

January 2022

EPEE EED position paper - Data centre efficiency and sustainability

The role of cooling for efficient and sustainable data centres

EPEE, representing the Refrigeration, Air-Conditioning and Heat Pump Industry (RACHP) in Europe, welcomes the provisions on data centre efficiency and sustainability included in the European Commission's proposal for a revised Energy Efficiency Directive (EED).

The number and size of data centres are expected to grow steadily due to the constant digitalization of more and more aspects of daily life. The high computational capacity of data centres translates into high quantities of energy used. In Europe alone, datacentres are projected to generate 3.2% of the total electricity demand in the EU by 2030¹. In addition, the role of data computing technologies as contributors to the green transition will require ever larger volumes of data to be stored and processed, e.g. in the Green Deal Data Space, the Digital Product Passport, and to support the proliferation of the Internet of Things/connected devices/products.

Where there is a lot of energy being used, there is also the need to dissipate significant amounts of heat, otherwise the data centre could overheat and malfunction. Cooling is therefore essential for data centres to compensate for the heat they generate. Since cooling requires considerable energy (usually around 40% of a data centre's energy input), it must be done in a sustainable way to minimize its impact on the data centre's overall energy draw and on the environment. State of the art sustainable cooling facilities use heat pumps to provide efficient data centre cooling and can recover and upgrade the heat for redistribution, via a district heating network for instance, to connected homes, industries, offices, and other types of end-uses. High temperature heat pumps, using excess heat from data centres for heating purposes, contribute greatly to reducing the use of fossil fuels and to integrating data centres into the wider energy system².

The data centre sector is already doing a lot to improve energy efficiency and is integrating renewable energy to a significant extent. EPEE note that this is the motivation for the self-regulatory initiative launched in January 2021, the '[Climate Neutral Data Centre Pact](#)'. However, we recognise that more can be done to sustain, consolidate and improve efforts, especially as the role of data in our society continues to increase. **EPEE therefore strongly supports the introduction of the data centre reporting requirements in the EED revision proposal as well as the empowering of the Commission to establish a harmonised methodology for data centre sustainability certification.**

¹ Environment Agency Austria & Borderstep Institute (2020): [Energy-efficient Cloud Computing Technologies and Policies for an Eco-friendly Cloud Market](#)

² See EPEE's [Count on Cooling campaign](#) for several case studies of sustainable data centre cooling solutions

How to further improve the EED proposal's data centre provisions

EPEE approve the Commission's proposal to build on the existing voluntary European Code of Conduct for Data Centre Energy Efficiency (ECoC4DCEE); a scheme that is curated by the Joint Research Centre (JRC). The JRC published a technical report³ in 2017 that underlines that more can be done to improve data centre energy efficiency. The JRC Technical Report shows that the 289 European data centres that were assessed have wide divergences in their energy efficiencies.

Ensuring that new data centres are built with the energy efficiency first principle driving decision making and planning, can substantially reduce the energy consumption of data centres. Technologies including energy efficient process and close control cooling systems are a key part of this equation, as part of what is referred to as Mechanical and Electrical (M&E) systems in data centres. However, the M&E industry currently faces a multiplicity of different calculation methods which result in highly divergent data centre energy efficiency values (measured in Power Usage Effectiveness (PUE)) for similar technological solutions.

An EU-wide harmonized regulatory scheme to improve the energy efficiency of data centres would therefore be extremely welcome. EPEE would therefore recommend taking into account the following considerations for further improvements to the EED provisions regarding data centre efficiency and sustainability:

- **A harmonised approach:** A harmonised EU level approach is preferable to Member States establishing asymmetric schemes and the proliferation of industry initiatives. In this regard, EPEE would prefer that Member States not be given flexibility to alter the scope and methodology of the EU's harmonised approach when choosing to voluntarily implement data centre sustainability schemes. Fragmentation is a major concern which would undermine the efficacy and comparability of the scheme and would furthermore threaten to undermine the economies of scale needed to deliver on the green transition for data centres, while limiting costs to consumers and industry.
- **The scope of the proposed reporting requirement:** A good approach for large data centres is not always true for smaller data centres. It is important to define the purpose, but also the different limits, depending on size. Overall, EPEE considers that 100 kW of installed IT power demand is an appropriate and proportionate threshold, as it would capture most commercial data centres but exclude, for instance, small server rooms.
- **Alignment with Green Public Procurement & sustainable finance criteria and enabling circularity options:** Ensuring alignment with the [EU's GPP criteria for 'Data centres, server rooms and cloud storage'](#), relevant EU Sustainable Finance Taxonomy Technical Screening

³ Joint Research Centre (2017): [Trends in data centre energy consumption under the European Code of Conduct for Data Centre Energy Efficiency](#)

Criteria (TSC) for ‘Data processing, hosting and related activities’ provided in the [Delegated Act on climate mitigation and climate adaptation](#), and possibly in the future with any application of the ErP regulatory framework to process and close control temperature control systems, is vital. It should be noted that currently, ErP does not cover units used to cool data centres and in addition the harmonized European standard (hEN) is not ready for application. In addition, EPEE would like to highlight that current GPP and Taxonomy criteria do not sufficiently promote circular usage (e.g. of refrigerants) in data centre cooling. Circular usage should be recognized as option alternative to, or to be combined with, the aforementioned GPP and Taxonomy criteria, supporting the EU Green Deal and circular economy approach.

