




SIEMENS



Comply with upcoming legal obligations and increase the energy efficiency of your enterprise

EU Energy Efficiency Directive

Background

The European Union is facing unprecedented challenges

- Increased dependence on energy imports
- Scarce energy resources
- The need to limit the effects of climate change

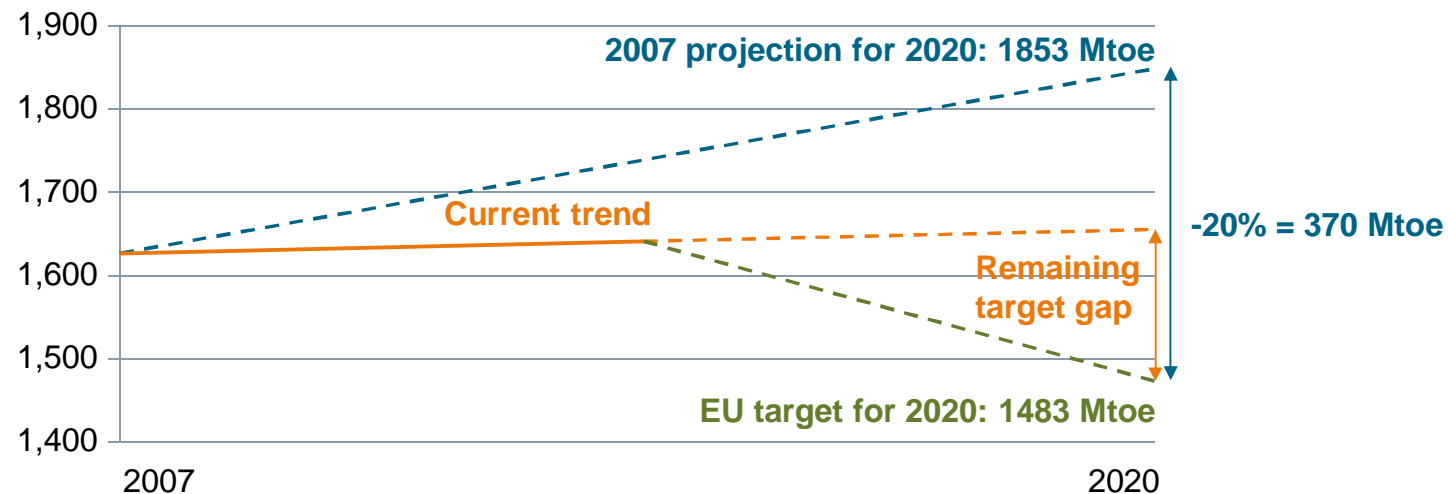
Energy efficiency is a valuable means to address each of these challenges. The European Energy Efficiency Directive (EU-EED) establishes a common framework of measures for the promotion of energy efficiency in the European Union

Objective of the Energy Efficiency Directive (EED)

The EU Energy Efficiency Directive (2012/27/EU) was published on October 25, 2012 and entered into force on December 4, 2012

EU 20% energy savings target: The target gap

EU 27 primary energy consumption (Mtoe)



Objective

Introduction of a **common framework to support energy efficiency in the EU**; this framework is supposed to ensure that the EU energy efficiency target in 2020 is met through the definition of indicative national efficiency targets

