TECHNICAL REPORT

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English Version

Information technology - Data centre facilities and infrastructures - Part 99-2: Recommended practices for environmental sustainability

Technologies de l'information - Installation et infrastructures des centres de traitement de données - Partie 99-2: Pratiques recommandées en faveur de la durabilité environnementale

Informationstechnik - Einrichtungen und Infrastrukturen von Rechenzentren - Teil 99-2: Empfohlene Praktiken für die Umweltverträglichkeit

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European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

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European foreword

This document (CLC/TR 50600-99-2:2021) was prepared by CLC/TC 215, "Electrotechnical aspects of telecommunication equipment".

This document supersedes CLC/TR 50600-99-2:2019.

CLC/TR 50600-99-2:2021 includes the following significant technical changes with respect to CLC/TR 50600-99-2:2019:

a) addition of the following new practices: 5.8, 7.10 and 8.1.4;

b) update of practices 6.2.1 and 6.3.2;

c) inclusion of practices CLC/TR 50600-99-1:2020, 7.2.1.2 as practice 5.9 and CLC/TR 50600-99-1:2020, 7.1.4 as 6.2.3 (with existing practices renumbered).

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

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

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

Any feedback and questions on this document should be directed to the users' national committee. A complete listing of these bodies can be found on the CENELEC website.

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 usually 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 environmental footprint) and with respect to economical 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, telecommunications cabling and physical security as well as the operation of the data centre. Effective management and operational information is important in order to monitor achievement of the defined needs and objectives.

Recognizing the substantial resource consumption, particularly of energy, of larger data centres, it is also important to provide tools for the assessment of that consumption both in terms of overall value and of source mix and to provide Key Performance Indicators (KPIs) to evaluate trends and drive performance improvements.

At the time of publication of this document, the EN 50600 series is designed as a framework of standards, technical specifications and technical reports covering the design, the operation and management, the key performance indicators for energy efficient operation of the data centre as well as a data centre maturity model.

The EN 50600-2 series defines the requirements for the data centre design.

The EN 50600-3 series defines the requirements for the operation and the management of the data centre.

The EN 50600-4 series defines the key performance indicators for the data centre.

The CLC/TS 50600-5 series defines the data centre maturity model requirements and recommendations.

The CLC/TR 50600-99-X Technical Reports cover recommended practices and guidance for specific topics around data centre operation and design.

This series of documents 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, operators, facility managers, ICT managers, project managers, main contractors;

2) consulting engineers, architects, building designers and builders, system and installation designers, auditors, test and commissioning agents;

3) facility and infrastructure integrators, suppliers of equipment;

4) installers, maintainers.

At the time of publication of this document, the 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*

EN 50600-4-6, *Information technology — Data centre facilities and infrastructures — Part 4-6: Energy Reuse Factor*

EN 50600-4-7, *Information technology — Data centre facilities and infrastructures — Part 4-7: Cooling Efficiency Ratio*

CLC/TS 50600-2-10: *Information technology — Data centre facilities and infrastructures — Part 2-10: Earthquake risk and impact analysis*

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.

