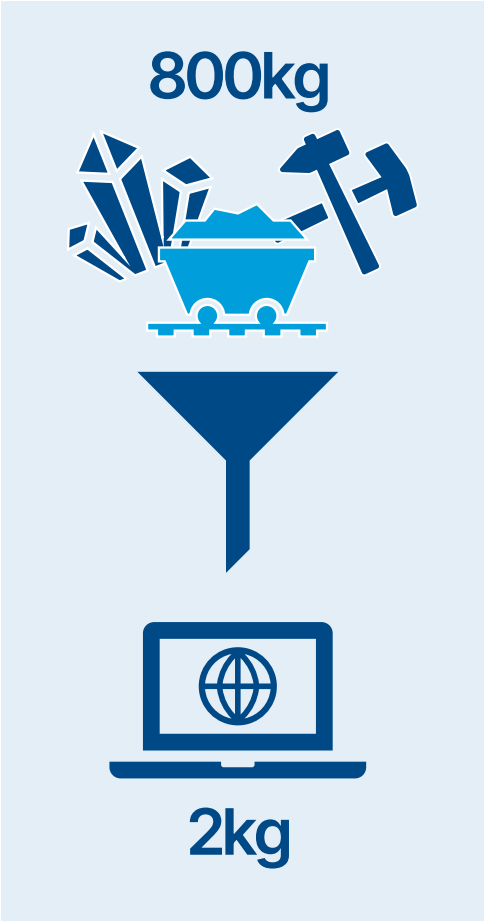
Digitalization's promise of dematerialization has yet to materialize



- **Global material footprint** has quadrupled since 1970 and may rise a further 60% until 2060 – **global concern**
- **Complexity** of devices is increasing – more elements from the periodic table used
  - Phones: 10 elements used in 1960, 27 in 1990 and 63 in 2021
- Heavy reliance on **raw materials**, including minerals and metals, plastics, glass and ceramics
- **Challenge**: low-carbon and digital technologies largely compete for the same minerals
  - Demand for cobalt, graphite and lithium is expected to increase by 500% until 2050

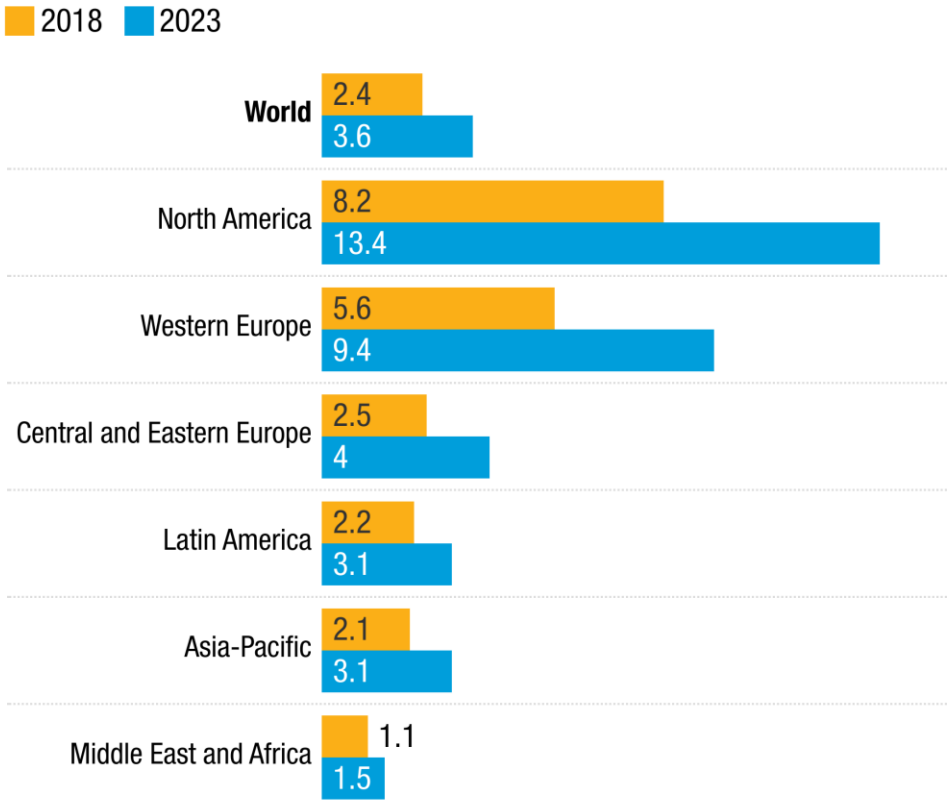
Sources: Justice et Paix (2019); Le Monde Diplomatique (2021); Hund et al./World Bank, 2020

Exponential growth in ICT demand and Internet use pushes the material footprint

UN trade & development

Significant increase in devices per capita in developed countries

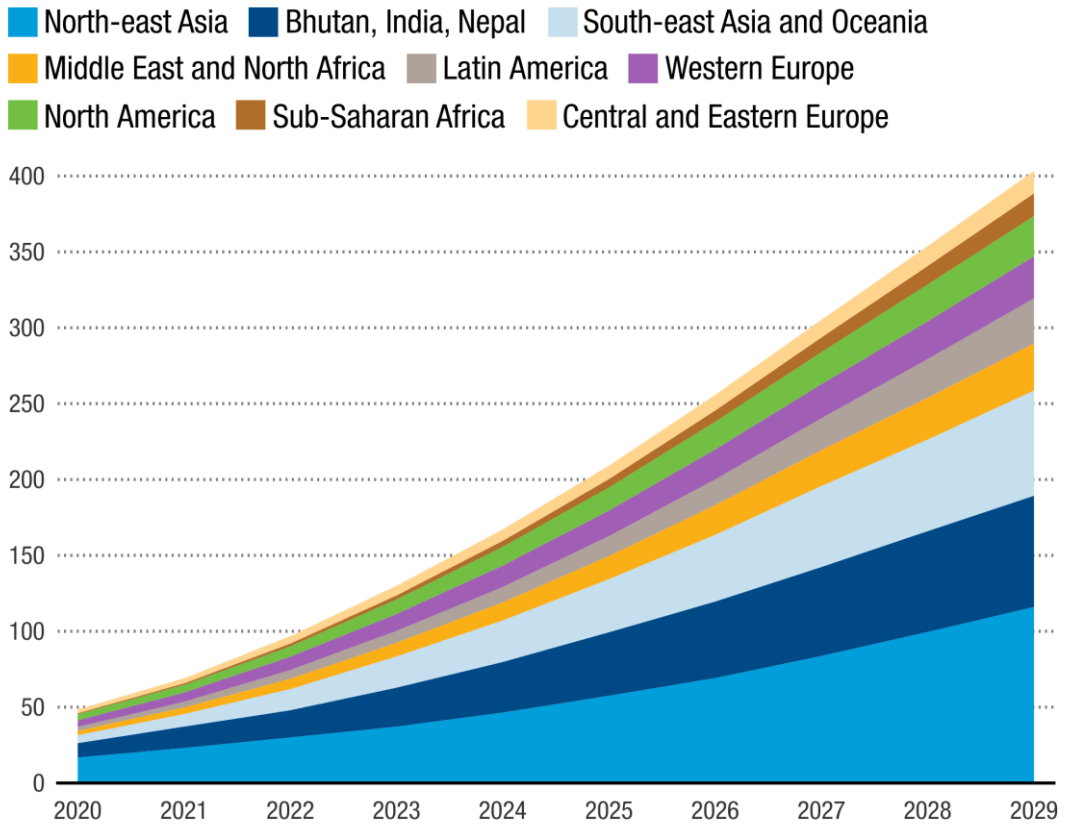
Average number of devices and connections per capita, by region, 2018 and 2023



Source: UN Trade and Development (UNCTAD) calculations based on Cisco.
Note: Country groups are those of the source.

