Denmark’s Agreement on Industrial Energy Efficiency (DAIIEE)

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<th>PROGRAM TYPE</th>
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<td>Energy Management</td>
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<td>1993-ongoing</td>
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<td></td>
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<td>2001-ongoing</td>
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<td></td>
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<td>date of mandatory EnMS implementation</td>
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<td></td>
<td>start of voluntary agreement</td>
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<td>Agreements are renewed after three years</td>
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In 1993, the Danish government introduced voluntary energy efficiency agreements with industry known as Denmark’s Agreement on Industrial Energy Efficiency (DAIIEE). While the agreements were introduced as early as 1993, mandatory energy management systems (ENMS) implementation was introduced in 2001. To participate in the voluntary agreement, enterprises must obtain an energy management certification (currently transitioning from EN 16001 standard to ISO 50001), make a number of “special investigations” (a comprehensive analysis on a specific energy aspect), and implement all projects with a simple payback horizon of less than four years. Companies joining the Agreement get a rebate on the CO2 tax applicable to all fossil energy sources.

Objective
To increase the energy efficiency of Denmark’s energy-intensive industries while ensuring their competitiveness is not threatened by the CO2 taxes.

Target Group
Size: Large
Industry focus: All industry. 106 enterprises are participating in the agreements (as of March 2012).

GHG emission source covered
Prior to 2008: all energy sources.
Since 2008: electricity only

Program Funding Source
Financed through the national budget

Total Program Funding
EUR 5.4 million each year.

Operating Mechanism
Companies joining the Agreement get a rebate on the CO2 tax levied based on the CO2 content of energy (*2). The voluntary agreements are made between enterprises and the Danish Energy Agency and run for a period of three years. To participate in the programme, enterprises must:

1. obtain an energy management certification (EN 16001 standard or ISO 50001).
2. make a number of special investigations.
3. implement all projects with a simple payback horizon of less than four years.

If the company does not comply with these requirements, the agreement is cancelled, and the company must pay back the tax rebate.

Special investigations allow for a comprehensive analysis of energy consumption of a process, plant, or overall production and energy...
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system and include an evaluation of the profitability of energy efficiency projects. The Special Investigations in Denmark focus on the more complicated processes that are not included in the energy reviews and include an evaluation of the profitability of energy efficiency projects.

Each firm manager of participating enterprises signs an agreement with the Danish Energy Agency. Prior to entering into an agreement, enterprises negotiate with the Danish Energy Agency regarding the timetable, special investigations and improvements in energy measuring/accounting systems. The basis for these negotiations is a proposal made by the enterprise specifying energy policy and targets, and how the company intends to reach these targets. The agreement lists the enterprise’s obligations.

To reduce administrative costs of entering an agreement, the Danish Energy Agency has devised “collective agreements” through which industrial associations can co-ordinate and negotiate with the Danish Energy Agency on behalf of a group of enterprises. Collective agreements are specially designed for companies with similar processes, products or energy consumption patterns.

Energy management system
EN 16001 (for companies beginning the standard adoption process prior to end of 2011). ISO 50001 (for companies beginning the standard adoption process after end of 2011)

Program Offerings for Industry
Training: The Danish Energy Agency trains external energy engineers to assist companies in implementing EnMS. Contact information for consultancy agencies that offer services to help companies comply with the programme requirements is available on their website.

Workshops and seminars: Networking activities and workshops enable the dissemination of best practices, and the sharing of experiences and knowledge.

Information and resources: Case studies, guidelines and practical and operative tools, resources on the DEA website help companies implement EnMS.

Financial Incentives: Companies can receive grants of 50 percent to cover the costs of conducting the Special Investigations (*3).

Implementing Agency Type
Public Institution or Agency

M&V requirements on industry
Each enterprise must seek certification to ISO 50001 or EN 16001 by third parties and submits data to the Danish Energy Agency on energy consumption and a number of other key performance indicators, including progress towards achieving their targets, either manually or through an online system. The annual reporting on implementation of the agreements and targets ensure close monitoring of the progress in each individual firm. Self-reporting is complemented by detailed random sample checks of the enterprises’ EnMSs and compliance with the agreement that are made by independent verification agents.

Evaluation of Program
The whole programme has been evaluated several times, typically on a three- to five- year basis. Independent consultants are contracted to carry out the evaluations. Evaluations have shifted focus from merely a quantitative analysis of data toward a more qualitative evaluation based on in-depth interviews with participants.

Impacts and Results
Metric
PJ or GWh saved over program duration

Target/goal
No quantified target for individual companies but a CO2 reduction estimate of 1996-2005 of 6% among participants, equivalent to a reduction 3% of total industry.

During the process of negotiating agreements, proposal made by the enterprise specifying energy policy and targets, and how the company intends to reach these targets

Analytic base for target (or target setting mechanism)
-

Savings (recent year)
Estimates of 1.9% annual savings over 2000-2003 [2]. Typical savings of 10-15% were observed during the first years of EnMS implementation.

Savings (program total)

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**Savings (Share of overall demand)**
Not available

**Average unit cost of energy saved**
Not available

**Non-energy benefits (co-benefits)**
The Danish Association of Energy Engineers estimates that the value of NEBs often is 2.5 to 3 times higher than the value of the energy efficiency projects. Several Danish case studies have documented the significant value of NEBs in Danish companies. [3] (*5)

**Other Information**

**Footnotes**

(*1) Special investigations allow for a comprehensive analysis of energy consumption of a process, plant, or overall production and energy system and include an evaluation of the profitability of energy efficiency projects. The Special Investigations in Denmark focus on the more complicated process that are not included in the energy reviews and include an evaluation of the profitability of energy efficiency projects.

(*2) In Denmark in 2010, the tax based on the CO2 content of energy was 0.062 DKK/KWh. The rebates vary for different end uses (process or heating), and on the basis of whether the process is deemed heavy or light. The tax rebates are adjusted annually in the period 2010–2015 by 1.8%.

(*3) Previously, companies could receive subsidies for independent energy audits covering up to 50 percent of the costs of the audits, as well as for energy efficiency investments. As the programme matured and companies became more familiar with energy management and experienced the benefits of implementing profitable opportunities, the government discontinued financial assistance in 2001.


(*5) Lokalenergi, a certified energy consultant by the Danish Energy Agency, is currently exploring methods for assessing the value of NEBs.

**Links and References**


**Useful reports**