

Business Plan for the CEN-CENELEC Workshop EINSTEIN on Good Practice for an Integrated Approach on Thermal Energy Audits

CEN-CLC/WS EINSTEIN Good Practice Thermal Energy Audits (GPTEA)

(approved during the Kick-off meeting on 2012-09-28)

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List of Abbreviations and Acronyms

CCMC	CEN-CENELEC Management Centre
CEN	Comité Européen de Normalisation European Committee for Standardization
CLC	CENELEC - European Committee for Electrotechnical Standardization
CEN-CLC WA	CEN-CENELEC Workshop Agreement
DIN	Deutsches Institut für Normung e. V. German Institute for Standardization
EINSTEIN	Expert system for an Intelligent Supply of Thermal Energy in Industry and other large scale applications

1 Status of the Business Plan

This Business Plan currently has the status as listed in Table 1.

Table 1 – Status of this Business Plan

Document Type	Actions required	Status
Draft Business Plan	To be further developed, prior to submission for approval	Development finalised Approved by proposer Approved by CEN/BT and CENELEC/BT
Business Plan	To be approved at the Kick-off meeting of the Workshop	Approved at the kick-off meeting

2 Background to the Workshop

2.1 General

Industrial thermal energy (heat and cooling) demand constitutes about 28 % of the total final energy demand and produces about 21 % of the CO₂ emissions in Europe. Space heating and cooling in buildings contributes another 27 % to the final energy demand.¹ Despite improvements in energy efficiency across Europe over the last decades, there remains a large unexploited potential for reducing energy demand which can be achieved by the intelligent combination of existing solutions and technologies.

In this context, energy audits are essential when it comes to efficiently and effectively assessing consumption of energy and suggesting measures to reduce energy consumption. Many methods have been developed, being supported by software tools and based on specific approaches.

However, frequently the required investments are not made due to e.g. lack of knowledge and too few resources made available for energy auditing.

These constraints too often lead to approaches that look at energy consumption focusing on singular aspects that seem to provide solutions but that in the end do not prove to fully exploit the potential for reduction.

However, a holistic integral approach allowing to best optimize thermal energy supply, including the possibilities of demand reduction by heat recovery and process integration, and by an intelligent combination of existing affordable heat (and cold) supply technologies, under the given economic constraints, would prove to generate results and measures that help to fully exploit any potentials.

¹ European Commission DG INFSO, Impact of Information and Communication Technologies on Energy Efficiency, Final Report, 2008; p.132.

2.2 The EINSTEIN II project funded under the IEE program of the European Commission

A holistic approach on energy audits is what the EINSTEIN project funded under the IEE program of the European Commission in the Competitiveness and Innovation Framework Programme (CIP) has set as its goal.

From 2007 to 2009, during the implementation of a first project phase (EINSTEIN I)², great interest in the EINSTEIN methodology and the EINSTEIN software tool by auditors was evidenced by the number of participants in the work shops and trainings.

The research on existing energy efficiency tools showed that the EINSTEIN approach was unique for the tools on the market and industrial companies were very curious to work with this kind of tool.

Results included:

- A methodology, the EINSTEIN tool-kit, available for low cost, efficient audits focused on optimizing the thermal energy demand and supply in industry for download on the web site
- 2,500 copies of the complete EINSTEIN tool-kit including the expert system software tool and the guidelines in 6 European languages
- 200 trained auditors that apply the EINSTEIN auditing tool-kit and act as multipliers
- 90 industrial companies audited using EINSTEIN

Thus, the project was granted a second phase (July 2010 to August 2012).

EINSTEIN II³ aims at a wider implementation of integral energy-efficient solutions for thermal energy supply in industrial companies with a high fraction of heat demand and for non-industrial users of similar demand profiles, such as hospitals, commercial buildings, district heating and cooling networks, etc. EINSTEIN II builds on the thermal energy auditing toolkit developed within the previous IEE project EINSTEIN. The toolkit, based on expert system software, guides the user through the whole procedure from auditing (visit, data acquisition etc.) and data processing, to the elaboration, design and quantitative evaluation of different solutions, applying the holistic approach, with possibilities of heat recovery and process integration and by an intelligent combination of existing economically viable technologies.

The following specific objectives had been set:

- Consolidate the EINSTEIN methodology and extend it to non-industrial uses
- Conduct intensive training of energy auditors etc. in more countries, including larger ones
- Validate the improved methodology in an audit campaign in 72 companies (industrial and non-industrial)

² <http://www.iee-einstein.org/>, query 2011-08-01

³ <http://www.einstein-energy.net/>, query 2011-08-01

- Contribute to CEN and CENELEC standardization activities in the field of energy audits.