Background

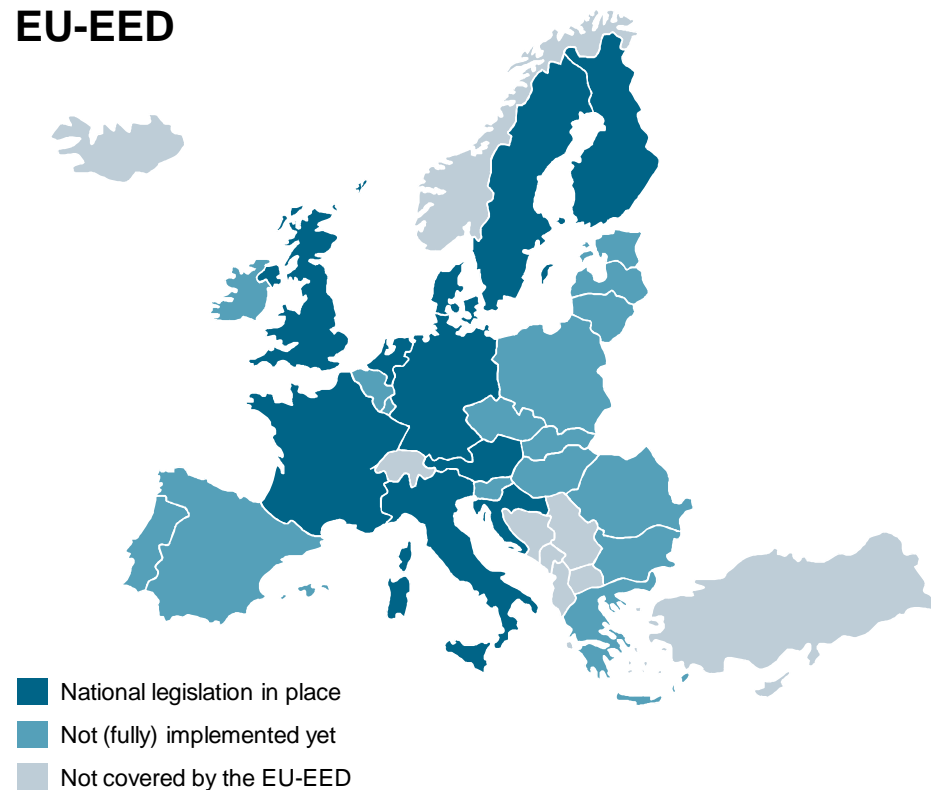
The directive lists a number of policies and measures for governments, energy suppliers and enterprises

Under Article 8 of the EU-EED, large enterprises employing at least 250 persons or exceeding an annual turnover of € 50 million and having a balance sheet above € 43 million are required ...

- ... to implement an energy management system to ISO 50001 or an environmental management system by December 2016 or
- ... to execute energy audits DIN EN 16247 carried out by accredited auditors every 4 years

EU countries covered by the EED regulation

EU-EED



Implementation

All EED requirements had to be implemented in national law before the transposition deadline on June 5, 2014

This was not achieved by the vast majority of member states; **some member states are still working on their legislation**

EU-EED content overview

Target setting

Subject matter and scope (Art. 1)

Energy efficiency targets (Art. 3)

Energy efficiency obligation schemes (Art. 7)

Increasing energy efficiency

Building renovation (Art. 4)

Exemplary role of public bodies' buildings
(Art. 5)

Energy efficiency obligation schemes (Art. 7)

**Energy audits and energy management
systems (Art. 8)**

Metering (Art. 9)

Billing information (Art. 10, 11)

Promotion of efficiency in heating
and cooling (Art. 14)

Energy transformation, transmission and
distribution (Art. 15)

Horizontal

Availability of qualification, accreditation and
certification schemes (Art. 16)

Information and training (Art. 17)

Energy services (Art 18)

Other measures to promote energy efficiency
(Art. 19)

Energy efficiency national fund, financing
and technical support (art. 20)

