



# SUSTAINABLE DATACENTRES AND ICT

MAKING ENERGY EFFICIENT  
DATACENTRES AND SUSTAINABLE  
INFORMATION AND COMMUNICATION  
TECHNOLOGY KEY CONTRIBUTORS  
TO THE SDGS



## SUSTAINABLE DATACENTRES

Digital innovation is changing societies, economies and industries with a scale and speed like never before. Yet, Information and Communications Technology (ICT) is also an ever-growing energy consumer.

Without dramatic increases in efficiency, datacentres and the ICT industry in general could use up to 20% of all electricity and be responsible for 5.5% of the world's carbon emissions by 2025.

However, ICT is also the key enabling technology for efficient use of energy through smart solutions. The Copenhagen Centre on Energy Efficiency aims to unlock this possibility.

The Centre works to make energy efficient datacentres and ICT technologies a key contributor to the UN Sustainable Development Goals on climate and energy by:

- Accelerating the global uptake of energy efficiency in datacentres and ICT by 2030 through research and innovation, action driven activities, and best practice sharing.
- Facilitating collaboration on energy efficiency opportunities in datacentres and ICT technologies in developing countries and emerging economies, aligned with the international climate and energy goals.



The Copenhagen Centre on Energy Efficiency's work and research on datacentres and ICT is geared towards the following three areas:

### SOFTWARE AND DIGITAL TECHNOLOGY:

Intelligent processes, enabled by digital technologies and software solutions, creating constant improvement on energy efficiency and GHG emission reductions. This area explores how digital applications and connected sensors and networks allow people and software to make real-time adjustments and decisions.

### HARDWARE, EQUIPMENT AND SYSTEMS:

Devices, equipment and systems related to lighting, cooling and power supply that help to optimize energy efficiency. This area aims to employ tools and processes to measure and improve the energy efficiency and sustainability of products and solutions, and to leverage current technology to inform and transform future practices.

### SMART CITY SYSTEMS:

Building a smart ecosystem through the Internet of Things, devices and digital technologies to collect and analyse data in a city. This area aims to explore how smart cities could provide resources to assist governments, city planners and digital service providers to deploy connected solutions and create cities that are truly smart.





Along with partners and stakeholders, the Copenhagen Centre on Energy Efficiency's work on datacentres and ICT covers four main thematic topics:

### ENERGY EFFICIENT DATACENTRES

Data centres currently demand about 3 % of the global electricity supply, and it is estimated that data centres could end up causing 14% of global GHG emissions by 2040.

With the economic and environmental ramifications of continued data centre growth more energy-efficient practices such as reducing cooling energy demand, reducing server power draw and utilizing waste heat are much needed.

### ENERGY PERFORMANCE STANDARDS AND LABELLING

Improving the energy efficiency of ICT devices through minimum standards and labelling, encouraging sustainability at production level and at consumer information level.

### SMART GRIDS

The use of smart grids is one of the most innovative ways for reducing electricity consumption and GHG emissions. Studies suggest that smart electricity grids could reduce primary consumption by the EU energy sector by almost 9% by 2020.

### SMART CITIES FOR HIGHER ENERGY AND RESOURCE EFFICIENCY

The smart city leverages data and digital connectivity to enable municipal governments to manage local resources based on real-time needs to increase efficiency.



With a focus on the most rollout-ready energy end-use sectors, the Copenhagen Centre on Energy Efficiency assists with project analysis, technology procurement, investment models, best-practice knowledge and research.

The Copenhagen Centre on Energy Efficiency works through four activities:

- Activating the knowledge base to assess energy efficiency potential and opportunities
- Developing public-private implementation projects available to attract the necessary finance
- Technical vocational educational training
- Replicating and communicating success

Using a model of standardisation, upscaling and replication, the Copenhagen Centre on Energy Efficiency is able to create impact reaching far beyond individual projects.



UNEP DTU Partnership is a UN Environment Collaborating Centre engaged in implementing UN Environment's Climate Change Strategy and Energy Programme.

Established by the Danish Ministry of Foreign Affairs, UN Environment and Technical University of Denmark (DTU), UNEP DTU Partnership is organisationally part of the DTU Department of Technology, Management and Economics.

UNEP DTU Partnership focuses on developing new knowledge and sustainable public private partnerships and is ready to act and engage with governments, cities and the private sector.

### COPENHAGEN CENTRE ON ENERGY EFFICIENCY

As part of UNEP DTU Partnership, the Copenhagen Centre on Energy Efficiency has established itself as an internationally recognized actor and acts as Energy Efficiency hub for the SEforALL initiative. The Copenhagen Centre on Energy Efficiency engages in partnerships with cities and countries on energy efficiency by examining current activities, identifying potential high-impact opportunities and providing guidance on best practice.

The Centre has a strong focus on in-country implementation, complementing other institutions active on energy efficiency.

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