

Standards for Energy Auditing and Energy Management

EINSTEIN II User and Developer Days 2012

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Brüssels

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Business Development

Overview

- Introduction to Standardization
- Standardization and its stakeholders
- Standardization for dissemination and innovation
- Standardization in EINSTEIN II

Profile of DIN Deutsches Institut für Normung

EINSTEIN
thermal energy
industry audit



- Registered non-profit association supported by the private sector
- Contract with the Federal Republic of Germany: German standards body responsible for European and international standards work, representing German interests
- DIN staff members 390
- External experts 29,000
- DIN Standards (total) 32,000
- Benefits of standardization 1% of GDP
- Directorate Innovation
 - Designed to boost DIN's presence in research and knowledge transfer and to increase the visibility of standardization as an instrument enabling the efficient realization of innovative developments

Definition of Standardization

- European Commission, 2008
 - Standardization is a voluntary cooperation among industry, consumers, public authorities and other interested parties for the development of technical specifications based on consensus...
 - Standardization complements market-based competition, typically in order to achieve objectives such as the interoperability of complementary products/services...
- EN 45020 Standardization and related activities - General vocabulary (ISO/IEC Guide 2)
 - Activity of establishing, with regard to actual or potential problems, provisions for common and repeated use, aimed at the achievement of the optimum degree of order in a given context.
- Standardization in Europe is reflecting requirements of industry towards standardization
 - Transparency, openness, consensus based
- This is supported by principles related to e.g.
 - Membership – structures – procedures and principles – strategy

R&D Phase Standardization of DIN at a glance



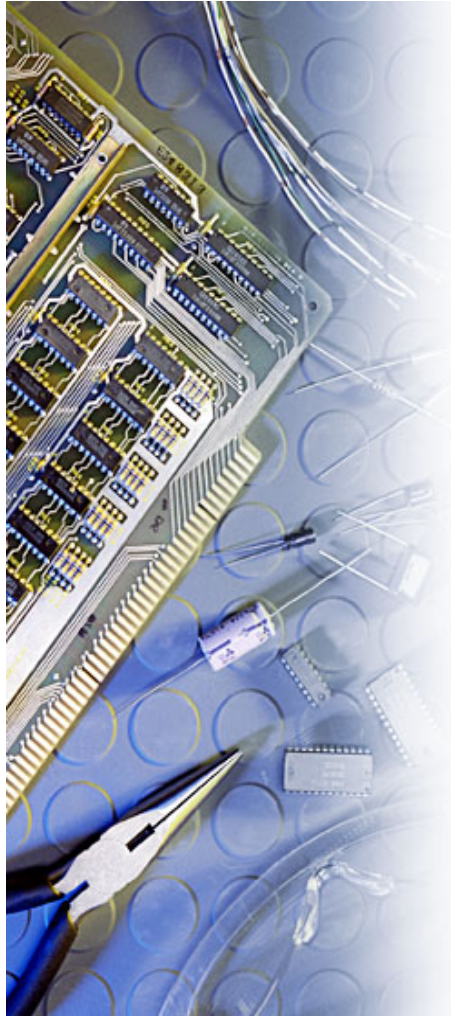
- Early integration of standardization into research projects
- Facilitation of exploitation of innovation potentials
- Standards enhance

- Visibility
- Accessibility
- Availability

of innovative know-how on a large scale and therefore the impact of R&D findings

R&D Phase Standardization of DIN at a glance

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- Benefits of R&D Phase Standardization
 - identifying standardization potentials of innovation projects
 - integrating practitioners and experts of projects into standardization
 - increasing the impact and exploitation of results in view of standardization
 - initiating new standardization activities
- Benefit for partners:
 - Insight into stakeholder perspectives, e.g. consumers, R&D environment
 - Participation in innovative standardization items with opportunities for strategic advantages
 - Gateway to CEN and ISO

Standardization for Dissemination

- Some general arguments
 - Standardization contributes to
 - the dissemination of knowledge in addition to scientific publications and patents, as standards represent the state of the art in science, technology, services, tools, techniques and management
 - the exploitation of funded research results, including intellectual property rights, which are integrated into standards
 - maximizing the practical application of research results