2.3 Motivation

Contribution to standardization activities thus had been specified as one of the goals of EINSTEIN II.

The objectives concerning standardization were refined when the project entered implementation:

- development of standards and contribution to standardisation activities ongoing in the European Committee for Standardization
- CEN-CENELEC JWG 3 "Energy Management and related services – General requirements and qualification procedures" (previously CEN-CLC/BT/TF 189)
- CEN-CENELEC JWG 4 "Energy efficiency and saving calculation" (previously CEN-CLC/BT/TF 190), and
- CEN-CENELEC JWG 1 "Energy audits".⁴

CEN-CLC JWG 2 "Guarantees of origin and energy certificates" has recently been added to be observed by EINSTEIN.

This approach goes beyond standardization being considered an instrument for the dissemination of research results, but it is integral part of the overall strategy of the project.

The organizational structure of the project reflects this and includes a work package "Standardization" where all activities related to standards work are bundled, including the implementation of a workshop on standardization for energy audits, realized in July 2011 in Vienna.

Standardization must be applied when the same methodology and tools for energy audits are used across borders in diverse national contexts as done in EINSTEIN I and II, while comparability of results is essential to evaluate e.g. overall energy savings potentials in Europe. It is essential also in such aspects as uniform training for auditors without neglecting culturally different training and learning approaches to achieve a similar level of professionalism.

Last but not least, EINSTEIN can deliver considerable assets to ongoing standardization and push knowledge and expertise, thus enhancing and accelerating standards work.

Next to developing a CEN-CLC WA where the integral approach of EINSTEIN on energy audits is presented as good practice suggesting a comprehensive procedure for energy audits, specific results of EINSTEIN will also be channelled into ongoing standards work.⁵ This potentially includes input to work related to M/479 Energy Audits.⁶

⁴ <http://www.einstein-energy.net/>, query 2011-08-02.

⁵ Refer to <http://www.cen.eu/cen/Sectors/TechnicalCommitteesWorkshops/CENTechnicalCommittees/Pages/default.aspx?param=700835&title=Energy%20audits> query 2012-02-22

⁶ Also refer to ftp://ftp.cen.eu/CEN/Sectors/List/Energy/energymanagement/M_479.pdf query 2012-02-27

The following results of EINSTEIN have been identified as exploitable knowledge for standardization:

- EINSTEIN accountancy system and definition of energy flows, temperature levels, etc. (for thermal energy auditing and defining energy flows it is essential to clearly define boundaries of subsystems, and temperature levels of the involved energy flows),
- reference methodology and (free and open source, therefore transparent) standard calculation tool for quantifying potential energy savings,
- reference on which type and amount of data should be collected for thermal energy,
- audits (at different levels of detail),
- providing technical infrastructure for creating a public database of benchmarks and benchmark projects.

As to which of the knowledge is to be used for the development of the CEN-CLC WA, refer to Clause 4.

This Business Plan is a deliverable of EINSTEIN II.

2.4 The market environment

Assessments of the market environment as well as of the market barriers have been realized during EINSTEIN I and can be downloaded from the following sources:

Review of thermal energy auditing practices and tools:

https://www.einstein-energy.net/media/static_pages/4%20EINSTEIN%20Documentation/EINSTEIN%20D2.2%20Review%20Auditing%20Practice%20and%20Tools.pdf⁷

Market Barriers to Energy Efficiency:

http://iee-einstein.org/images/Download_Center/barriers%20to%20energy%20efficiency%20final.pdf⁸

A report on ***Good Practices of Thermal Energy Saving Measures in Industry*** is available at

http://iee-einstein.org/index.php?option=com_content&task=view&id=18&Itemid=39⁹

An ***Executive Summary on the Energy Audits*** realized during EINSTEIN I and their results, available at

http://iee-einstein.org/images/Download_Center/executive%20summary%20on%20energy%20audit%20results.pdf¹⁰

⁷ Query 2011-08-01

⁸ Query 2011-08-01

⁹ Query 2011-08-01

¹⁰ Query 2011-08-01

includes a statistical evaluation of the results of the EINSTEIN audit campaign and presents the results in terms of energy and CO₂ saving potentials. It also lists energy consumption and saving potential for those countries where audits had been realized (Austria, Czech Republic, Italy, Poland, Slovenia, and Spain). An assessment of the EINSTEIN methodology and tool at that point was the basis for the further development of both in EINSTEIN II, contributing knowledge and expertise also to the development of the CEN-CLC WA.

