



COPENHAGEN CENTRE  
ON ENERGY EFFICIENCY  
SEforALL EE HUB



# ITU Sustainable Digital Transformation Dialogues - Africa

## Green Data Centres for Sustainable Digital Transformation in Africa

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# Africa's \$180B Internet economy future

## Growing urban, mobile population

1.3B

people in 2019

2.5B

people in 2050



Digital connectivity

40%

of population in 2019

10% increase leads to 2.5% increase in GDP per capita



Urbanization

45%

of population will be in cities by 2025

## Expanding tech ecosystem



Tech talent

700K

developers in 2019



E-commerce and fintech are key sections driving the digital economy

## Infrastructure investments

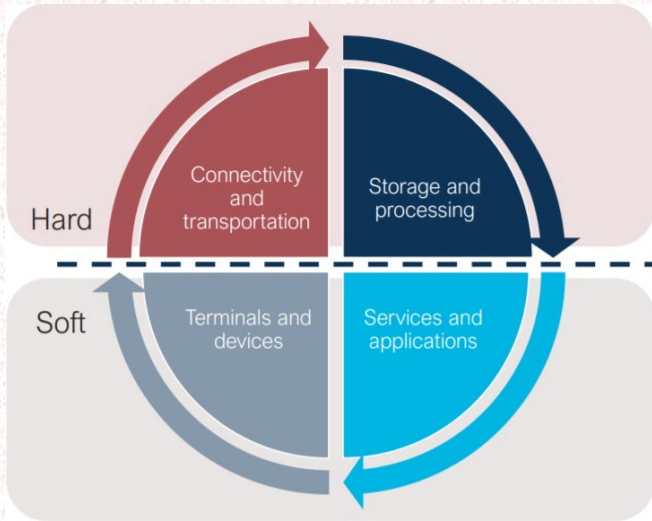
Drives increased access to more affordable higher-speed Internet

Source: e-Economy Africa 2020.

## Pro-innovator regulation

Including startup acts and regional harmonization, such as the African Continental Free Trade Area (AfCFTA)



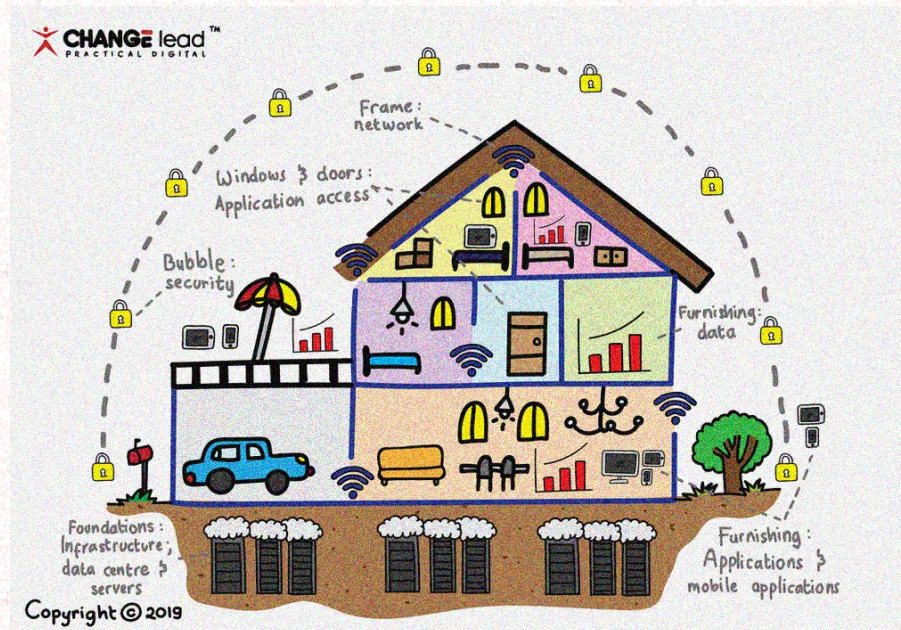


Digital Infrastructure is an integrated system including 2 categories:  
(hard) physical and (soft) non-physical

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.