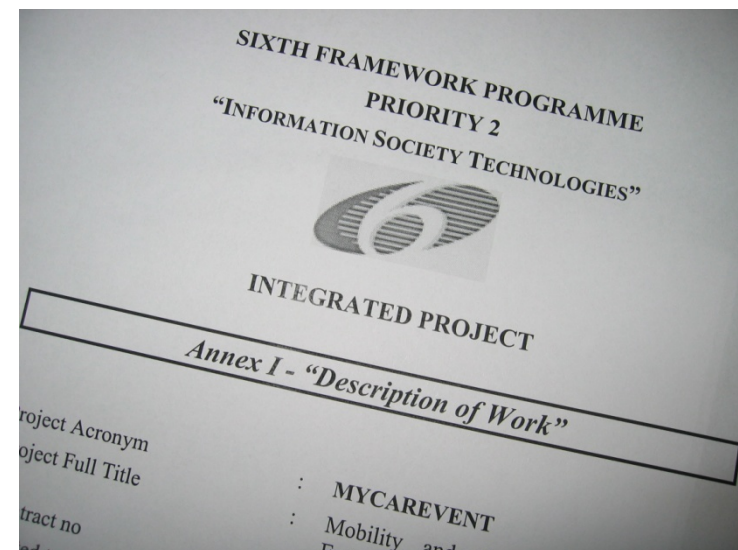


Standardization for Research

- Arguments for researchers and research organizations
 - Standardization facilitates:
 - the transfer of knowledge and technology into marketable products and services
 - the dissemination and exploitation of research results
 - the enhancement of recognition and reputation
 - networking with other researchers, industries and stakeholders for future research and innovation

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Standardization for Investment

- Arguments for venture capitalists and financial organizations
 - Standardization facilitates
 - the assessment of new technologies;
 - investment decisions related to specific companies based on their involvement in standardization

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Standardization for Enterprises

□ Arguments for enterprises

□ Standardization facilitates

- shaping the framework conditions of new and emerging markets;
- the access of new technologies to the market;
- reduced time to market and increased market share;
- timely access to knowledge of other stakeholders;
- networking with competitors, suppliers, customers and regulatory bodies;
- interoperability of own technologies with complementary technologies;
- the management of financial risk related to innovations;
- the acceptance of innovations among customers and public procurers;



IEE and Standardization

- The Intelligent Energy – Europe (IEE) programme is giving a boost to clean and sustainable solutions. It supports their use and dissemination and the Europe-wide exchange of related knowledge and know-how.
- Targeted funding is provided for creative projects putting this idea into practice
- The projects help to further the three main objectives:
 - Promoting energy efficiency and encouraging the rational use of energy sources
 - Increasing the use of new and renewable energy sources as well as encouraging energy diversification
 - Stimulating energy efficiency and renewables in the field of transport.

IEE, EINSTEIN II and Standardization

- Community Added Value (IEE requirement)
 - European dimension
 - Results of standardization derived from EINSTEIN II are developed on the European level in the environment of CEN, the European Committee for Standardization, with participation open to any party
 - DIN is one of the drivers of European Standardization
 - Geographical outreach
 - European Standards, developed by CEN, are implemented in 32 countries in Europe (including Turkey) and requested to be implemented by a large number of neighboring countries
 - Transferability
 - Results of standardization are publicly available
 - Standards are voluntary; they may be referenced by legislation

EINSTEIN II and Standardization

□ Work Package 4 – Standardization

□ Goals

- Interact with and give support to ongoing standardization activities
- Initiate work on standards

□ Activities

- Develop a standardized methodology; harmonization with existing standards
- Contribute to ongoing standardization activities
- Prepare a specific "thermal energy audit standard"
- Organize a stakeholder WS to assess needs for further standards and to channel interests among stakeholders.

□ Tasks

- 4.1 Interaction with Standardization
- 4.2 Development of thermal energy audit standard
- 4.3 Trends Analysis Workshop



EINSTEIN II and Standardization

- Work Package 4 – Standardization – Tasks

- 4.1 Interaction with Standardization

- Assessment of existing standards and standards under development



- Collaboration with existing committees

- Analysis of existing committees and structure in standardization related to energy audits