2.5 The legal environment (Directives and relevant national legislation)

The EINSTEIN II project addresses specific topics related to the implementation of sustainable schemes for energy audits and energy management in line with Article 12 of Directive 2006/32/EC. This Directive states: "Member States shall ensure the availability of efficient, high-quality energy audit schemes which are designed to identify potential energy efficiency improvement measures (...) to all final consumers, including (...) commercial and small and medium-sized industrial customers".

The standardized energy audit methodology and tools being developed by EINSTEIN II in combination with the activities towards standardization of energy auditing will help Member States to ensure the availability of this efficient high-quality energy audit scheme in the field of thermal energy, where up to now structured and comprehensive methodologies have not been available.

Due to its specific focus on thermal energy, the EINSTEIN project also contributes to the EU policies directed to the promotion of Renewable Heating and Cooling (Renewable Energy Roadmap and the potential Community measure on Renewable Energy Sources in Heating and Cooling, the so-called "RES-H/C" directive), the Directive on the promotion of the use of energy from renewable sources (Directive 2009/28/EC of the European Parliament and of the Council of 23 April 2009), of increasing energy end-use efficiency and energy services (Directive 2006/32/CE) and of the increased use of CHP (distributed generation of electricity; Directive 2004/8/EC of the European Parliament and of the Council of 11 February 2004 on the promotion of cogeneration).

As the development of the CEN-CENELEC Workshop Agreement falls within the implementation of the project, the CEN-CLC WA will in as much also contribute to the goals of the directives quoted.

2.6 Existing standards, standards related activities and documents

The project EINSTEIN II provided the opportunity to assess the landscape of existing standards, ongoing activities as well as future work.

In the case of energy audits and related to this, energy management, standards are being developed at national, European and the international levels.

An overview of selected standards, ongoing activities and relevant committees can be found in Annex A.

A Trends Analysis Workshop on Standardization for Energy Audits was organized in July 2011 to bring together people and parties interested to discuss existing work and potentials of EINSTEIN II for standardization. A documentation of this workshop can be found at www.ebn.din.de/ including an overview of the strategy of EINSTEIN II concerning standardization.

3 Workshop proposers and Workshop participants

Table 2, Table 3, Table 4 and Table 5 give information on workshop proposers and experts having registered and endorsed the business plan at various stages of the workshop.

Table 2 – List of Workshop Proposers

	Company	Name
1	energyXperts.NET	Dr. Hans Schweiger
2	energyXperts.NET	Dr. Claudia Vannoni
3	To be amended	
n		

Table 3 – Contact point on the part of the Workshop proposers

	Contact point	Dr. Hans Schweiger
1	Company	energyXperts.NET Ingeniería Termo-energética y Energías Renovables Thermische Energietechnik und erneuerbare Energien Thermo-energetical Engineering and Renewable Energies Barcelona (Spain) / Berlin (Germany) www.energyxperts.net
2	Contact data	Berlin Office: +49 30 4606 44-00 hans.schweiger@energyxperts.net

Table 4 – List of Participants at the Kick-off Meeting

	Company	Name
1		
2		
3		
4		
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9		
10		

	Company	Name
n		

Table 5 – Participants endorsing the Business Plan¹¹

	Company	Name
1		
2		
3		
4		
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7		
8		
9		
10		
n		

4 Workshop scope and objectives

This Workshop will lay out an integrated approach on thermal energy audits, based on the EINSTEIN methodology, guiding the user through the whole auditing procedure, from preparation of visit and data acquisition, to data processing, to the evaluation of alternative solutions and reporting. The EINSTEIN approach for thermal energy audits, which will be referred to, is described in detail in the document 'Guide for EINSTEIN Thermal Energy Audits' and complementary documents, available for download at: <http://www.einstein-energy.net/tool-kit>. The methodology is implemented in the EINSTEIN software tool, also available from the above mentioned website.

Duplication of work realized in CEN-CENELEC/JWG 1 on energy audits shall be avoided and shall not be covered by the scope of the CEN-CLC WA. It is, however, intended that the content of the CEN-CLC WA will serve as future input for standardization work.

¹¹ The companies marked with an asterisk having registered after the Kick-off meeting.

5 Workshop Program

5.1 Work Plan

The deliverable of this workshop consists of one CEN-CENELEC Workshop Agreement; it shall be published in English.

