

English Version

**Information technology - Data centre facilities and infrastructures
- Part 99-1: Recommended practices for energy management**

Technologies de l'information - Installations et
infrastructures de centres de traitement de données - Partie
99-1 : Pratiques recommandées relatives à la gestion
énergétique

Informationstechnik - Einrichtungen und Infrastrukturen von
Rechenzentren - Teil 99-1: Empfohlene Praktiken für das
Energiemanagement

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European foreword

This document (CLC/TR 50600-99-1:2019) has been prepared by CLC/TC 215 “Electrotechnical aspects of telecommunication equipment” in conjunction with the Directorate-General Joint Research Centre (DG JRC) of the European Commission (EC).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document supersedes CLC/TR 50600-99-1:2018.

CLC/TR 50600-99-1:2019 includes the following significant technical changes with respect to CLC/TR 50600-99-1:2018:

- by updating to recently agreed energy management practices and aligns with the 2019 edition of the *EU Code of Conduct for data centres Best Practices* document.
- Environmental Sustainability practices incorporated within the 2019 edition of the *EU Code of Conduct for data centres Best Practices* document have now been re-located to CLC/TR 50600-99-2:2019.

This document aligns with the Best Practices document of the Code of Conduct for Data Centre Energy Efficiency (CoC) scheme operated by the DG JRC and continues to be prepared by data centre experts from operators, vendors, consultants, academics, professional and national bodies.

The publication of this Technical Report is intended to integrate recommended Practices of energy management into the EN 50600 series developed by CLC/TC 215.

This document has been prepared under a mandate given to CENELEC by the European Commission and the European Free Trade Association.

Regarding the structure of the EN 50600 series, see the Introduction.

Introduction

The unrestricted access to internet-based information demanded by the information society has led to an exponential growth of both internet traffic and the volume of stored/retrieved data. Data centres are housing and supporting the information technology and network telecommunications equipment for data processing, data storage and data transport. They are required both by network operators (delivering those services to customer premises) and by enterprises within those customer premises.

Data centres need to provide modular, scalable and flexible facilities and infrastructures to easily accommodate the rapidly changing requirements of the market. In addition, energy consumption of data centres has become critical both from an environmental point of view (reduction of carbon footprint) and with respect to economic considerations (cost of energy) for the data centre operator.

The implementation of data centres varies in terms of:

- a) purpose (enterprise, co-location, co-hosting, or network operator facilities);
- b) security level;
- c) physical size;
- d) accommodation (mobile, temporary and permanent constructions).

The needs of data centres also vary in terms of availability of service, the provision of security and the objectives for energy efficiency. These needs and objectives influence the design of data centres in terms of building construction, power distribution, environmental control and physical security. Effective management and operational information is required to monitor achievement of the defined needs and objectives.

This series specifies requirements and recommendations to support the various parties involved in the design, planning, procurement, integration, installation, operation and maintenance of facilities and infrastructures within data centres. These parties include:

- 1) owners, facility managers, ICT managers, project managers, main contractors;
- 2) architects, consultants, building designers and builders, system and installation designers;
- 3) facility and infrastructure integrators, suppliers of equipment;
- 4) installers, maintainers.

At the time of publication of this Technical Report, EN 50600 series will comprise the following standards and documents:

EN 50600-1, *Information technology — Data centre facilities and infrastructures — Part 1: General concepts*;

EN 50600-2-1, *Information technology — Data centre facilities and infrastructures — Part 2-1: Building construction*;

EN 50600-2-2, *Information technology — Data centre facilities and infrastructures — Part 2-2: Power supply and distribution*;

EN 50600-2-3, *Information technology — Data centre facilities and infrastructures — Part 2-3: Environmental control*;

EN 50600-2-4, *Information technology — Data centre facilities and infrastructures — Part 2-4: Telecommunications cabling infrastructure*;

EN 50600-2-5, *Information technology — Data centre facilities and infrastructures — Part 2-5: Security systems*;

EN 50600-3-1, *Information technology — Data centre facilities and infrastructures — Part 3-1: Management and operational information*;

EN 50600-4-1, *Information technology — Data centre facilities and infrastructures — Part 4-1: Overview of and general requirements for key performance indicators*;

EN 50600-4-2, *Information technology — Data centre facilities and infrastructures — Part 4-2: Power Usage Effectiveness*;

EN 50600-4-3, *Information technology — Data centre facilities and infrastructures — Part 4-3: Renewable Energy Factor*;

CLC/TR 50600-99-1, *Information technology — Data centre facilities and infrastructures — Part 99-1: Recommended practices for energy management*;

CLC/TR 50600-99-2, *Information technology — Data centre facilities and infrastructures — Part 99-2: Recommended practices for environmental sustainability*;

CLC/TR 50600-99-3, *Information technology — Data centre facilities and infrastructures — Part 99-3: Guidance to the application of EN 50600 series*.

The inter-relationship of the documents within the EN 50600 series is shown in Figure 1.