Mobile data traffic is expected to more than double within the next 5 years

Data traffic by region, exabytes per month, 2020–2029

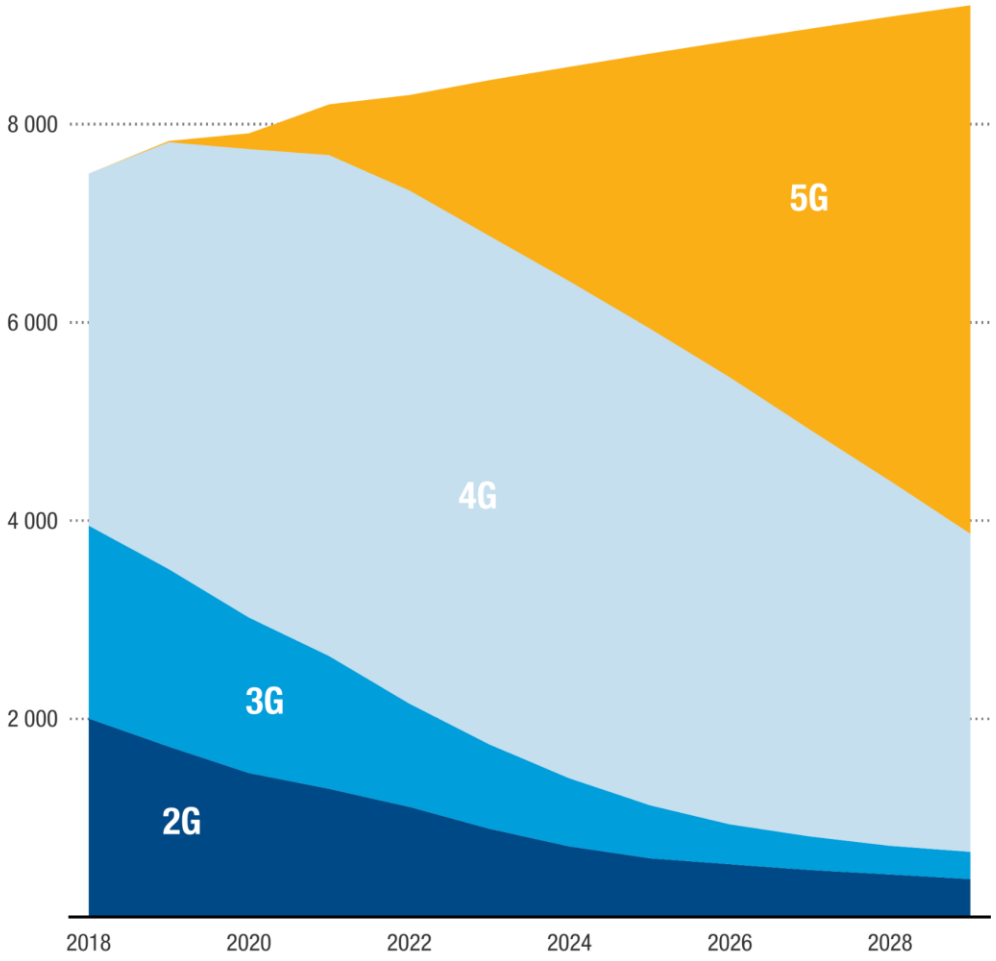


Source: UN Trade and Development (UNCTAD), based on Ericsson Mobility Visualizer.
Note: Country groupings are as defined by the source.

Exponential growth – further examples

Mobile broadband dominates global subscriptions

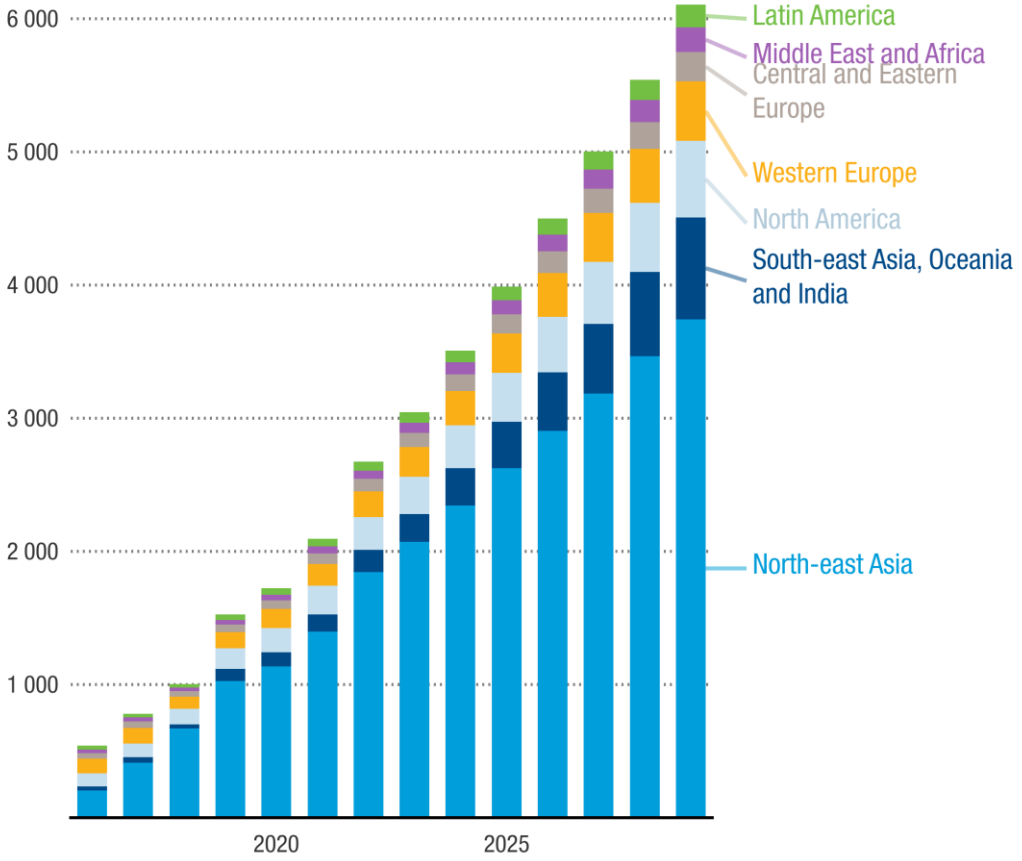
Global mobile subscriptions, by technology, 2018–2029



Source: UN Trade and Development (UNCTAD), based on Ericsson Mobility Visualizer – Mobility Report November 2023.

Internet of things devices forecast to surge amid digital economy boom

IoT devices with cellular connections, by country groupings, millions of connections, 2016–2029



Source: UN Trade and Development (UNCTAD), based on Ericsson Mobility Visualizer – Mobility Report November 2023.

Supply response pushes the mining frontier

Growing demand

- Both low-carbon and digital technologies require significant amounts of raw materials

New exploration

- Spurring **increased exploration** for new deposits
  - Global exploration budgets: +34% in 2021; +16% in 2022
  - But declining rates of discoveries of some critical minerals in recent years

Development of new mines

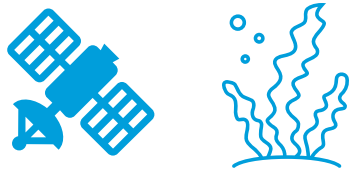
- Sharp increase in **mine development**
  - Investments: +20% in 2021; +30% in 2022

Production

- Increasing supply pressures and extraction difficulties as ore grades decline
  - Less efficient and time lag in availability

Need to rethink modes of consumption and production in view of potential limits to minerals supply on a finite planet and intergenerational equity

New mining frontiers?



Sources: S&P Global Market Intelligence (2023); IEA (2023a)

Geopolitics matter and may exacerbate digitalization's environmental footprint

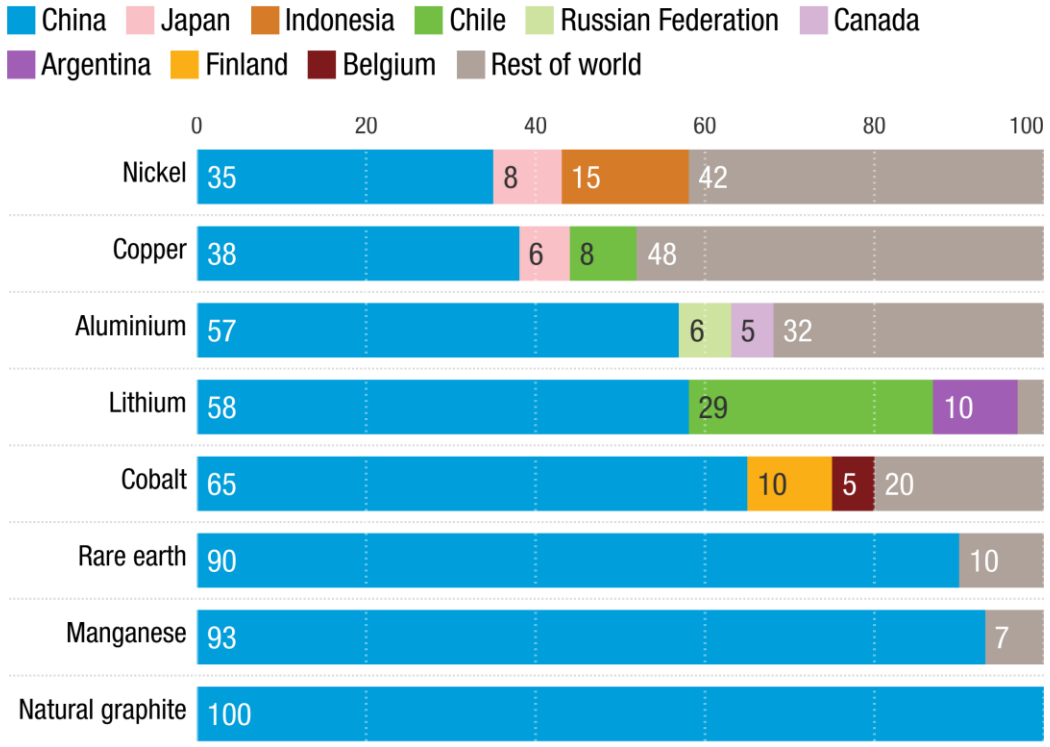
- High geographic concentration of mineral and metal reserves, extraction and processing
- For example, extraction in 2023:
  - 74% of cobalt – in the Democratic Republic of the Congo
  - 72% of lithium – in Australia and Chile
  - 59% of manganese – in Gabon and South Africa
- Most raw materials are exported for processing

Strategic interest in transition minerals are spurring new industrial policies in many countries

Risk of an expanded environmental footprint through hoarding and overcapacity

China leads in critical mineral processing

Share of top mineral processing countries in world total for selected minerals



Source: UN Trade and Development (UNCTAD), based on OECD (2023a).