As funding originates from public sources and results might be of public interest, an external comment phase is foreseen; for this purpose the draft version of the CEN-CLC WA shall be made publicly available for 60 days on the CEN and CENELEC websites.

From that page, potential commentators are guided through the commenting process. All comments shall be submitted to the secretariat endorsed at the kick-off meeting for follow-up.

All comments received will be considered by the chairperson preliminary to a meeting of participants of the workshop at which each comment received shall be presented, discussed and resolved. It shall depend on the number of comments received if this meeting shall coincide with the final meeting of the workshop where the final version the CEN-CLC WA shall be endorsed by parties present.

Any meeting except for the kick-off and the final meeting can be organized as virtual meeting. If the comments received are only from parties registered for the workshop (i.e. not from parties not registered, but from parties interested in the issue and hence having commented during the external comment stage) the endorsement of the CEN-CLC WA can be handled through a written approval or disapproval process in which the registered parties participate.

The time schedule for the workshop is being influenced by the runtime of the EINSTEIN II project, as partial funding for the Workshop activities originate from EINSTEIN II project funds. Additionally, the delivery of a final draft for the CEN-CLC WA is one of the deliverables of the project, thus any activity related to the development of the final draft must be finalised before the end of the project on 2012-10-31.

Table 6 gives an overview of the schedule of the Workshop.

Table 6 – Work Schedule

Activity Action	Month in 2012-2013															
	2011	01	02	03	04	05	06	07	08	09	10	11	12	01	02	
Development and Consultation of Business Plan																
Public availability of Business Plan																
Kick-off Meeting																
Elaboration of Draft CEN-CLC WA																
Public comments on CEN-CLC WA																
Resolving comments																
Endorsement of final version of CEN-CLC WA																
Final version sent to CCMC for publication																

6 Workshop structure

This Workshop shall be led by a chairperson and in case of absence or unavailability, by a vice-chair. The Workshop secretariat shall be responsible for the management of the Workshop.

6.1 CEN-CENELEC Workshop Chairperson

A proposal for the chairperson will be made by the Workshop proposers; he/she or any other candidate nominated during the period of publication of this Business Plan or at the Kick-off will be approved at the Kick-off meeting by the parties present. His/her responsibilities include:

- Chairing the CEN-CENELEC Workshop meetings,
- Representing the CEN-CENELEC Workshop in outside meetings in cooperation with CCMC and with the Workshop secretariat,
- Monitoring the progress of the CEN-CLC WA,
- Ensuring liaison with relevant CEN and CENELEC Technical Committees,
- Interface with CCMC regarding strategic directions, problems arising, external relationships, etc.

6.2 CEN-CENELEC Workshop Vice-Chair

The Workshop Vice-Chair shall be appointed in the Kick-off meeting. The Vice-Chair shall support and assist in all responsibilities outlined for the Chairperson. In the absence of the Chairperson, the Vice-Chair will represent the CEN-CENELEC Workshop at outside meetings in cooperation with CCMC and will interface with CCMC regarding strategic directions, problems arising, external relationships, etc.

6.3 CEN-CENELEC Workshop Secretariat

The CEN-CENELEC Workshop Secretariat is providing the formal link to the CEN-CENELEC system. The following main activities will be carried out by the Workshop Secretariat:

- Organizing CEN-CENELEC Workshop plenary meetings,
- Producing CEN-CENELEC Workshop minutes and action lists,
- Forming the administrative contact point for CEN-CLC WA project,
- Managing CEN-CENELEC Workshop attendance lists,
- Managing CEN-CENELEC Workshop document registers,
- Following-up action lists,
- Assisting Chairperson in monitoring and following-up of electronic discussions – in case the CEN-CENELEC Workshop is mainly working by electronic means,
- Administrating the liaison with relevant CEN and CENELEC TCs, if applicable.

The German CEN member DIN is proposed to hold the Secretariat subject to the endorsement at the Kick-off meeting.

7 Resource requirements

7.1 Costs of the CEN-CENELEC Workshop Secretariat

The administrative costs of CEN-CENELEC Workshop Secretariat and other logistical support will be covered by resources from the IEE project EINSTEIN II.

The copyright of the CEN-CLC WA shall be with CEN and CENELEC.

7.2 Participation and Registration Fee

The registration and participation at this CEN-CENELEC Workshop is free of charge; each participant shall bear his/her own cost for travel and subsistence.