- Liaison with CEN/CLC JWG 1

- Information for partners on activities and draft standards

European Standards related to Energy Audits

Standard	Title	Status
European level		
CEN-CLC/TR 16103	Energy management and energy efficiency – Glossary of terms	published
EN 15241	Ventilation for buildings. Calculation methods for energy losses due to ventilation and infiltration in buildings	published
EN 15243	Ventilation for buildings – Calculation of room temperatures and of load and energy for buildings with room conditioning systems	published
EN 15316 series	Heating systems in buildings. Method for calculation of system energy requirements and system efficiencies	published
EN 15900	Energy efficiency services – Definitions and requirements	published
EN 16001	Energy Management Systems – Requirements with guidance for use	published
prEN 16212	Energy Efficiency and Savings Calculation, Top-down and Bottom-up Methods	under approval

European Standards related to Energy Audits

Standard	Title	Status
European level		
prEN 16231	Energy efficiency benchmarking methodology	under approval
prEN 16247-1	Energy audits – Part 1: General requirements	under approval
prEN 16247-2	Energy audits – Part 2: Buildings	under preparation
prEN 16247-3	Energy audits – Part 3: Processes	under preparation
prEN 16247-4	Energy audits – Part 4: Transportation	under preparation
prEN 16325	Guarantees of Origin related to energy – Guarantees of Origin for Electricity	under approval


International Standards related to Energy Audits

Standard	Title	Status
International level		
ISO 6946:2007	Building components and building elements – Thermal resistance and thermal transmittance – Calculation method	published
ISO 9251:1987	Thermal insulation – Heat transfer conditions and properties of materials – Vocabulary	published
ISO 10077 series	Thermal performance of windows, doors and shutters – Calculation of thermal transmittance	published
ISO 15927 series	Hygrothermal performance of buildings – Calculation and presentation of climatic data	published
ISO 23045:2008	Building environment design – Guidelines to assess energy efficiency of new buildings	published
ISO 50001:2011	Energy Management Systems	published

International Standards related to Energy Audits

Standard	Title	Status
International level		
ISO/CD 12655	Presentation of real energy use of buildings	under development
ISO/AWI 16343	Energy performance of buildings – Methods for expressing energy performance and for energy certification of buildings	under development
ISO/AWI 16344	Energy performance of buildings – Common terms, definitions and symbols for the overall energy performance rating and certification	under development
ISO/AWI 16346	Energy performance of buildings – Assessment of overall energy performance	under development

EINSTEIN II and Standardization

- Work Package 4 – Standardization – Tasks
- 4.1 Interaction with Standardization
 - Assessment of existing standards and standards under development
 - Collaboration with existing committees
 - Analysis of existing committees and structure in standardization related to energy audits
 - 
 - Liaison with CEN/CLC JWG 1
 - Information for partners on activities and draft standards

Selected Committees at CEN/CLC and ISO/IEC

Committee	Name
CEN/TC 156	Ventilation for buildings
CEN/TC 228	Heating systems in buildings
CEN-CLC/JWG 1 with 4 Task Groups	Energy audits
CEN-CLC/JWG 2	Guarantees of origin and energy certificates
CEN-CLC/JWG 3	Energy Management and related services - General requirements and qualification procedures
CEN-CLC/JWG 4	Energy efficiency and saving calculation
CEN-CLC/BT SFEM	Sector Forum Energy Management
ISO/TC 163	Thermal performance and energy use in the built environment
ISO/TC 242	Energy Management
ISO/TC 257	General technical rules for determination of energy savings in renovation projects, industrial enterprises and regions
ISO/IEC JTC 2	Energy efficiency and renewable energy sources – Common terminology
ISO/IEC JTC 2/WG 1	Energy efficiency – Concepts and diagrams
ISO/IEC JTC 2/WG 2	Inputs from existing reference documents
ISO/IEC JTC 2/WG 3	Renewable energy sources – Terms and definitions

EINSTEIN II and Standardization

□ Work Package 4 – Standardization – Tasks

□ 4.1 Interaction with Standardization

□ Assessment of existing standards and standards under development

□ Collaboration with existing committees

□ Analysis of existing committees and structure in standardization related to energy audits