- **Data collection:** Host the data collected on data centres via the reporting requirements and under the future schemes in a centralised EU database, possibly the EU Building Stock Observatory (EU BSO).

The Annex to this paper outlines a number of suggested amendments to the EED proposal with the aim of addressing the points above.

About EPEE:

EPEE represents the Refrigeration, Air-Conditioning and Heat Pump industry in Europe. Founded in the year 2000, EPEE’s membership is composed of over 50 member companies as well as national and international associations from three continents (Europe, North America, Asia). With manufacturing sites and research and development facilities across the EU, which innovate for the global market, EPEE member companies realize a turnover of over 30 billion Euros, employ more than 200,000 people in Europe and also create indirect employment through a vast network of small and medium-sized enterprises such as contractors who install, service and maintain equipment. Please see our website (<https://www.epeeglobal.org/>) for further information.

ANNEX: Amendments to the Proposal for a DIRECTIVE OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on energy efficiency (recast) (2021/0203 (COD))

Proposal for a regulation
Article 11 – paragraph 10

Text proposed by the Commission

10. Without prejudice to paragraphs 1 to 9, Member States shall require, by 15 March 2024 and every year thereafter, owners and operators of every data centre in their territory with a significant energy consumption to make publicly available the information set out in point 2 of Annex VI, which Member States shall subsequently report to the Commission.

Amendment

10. Without prejudice to paragraphs 1 to 9, Member States shall require, by 15 March 2024 and every year thereafter, owners and operators of every data centre in their territory with ***an installed IT power demand greater than 100 kW, until this is superseded by the minimum threshold defined pursuant to Article 31(3)***, to make publicly available the information set out in point 2 of Annex VI, which Member States shall subsequently report to the Commission ***for publication in the EU Building Stock Observatory***.

Justification

The scope of the reporting requirement is insufficiently precise. A significant amount of discretion is left to the Member States to define what is considered a significant energy consumption which risks diverging definitions. This is recognised in Article 31(3) under which the Commission is empowered to adopt a common Union scheme for rating the sustainability of data centres, part of which is to define the minimum threshold.

EPEE consider it unlikely that the common Union scheme will be adopted before the proposed application of the data centre reporting requirement on 15 March 2024. As such EPEE suggest that an interim minimum threshold is available as a stopgap.

The industry self-regulatory initiative, the [Climate Neutral Data Centres Pact](#), uses 50 kW of installed IT power demand as the threshold for the scheme. In the context of the proposed mandatory reporting requirements, 100 kW of installed IT power demand is an appropriate and proportionate threshold, which would exclude small server rooms, for example in a single office or for multiple offices in an office building.

In addition, availability and accessibility of the reported information is essential to operationalising it in pursuit of sustainability improvements. Under the EED the Member States are required to publish and to yearly update inventories of certain public buildings. However, only seven Member States have their inventories publicly accessible on the centralised Commission [website](#). The Commission should ensure publication of all such data, including on data centres, on centralised EU-level platforms so that it is easily accessible to stakeholders across the EU. [The EU Building Stock Observatory](#) is an existing platform that can be utilised in this respect.

Proposal for a regulation

Recital 67

Text proposed by the Commission

(67) The data centre sustainability indicators can be used to measure four basic dimensions of a sustainable data centre, namely how efficiently it uses energy, how much of that energy comes from renewable energy sources, the reuse of any waste heat that it produces and the usage of freshwater. The data centre sustainability indicators should raise awareness amongst data centre owners and operators, manufactures of equipment, developers of software and services, users of data centre services at all levels as well as entities and organisations that deploy, use or procure cloud and data centre services. It should also give confidence about the actual improvements following efforts and measures to increase the sustainability in new or existing data centres. Finally, it should be used as a basis for transparent and evidence-based

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planning and decision-making. Use of the data centre sustainability indicators should be optional for Member States.

planning and decision-making. Use of the data centre sustainability indicators should be **mandatory** for Member States.

Proposal for a regulation

Article 31 – paragraph 3

Text proposed by the Commission

3. The Commission is empowered to adopt delegated acts in accordance with Article 32 to supplement this Directive by establishing, after having consulted the relevant stakeholders, a common Union scheme for rating the sustainability of data centres located in its territory. The scheme shall establish the definition of data centre sustainability indicators, and, pursuant to paragraph 9 of Article 10 of this Directive, define the minimum thresholds for significant energy consumption and set out the key indicators and the methodology to measure them.

Amendment

3. The Commission is empowered to adopt delegated acts in accordance with Article 32 to supplement this Directive by establishing, after having consulted the relevant stakeholders, a **mandatory** common Union scheme for rating the sustainability of data centres located in its territory. The scheme shall establish the definition of data centre sustainability indicators, and, pursuant to paragraph 9 of Article 10 of this Directive, define the minimum thresholds for significant energy consumption and set out the key indicators and the methodology to measure them.

