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SLOVENSKI STANDARD
SIST-TS CLC/TS 50600-5-1:2022

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Informacijska tehnologija - Naprave in infrastruktura podatkovnega centra - 5-1. del: Zrelostni model za upravljanje z energijo in okoljsko trajnostjo

Information technology - Data centre facilities and infrastructures - Part 5-1: Maturity Model for Energy Management and Environmental Sustainability

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ICS:

27.015	Energijska učinkovitost. Ohranjanje energije na splošno	Energy efficiency. Energy conservation in general
35.110	Omreževanje	Networking

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Information technology - Data centre facilities and infrastructures - Part 5-1: Maturity Model for Energy Management and Environmental Sustainability

Technologie de l'information - Installation et infrastructures de centres de traitement de données - Partie 5-1 : Modèle de maturité pour la gestion de l'énergie et la durabilité environnementale

Informationstechnik - Einrichtungen und Infrastrukturen von Rechenzentren - Teil 5-1: Reifegradmodell für Energiemanagement und Umweltverträglichkeit

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CENELEC

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

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CLC/TS 50600-5-1:2021 (E)

European foreword

This document (CLC/TS 50600-5-1:2021) has been prepared by CLC/TC 215, "Electrotechnical aspects of telecommunication equipment".

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.

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.

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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.

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At the time of publication of this document, 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 50600-5-1, *Information technology — Data centre facilities and infrastructures — Part 5-1: Maturity Model for Energy Management and Environmental Sustainability*

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 for the application of EN 50600 series*

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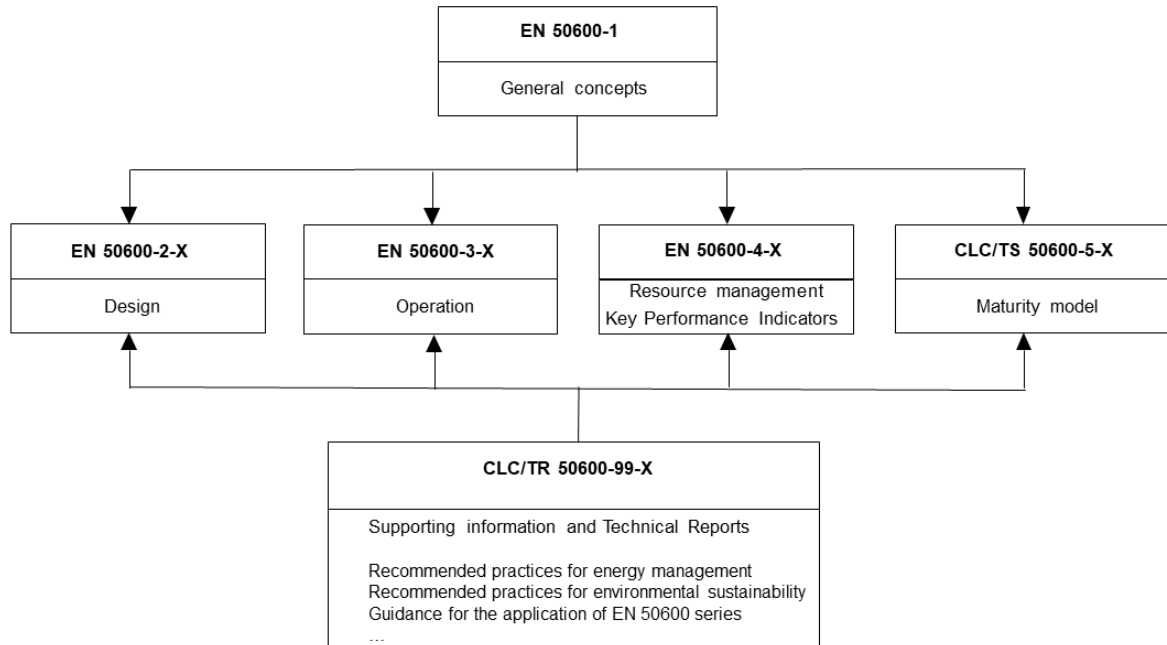
Figure 1 — Schematic relationship between the EN 50600 series of documents

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 provides a maturity model addressing the facilities, infrastructures and the information and communication technology (ICT) equipment of the data centre to enable data centre owners/operators to:

— employ a framework to baseline their data centre design and practices;

— determine the level of maturity applicable to their data centre;

— identify relevant guidance on potential areas of improvement together with the anticipated benefits to justify the resources required;

— develop an action plan to migrate to higher maturity levels.

