

Best Practices for Implementing the Energy Efficiency Directive (EED)

by Snezhina Mileva and Irina Gilfanova

Executive summary

The European Union has set an ambitious goal of improving energy efficiency by 20% by 2020. The new Energy Efficiency Directive (EED) offers some best practices on how to identify initiatives with the greatest potential to improve efficiency, how to prioritize efficiency investments, and how to ensure that available incentives are accessed. Key measures include conducting energy audits, designing a data monitoring system, installing smart meters, utilising industry expertise, and staying on top of national legislation.

Introduction

Reducing energy consumption and improving energy efficiency are among the main priorities of the European Union (EU) climate change and energy policy. The EU has made consistent progress towards fulfilling its Kyoto Protocol commitment to fight climate change by reducing greenhouse gas emissions. Furthermore, the EU adopted number of measures to address the issue of the EU's contribution to global warming and energy security. This policy has resulted in a diverse and complex legislative environment.

In 2006 the European Union adopted the Energy End-Use Efficiency and Energy Services Directive (ESD). The ESD requires member states to submit three National Energy Efficiency Action Plans (NEEAPs), scheduled for 2007, 2011, and 2014. EU also pledged to achieve 3 goals before 2020:

- 20% reduction in greenhouse gas emissions
- 20% share of renewable energy
- 20% increase in energy efficiency.

Surveys conducted on member countries' implementation of NEEAPs revealed an insufficient understanding of the benefits of implementing energy-efficiency measures. Consequently, a large number of experts stressed the important role EU legislation could play in driving national energy-efficiency policies. It was emphasised that there is a significant potential for energy savings, especially in energy-intensive sectors such as buildings, manufacturing, energy conversion, and transport. Aimed at reaching this ambitious goal, the Energy Efficiency Directive (EED) was adopted in December 2012 and member states have 18 months to implement it. The EED tries to fill the gap between existing EU framework directives and implement national and international measures on energy efficiency, covering all sectors except transport, and included measures related to supply efficiency.

Figure 1

The new EED was adopted in December 2012, and countries implement the Directive in June 2014.



The Energy Efficiency Watch project reported on the significant non-economic barriers to implementation, such as administrative and legal barriers, lack of information, and quality assurance measures. The Energy Efficiency Directive attempts to eliminate three top obstacles:

1. Lack of reliable and detailed energy data
2. Insufficient energy advice and expertise about the best practices for energy management
3. Difficulty in following and implementing mandated requirements due to ambiguities in the legislative framework

This paper discusses how the EED attempts to resolve these market barriers by providing “best practices,” or recommendations for implementation. The following 3 approaches may be taken to build an effective strategy that will help to meet legislative requirements in a timely manner.

1. Capture energy data and put monitoring processes in place
2. Leverage energy-management expertise and calculate long-term potential savings
3. Regularly review regulatory requirements and legislative incentives

Capture and analyse energy data

Today many companies lack sufficient processes to capture energy-consumption data and monitor performance. This hampers their ability to measure where they stand today and how successfully any efficiency initiatives would improve performance in the future. When decision-makers and investors are unable to quantify estimated savings expected from implementing energy-efficiency measures, they are less willing to fund such investments. The inability to quantify improvements in efficiency may also prevent companies from taking advantage of energy-efficiency incentives offered through legislation. Even at companies where energy data is getting captured, it may not always be accessible to decision-makers. Often the tools to analyse the data are not in place, making it difficult to translate data into actionable intelligence and practical, cost-effective recommendations.

Design a data monitoring system

Establishing a data monitoring process starts with the design of the sub-metering site plan/structure. Sub-metering energy data enables process-specific energy diagnostics, which is a key tool in identifying energy-intensive processes on site, uncovering sources of energy waste, and therefore effectively prioritizing measures that will have the greatest impact on improving energy efficiency.

Companies must also ensure that meter data is consistently captured, stored, and reformatted to analyse energy need vs energy use. A variety of interfaces and metering software are available to enable this process. The immediate benefits include establishing an accurate energy-use baseline, determining consumption patterns, and improving the accuracy of forecasts by identifying dependencies (external factor correlations).