Proposal for a regulation

Article 31 – paragraph 4 (new)

Text proposed by the Commission

Amendment

4. The Member States shall implement the mandatory common Union scheme for rating the sustainability of data centres established pursuant to Article 31(4) no later than one year after the publication of the implementing regulations in the Official Journal.

Justification

EPEE welcome the proposal to empower the Commission under Article 31(3) to establish a common Union scheme for rating the sustainability of data centres. Indeed, a harmonised EU level approach is preferable to Member States establishing asymmetric schemes and the proliferation of industry initiatives. However, the scheme should be mandatory if the benefits from its implementation are to be ensured, maximised and to limit the possibility for asymmetric implementation by the Member States. The comparability of the reported information across the Member States is vital for supporting evidenced based policy making in the future. Asymmetric implementation also risks creating barriers to trade that fragment the internal market for the Mechanical and Electrical (M&E) products that provide energy efficient process and close control cooling, depriving the green transition of economies of scale that are invaluable in delivering the green transition cost effectively.

**Proposal for a directive
Article 24 – paragraph 4**

Text proposed by the Commission

5. In order to assess the economic feasibility of increasing energy efficiency of heat and cooling supply, Member States shall ensure that an installation level cost-benefit analysis in accordance with Annex XI is carried out where the following installations are newly planned or substantially refurbished:

(d) a data centre with a total rated energy input exceeding 1 MW level, to assess the cost and benefits of utilising the waste heat to satisfy economically justified demand, and of the connection of that installation to a district heating network or an efficient/RES based district cooling system. The analysis shall consider cooling system solutions that allow removing or capturing the waste heat at useful temperature level with minimal ancillary energy inputs.

Amendment

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(d) data centre with a total rated energy input exceeding 1 MW level, to assess the cost and benefits of utilising the waste heat to satisfy economically justified demand, and of the connection of that installation to a district heating network or an efficient/RES based district cooling system **or other waste heat recovery solutions**. The analysis shall consider cooling system solutions that allow removing or capturing the waste heat at useful temperature level with minimal ancillary energy inputs.

Proposal for a directive
Article 24 – paragraph 5

Text proposed by the Commission

Amendment

5. Members may exempt from paragraph 4:

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- (a) data centres whose waste heat is or will be used in a district heating network or directly for space heating, domestic hot water preparation or other uses in the building or group of buildings where it is located.

- (c) data centres whose waste heat is or will be used in a district heating network or **is recovered** directly for space heating, domestic hot water preparation or other uses in the building or group of buildings where it is located.

Justification

EPEE welcome the provisions under Article 24 (4) to “assess the economic feasibility of increasing energy efficiency of heat and cooling supply” at installation level via a cost-benefit analysis when an installation is “newly planned” or is set to be “substantially refurbished”. In particular, EPEE welcome that according to paragraph (d) “data centres with a total rated energy input exceeding 1 MW level” are in the scope of this requirement, and that the CBA can be substituted for an energy audit for data centres under paragraph (d).

However, EPEE note that an exemption is provided under Article 24 (5)(c) from the requirement to conduct an analysis if the data centres has already or is planning to integrate waste heat recovery. Significantly, this covers waste heat recovery for district heating and waste heat recovery for space heating, domestic hot water, or other uses in the data centre facility. EPEE welcome the acknowledgement of the potential for waste heat recovery to reduce on-site energy consumption. Indeed, some EPEE members manufacture CRAC, process and close control units that integrate these technologies. Whilst they can be used to reduce the space heating demand elsewhere in the data centre facility, they can also be used to reduce energy demand for server cooling by converting the recovered waste heat energy into energy that can be used for cooling via the use of refrigerant cycles.

In line with energy efficiency first and circular economy principles this recovered energy can significantly reduce the energy consumption required for data centre cooling. EPEE firmly believes that such waste heat recovery applications at the level of Technical Building Systems

should not be discriminated against in the context of waste heat from data centres but should rather be promoted via clear inclusion in the scope of the CBA under Article 24 (4) which is consistent with the wording of the exemption under Article 24 (5)(c).

Proposal for a regulation

ANNEX VI – part MINIMUM CRITERIA FOR ENERGY AUDITS INCLUDING THOSE CARRIED OUT AS PART OF ENERGY MANAGEMENT SYSTEMS

Text proposed by the Commission

(e) build, whenever possible, on life-cycle cost analysis (LCCA) instead of Simple Payback Periods (SPP) in order to take account of long-term savings, residual values of long-term investments and discount rates;

Amendment

(e) build, whenever possible, on life-cycle cost analysis (LCCA) instead of Simple Payback Periods (SPP) in order to take account of long-term savings, ***sustainable effects of circular usage***, residual values of long-term investments and discount rates;

Justification

The scope of the energy audits should be explicitly expanded to cover assessment of the beneficial effects of circularity, in line with EU Green Deal / Circular economy direction.