The current document focusses on environmental impact (energy management and environmental sustainability). Other elements might be included in future documents.

NOTE   The term "environmental *sustainability*" is used recognizing that well established treatments of "sustainability" feature three separate viability objectives (environmental, economic and social). For the purposes of this document, only elements of environmental viability are considered.

This document supports the wider adoption of recommended practices of other documents in the EN 50600 series and those of other recognized relevant standards in the area of energy management and environmental sustainability.

1 Scope

This document provides a maturity model addressing the environmental impact (energy management and environmental sustainability) of the facilities, infrastructures and the information and communication technology (ICT) equipment accommodated by the data centre.

NOTE   The term "environmental *sustainability*" is used recognizing that well established treatments of "sustainability" feature three separate viability objectives (environmental, economic and social). For the purposes of this document, only elements of environmental viability are considered.

The elements addressed include design, procurement, operation and end-of-life. The achievement of the Levels of the maturity model are based upon confirmation of the implementation of applicable practices of CLC/TR 50600-99-1 and CLC/TR 50600-99-2.

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 centre facilities and infrastructures*

CLC/TR 50600-99-1:2021, *Information technology – Data centre facilities and infrastructures - Part 99-1: Recommended practices for energy management*

CLC/TR 50600-99-2:2021, *Information technology – Data centre facilities and infrastructures - Part 99-2: Recommended practices for environmental sustainability*

3 Terms, definitions and abbreviations

3.1 Terms and definitions

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

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

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

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

3.2 Abbreviations

For the purposes of this document the abbreviations of the EN 50600 series documents apply.

4 Concepts of data centre maturity

4.1 Overview

This document describes a 5-level maturity model which separately addresses multiple elements of the facilities, infrastructures and the information and communication technology (ICT) equipment of the data centre in relation to their environmental impact (energy management and environmental sustainability). Other elements may be included in future documents.

It covers design, procurement, operation and end-of-life.

The purpose of the document is to enable data centre owners/operators to:

—   employ a framework to baseline their data centre design and practices;

— determine the level of maturity applicable to their data centre;

— identify relevant guidance on potential areas of improvement together with the anticipated benefits to justify the resources required;

— develop an action plan to migrate to higher maturity levels.

This document supports the wider adoption of recommended practices of other documents in the EN 50600 series and those of other recognized relevant standards in the area of energy management and environmental sustainability.

The maturity model described by this document is applicable to all data centres and recognizes that the implementation of data centres varies in terms of:

a) purpose (enterprise, co-location, co-hosting, or network operator facilities);

b) availability class;

c) security level;

d) physical size;

e) accommodation (mobile, temporary and permanent constructions).

The maturity model also recognizes that the purpose, or business model, of a data centre can prevent some of the elements to be addressed fully, or in part, by the data centre owner/operator.

For all the above reasons, the maturity model cannot be applied as a comparison of data centres unless all the factors relating to the data centre were identical.

4.2 Basis of the maturity model

The maturity model is based upon the practices described in CLC/TR 50600-99-1 and CLC/TR 50600-99-2.

The eight elements addressed by the maturity model are:

a) MANAGEMENT: Management and operational information;

b) INFRASTRUCTURE: Building;

c) INFRASTRUCTURE: Power supply and distribution;

d) INFRASTRUCTURE: Environmental control;

e) ICT: Software;

f) ICT: Compute;

g) ICT: Storage;

h) ICT: Networking.

NOTE   Security systems and telecommunications cabling are not addressed in this document.

There are 5 levels applicable to each element with the progression within the model designated Level 1 to Level 5.

4.3 Progress along the Levels of the maturity model

The practices associated with each level are listed in the following clauses.

a) LEVELs 1, 2 and 3: Clause 5;