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Technical guidelines for the evaluation of energy savings of thermal power plants

Lignes directrices techniques pour l'évaluation des économies d'énergie des centrales électriques thermiques

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Foreword

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The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see www.iso.org/iso/foreword.html.

This document was prepared by ISO/TC 301, *Energy management and energy savings*.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

This document provides a general and practical framework for evaluating energy savings of thermal power plants, including steam power plants based on the Rankine cycle, gas turbine plants and combined cycle systems. These power plants mainly comprise one or several thermal power generating units (TPGUs) to produce electricity only or both electricity and heat (i.e. cogeneration facilities and combined heat and power systems) by burning coal, oil products, natural gas and/or other fuels.

This document covers principles, procedures, evaluation indexes and calculation methods when determining the potential of energy savings of an existing TPGU before (an) energy performance improvement action(s) (EPIAs) or evaluating the contract guarantees of its energy savings after the EPIA(s) (e.g. energy performance contracting).

This document can be used by any interested party that intends to evaluate energy savings of a thermal power plant.

The relationship of this document with related standards and the Plan-Do-Check-Act cycle is shown in Figure 1.

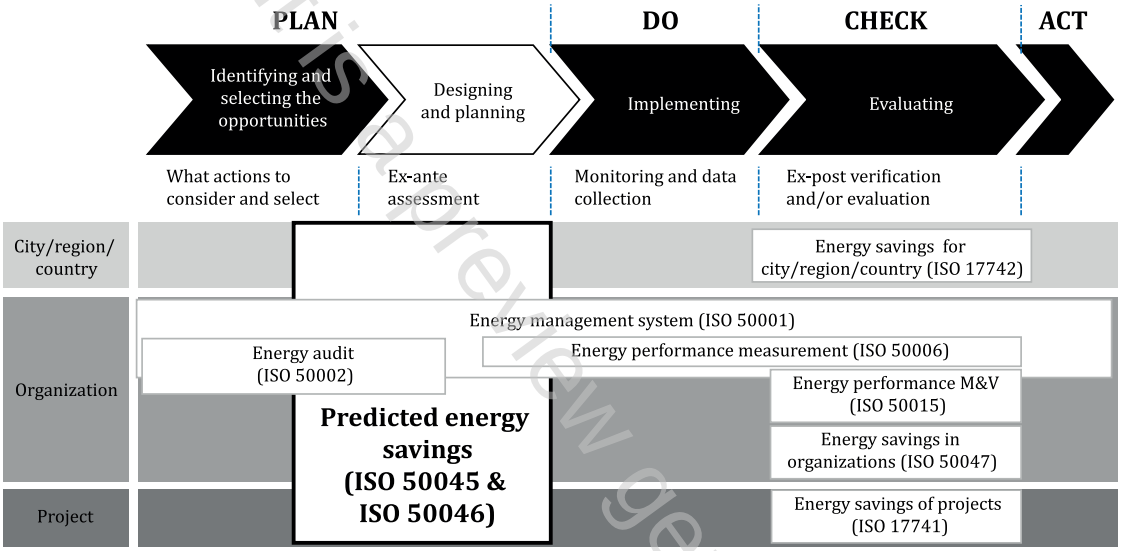

Figure 1 — General process for iterative improvement

Technical guidelines for the evaluation of energy savings of thermal power plants

1 Scope

This document gives general technical guidelines for evaluating energy savings of thermal power plants before and/or after implementing energy performance improvement action(s) (EPIAs). It includes evaluation, unit component efficiency, indexes calculation, analyses and reporting.

This document is applicable to existing thermal power generating units (TPGUs), where fossil fuels (e.g. coal, oil, natural gas) are combusted to generate electricity only or to supply thermal energy with the additional production of electricity (i.e. combined cycle power plants).

NOTE A typical thermal power plant encompasses at least one TPGU. If there is more than one, the TPGUs can run independently.

Results obtained in accordance with this document can be used either to evaluate the potential of energy savings or to determine fulfilment of contract guarantees. They do not provide a basis for comparison of the energy savings between TPGUs.

This document does not prescribe performance tests or measurements for TPGU equipment components/systems, the sampling and analysis of the fuels used, substances added for control of emissions (e.g. halide, limestone) and by-products (e.g. ash, gypsum), and instruments to be employed, but it does specify parameters of interest in the determination of energy savings. Applicable procedures can be found in relevant documents (published or to be published).

2 Normative references

There are no normative references in this document.

3 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:

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

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

3.1
energy savings
ΔE
reduction of energy consumption compared to an energy baseline

Note 1 to entry: Energy savings can be actual (realized) or expected (predicted).

Note 2 to entry: Energy savings can be the result of implementation of an *EPIA* (3.4).

[SOURCE: ISO 17743:2016, 3.8, modified — "or autonomous progress" has been deleted from Note 2 to entry.]