Sources: United States Geological Survey (2023)

Resource-rich developing countries should benefit

Challenges

Developing countries engage in low value-added activities of the ICT value chain

- Risk of deepening commodity dependence
- Unequal ecological exchange
- Environmental and social concerns from mining

- Address trade and rent imbalances
- Regional cooperation for better exporter representation in negotiations
- International cooperation for
  - Sustainable sourcing practices
  - Balancing stakeholder needs

Opportunities

Leverage rising mineral demand for development

- Diversification along the value chain
- Structural transformation

Chapter III:
Environmental impacts in the use phase of digitalization

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Digitalization is boosting energy and water consumption

Energy efficiency and rebound effects

- Higher speeds and new applications increase use and traffic
- Rebound effects lead to more total consumption

Data centres and networks

- Backbone of the digital economy
- Bulk of emissions and energy footprint in this phase

User devices

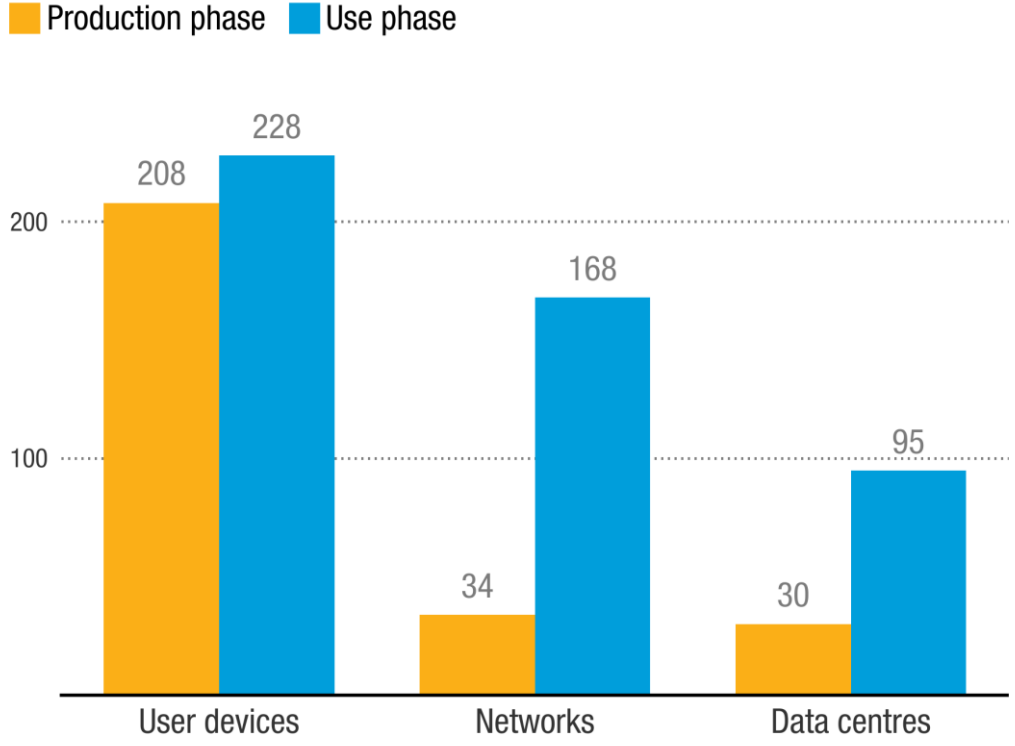
- Highly energy efficient per device
- Sheer number of devices leads to large impact

Water consumption

- Data centres' water use for cooling rising

Higher CO2 emissions from use phase across ICT infrastructure

Life-cycle greenhouse gas emissions, by ICT infrastructure type, megatons of CO2 equivalent emissions, 2020



Source: UN Trade and Development (UNCTAD), based on Malmodin et al. (2024)

Between efficiency and demand: User device impact is growing

- **Shift to smaller, energy-efficient devices**: Overall energy consumption has remained relatively flat
- **Smartphones consolidate functions**: One device often replaces several, reducing manufacturing and power needs
- **Rebound effects**: More demand for larger screens in monitors and TVs offsets some energy gains

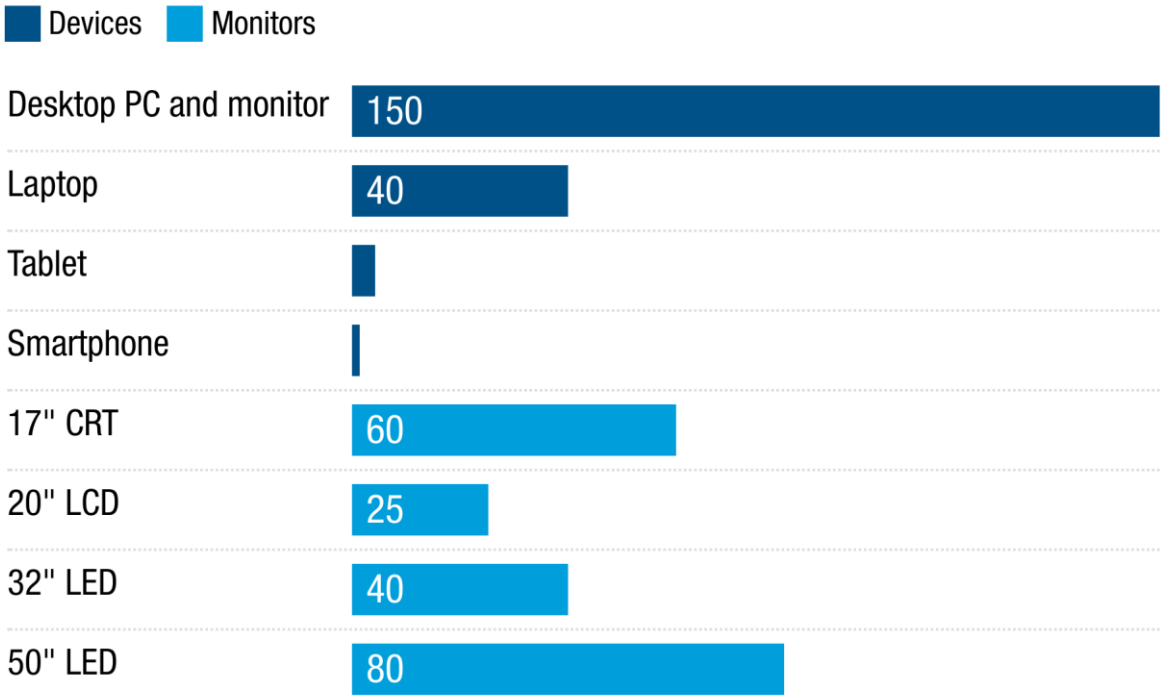
Energy consumption estimates

ICT end-user devices and non-ICT consumer electronics (2020)

Total energy use estimate (TWh)	Global electricity use share
600–1000	2.5–4%

Typical daily power consumption of devices and monitors is characterized by their size and screen technology

in Watts



Source: UN Trade and Development (UNCTAD), based on Urban et al. (2017) and Kamiya (2020a).

Sources: Andrae (2020); Andrae and Edler (2015), Malmodin and Lundén (2018); Malmodin (2020); Malmodin et al. (2024)

Data centres have an impact globally and locally

Data centres globally consume an estimated 460 TWh of electricity – similar to that of France

Pressure on local electricity grids is growing

- Ireland: 18% of total electricity consumption
- Singapore: 7%

Other local impacts

Water use climate and location dependent

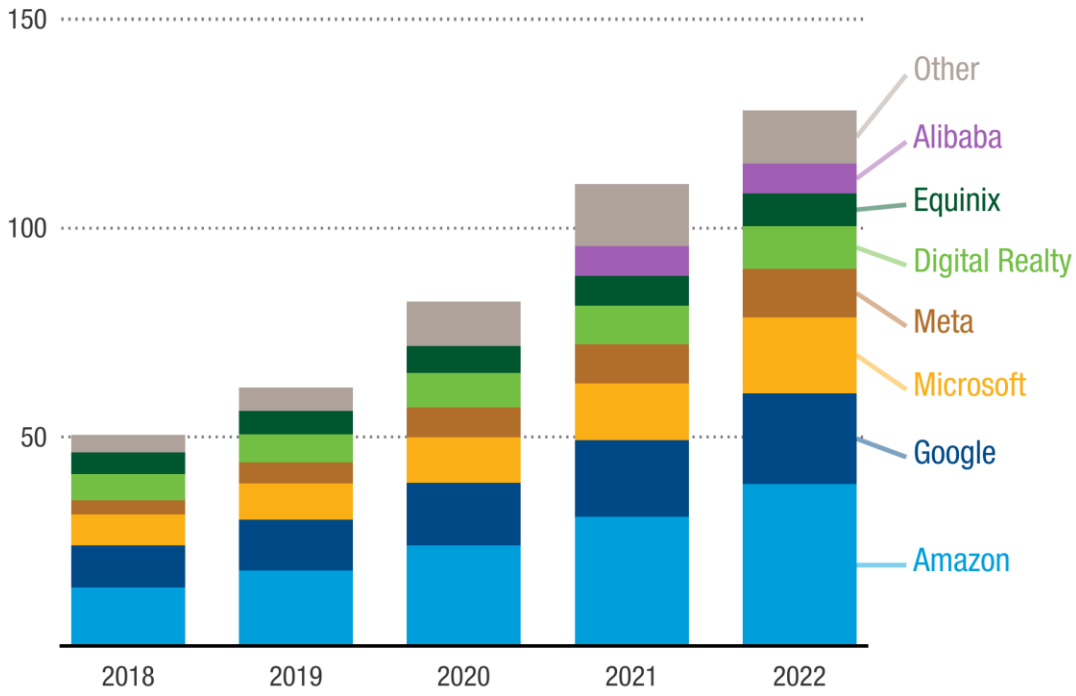
Noise

Measures to reduce impact

- Enhance energy and cooling efficiency
- Allow higher operation temperatures
- Make code more efficient and tailor software
- Address storage of rarely used data
- Switch to low-carbon energy sources

Electricity use by 13 of the world's largest data centre operators more than doubled between 2018 and 2022

Annual electricity consumption by selected data centre operators, terawatt hours, 2018–2022



Source: UN Trade and Development (UNCTAD), based on company reports.
Note: Other includes: Apple, Baidu, Chindata, GDS, Tencent, VNET.

