ITU-T Side Event-
Towards a sustainable digital transformation and a net-zero emission with emerging technology

Digital Infrastructure Development for Sustainable Digital Transformation

Xiao Wang 王潇
UNEP DTU Partnership, Copenhagen Centre on Energy Efficiency

Emerging Technology for Connectivity: Accelerating Digital Transformation in LDCs, LLDCs and SIDS
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Content

- Digital Economy and challenges
- Introduction to digital infrastructure and digital ecosystem
- Introduction to data centre
- Energy and environmental impacts of data centres
- Environmental efficiency solutions
The digital economy impacts all SDGs and is closely associated with several frontier technologies and fuelled by data. Recent trends in the digital economy include:

- Blockchain
- Data analytics
- Artificial intelligence
- 3D printing
- Internet of Things
- Automation & Robotics
- Cloud computing

Global Internet Protocol traffic, a proxy for data flows, has grown dramatically, but the world is only in the early days of the data-driven economy. Key milestones include:

- 100 gigabytes (GB) of traffic per second (1992)
- 100 GB per second (2002)
- 46,600 GB per second (2017)
- 150,700 GB per second (2022)

Still huge digital divides:

- Half of the world remains offline
- In LDCs only 1 in 5 people are online
- Gender gap is the widest in the poorest economies
Digital Infrastructure is an integrated system including 2 categories: (hard) physical and (soft) non-physical. It is the foundation of the digital economy.

Digital Infrastructure is no longer limited to hard physical assets, structures, and facilities. It extends to the architecture that connects it and to the technological applications to operate it.

We need connectivity infrastructure and datacenter infrastructure to support locally-deployed digital services and the growth of a local digital ecosystem.
A data centre is a dedicated building, which houses the technology for data processing, data storage and data communication of one or more organizations.
ENERGY FORECAST

Widely cited forecasts suggest that the total electricity demand of information and communications technology (ICT) will accelerate in the 2020s, and that data centres will take a larger slice.

- Networks (wireless and wired)
- Production of ICT
- Consumer devices (televisions, computers, mobile phones)
- Data centres

The chart above is an ‘expected case’ projection from Anders Andrae, a specialist in sustainable ICT. In his ‘best case’ scenario, ICT grows to only 8% of total electricity demand by 2030, rather than to 21%.

Figure 3. Share of energy demand by different components in data centres globally (2020). Elaborated with data from International Energy Agency

ENERGY SCALE

Global electricity demand

20,000 TWh

Electricity use by ICT

2,000 TWh

200 TWh

Data-centre electricity demand

20 TWh

Bitcoin use by mid-2018

Sources: IEA/A. Andrae/Ref. 6

Figures are approximate.
An estimated 20 to 50 million metric tonnes of E-Waste is disposed globally every year depositing heavy metals and other hazardous waste into our landfills.

If measures are not taken, E-Waste is expected to grow 8% each year.

Water use in electricity was x4 greater than that used on-site for cooling: 7.6 litres of water is used for every 1 kWh of electricity generated compared to 1.8 litres per kWh of total data centre site energy use.
THE GREEN DEAL NEEDS GREEN INFRASTRUCTURE

2020
Signing of the Climate Neutral Datacenter Pact.

2025
First milestones of the pact.

2030
Climate Neutral datacenters.

WE REUSE AND REPAIR SERVERS

WE PURCHASE 100% CARBON-FREE ENERGY

WE PRIORITIZE WATER CONSERVATION

Cloud computing is the technological force for change behind the European Green Deal & Digital Strategy. Cloud infrastructure providers & data center operators created a self-regulatory initiative for data centers to be climate neutral by 2030.

WE PROVE ENERGY EFFICIENCY WITH MEASURABLE TARGETS

ClimateNeutralDataCentre.net
Thank you!  
https://c2e2.unepdtu.org/sustainable-datacentres-and-ict/