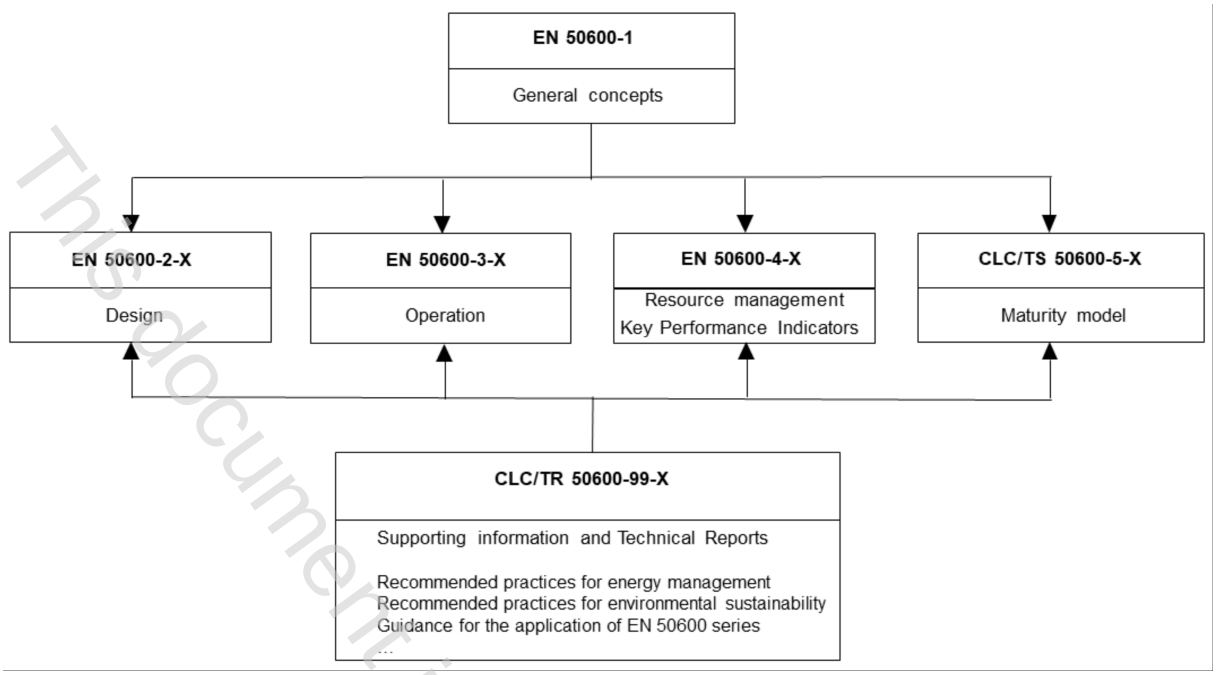

Figure 1 — Schematic relationship between the EN 50600 series of documents

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.

This document is a compilation of recommended practices for improving the environmental sustainability of data centres.

This document considers that environmental sustainability of a data centre comprises three key areas:

— energy use;

— embodied impact of information and communication technology (ICT) equipment and mechanical and electrical systems;

— source energy mix of the above (i.e. amount of renewable content).

The recommended practices for improving the environmental sustainability of data centres relating to operational energy use of a data centre (i.e. reductions of energy consumption and/or improvements of energy efficiency, re-use of energy and use of renewable energy) are detailed in CLC/TR 50600-99-1.

However, any recommendations of CLC/TR 50600-99-1 that have applicability beyond energy management and concern environmental sustainability will be included in this document. The long-term objective is to avoid unintentional duplication of recommended practices in the two documents.

This document provides recommended practices to:

— assess and implement improvements to the environmental sustainability in data centres, by means of Life Cycle Assessment (LCA);

— assist the industry in taking steps towards more sustainable behaviour.

Customers or suppliers of information and communication technology (ICT) services possibly 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 the 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.

1 Scope

This document is a compilation of recommended practices for improving the environmental sustainability of both new and existing data centres. Environmental impacts consider not just those associated with electricity but also water usage and other pollutants.

It is recognized that the practices included are not 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 series, *Information technology — Data centres facilities and infrastructures*

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

3 Terms, definitions and abbreviations

3.1 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

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

— IEC Electropedia: available at https://www.electropedia.org/

— ISO Online browsing platform: available at https://www.iso.org/obp

3.1.1
embodied impact
environmental impact caused pre- and post-use, including during manufacture and disposal

3.1.2
energy efficiency
measure of the work done (as a result of design and/or operational procedures) for a given amount of energy consumed

[SOURCE: CLC/TR 50600-99-1:2021, 3.1.11]

3.1.3
energy management
combination of reduced energy consumption and increased energy efficiency, re-use of energy and use of renewable energy

Note 1 to entry: See also EN 50600-3-1 for another definition of energy management.

[SOURCE: CLC/TR 50600-99-1:2021, 3.1.12]

3.1.4
information and communication technology (ICT) equipment
information technology (IT) and network telecommunications (NT) equipment providing data storage, processing and transport services

Note 1 to entry: Representing the “critical load” of the data centre

[SOURCE: CLC/TR 50600-99-1:2021, 3.1.16]