Sources: IEA (2024), Ireland CSO (2023), Singapore MCI (2021).

Compute-intensive technologies boost energy and water use

AI, blockchain, 5G and IoT increase data processing needs and the environmental footprint of ICTs

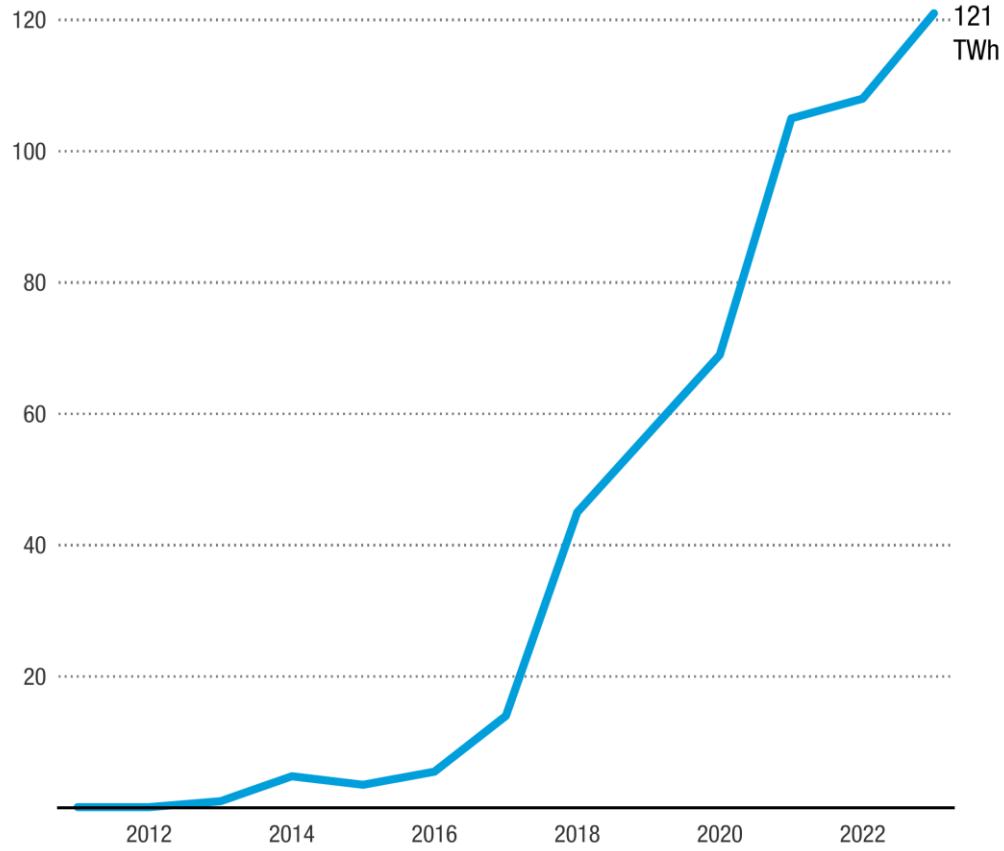
- Meta's machine-learning demand for computing has doubled annually
- Microsoft's data centres used 700,000 litres of potable water to train GPT-3 in the United States
- Blockchain energy demand expected to increase by 50% between 2022–2026

In view of expansion of compute-intensive technologies

- Essential to use low-carbon electricity, enhance data centre efficiency and manage equipment waste
- Improve availability of data on environmental footprint

Bitcoin's energy consumption has risen steeply over last decade

Annual bitcoin energy consumption, terawatt hours (TWh), 2010–2023



Source: UN Trade and Development (UNCTAD) calculations based on Cambridge Centre for Alternative Financing (2023).

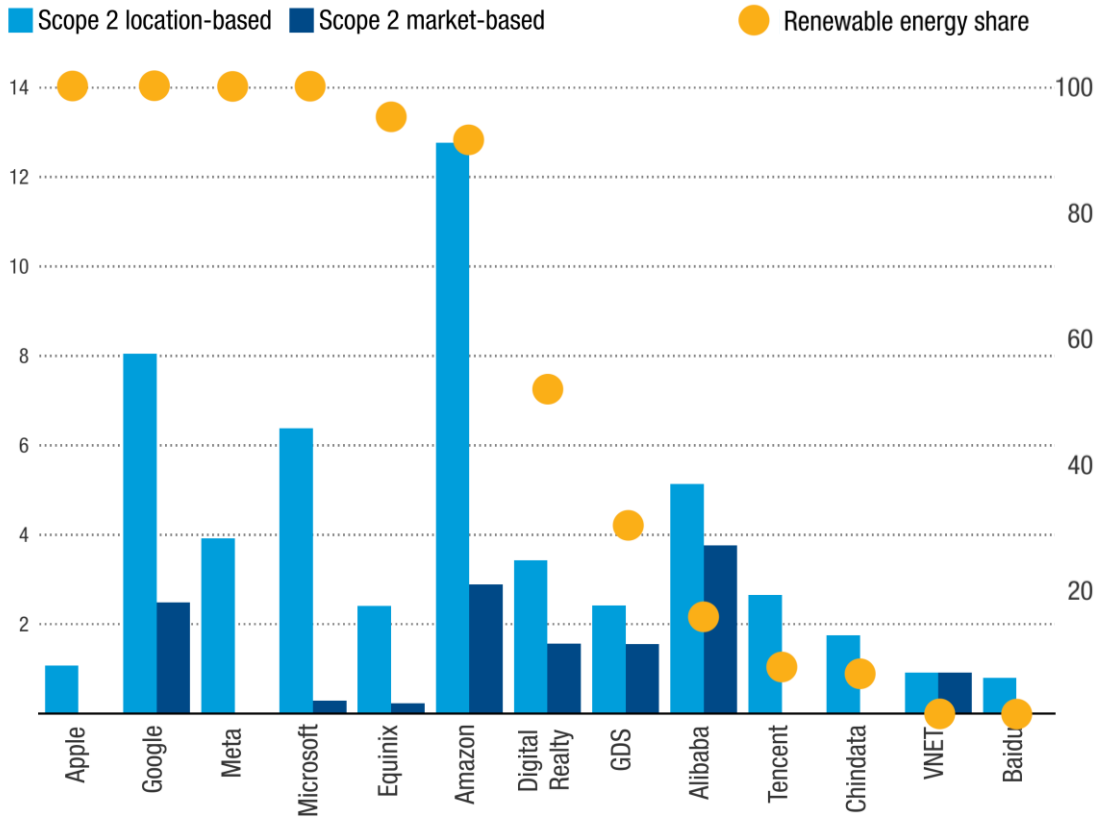
Sources: Meta (2022), Li, Yang, et al. (2023), IEA (2024).

The share of renewable energy sources varies by company

- Large data centre operators aim to reduce GHG emissions through power purchase agreements (PPAs)
- In **US**: renewable energy purchasing in 2022, was led by Amazon, Google, Meta and Microsoft
- PPAs reduce market-based scope 2 emissions as reported under GHG Protocol standards relative to location-based ones
- Data suggest a high share of renewable energy for some large data centre providers
- ...but a relatively low share in others
- Matching 100% annual energy demand with renewable purchases does not mean that data centres are powered only by renewable sources

Data centre providers vary in their use of low-carbon energy

Renewable energy share (in percentage of total energy use) and scope 2 emissions (megatons of CO2 equivalents), selected data centre operators, 2022



Source: UN Trade and Development (UNCTAD), based on Alibaba (2023); Amazon (2023a, 2023b); Apple (2023); Baidu (2023); Chindata Group (2023); Digital Realty (2023); Equinix (2023); GDS (2022); Google (2023); Meta (2023); Microsoft (2023a); Tencent (2023); VNET Group (2023).

Data centres in developing countries – need to consider their sustainability

Africa

- Less than 1% of global capacity, 2/3 of which is in South Africa
- **Electricity outages** remain an obstacle
- **Growth drivers:** Rising Internet users and data sovereignty
- Electricity demand to rise from 1 to 5 TWh (2020–30)
- **Market value** may reach $3 billion by 2025
- Opportunity to **jointly develop grid and ICT infrastructure**
- **Spearhead integration of sustainability metrics** in data centre development

Asia

- **Market value** may reach $28 billion by 2024
- **Growth drivers**: Global cloud providers, social media, video streaming, e-commerce, banking
- **Main countries**: China, India, Singapore, Indonesia, Malaysia, and Thailand
- Drive towards **sustainability policies** for data centres to address emissions and concerns linked to tropical climate

Latin America and the Caribbean

- Around 30 data centres with 15–20 MW capacity
- **Main countries**: Brazil leads, followed by Chile, Colombia and Mexico
- **Investments** of $9 billion expected (2021–2027)
- Hyperscale data centres under civil society pressure for cleaner operations
- Concerns over high water use
- Brazil: Initiative to study data centre development and renewable energy

Sources: Kadium Limited (2022), Africa Data Centres Association (2021), IEA (2022d); EcoBusiness Research (2020), Digital Centre (2021); Echeberría (2020).