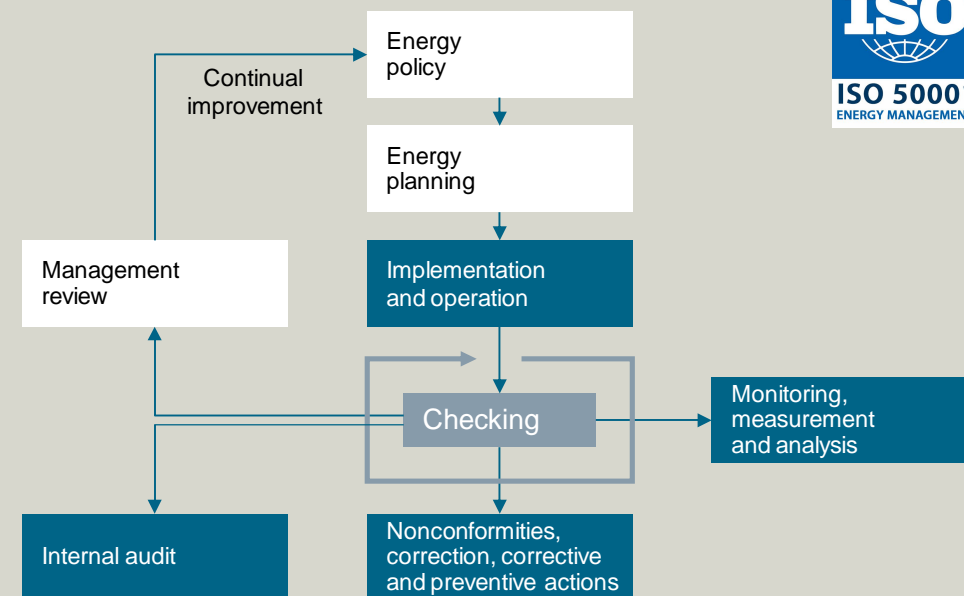
Energy audits and energy management systems (Article 8)

Large enterprises have to conduct an **energy audit (EA)** every **4 years** and are exempted from this requirement if they are implementing an **energy or environmental management system (EnMS)** by **December 5, 2015**

Energy audit



Energy management system (EnMS)



ISO50001 compliant EnMS include annual Technical Analyses as part of the Energy Planning Procedure

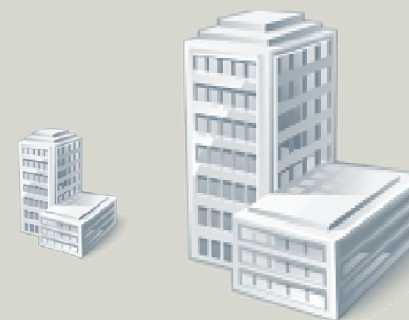
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Large enterprises according to EU-EED

Definition

Large enterprises are “non-SMEs”; (...) SMEs are companies, which employ fewer than 250 persons and which have an annual turnover not exceeding EUR 50 million, and/or an annual balance sheet total not exceeding EUR 43 million'. (...)

Enterprises need to include the data of other related enterprises in other countries (including outside the EU) to assess whether they can be considered to be an SME or not. An enterprise that holds over 25% of capital or voting rights in another enterprise, or vice versa 25% of its capital or voting rights are held by a different enterprise, is a partner or linked enterprise