The EED calls for governments to lead by example in utilising energy data to achieve improved energy efficiency. They are required to develop inventories with full data on energy use in buildings, map current energy performance in the whole building stock, prioritize the less-efficient buildings to be renovated, and procure the most-efficient products and services.

Conduct energy audits

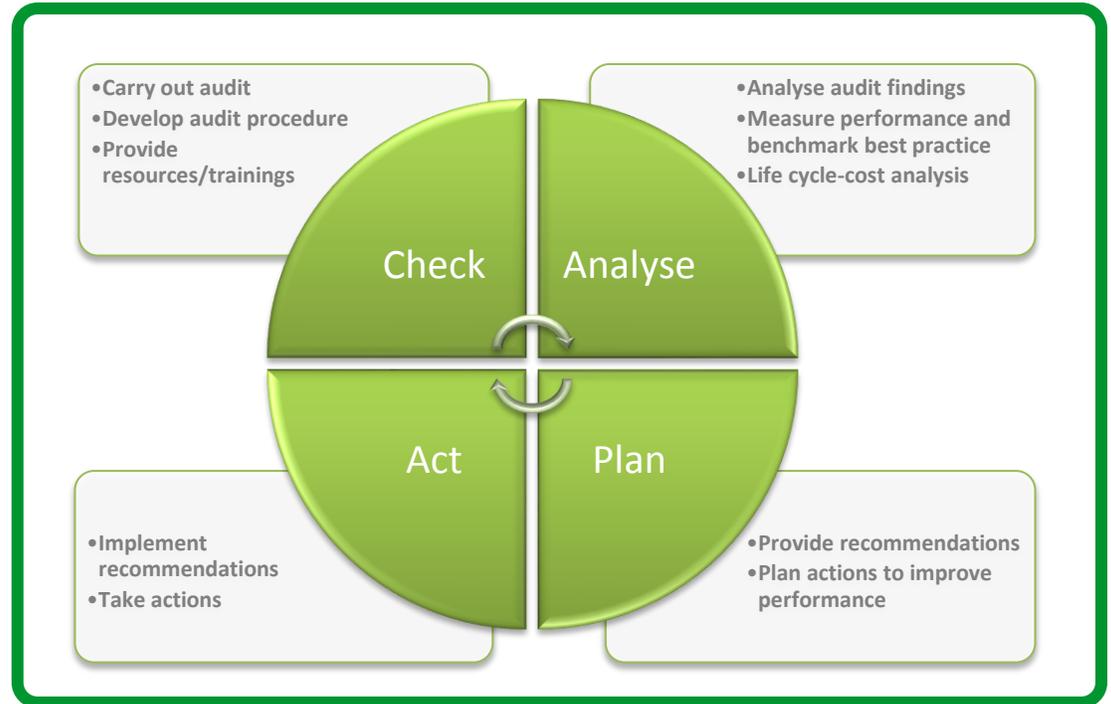
The new EED introduces a requirement for companies to conduct mandatory energy audits as a means to identify energy-efficiency objectives. An integral part of energy management systems (EMS), energy audits “identify, quantify, and report existing energy consumption savings opportunities profiles and energy savings opportunities.”¹ On-site audits and regular surveys provide a baseline of reliable technical and financial information that may be used to develop and implement feasible and cost-effective efficiency projects and measure performance of implemented activities. Energy audits aim to establish a systematic, routine process for reviewing energy consumption, diagnosing energy waste on-site, and ensuring continuous energy-efficiency improvement.

¹ Coalition Guide to the Energy Efficiency Directive, Section II.5.1, p. 57

Sub-meters capture installations' specific energy data that can be analysed to determine patterns and uncover sources of energy waste.

Figure 2

A systematic “plan-act-check-analyse” closed-loop cycle of auditing helps ensure continuous energy-efficiency improvements.