8 Related activities, liaisons, etc.

EINSTEIN II has established a (project) liaison with CEN-CLC/JWG 1 "Energy Audits", following the recommendation by CEN and CENELEC to establish a cooperation in the field of standardization for energy audits between the consortium and the CEN-CLC Working Group. This was done by CCMC issuing a letter of recommendation at the time of application for EINSTEIN II.

9 Contact points

Chairperson

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Annex A – Relevant standards and standards committees¹²

Table A.1 – Select list of existing standards and standards under preparation

Standard	Title	Status	Committee
European level			
CEN-CLC/TR 16103	Energy management and energy efficiency – Glossary of terms	published	CEN/SS F23
EN 15241	Ventilation for buildings – Calculation methods for energy losses due to ventilation and infiltration in buildings	published	CEN/TC 156
EN 15243	Ventilation for buildings – Calculation of room temperatures and of load and energy for buildings with room conditioning systems	published	CEN/TC 156
EN 15316 series	Heating systems in buildings – Method for calculation of system energy requirements and system efficiencies	published	CEN/TC 228
EN 15900	Energy efficiency services – Definitions and requirements	published	CEN-CLC/JWG 3
EN 16001	Energy Management Systems – Requirements with guidance for use	withdrawn, superseded by EN ISO 50001 'Energy management systems – Requirements with guidance for use (ISO 50001:2011)'	CEN-CLC/JWG 3
EN 16212	Energy Efficiency and Savings Calculation, Top-down and Bottom-up Methods	published	CEN-CLC/JWG 4
EN 16231	Energy efficiency benchmarking methodology	published	CEN-CLC/JWG 3
EN 16247-1	Energy audits – Part 1: General requirements	Published	CEN-CLC/JWG 1

¹² List and status of standards to be amended.

Standard	Title	Status	Committee
prEN 16247-2	Energy audits – Part 2:Buildings	under development	CEN-CLC/JWG 1
prEN 16247-3	Energy audits – Part 3: Processes	under development	CEN-CLC/JWG 1
prEN 16247-4	Energy audits – Part 4: Transport	under development	CEN-CLC/JWG 1
prEN 16247-5	Energy Audits – Part 5: Qualification of Energy auditors	in preparation	CEN-CLC/JWG 1
prEN 16325	Guarantees of Origin related to energy – Guarantees of Origin for Electricity	under approval	CEN-CLC/JWG 2
International level			
ISO 6946:2007	Building components and building elements – Thermal resistance and thermal transmittance – Calculation method	published	ISO/TC 163
ISO 9251:1987	Thermal insulation – Heat transfer conditions and properties of materials – Vocabulary	published	ISO/TC 163
ISO 10077 series	Thermal performance of windows, doors and shutters – Calculation of thermal transmittance	published	ISO/TC 163
ISO 15927 series	Hygrothermal performance of buildings – Calculation and presentation of climatic data	published	ISO/TC 163
ISO 23045:2008	Building environment design – Guidelines to assess energy efficiency of new buildings	published	ISO/TC 205
ISO 50001:2011	Energy Management Systems	published	ISO/TC 242
ISO/DIS 13612-1	Heating and cooling systems in buildings – Method for calculation of the system performance and system design for heat pump systems – Part 1: Design and dimensioning	under development	ISO/TC 205
ISO/DIS 13612-2	Heating and cooling systems in buildings – Method for calculation of the system performance and system design for heat pump systems – Part 2: Energy calculation	under development	ISO/TC 205
ISO/DIS 13675	Heating systems in buildings – Method for calculation of the system performance and system design – Combustion systems (boilers)	under development	ISO/TC 205
ISO 11855 series	Building environment design – Design, dimensioning, installation and control of embedded radiant heating and cooling systems	published	ISO/TC 205
ISO/TR 9165:1988	Practical thermal properties of building materials and products	published	ISO/TC 163

Standard	Title	Status	Committee
ISO/DIS 12655	Energy performance of buildings – Presentation of real energy use of buildings	under development	ISO/TC 163
ISO/DIS 16343	Energy performance of buildings – Methods for expressing energy performance and for energy certification of buildings	under development	ISO/TC 163
ISO/PRF TR 16344	Energy performance of buildings – Common terms, definitions and symbols for the overall energy performance rating and certification	under development	ISO/TC 163
ISO/DIS 16346	Energy performance of buildings – Assessment of overall energy performance	under development	ISO/TC 163

Table A.2 – Committees active in standardization relevant or potentially relevant for EINSTEIN II