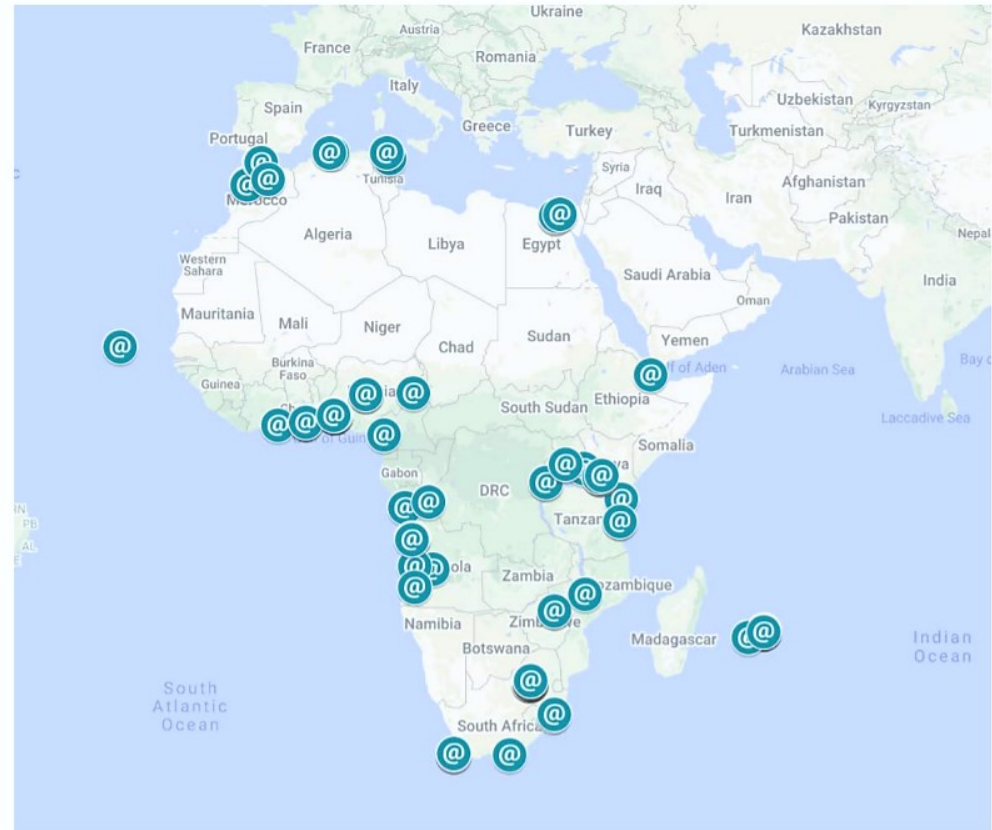
We need connectivity infrastructure and datacenter infrastructure to support locally-deployed digital services and the growth of a local digital ecosystem.



Africa's data centre market is expected to exceed \$3 billion by 2025, growing at a composed annual growth rate of over 12% during the forecast period. It is also expected that over 70% of organisations operating in the region will shift to the cloud by 2025.

Africa currently accounts for less than 1 per cent of total available global data centre capacity, despite being home to about 17 per cent of the world's population.

Sample data centre locations in Africa<sup>43</sup>





# THE GREEN DEAL NEEDS GREEN INFRASTRUCTURE



WE REUSE AND REPAIR SERVERS



WE PROVE ENERGY EFFICIENCY  
WITH MEASURABLE TARGETS



2020

Signing of the  
Climate Neutral  
Datacenter Pact.

2025

First milestones  
of the pact.



2030

Climate Neutral  
datacenters.