Large enterprise



>249 full-time employees

or



>50 mil. EUR annual turnover

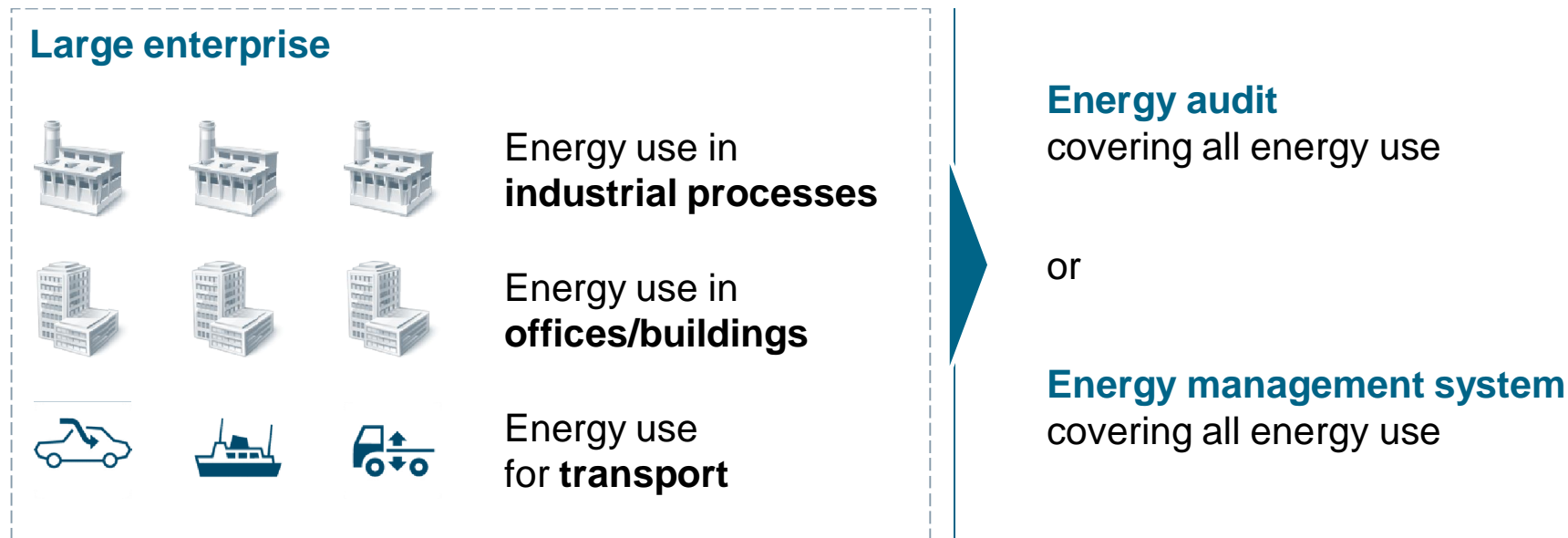
and



>43 mil. EUR annual balance sheet

Energy audits and energy management systems Scope

Under the EU-EED the obligation for energy audits and energy management systems covers the **total energy use** of all operations of a large enterprise



National implementations may exclude a fraction of the energy from the auditing obligations (**de-minimis** – 5 to 10% of total energy use)

National implementations Energy audits and EnMS

Energy audits shall be based on the following guidelines: (Annex VI)

Up-to-date, measured, traceable operational data on energy consumption (and load profiles)



Life-cycle cost analysis (LCCA) instead of simple payback periods in order to take account of long-term savings, residual values of long-term investments and discount rates

Detailed review of the energy consumption profile of buildings or groups of buildings, industrial operations or installations, including transportation



Be proportionate, and sufficiently representative to permit the drawing of a reliable picture of overall energy performance and identify opportunities for improvement

+ Reference to EN16247

Energy audits shall allow detailed and validated calculations for the proposed measures so as to provide clear information on potential savings



Energy or Environmental Management System (Art. 8)

Include an energy audit on the basis of the minimum criteria



Certified by an independent body according to the relevant European or International Standards

National differences Examples

	UK	GER	AT	FR
Definition of large enterprise	Threshold within UK	EED Definition	Threshold within AT	EED Definition
De-minimis rule/ coverage	90/10	90/10	90/10	80/20 (energy costs)
Audit standards	ESOS	EN16247	EN16247 + additional req.	EN16247
Internal audits/ internal auditors	Yes	Yes	No	Yes
Management system	ISO50001	ISO50001, EMAS	ISO 14001, ISO 50001, EMAS	ISO 14001, ISO 50001
Auditor requirements	Registered; existing proof of qualification; "PAS 51215:2014 - Energy efficiency assessment"	Certification of qualification and work experience	Education and work experience, stricter requirements for audits	Registered individually for buildings, processes and transport; strict code of qualification

National differences Penalties

EU-EED Article 18

“Member States shall lay down the rules on penalties...”

“The penalties provided for shall be effective, proportionate and dissuasive.”