Utilise expertise

Many companies lack the expertise and knowledge to identify and evaluate opportunities to improve energy efficiency. They do not have sufficient information on energy-efficient solutions, or awareness of the various options available to save energy and costs. Another barrier is the risk companies see in committing funds to projects that have longer payback periods, especially when the return on investment is not well understood or quantified.

This is where systematic energy-efficiency audits again help. Though the EED requirement is primarily intended to collect and analyse energy data on-site, it also aims to overcome the challenge of insufficient energy advice and lack of knowledge on the best available practices. Companies now must establish internal procedures for energy audits to be conducted by external or in-house experts. The new EED addresses the quality of these audits, setting standards for the auditors' qualifications and requiring “energy advisory” recommendations. The Directive outlines certification, accreditation and qualification schemes for energy-management providers and technical auditors, and calls for suitable training programmes to be established. Member states must ensure that energy auditors meet minimum experience and training requirements, receive nationally accredited certification, and undergo a periodic certification renewal. The EED also suggests that audit recommendations and calculations of potential savings shift from simple payback periods to a life-cycle cost analysis approach. This allows companies to evaluate the long-term and residual value of proposed efficiency measures.

In order to benefit from the audits, companies must establish an on-site energy-management system and then implement the audit recommendations. This allows companies to benchmark and monitor the results of implemented energy-efficiency measures and determine best performance levels in industrial processes and supplementary applications.

Member states should take advantage of the spill-over effects of the higher EED requirements for energy audits, in order to improve the quality of audits. Although many

companies have implemented in-house audit processes, they often lack the tools and expertise to carry out detailed audits to enhance understanding of energy management on-site and identify potential improvements. Detailed audits carried out by experts often involve performing on-site equipment tests, developing energy profiles for existing equipment and systems, collecting energy performance data, and providing comprehensive information on the payback periods associated with potential energy-efficiency and renewable energy projects.

Review legislation as part of energy plan

As discussed in the Introduction, the EU climate change and energy policy comprises a number of legislative measures that simultaneously address different aspects of the problem. The Energy Efficiency Directive requires member states to reach a 20% improvement in energy efficiency yet provides reasonable freedom on how to implement efficiency measures. The Directive allows each country's legislation individual specificity, so that each country could utilise its expertise and experience in particular legislative instruments. Legislation is diverse among countries, and certain types of initiatives and measures have a longer history or are better accepted by companies in some countries than others. The objective is to develop legislative stimuli that function more effectively across the European Union and to pilot different approaches.

Following legislation will help customers prepare for the changes ahead of time. For example, expecting the implementation of the mandatory energy audits under Article 8 of the EED may get companies to defer pending audits to meet compliance timeframes. Other legislation allows member states to compensate energy-intensive industries for increases in electricity costs resulting from compliance with EU directives. Companies that monitored legislation proactively have been able to apply for compensation from the beginning.

By working on different levels and addressing multiple players within the energy markets, the EED tries to have an overarching impact and meet the EU energy-efficiency goal for 2020. The scope of the EED is intentionally wide, because it addresses all the areas where insufficient progress has been realised so far. Different articles within the Directive deal with a variety of energy-efficiency issues:

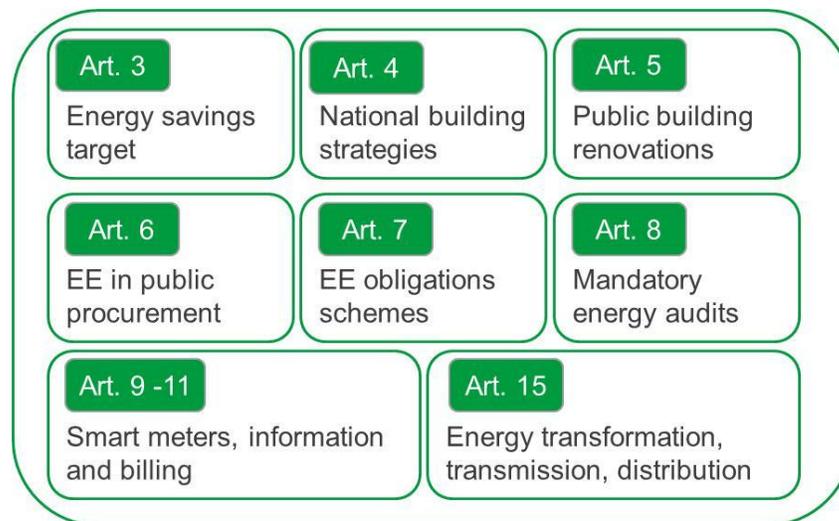


Figure 3

The EED has a broad scope intentionally, as it addresses a wide variety of energy efficiency issues.

However, a direct consequence of this approach is the creation of a very dynamic and complex legislative environment under which businesses must operate. The requirements for compliance vary from one member state to another, and the business case for implementing energy standards or installing energy-saving equipment varies.

Take, for example, Article 8 of the EED regarding mandatory energy audits. The regulation is clear as to who is affected: companies with more than 250 employees, more than 50M€ turnover (more than 43M€ on the balance sheet). However, how compliance is determined is different for each country, and there is no consistent mechanism for supporting audits.

Table 1

The implementation and regulations for the EED vary greatly from one country to another.

	UK	France	Germany	Spain
Art. 8, mandatory audits for non-SME	Compliance scheme (ESOS)	Compliance regulation, high penalties	Encouraging EMS implementation through tax benefits	Compliance regulation (Administrative Registry of Energy Audits)
Art. 8, energy audits support	Through Green Deal/Carbon Trust	Grants	Grants	N/A

In addition, in 2016 the EED will be re-evaluated to identify underachieving areas where the 2020 goals are in jeopardy of not being met. It is expected that this review will bring a new wave of legislative amendments.

Under the legislation, member states are expected to incentivize a variety of measures to ensure their adoption in the marketplace. Such incentives may make new projects affordable where previously they were not. Understanding the various legislative measures and the impact they have on the energy market is critical to companies pursuing strategic energy management. Integrating legislative reviews into the corporate energy policy is a powerful best practice to drive a company's energy-efficiency success.

Conclusion

The impact of the Energy Efficiency Directive cannot be measured by success in achieving target goals by only one sector. Nor will legislative compliance with only some articles be sufficient. Setting the European Union on track for its 20-20-20 targets will be achieved through a combination of measures that shift all countries' energy-consumption and -management patterns. By working on different levels and addressing multiple players in the energy markets, the EED drives the creation of a dynamic market for energy-efficiency services and makes sure that the expected benefits from energy efficiency are fully captured and realised.

The EED sends a clear signal to businesses that energy efficiency is a priority for the EU. Its ultimate objective is to integrate energy efficiency into the daily operations of businesses. This means establishing a strategic energy policy that adheres to and takes advantage of legislation, developing and analysing energy data on which to base conclusions and develop recommendations, and implementing energy-efficiency best practices.

Practical steps to achieving these objectives include:

- Develop a data monitoring system
- Install smart meters to capture data on usage patterns
- Conduct energy audits that make data-based recommendations for measures having the greatest potential impact
- Utilise expert advice (external or in-house) to identify opportunities for efficiencies
- Integrate regular monitoring of legislation into corporate energy strategy plans



About the authors

Snezhina Mileva is a Head of Legislative Intelligence, EMEA, for Schneider Electric Energy and Sustainability Services. She has a Bachelor's Degree from the Economic University of Varna and a Master of Business Administration with honours from the Central European University Business School, Budapest. She collaborated on number of research projects and publications, including an academic paper on the impact of implementing smart meters and a white paper on sustainability.

Irina Gilfanova is a Team Lead at Schneider Electric's Energy and Sustainability Services. She is involved in regulatory and voluntary sustainability reporting, monitoring of carbon accounting standards and practices. She holds an MS in Environmental Science and Policy from Central European University, Budapest. Previously she was involved in EU FP-7 project on observation and assessment system supporting sustainable development. She has participated in number of international conferences and has written publications focused on decision-making support tools.