□ Liaison with CEN/CLC JWG 1



□ EN 16247-1 Energy audits – Part 1: General requirements

□ prEN 16247-2 Energy audits – Part 2: Buildings

□ prEN 16247-3 Energy audits – Part 3: Processes

□ prEN 16247-4 Energy audits – Part 4: Transportation

□ NWI ... Energy Audits – Part 5: Competences

□ Information for partners on activities and draft standards



□ Commenting on draft standards

□ Status of development of standards

□ Mandate M/457 of the EC

M/457 Energy Audits



- Mandate to CEN, CENELEC and ETSI for elaboration of standards regarding energy audits
 - Elaboration of a reliable, accurate and reproducible European standard(s), laying down common aspects of the auditing process and the outcomes of this process with a view of conceiving an energy audit methodology.
 - Benefits of a standard on energy audit:
 - Reduce uncertainties related to: expectations, objectives and terminology
 - Important tool to stimulate investments in energy savings
 - Contributing to a fair competition of auditors in the internal market
 - A tool for designing energy audit methodology and energy audit programs
 - Reduce risk of energy efficiency investments
 - Ensure customer confidence in the outcome of the energy audit
- Mandate led to accelerated development of the EN 16247 series

DIN

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- Presentation of Potential Contributions of EINSTEIN to Standardization (aka also for presentation)**
- EINSTEIN accountability scheme and definitions**
 - definitions, terms, boundaries of systems/subsystems, temperature taking, which temperature to take where in the system, etc.
 - EINSTEIN audit methodology**
 - 10-step methodology unique to EINSTEIN added value of project to be offered to standardization
 - EINSTEIN reference for data types and queries**
 - levels of analysis: "quick-and-dirty", standard, detailed
 - EINSTEIN benchmark databases and catalogues**
 - contents available from EINSTEIN, e.g. catalogue of saving measures
 - EINSTEIN free & open source software**
 - too complex and volume very large
- Contribution of EINSTEIN II to standardization**
- EINSTEIN II results can be matched to existing activities
 - Observe ongoing standardization as to prevent duplication of work
- Discussion of potential contributions**
- Guidance to ongoing standardization activities
 - Providing input for SPEN
 - Development of a proper EINSTEIN II specification to be proposed as input for GENVOG JWG
 - Development of original EINSTEIN II standards
- Requirements for audits**
- methodology
 - tools
 - training of auditors
 - development of training data bases and catalogues
 - instructions for auditors
- EINSTEIN as good practice for an integrated approach on energy audits**
- consisting of:
 - methodology
 - tools
 - training of auditors
 - development of training data bases and catalogues
 - instructions for auditors

EINSTEIN II and Standardization

- Work Package 4 – Standardization – Tasks
 - 4.2 Development of thermal energy audit standard
 - Development of a CEN Workshop Agreement (CWA)
 - Elaboration of a business plan
 - Preparation for publication of a CWA
 - ▶ □ Current status
 - Business plan passed through procedure of approval, comments resolved in a meeting
 - Procedure lead to a delay
 - Business plan ready for publication
 - Kick-off Workshop as soon as possible
 - Participation open to any interest party
 - Registration via www.cen.eu
 - 4.3 Trends Analysis Workshop