Up to
20,000 EUR

Austria

Up to
50,000 EUR

Germany
(draft)

Up to
90,000 GBP

UK

Up to
2% of
turnover
(of the last
closed fiscal
year; without
taxes; 4% at
repetition)

France

Summary

The basics at a glance

EU wide obligation

- EU EED is being rolled out in all member states
- Differences in national legislations have to be carefully taken into consideration
- Compliance Date: 5 December 2015

Non-SME: Cumulative approach

- Small affiliates of larger groups may be covered by the scheme (e.g. small offices)

Energy audits compliant to EN16247

- Coverage of transport energy demand in some countries compulsory
- De-minimis rule depending on national implementation

Requirements to auditors depend on national implementation

- Accreditation by Energy Efficiency Agency or alike

ISO50001 usually guarantees full compliance

- Corporate approach as well as single-site approach

Our suggestions

Early start of internal discussion

- We suggest an early start of the internal discussion about advantages and disadvantages of both “routes to compliance”, including the main stakeholders and incorporating regulatory information at an early stage
- Siemens can assist in this discussion and provide valuable insights

Preferred compliance option

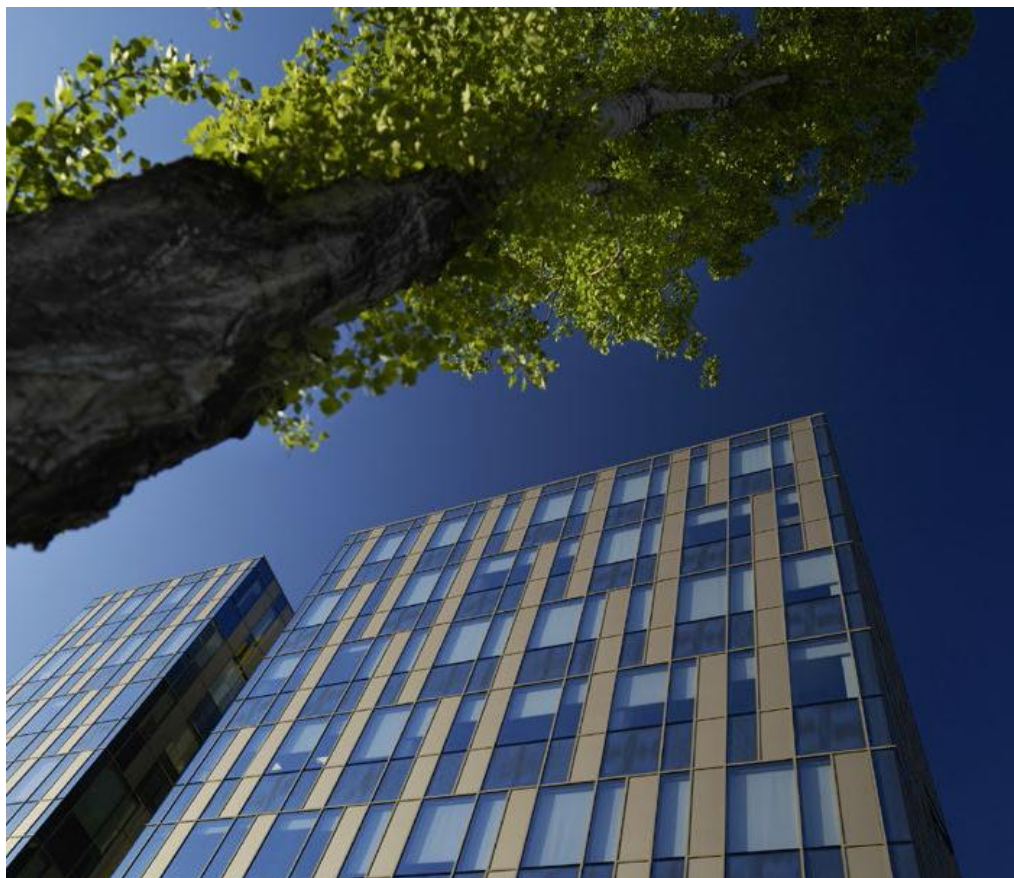
- For Large Enterprises **with few sites** in EU member states, the execution of energy audits may be the easier “route to compliance” in the first year, even though the added value for the company is limited
- For Large Enterprises **with a large number** of sites in EU member states, we consider the implementation of a structured energy management system the most viable ‘route to compliance’ and the option which generates highest value for a company. A mixed system might be advisable
- Existing management structures and procedures should be incorporated; existing management systems (frequently, German sites are already certified ISO50001) should be used as best-practice; corporate guidance should be given for the roll-out; by means of matrix certification, (financial) effort for certification can be limited

