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# TECHNICAL SPECIFICATION

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## Energy management system application program interface (EMS-API) – Part 600-1: Common Grid Model Exchange Specification (CGMES) – Structure and rules

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# ENERGY MANAGEMENT SYSTEM APPLICATION PROGRAM INTERFACE (EMS-API) –

# Part 600-1: Common Grid Model Exchange Specification (CGMES) – Structure and rules

## FOREWORD

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- the required support cannot be obtained for the publication of an International Standard, despite repeated efforts, or
- the subject is still under technical development or where, for any other reason, there is the future but no immediate possibility of an agreement on an International Standard.

Technical specifications are subject to review within three years of publication to decide whether they can be transformed into International Standards.

IEC TS 61970-600-1, which is a technical specification, has been prepared by IEC technical committee 57: Power systems management and associated information exchange.

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The text of this technical specification is based on the following documents:

| Enquiry draft | Report on voting |
|---|---|
| 57/1815/DTS | 57/1871/RVDTS |

Full information on the voting for the approval of this technical specification can be found in the report on voting indicated in the above table.

This document has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all parts in the IEC 61970 series, published under the general title *Energy management system application program interface (EMS-API)*, can be found on the IEC website.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under "http://webstore.iec.ch" in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

A bilingual version of this publication may be issued at a later date.

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# INTRODUCTION

The purpose of the Common Grid Model Exchange Specification (CGMES) is to define the interface between Transmission System Operators (TSO) software in order to exchange power system modelling information as required by the European Network of Transmission System Operators for Electricity (ENTSO-E) and TSO business processes.

The CGMES is used as a baseline exchange specification for the implementation of the Common Grid Model (CGM) methodologies in accordance with the requirements for the implementation of various European network codes and guidelines. The CGMES applies to applications dealing with power system data management, as well as applications supporting the following analyses:

- load flow and contingency analyses,
- short circuit calculations,
- market information and transparency,
- capacity calculation for capacity allocation and congestion management, and
- dynamic security assessment.

The conformity of the applications used for operational and system development exchanges with the CGMES is crucial for the needed interoperability of these applications. ENTSO-E therefore developed and approved the CGMES Conformity Assessment Framework as the guiding principles for assessing applications' CGMES conformity. This technical specification relies on the CGMES Conformity Assessment Process operated by ENTSO-E in order to ensure that the CGMES is properly implemented by suppliers of the applications used by TSOs.

The CGMES is a superset of the former ENTSO-E CIM based data exchange standard (Profile 1) which was based on CIM14 (UML14v02) and has been used for certain network models exchanges since 2009. The CGMES reflects TSO requirements (as known by 2014) for accurate modelling of the ENTSO-E area for power flow, short circuit, and dynamics applications whilst also allowing for the exchange of any diagram layouts including GIS data of a grid model.

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# ENERGY MANAGEMENT SYSTEM APPLICATION PROGRAM INTERFACE (EMS-API) –

# Part 600-1: Common Grid Model Exchange Specification (CGMES) – Structure and rules

## 1 Scope

This technical specification on the CGMES defines the main rules and requirements related to the CGMES which are mandatory for achieving interoperability with the CGMES and for satisfying business processes. In this document requirements are indicated as such in a tabular format. Some descriptions are merely used for clarification and are marked “Informational”.

The profiles which belong to CGMES are defined in IEC 61970-600-2:2017. The related technical information and documentation (i.e. RDFS, OCL, XMI and HTML) needed for the implementation of the CGMES, which is not copyrighted by either IEC or CENELEC, is available at the ENTSO-E web site.

The CGMES is defined using information on the Common Information Model (CIM) available in the public domain.

Future editions of this technical specification will be released to describe following CGMES versions which will reflect additional requirements due to European network codes or guidelines.

## 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.

IEC 61970-452, *Energy management system application program interface (EMS-API) – Part 452: CIM model exchange specification*

IEC 61970-453, *Energy management system application program interface (EMS-API) – Part 453: Diagram layout profile*

IEC 61970-456, *Energy management system application program interface (EMS-API) – Part 456: Solved power system state profiles*

IEC 61970-552, *Energy management system application program interface (EMS-API) – Part 552: CIMXML Model exchange format*

IEC 61968-4, *Application integration at electric utilities – System interfaces for distribution management – Part 4: Interfaces for records and asset management*

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