Concluding observations on the use phase

- Impact should be assessed using multiple criteria
- Significant measurement challenges exist, including a lack of relevant data
- Electricity consumption by data centres expected to more than double by 2026
- More attention should be given to the water impact
- Effective global organization of data-centre capacity requires effective data governance frameworks
- As users we can reduce the impact by using smaller screens, keep devices longer and avoid data hoarding

Chapter IV:
End of the cycle? Digitalization-related waste and the circular economy

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Digitalization-related waste is growing, with uneven regional implications

Digitalization-related waste

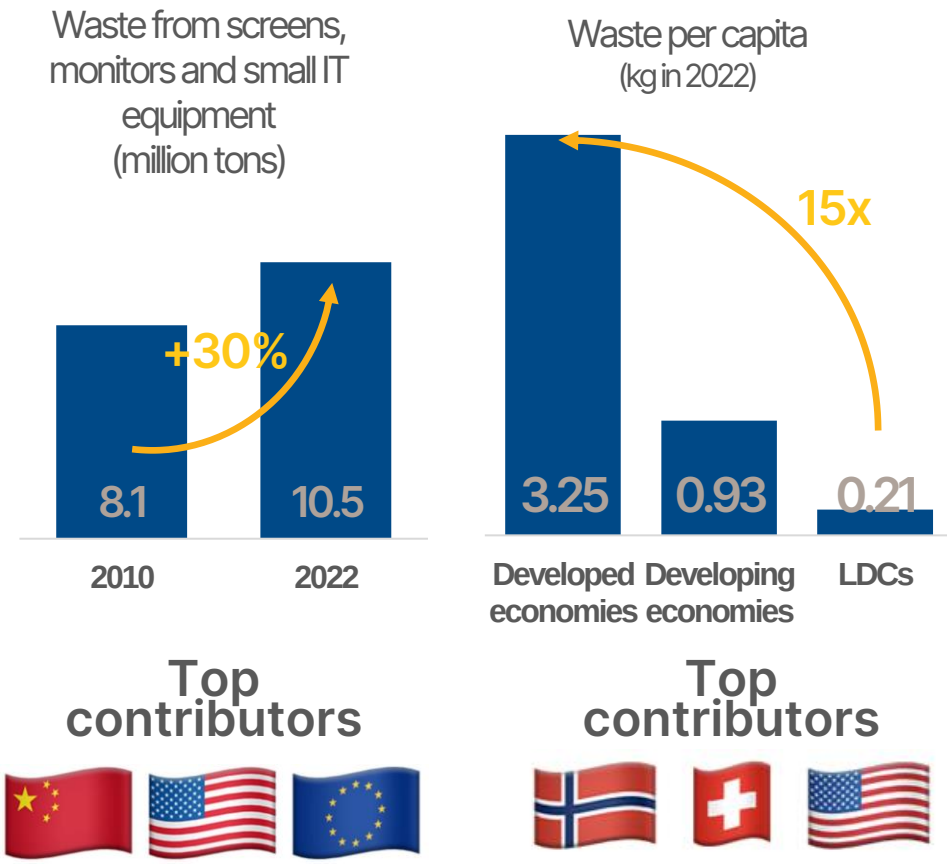
Hazardous material
Can cause negative environmental, health and social impacts

Valuable parts
Can provide economic and environmental benefits

Issues with measuring the waste

- Incorrect disposal
- Difficulty tracking due to high degree of informality in the sector
- Limited recording and documenting of waste flows

Regional disparities are significant and mirror digital divides



Source: UN Trade and Development calculations based on UNITAR-SCYCLE.

Growth of digitalization-related waste is set to continue

Drivers of digitalization-related waste

- Increased consumption
- Short-lifespan of devices
- Declining prices
- Low consumer awareness of waste implications
- Linear production model
- Limited repair options

Programmed obsolescence
(e.g., slowing smartphones, ink cartridges, phasing out software support, rapidly changing models)

Banned in
- France
- Quebec (Canada)

Civil society demands to address the situation
- Laws against planned obsolescence
- Minimum durability criteria
- Product lifetime labelling
- Affordable and accessible repairs
- Right-to-repair legislation
- Monitoring of trends in product lifetime and
- Consumer education and information

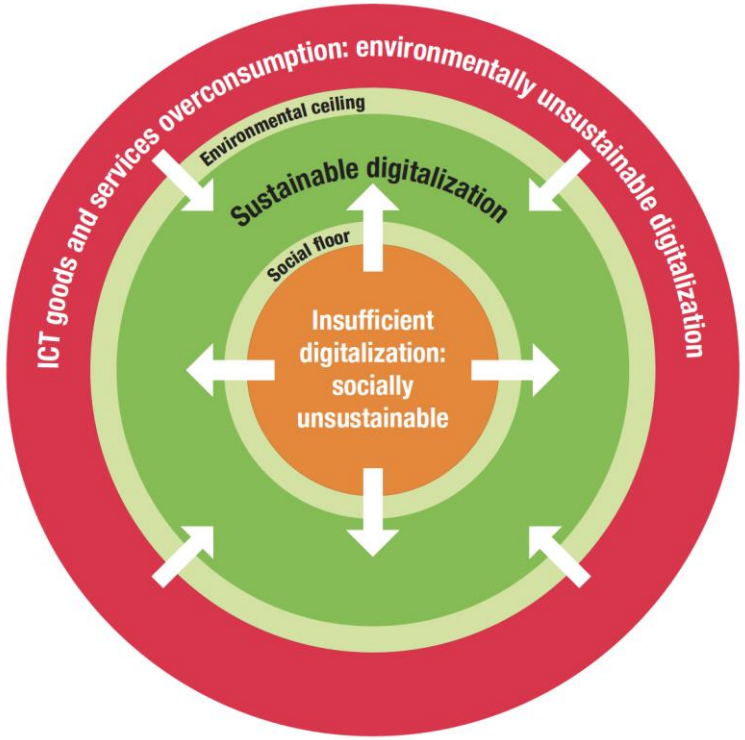
Sustainability requires consumption in the digital economy to be rethought

Aim to deliver human well-being within planetary boundaries

- High-income countries marked by overconsumption
- Digital divides persist in developing countries (in terms of access, affordability and use)
- Digitalization necessary for economic participation

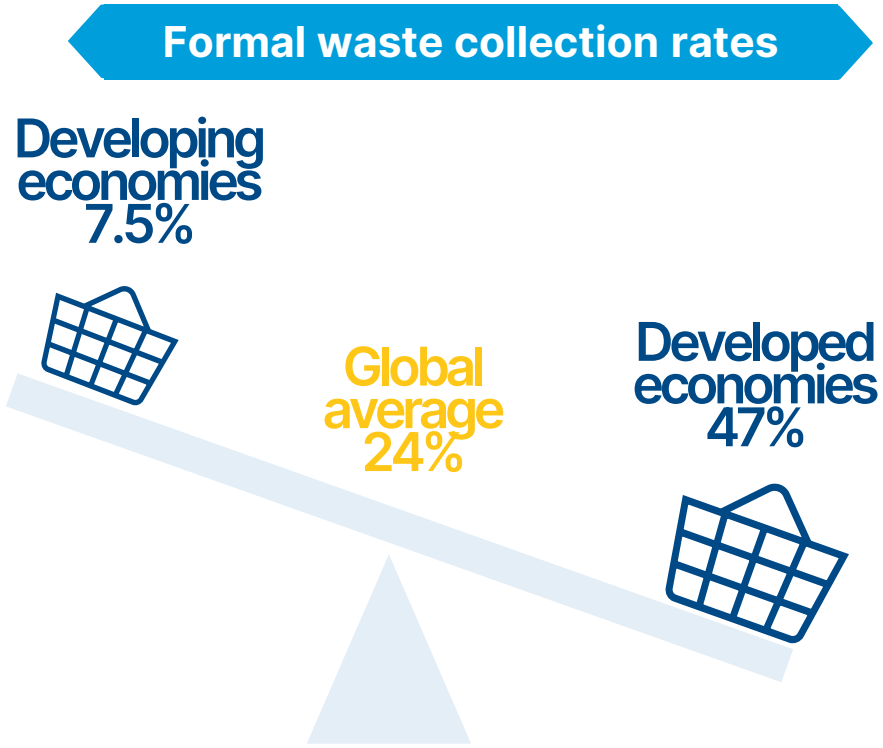
Achieving sustainable digital sufficiency requires

- moderation of **overconsumption**
- allowing those **not sufficiently connected** to keep **digitalizing for development**



Source: UN Trade and Development, based on Wiedmann et al. (2020).