Energy audit vs. EnMS

Achievement and Added-Value	Energy Audit	Energy Management
Identification of Energy Efficiency Optimization Potential	✓	✓
Catalogue of optimization measures, prioritization and action plan	✓	✓
Long-term strategic approach including a written policy concerning energy efficiency	X	✓
Top management involvement and therefore engagement throughout all staff levels	X	✓
Limited financial effort for a single & individual site	✓	X
Written programs and documented commitments on annual targets and action plans	X	✓
Consistent monitoring on pre-defined KPIs and therefore on-going comparability on-site and throughout the group	X	✓
Continuous improvement of energy and utility related performance	X	✓

- Companies that adopt EnMS usually save up to 10 to 30% of their total energy use
- The majority of energy and energy cost savings (more than 70%) can be attributed to (no-cost or low-cost) operational energy performance improvement actions

EU-EED advisory services



We will advise you in

- Deciding for the most cost-effective route to compliance under the EU-EED and the respective national legislation
- Finding a solution that is tailored to your company

We will support you in

- Meeting the regulatory obligations in your countries of operation
- Continuously increasing your energy efficiency
- Reducing your energy costs

Siemens service offerings details

EU-EED compliance

Decision making process & roadmap development

System implementation

Ongoing services

December 5, 2015

1. Information on national legislations

Presentation of general information on the EU-EED, individual particularities of national implementation in the countries of operation of the client, general discussion of alternatives

2. Status quo analysis

Analysis of existing certifications, management schemes (ISO14001, ISO9001, EMAS), non-formalized energy management structures, energy audits performed over the past three years, etc.

3. Scenario cost & effort analysis

Assessment of the costs and benefits associated with the execution of individual energy audits (X sites in Y countries) vs. the introduction and certification of an EnMS at European level

4. Approach & road-map development

Management workshop outlining a framework for EED-compliance, either by setting appropriate requirements for audits or by drafting a road map for the introduction of ISO50001 across Europe.

Energy audits (EN 16247)

- Accredited energy auditors
- Aligned to specific national legislation
- Assessment of buildings, processes, transport, as required
- Lifecycle cost analysis as required
- Documentation and certification as required

Energy management system (ISO50001)

- Individual energy management maturity assessment
- Introduction of structures and processes
- Data management and monitoring
- System documentation
- Internal audits and trainings
- Facilitation of certification

Energy efficiency projects

- Project development and implementation
- Performance guarantees
- Financing

Ongoing monitoring & optimization

- Common data platform
- Data analytics for processes and buildings
- Ongoing performance assurance

Enm system enhancement

- Annual audit and management review
- Process and documentation adaptation
- Regular re-certification