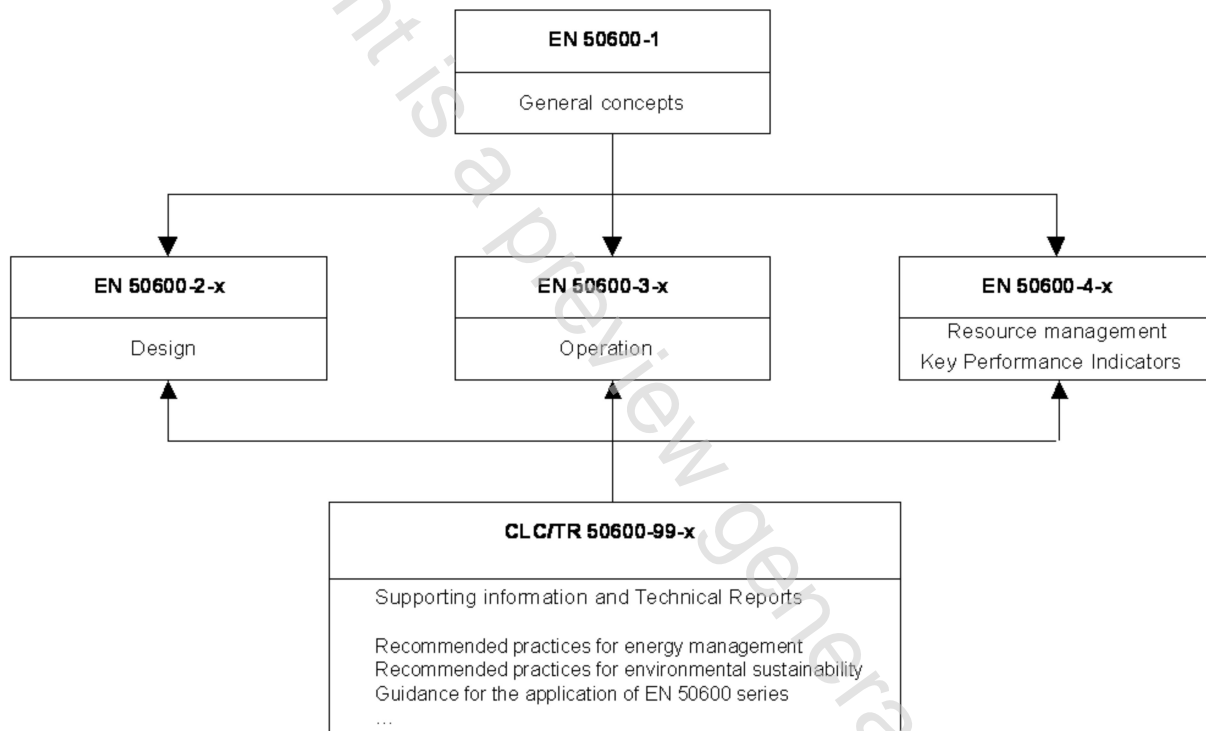


Figure 1 — Schematic relationship between the EN 50600 series of documents

EN 50600-2-X documents specify requirements and recommendations for particular facilities and infrastructures to support the relevant classification for “availability”, “physical security” and “energy efficiency enablement” selected from EN 50600-1.

EN 50600-3-X documents specify requirements and recommendations for data centre operations, processes and management.

EN 50600-4-X documents specify requirements and recommendations for key performance indicators (KPIs) used to assess and improve the resource usage efficiency and effectiveness, respectively, of a data centre.

The Directorate-General Joint Research Centre (DG JRC) of the European Commission operates a Code of Conduct for Data Centre Energy Efficiency (CoC) scheme. In support of the scheme, a “best practices” document has been established by DG JRC. To enhance the visibility, these Best Practices have been converted in this Technical Report to create recommended Practices for improving the

energy management (i.e. reduction of energy consumption and/or increases in energy efficiency) of data centres.

The areas addressed are:

- physical building;
- mechanical and electrical equipment;
- computer room;
- cabinets/racks;
- ICT equipment;
- operating systems;
- virtualization;
- software;
- business practices.

The Practices are separated into Expected Practices as referenced in the CoC (see Clause 5) and other Practices which can be employed as optional or alternative solutions in particular cases (see Clause 6). Practices under consideration for the next or future revision/amendment of this Technical Report are included in Clause 7. During the maintenance of this Technical Report, the Practices of Clauses 6 and 7 might be augmented and others might migrate into Clause 5.

The Practices listed in Clauses 5, 6 and 7 are referenced as x.yyy where x is the clause number and yyy is a sequential number starting within each (sub-)clause.

Customers or suppliers of information and communication technology (ICT) services might also find it useful to request or provide a list of the Practices of this Technical Report that are implemented in a data centre to assist in procurement of services that meet their environmental or sustainability standards.

This Technical Report also:

- acts as an education and reference document to assist data centre operators in identifying and implementing measures to improve the energy management of their data centres;
- provides a common terminology and frame of reference for describing an energy management practice, avoiding doubt or confusion over terminology.

1 Scope

This document is a compilation of recommended Practices for improving the energy management (i.e. reduction of energy consumption and/or increases in energy efficiency) of data centres. It is historically aligned with the EU Code of Conduct for Data Centre Energy Efficiency (CoC) scheme operated by the Directorate-General Joint Research Centre (DG JRC) of the European Commission (EC).

It is recognized that the Practices included might not be universally applicable to all scales and business models of data centres or be undertaken by all parties involved in data centre operation, ownership or use.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 50600-1:2012, *Information technology — Data centre facilities and infrastructures — Part 1: General concepts*

EN 50600 (series), *Information technology — Data centre facilities and infrastructures*

3 Terms, definitions and abbreviations

3.1 Terms and definitions

For the purposes of this document, the terms and definitions in the EN 50600 series and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <http://www.iso.org/obp>

3.1.1

airflow pathway

route taken by air to reach a specific point

3.1.2

albedo

diffuse reflectivity or reflecting power of a surface

3.1.3

availability

ability of an item to be in a state to perform a required function under given conditions at a given instant of time or over a given time interval, assuming that the required external resources are provided

[SOURCE: EN 50600-1:2012, 3.1.1]