Digitalization-related waste collection needs to expand



Challenges in developing countries

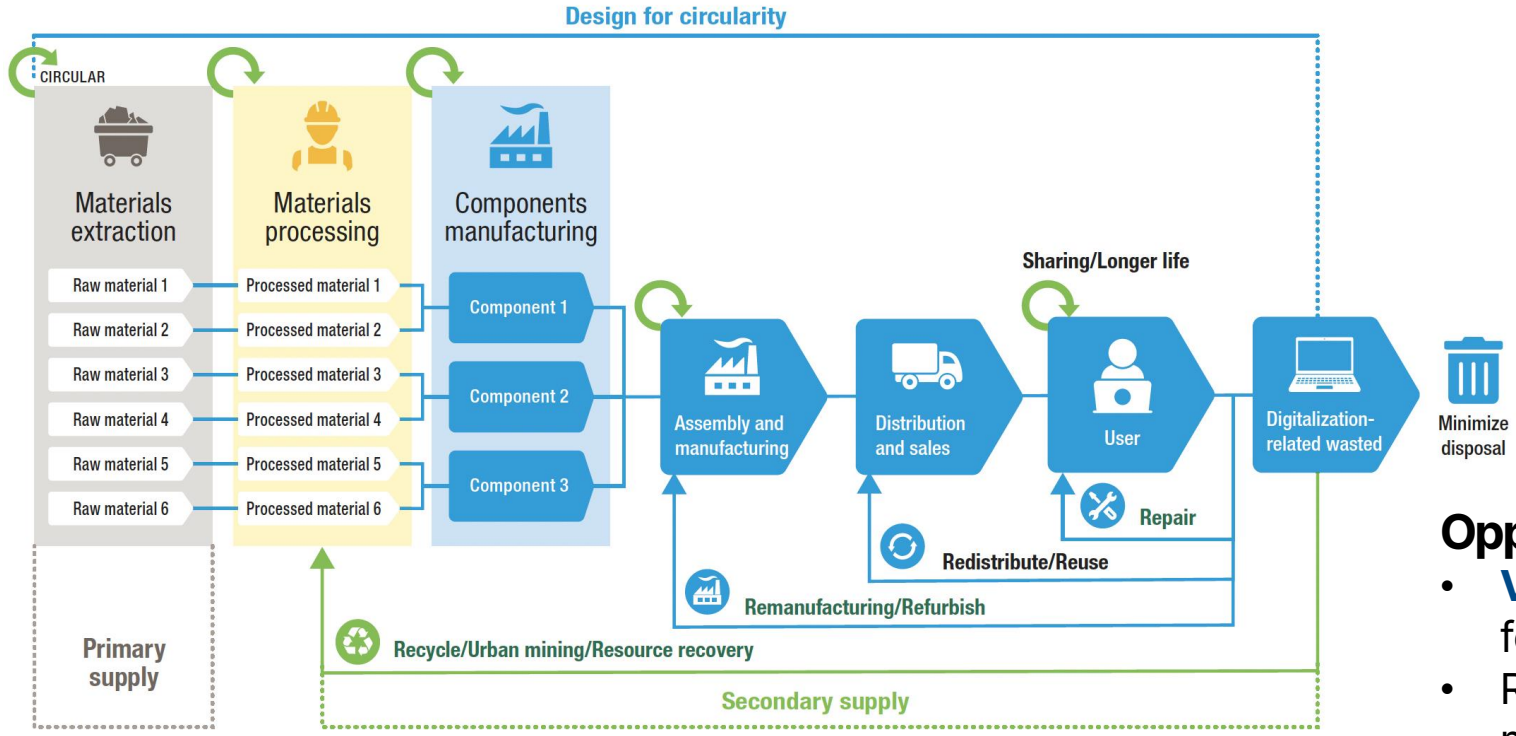
- Lack of formal collection systems
- Reliance on the informal sector
- Only 1 in 4 have relevant waste management legislation

Unequal ecological exchange

- Higher-value waste parts exported to **developed countries**
- Uncontrolled trade in used digital equipment mainly from developed to **developing countries**
- **Developing countries** face greater environmental and social costs

Source: UN Trade and Development calculations based on UNITAR-SCYCLE.

A digital economy that is circular by design can foster environmental sustainability



Source: UNCTAD, adapted from Deloitte (2023).

Circularity principles

Reduce Refuse Reuse

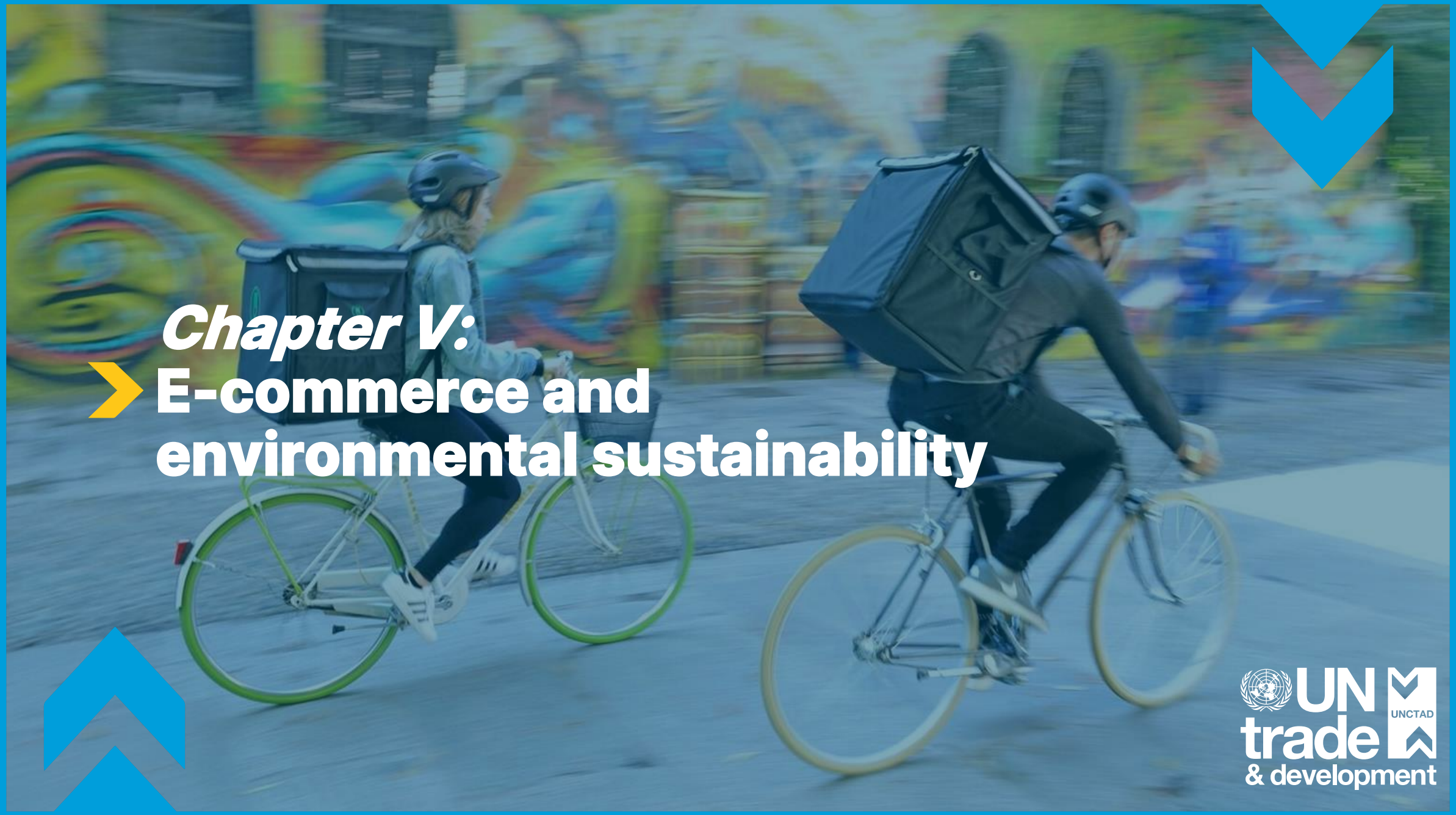
Repair Recycle

Opportunities for developing countries

- **Value addition** and **job creation** by formalizing recycling and recovering
- Repair, refurbishing and second-hand markets may **reduce digital divides**
- Sustainable practices **reduce resource use and waste**
- **Regional cooperation for processing facilities** to create value

Concluding observations on the end-of-life phase

- Digitalization-related waste expected to increase
- Current waste management practices are insufficient
- Most waste is generated in rich countries
- Shift to a circular digital economy needed to reduce waste
- Market for recycling, refurbished and second-hand electronics estimated to triple in coming decade
- Developing countries should be able to benefit from this shift
- Globally, coordinated response is needed