WE PURCHASE 100% CARBON-FREE ENERGY



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 PRIORITISE WATER CONSERVATION

# Thank you!

<https://c2e2.unepdtu.org/sustainable-datacentres-and-ict/>

**DATA CENTRE BRIEF SERIES FEBRUARY 2020**

**BRIEF 1 Environmental sustainability of data centres: A need for a multi-impact and life cycle approach**

**KEY MESSAGES**

- The concerns over energy use of data centres and associated impacts on climate change have aimed efforts to reduce data centres' energy demand during operations.
- The focus on reducing climate change related impacts arising from data centres' operations can overlook relevant environmental impacts from other life cycle stages, including raw material extraction, equipment manufacturing, data centre construction, end of life of equipment and data centre buildings.
- To support the design of truly sustainable data centres, more comprehensive environmental sustainability assessments, encompassing the entire life cycle and focusing on a broad spectrum of environmental problems, are needed.
- This issue brief uses examples to showcase the substantial environmental impacts of data centres stemming from other life cycle stages than their operation and calls for the use of Life Cycle Assessment (LCA) to assess and address such impacts.

**DATA CENTRE BRIEF SERIES JULY 2020**

**BRIEF 2 Data Centres: Digitalisation Powerhouse and Energy Efficiency Potential**

**KEY MESSAGES**

- The digitalisation of the economy worldwide and technological innovations such as artificial intelligence (AI), Internet of things (IoT) and blockchain are driving exponential growth in the demand for data centres' services.
- Data centres use approximately 200 TWh of electricity annually, corresponding to roughly 1% of global electricity demand.
- To curb the rapid growth in the energy use of data centres, it is key that the future demand for data centres' services will be met by energy-efficient data centres and that their uptake of renewable energy is accelerated.
- Policy makers should establish robust mechanisms to collect data and publish statistics on the energy use of data centres, similarly to what has been done for other energy-intensive sectors.

**DATA CENTRE BRIEF SERIES SEPTEMBER 2020**

**BRIEF 3 Reducing the energy use of video gaming: energy efficiency and gamification**

**KEY MESSAGES**

- Video gaming is an increasingly popular leisure activity worldwide, but it has environmental impacts due to the energy used during climate change and resource losses over the entire life-cycle of the gaming devices.
- Among these, equipment in households, gaming devices are gradually becoming more relevant in terms of their overall energy use.
- Playing video games on newer generation game consoles uses significantly less energy than playing on computers, when the unit energy consumption of the equipment is considered.
- Playing video games in the cloud, known as cloud gaming, can draw as much as a three-fold increase in energy use compared to local gaming.
- The energy used in gaming should be integrated into end-use energy demand forecasts and routinely updated with demographic data and technology preferences, which can change quickly.
- Improved consumer information and the quantification of energy information are recommended ways that can have a direct effect on behaviour change.

**DATA CENTRE BRIEF SERIES JANUARY 2021**

**BRIEF 4 Innovative Data-Centre Cooling Technologies in China - Liquid Cooling Solution**

**KEY MESSAGES**

- The increased need to dissipate heat caused by the increased power consumption of IT equipment in data centres calls for energy-efficient cooling solutions. Liquid cooling, with its efficient heat transfer and high energy-saving characteristics, is becoming preferred in China and is now spreading with successful business cases already on the market.
- Liquid cooling still faces many challenges in the development process. There is an urgent need to promote the development of technology and industry by strengthening industry guidance, standardising the evaluation system, and improving the industrial ecosystem, among other measures.
- This brief showcases the Alibaba and Tencent data centres' advanced liquid-cooling systems. Of the top leading Chinese internet companies, Alibaba has achieved large-scale deployment of liquid cooling technology.

**Digital Climate Emergency Series**

**Zero Carbon Emissions in Digitalization**

03 March 2020

DANISH DATA CENTER INDUSTRY

**Digital Climate Emergency Series**

**Beyond Energy Efficiency - Life Cycle Based Data Centre Sustainability**

02 July 2020

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