4E

Energy Efficient End-use Equipment
International Energy Agency

ENERGY EFFICIENCY POLICY BRIEF

Policy Development on Energy Efficiency of Data Centres

EDNA19

The Efficient, Demand Flexible Networked Appliances (EDNA) Platform of the 4E TCP provides analysis and policy guidance to members and other governments aimed at improving the energy efficiency and demand flexibility of connected devices and networks.

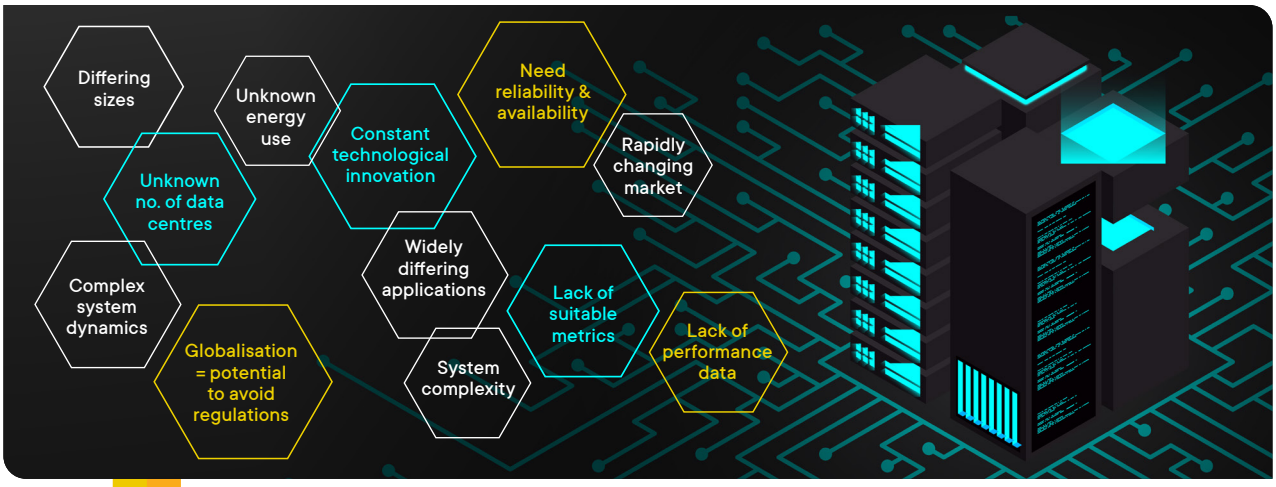
This briefing summarises the key findings of the EDNA report: ***Policy Development on Energy Efficiency of Data Centres***, which stems from EDNA's workstream on this topic. The workstream aims to provide policy makers with information and evidence-based recommendations for policy measures to improve the efficiency of data centres, including the impact of these measures and suggestions for implementation.

The IEA estimates that global data centre electricity consumption in 2022 was 240-340 TWh, or around 1-1.3% of global final electricity demand. This excludes energy used for cryptocurrency mining, which was estimated to be around 110 TWh in 2022.

The EDNA report provides an overview of current and planned initiatives for the energy efficiency of data centres, including mandatory data centre registries and information collection. It also summarises the energy savings results from detailed modelling of potential measures for data centres, and presents a range of issues for policy makers to consider. Note that the report deals only with the energy efficiency of data centres and this deliberately does not include measures such as use of renewables and export of waste heat.

Observations for Policy Makers

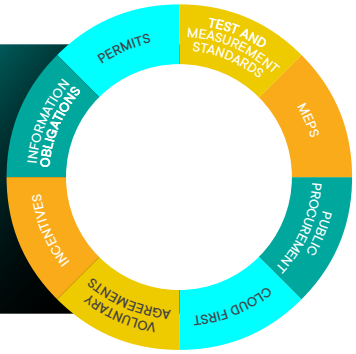
Energy efficiency policies for data centres are challenging, for a number of reasons:



Policies can address some of these challenges, for example a first step can be to obligate the provision of various information.

Following this, once a robust evidence base is established, policy makers will be in a stronger position to make more effective policies.

There are several types of policies available (refer to main report for examples).



MORE INFORMATION

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The EDNA report on **Policy Development on Energy Efficiency of Data Centres** as well as further **EDNA website** and by contacting the EDNA operating agent at **steve@beletich.com.au**

Key Findings

Policies can be used to mandate or encourage various *measures*

A ***measure*** refers to the technical solution which is targeted in order to save energy - examples include reducing PUE (Power Usage Effectiveness), and increasing utilisation. A ***policy*** is a (usually government) tool for stimulating energy efficiency, such as MEPS, public procurement, and permits. The table below maps the measures against policies which could either mandate them or encourage their adoption. Note that the vast majority of policies target PUE. Note also that 'obligations' refer to requirements for large energy users (including in some cases data centres) to reduce energy or meet various targets.

LEVEL	MEASURE	POLICIES THAT COULD MANDATE ADOPTION	POLICIES THAT COULD ENCOURAGE ADOPTION
System	Shift to cloud	› Cloud first	› Public procurement
Infrastructure	Reduce PUE	› Permits › MEPS › Public procurement › Voluntary agreements	› Obligations › Incentives
IT equipment	Increase utilisation	› Permits › Public procurement	› Obligations › Incentives
	Increase server efficiency	› Permits › Public procurement	› Obligations › Incentives
	Low utilisation shutdown	› Public procurement	› Permits › Obligations › Incentives
All	Combination of above	› Public procurement	› Permits › Obligations › Incentives

Modelling reveals the potential electricity savings of various measures

The EDNA report relied on complex modelling that was undertaken by EDNA consultants, to estimate the potential global energy savings of various measures.

The results are shown in the figure below, which shows the annual global electricity savings potential for five different measures, as well as the total for all measures (note that the total is lower than the sum of savings, due to overlap).