Chapter V: E-commerce and environmental sustainability

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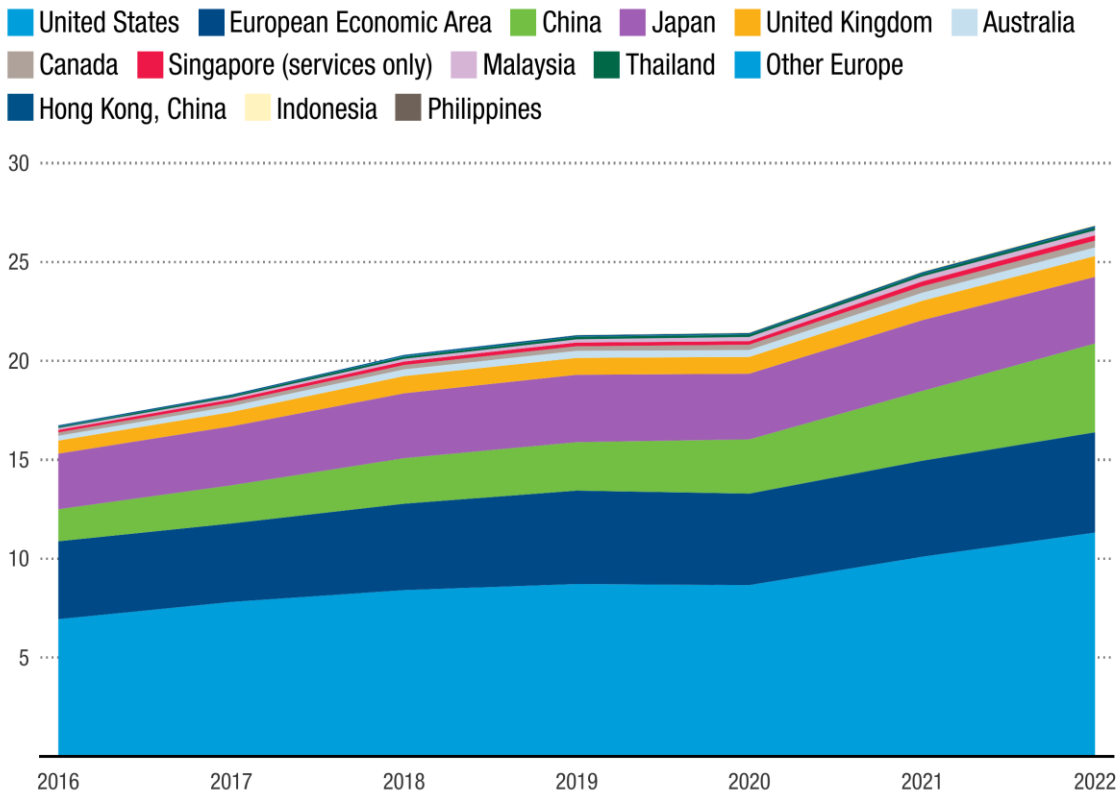
Kick-off poll

E-commerce is booming, with indirect environmental effects from digital use

- Around 2.3 billion people shopped online in 2021, up from less than 100 million in 2000
- **Global e-commerce sales of the top-35 platforms** surged from $2.6 trillion to more than $4 trillion between 2019–2021, led by Alibaba, Amazon, JD.com and Pinduoduo
- **Business e-commerce sales in 43 economies** rose from $17 trillion to $27 trillion between 2016–2022
- Most sales are domestic, but **international e-commerce is growing**
- Shift to e-commerce in developing countries and LDCs is **just starting**

Business e-commerce sales have grown by nearly two-thirds over the last six year

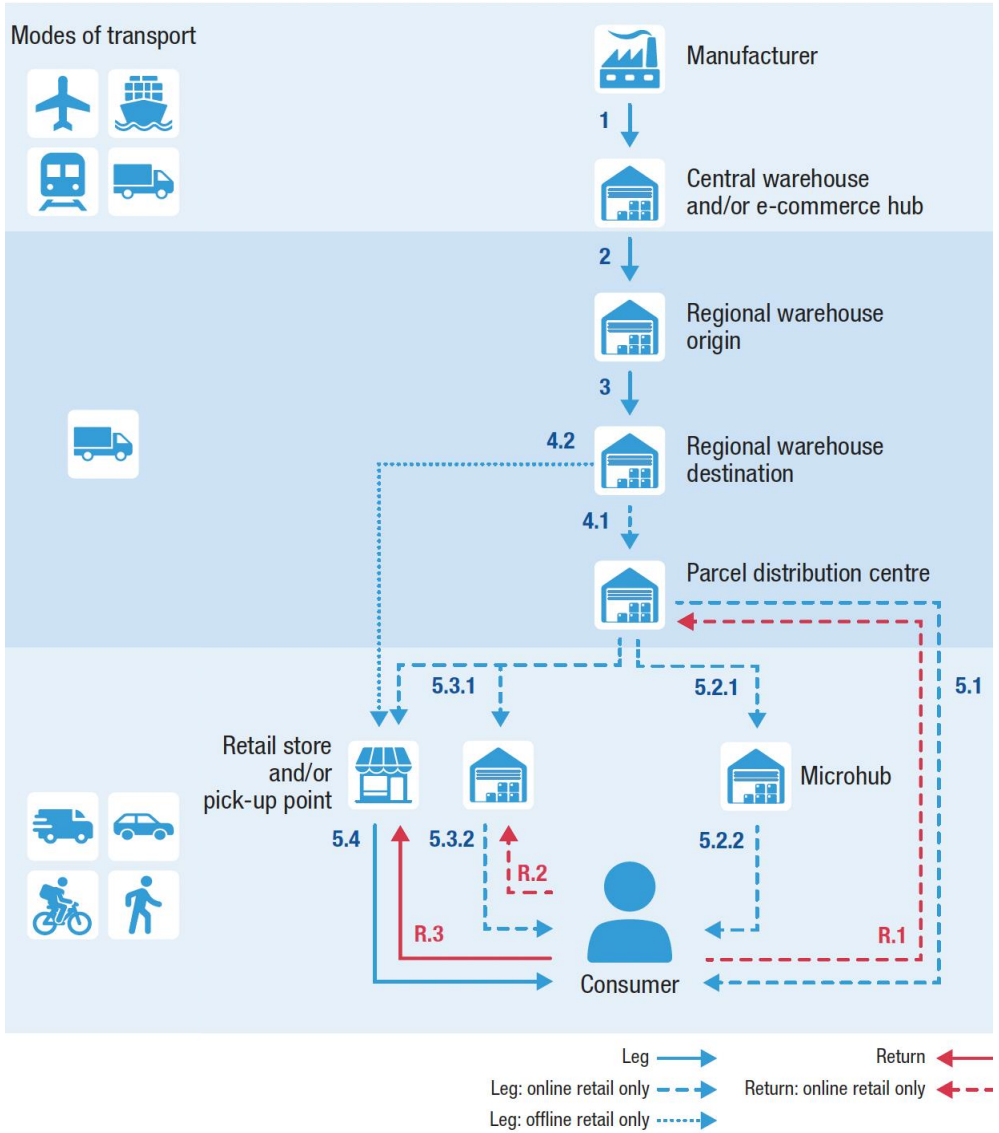
E-commerce sales by businesses across 43 developed and developing economies representing three quarters of global GDP (trillion $, current prices)



Source: UNCTAD (2024): Estimates of business e-commerce sales and the role of online platforms, UNCTAD Technical Notes on ICT for Development, No. 1, based on Eurostat digital economy and society database, national statistical agencies.
Note: * estimated. See source for more information. Other Europe: Bosnia and Herzegovina, Serbia.

Sources: World Bank Global Findex (2021), UNCTAD (2024).

The footprint of online vs. offline retail is highly situation dependent



	Online	Offline
Ware-housing and distribution	More warehouse space, higher emissions from logistics	Centralized warehousing but more land use and energy for stores
Product packaging and waste	More packaging, overpackaging and waste	Less individual packaging waste
Transport and delivery	Mixed impact: *lower* – with optimized delivery; *higher* – with fast delivery and failed attempts	Personal car trips contribute more emissions, less when using public transport
Returns	More returns, packaging transportation and potential waste	Lower impact: Fewer returns and less packaging waste
Consumer behaviour	Increased impulsive buying, more mass consumption	Lower impact: Planned trips especially with public transport or walking

Source: UN Trade and Development, based on European Commission (2022a).

Examples of more sustainable e-commerce practices

Warehousing and distribution

- **Solar panels to power logistics warehouses**
  Emissions reduction by 21,000 MtCO2e in 2023 for Alibaba e-commerce
- **Efficient storage**
  Reduce mandatory packaging for storage of items (Lazada)
- **Moving closer to customers**
  Network of central logistics facilities, cutting trips per day and emissions (Jumia, Nairobi)

Product packaging and waste

- **Governments addressing plastic pollution**
  Electronic waybills (China)
  Banning single-use plastics (e.g. India and Rwanda)
- **Limit additional (branded) packaging**
  Shipping in primary packaging (Mercado Libre)
  Paper-based wrapping materials instead of plastic (Amazon India)
- **Recycling initiatives**
  Recycling options at “pick-up, drop-off” stations (Cainiao – 24 mio items recycled/reused)
  Multi-use packaging loops

Examples of more sustainable e-commerce practices (cont.)