Committee	Name	Scope	Secretariat ¹³
CEN/TC 156	Ventilation for buildings	Standardization of terminology, testing and rating methods, dimensioning and fitness for purpose of natural and mechanical ventilation systems and components for buildings subject to human occupancy.	BSI
CEN/TC 228	Heating systems in buildings	Standardisation of functional requirements for all types of heating systems in buildings, including domestic hot water production. The work includes: - General performance requirements for heating systems, considered as a whole and taking into account work already being done in other CEN/TCs; - General requirements for design of heating systems; - Requirements for installation and commissioning, including tests on the heating system as a whole; - Requirements for preparation of instructions for operation and maintenance; - Methods for calculation of design heat loads, as basis for sizing of heat emitters and heat generators; - Methods for calculation of energy requirements of heating systems, including energy economy and environmental impact, as basis for supporting energy performance criteria and/or energy labelling of heating systems; - Co-operation with other CEN/TCs responsible for related systems and products in order to establish	DIN

¹³ For information on ISO secretariats refer to http://www.iso.org/iso/standards_development/technical_committees/list_of_iso_technical_committees.htm, query 2011-08-02, for information on CEN and CENELEC secretariats refer to <http://www.cen.eu/cen/Members/Pages/default.aspx> and <http://www.cenelec.eu/dyn/www/f?p=WEB:5:1418892455326943>, query 2011-08-02.

Committee	Name	Scope	Secretariat ¹³
		a common terminology and a common set of technical parameters.	
CEN-CLC/JWG 1	Energy audits		BSI
CEN-CLC/JWG 2	Guarantees of origin and energy certificates	Standardization on guarantees of origin for trading and/or disclosure/labelling of electricity and CHP and on energy certificates.	SIS
CEN-CLC/JWG 3	Energy Management and related services – General requirements and qualification procedures	To elaborate EN standards in the energy management and related services field: - Energy Management Systems: definition and requirements - Energy Service Companies (ESCO): definition, requirements and qualification procedures - Energy Managers and Experts: roles, professional requirements and qualification Procedures.	UNI
CEN-CLC/JWG 4	Energy efficiency and saving calculation	Standards for common methods of calculation of energy consumption, energy efficiencies and energy savings and for a common measurement and verification of protocol and methodology for energy use indicators.	NEN
CEN-CLC/BT SFEM ¹⁴	Sector Forum 'Energy Management'		AFNOR
ISO/TC 163	Thermal performance and energy use in the built environment	Standardization in the field of building and civil engineering works of thermal and hygrothermal performance of materials, products, components, elements and systems, including complete buildings; of thermal insulation materials, products and systems for building and industrial application, including insulation of installed equipment in buildings. ¹⁵	SIS
TC 163/SC 1	Test and measurement methods		DIN
TC 163/SC 2	Calculation methods		SN
TC 163/SC 3	Thermal insulation products		SCC
ISO/TC 205	Building environment design	Standardization in the design of new buildings and retrofit of existing buildings for acceptable indoor environment and practicable energy	ANSI

¹⁴ Acting as an advisory body; SFEM is not a technical body.

¹⁵ Refer to http://www.iso.org/iso/standards_development/technical_committees/list_of_iso_technical_committees/iso_technical_committee.htm?commid=53476 for further information on the scope, query 2011-08-02

Committee	Name	Scope	Secretariat ¹³
		conservation and efficiency. Indoor environment includes air quality, and thermal, acoustic, and visual factors. ¹⁶	
ISO/TC 242	Energy Management	Standardization in the field of energy management, including for example: energy efficiency, energy performance, energy supply, procurement practices for energy using equipment and systems, and energy use as well as measurement of current energy usage, implementation of a measurement system to document, report, and validate continual improvement in the area of energy management.	ANSI
ISO/TC 242/WG	Energy Management		ANSI
ISO/TC 257	General technical rules for determination of energy savings in renovation projects, industrial enterprises and regions	Standardization in general technical rules for determination of energy savings in renovation projects, industrial enterprises and regions.	SAC
ISO/IEC JTC 2	Energy efficiency and renewable energy sources – Common terminology	Standardization in the field of Energy efficiency and renewable energy sources – Common	AFNOR
ISO/IEC JTC 2/WG 1	Energy efficiency – Concepts and diagrams		ANSI
ISO/IEC JTC 2/WG 2	Inputs from existing reference documents		SIS
ISO/IEC JTC 2/WG 3	Renewable energy sources – Terms and definitions		AFNOR

¹⁶ Refer to http://www.iso.org/iso/standards_development/technical_committees/list_of_iso_technical_committees/iso_technical_committee.htm?commid=54740 for further information on the scope, query 2011-08-02.