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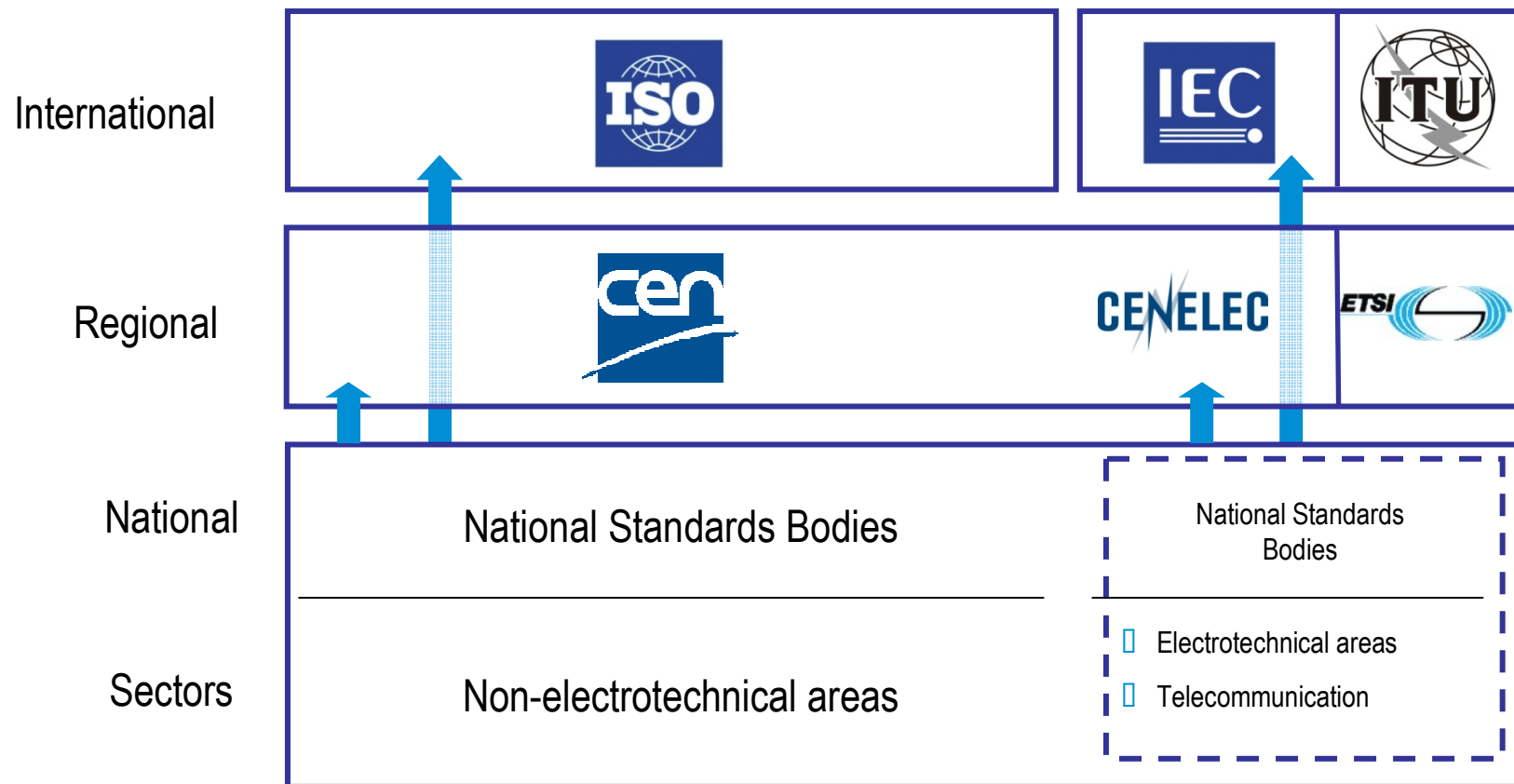


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Three-Level Structure of Standardization



EN 16247

- Standard to be published in 4 parts
- prEN 16247-1
Energy audits - Part 1: General requirements

- Abstract

This European standard specifies the requirements, common methodology and deliverables for energy audits. It applies to all forms of establishments, energy and use of energy, excluding individual private dwellings. This part covers the general requirements common to all energy audits. Specific energy audit requirements will complete the general requirements in separate parts dedicated to energy audits for buildings, industrial processes and transportation

- Part 1 to be published in March 2010 for public 2-month enquiry

- prEN 16247-2 Energy Audits Part 2: Buildings
- prEN 16247-3 Energy Audits Part 3: Processes
- prEN 16247-4 Energy Audits Part 4: Transport
 - Parts 2 to 4 to be published in a bi-monthly rhythm

prEN 16247-3 Energy Audits Part 3: Processes

- Excerpt from prEN 16247-3 Energy Audits Part 3: Processes
 - Energy audits carried out in relation to industrial processes, systems and equipment will apply to commercial, industrial and public-sector organizations and includes common systems and utilities such as motor systems, pumps, compressed-air and steam systems, boilers and self-generation systems. Reference to the CEN standards on energy management shall be made.

ISO 50001:2011-06 - Abstract

□ ISO 50001:2011 ...

- specifies requirements for establishing, implementing, maintaining and improving an energy management system, whose purpose is to enable an organization to follow a systematic approach in achieving continual improvement of energy performance, including energy efficiency, energy use and consumption.
- specifies requirements applicable to energy use and consumption, including measurement, documentation and reporting, design and procurement practices for equipment, systems, processes and personnel that contribute to energy performance.
- applies to all variables affecting energy performance that can be monitored and influenced by the organization. ISO 50001:2011 does not prescribe specific performance criteria with respect to energy.
- has been designed to be used independently, but it can be aligned or integrated with other management systems.

ISO 50001:2011-06 - Abstract

□ ISO 50001:2011 ...

- is applicable to any organization wishing to ensure that it conforms to its stated energy policy and wishing to demonstrate this to others, such conformity being confirmed either by means of self-evaluation and self-declaration of conformity, or by certification of the energy management system by an external organization.
- also provides, in Annex A, informative guidance on its use.