Transport and delivery

- **Move to low-carbon transport**
- **Making last-mile delivery more efficient**
  Pick-up stations; delivery route optimization; consolidation of packages

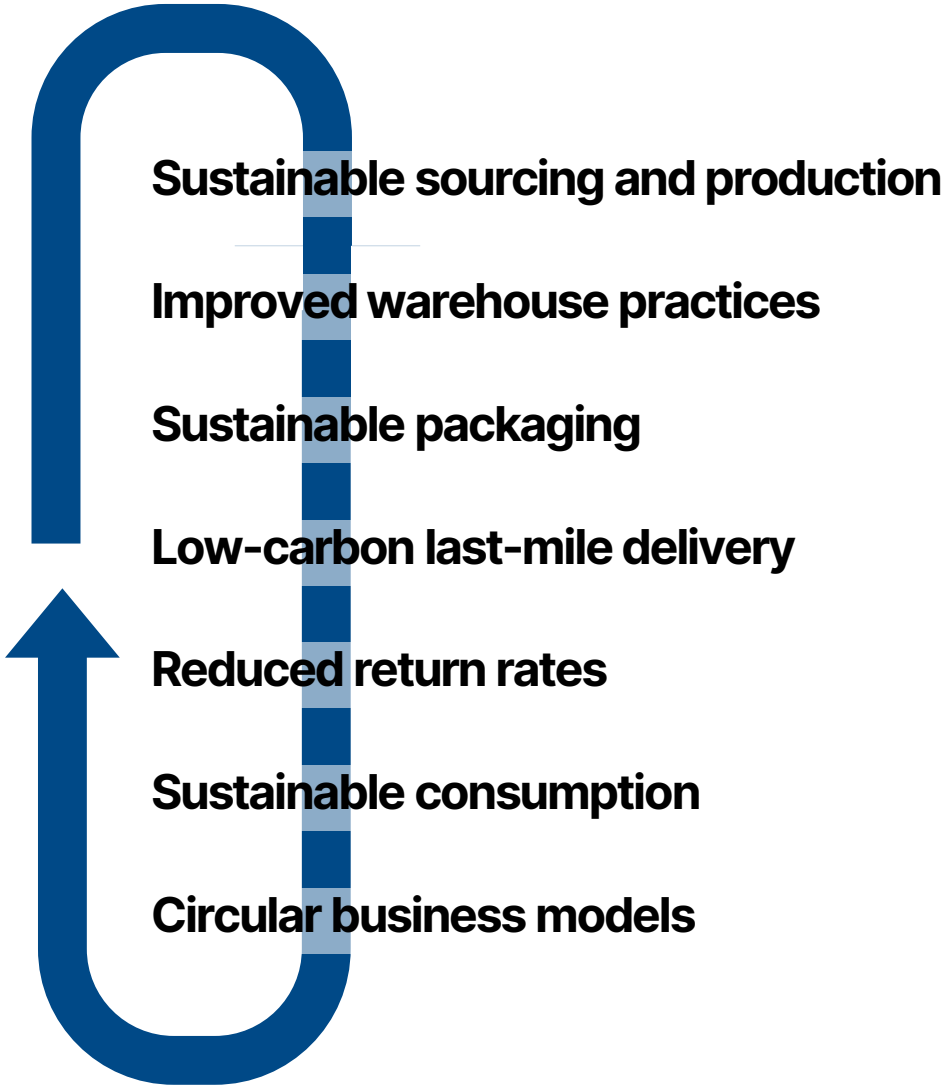
Returns

- **Improving product information**
  Augmented reality to try on or place products (Gap, Ikea)
- **Fair use policies of free returns**
  Maximum number of free returns within a period (Boozt)
  Paid returns
- **Consolidating shipments**
  Drop-off locations
  Letting customers to keep products despite refunds (Jumia)
- **Regulating product destruction**
  Bans (e.g. France)
  Tax incentives for donations (e.g. Belgium)

Consumer behaviour

- **Reliable sustainability information**, incl. eco-labels
- **Ethical nudging**
  Information on delivery methods (Shopify carbon calculator)

Strategies for more sustainable e-commerce



Policy actions

Regulatory framework to promote better e-commerce practices

Incentives for resource-efficient infrastructure and delivery systems

Encourage environmentally conscious consumption

Regulation to prevent false claims

Environmental labels

Consumer protection and awareness campaigns

Incentivize eco-friendly choices

Improving evidence base for policymaking

Data collection and set sustainability disclosures

Chapter VI:
Towards environmentally sustainable digitalization that works for inclusive development
Policy actions

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A new policy mindset is required to address key challenges

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Innovative approaches needed

Embrace new business models and strategies that maximize digitalization's positive impacts while minimizing the negatives

Reduce consumption to optimize scarce resource use without harming future generations

Cut carbon emissions to prevent catastrophic climate change

Leverage digitalization-related waste to transform waste into opportunities for recovery, recycling and reuse within a circular economy

SDG 12 is particularly relevant

This goal points to the need to use the planet's scarce natural resources more responsibly, produce more sustainably

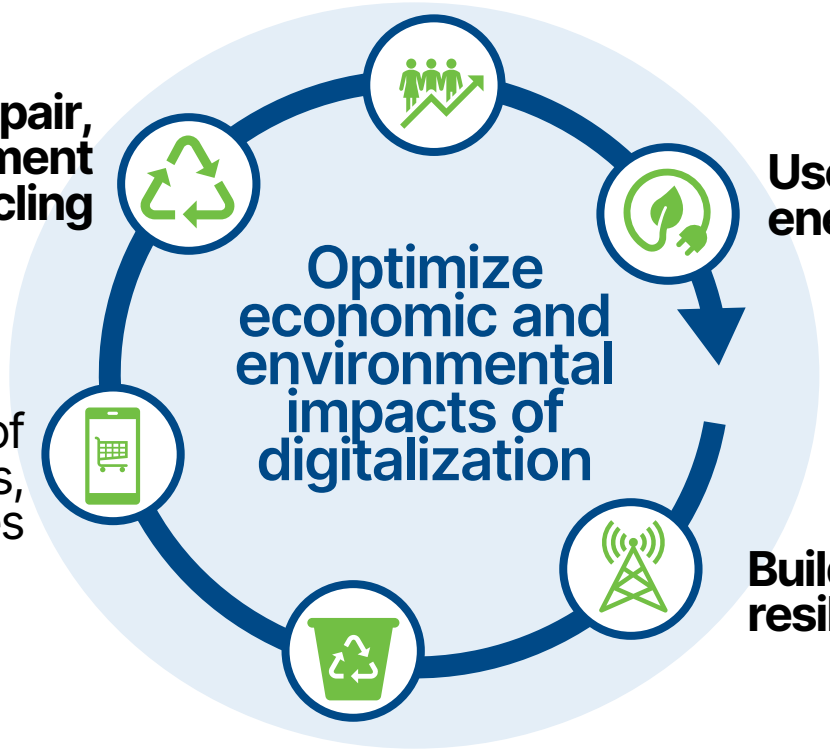
- Achieve the sustainable management and efficient use of natural resources (12.2)
- Achieve the environmentally sound management of chemicals and all wastes (12.4)
- Substantially reduce waste generation (12.5)
- Encourage companies, especially large and transnational ones, to adopt sustainable practices and to integrate sustainability information into their reporting cycle (12.6)
- Promote public procurement practices that are sustainable (12.7)
- Ensure that people everywhere have the relevant information and awareness for sustainable development and lifestyles (12.8)
- Support developing countries to strengthen their scientific and technological capacity to move towards more sustainable patterns of consumption and production (12.a)

Pre-conditions for effective policymaking

Eight fundamentals as a basis of policies for an inclusive and environmentally sustainable digital economy

1. Integrate economic, environmental and other goals related to sustainable development
2. Recognize disparities in living standards and resource use within and between countries at different levels of development
3. Economic development that is not environmentally sustainable will be economically unsustainable
4. Consider the whole life cycle of digital equipment and infrastructure
5. Consider the full range of environmental impacts
6. Involve all stakeholders in the shared endeavour to achieve a sustainable digital economy
7. Be consistent with relevant United Nations and international goals, especially the SDGs
8. Be agile, capable of responding and adapting to changes in the context of the digital economy, including technological developments

Shifting towards a circular digital economy for inclusive and sustainable development



Boost opportunities through business growth and job creation

Use low-carbon energy

Build adaptive and resilient infrastructure

Recover resources from devices

Reduce wasteful use of digital networks, products, services

Prioritize repair, reuse, refurbishment and recycling

Key actions along the digital life cycle

- Design for sustainability: create platforms and products that foster sustainable consumption
- Encourage resource efficiency: promote sufficiency and frugality to curb overconsumption
- Maximize resource value: facilitate recovery and reuse

Addressing the double bind of developing countries

Developing countries bear the **brunt of the costs of digitalization**

- Raw material extraction
- Digital waste
- Climate vulnerability
- Digital divide

Developed countries capture most benefits

Common but differentiated responsibilities

Policy implications

Digitally-developed countries should

- **lead** the shift to an inclusive and sustainable digital future
- **support** developing countries in building capacities to harness digitalization

Bold action needed at national and international level

National level

- Integrate digital, economic and environmental sustainability strategies
- Focus on reducing GHG emissions, water use and waste by using digital solutions, while being mindful of digital footprint

International level

- Strategies and policies that recognize countries' diverse needs and priorities, recognizing opportunities especially for developing ones
- Development partners should reinforce support to low-income countries to strengthen capabilities for digitalization and sustainability

Upcoming policy dialogues

Summit of the Future
Our Common Agenda
Global Digital Compact

working together towards 2025
World Summit on the Information Society
Turning targets into action
Geneva 2003 | Tunis 2005 | New York 2015

2030 Agenda for Sustainable Development

An integrated global approach to digitalization and the environment that works for people and the planet

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Multilateral and cross-sector dialogue between digital and low-carbon policy communities for international standards and policymaking

Multi-stakeholder partnerships across governments, businesses and academia for stronger outcomes

Focus on environmental impact of digitalization's role in global environmental processes and vice versa

UN Trade and Development (UNCTAD) calls for

The international community to develop **inclusive and integrated approaches** that

- **align digital and environmental policies at all levels** and drives collective action
- **track ICT sector's environmental footprint** comprehensively

A just and sustainable digital economy requires just and sustainable policies

António Guterres
Secretary-General
United Nations

UN trade & development

For more information

unctad.org/der2024