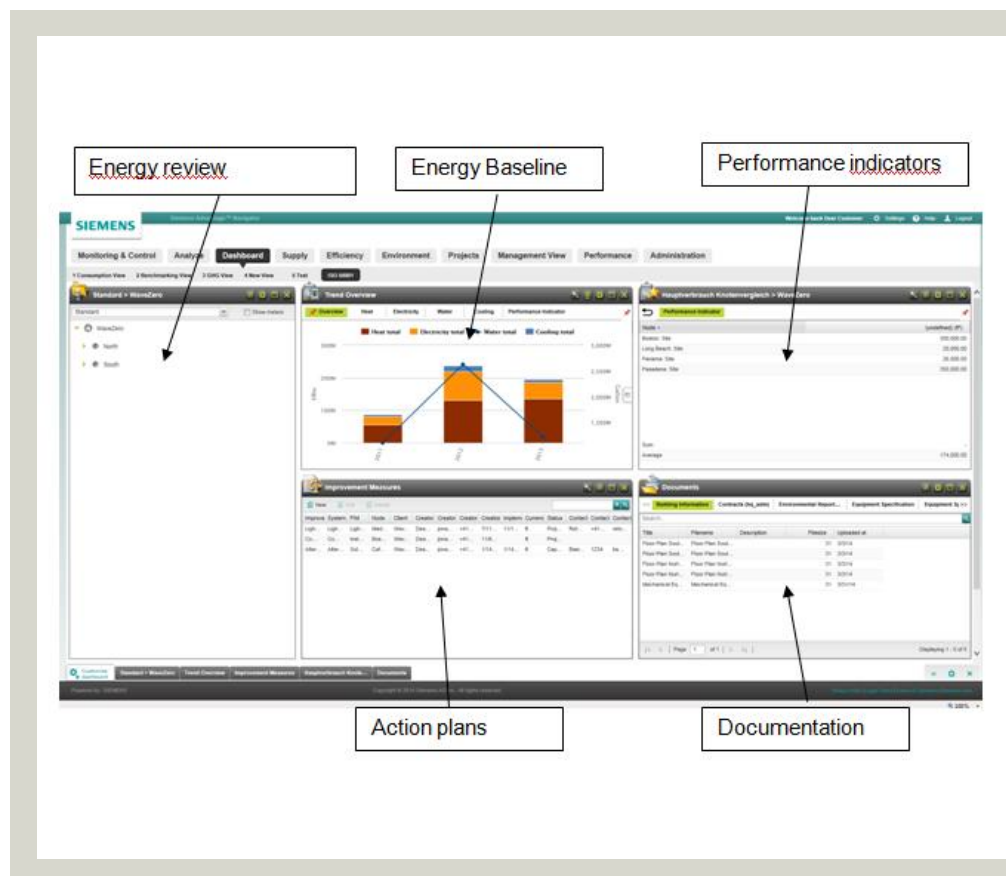
Energy strategy development

- Strategic energy supply optimization
- Corporate energy efficiency programs
- Regulatory advisory

The web-based service platform Navigator from Siemens

- The web-based service platform Navigator from Siemens can be used as the main platform for ISO 50001
- It guides you through the internal and external audits as well as the review processes; and helps to comply with requirements of the ISO 50001 standard
- The web-based service platform Navigator from Siemens will help to collect and organize required data and documents. It drives to put in action the potential revealed through ISO 50001 and helps to track the progress of projects and achieved savings

The web-based service platform Navigator from Siemens – Available reports and interface



Energy review

With the tree structure widget it can clearly identify the different consumption points of the certified entity

Energy baseline

Various reports in Navigator provide capabilities for calculating a baseline and benchmarking the performance over time. Reports cover extensive media types, various fuels, heat, electricity.

Performance indicators

Key KPI's can be evaluated

Action plans

Through the project app and improvement measures widget all action plans can be listed with the expected savings in kWh, CO₂ and EUR

Documentation

All relevant documentation to the certification can be stored in Navigator. Documents are also easily accessible during audits

Your benefits

Benefit from our EU-wide approach and know-how regarding the different domestic regulations, energy markets and funding programs on energy efficiency. Siemens experts have extensive experience in implementing energy management systems and in performing corresponding energy audits with highly qualified and certified auditors

With our services you will not only be able to meet the upcoming obligations but also create a solid basis for the identification of optimization potential and the reduction of your energy costs

Consequently, Siemens supports you in developing corporate energy efficiency and sustainability programs which may contain the following services

- Realizing and financing energy saving measures
- Implementing an energy monitoring and controlling system
- Continuous optimization of building performance by permanent control of technical facilities

Highlights

- Compliance with European and national energy efficiency regulations
- Increase in transparency of energy data
- Identification of efficiency potential
- Implementation of optimization measures to increase energy efficiency
- Sustainable reduction of energy costs

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