Sweden Programme for Improving Energy Efficiency in Energy Intensive Industries (PFE)

PROGRAM TYPE | COUNTRY | TIMEFRAME
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Energy Management | Sweden | 2005-ongoing (*2) Agreements with individual companies last five years.

Program Summary

The Programme for improving energy efficiency in energy intensive industries (PFE) was introduced on January 1st 2005 as part of a voluntary agreement between industry and government. The programme aims to increase energy efficiency in energy intensive industries with a focus on electricity consumption. Energy-intensive companies in the manufacturing industry can be granted tax exemption on their electricity consumption (0.55 € per MWh) if they take action to improve their energy efficiency under the PFE.

Objective

Increasing energy efficiency in participating energy-intensive companies.

Target Group

Size: Large energy-intensive companies (*1)

Industry focus: All industry

GHG emission source covered

Electricity use

Program Funding Source

Swedish Energy Agency

Total Program Funding

Not available

Implementation Details

Operating Mechanism

The Swedish Energy Agency decides, based on whether the “energy-intensive” criteria (*1) have been met, if a company may participate in the PFE.

Duration of company participation in the PFE is five years. In the first two years the company must obtain certification for a standardized energy management system (ISO 50001 or EN 16001) and introduce energy efficiency screening procedures for the purchasing of high-consumption electrical equipment. It must also carry out an energy review, which identifies a list of EE opportunities.

In the following three years the company must implement the EE measures identified thanks to the mandatory energy review. The company is also required to submit a report to the Swedish Energy Agency on the energy management system in place (EN 16001 or ISO 50001), the energy review that has been undertaken and the list of measures identified.

At the end of the five years another report must be submitted to the Swedish Energy Agency. This report should describe and summarize the actual result of the implemented measures.

Energy management System

EnMS Standard ISO 50001 (previously the EU standard EN16001 and the Swedish Standard SS637750)

Program Offerings for Industry

- Resources: Manuals on EnMS, energy audits, analysis and mapping; templates for life cycle costing; Guide to procedures on purchasing energy-intensive equipment and project planning
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- **Technical assistance and training:** the Swedish Energy Agency in cooperation with other partners has initiated a training course for practitioners in "LEAN production/energy management", on life-cycle costing calculations and routines for EE procurement.

- **Networking and workshops:** Seminars for program participants and best practice dissemination are held on a regular basis [3].

- **Exemption from carbon tax on electricity of 0.55 € per MWh.**

**Supervising Agency**
Swedish Energy Agency

**Implementing Agency**
Swedish Energy Agency

**Implementing Agency Type**
Public Institution or Agency

**M&V requirements on industry**
Companies must obtain certification of energy management system by a third party certification body. Participating enterprises are obliged to report results both after the second and after the fifth and final year of the programme period. Second-year reporting contains deemed (estimated) savings (*3) from planned measures; the fifth-year reporting contains data based on measurements or engineering calculations of the actually implemented measures.

**Evaluation of Program**
The programme result, i.e. the impact in terms of quantified electricity savings, is based on the bottom-up calculations performed and reported by the companies to the Swedish Energy Agency (SEA). In their communication of programme results, the SEA compares the aggregate of reported electricity savings with the base year (i.e. 2004) electricity demand of participating companies.

To reduce reporting requirements for enterprises, the SEA uses a data-based system. For analysis and evaluation, the system can be used by the Agency to automatically generate and aggregate results from enterprise reports. The SEA follows up with participant surveys and interviews stakeholders (e.g. certification and accreditation bodies, sector organisations). Independent academic studies and evaluations have also proven to be a valuable source of information.

**Impacts and Results**

**Metric**
Gross electricity savings.

**Target/goal (of the program)**
To achieve savings equivalent to or above the effect of the carbon tax on electricity. This was estimated to be 0.6 TWh/year in the first phase 2004–2009. No targets are individually agreed or negotiated with companies.

**Analytic base for target (or target setting mechanism)**
To achieve savings equivalent or above the effect of the carbon tax on electricity

**Savings (recent year)**
- 1.45 TWh annual electricity gross savings (over 2004–2009)
- Annual Net electricity savings have been estimated at 689 – 1015 GWh during the first five year period (2004–2009) [7]
- The PFE program has, in addition to the electricity savings, caused a potential multiplier effect on heat and fuel savings of up to 950GWh/year. [7]

**Savings (program total)**
- Gross savings of 7.25 TWh (over 2004–2009)
- Net savings of 3.45 to 5.08 TWh (over 2004–2009)

**Savings (Share of overall demand)**
Approximately 1% per year (i.e. savings of 1.45 TWh out of average industrial final energy use of 151 TWh over 2004–2009). 5% energy savings over five years (over 2004–2009)
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**Average unit cost of energy saved**
- Estimated investments in first 5 year period: € 70 million (> 1200 measures). Estimated savings € 15 million a year for tax exemption
- Savings by increased efficiency estimated at € 70 million a year.

**Non-energy benefits (co-benefits)**
Not quantified.

**Other Information**

**Footnotes**

(*1) “Energy-intensive” is defined as:

The cost of energy (purchases and generated) in the company amounts to at least 3% of the value of the company’s production, and the company’s energy, carbon dioxide and sulphur taxes amount to at least 0.5% of the company’s added value.

A company can participate as a whole or only with those parts of the company that are energy-intensive, as long as these parts are run independently and have their own funds.

(*2) Sweden is currently negotiating the future of the PFE with the European Commission (DG Competition) as the carbon tax exemption was found to non-compliant with EU State Aid Guidelines. Enterprises willing to take part into five-year agreements under the PFE can do so throughout 2012 and are allowed to complete the full five-year program. However, conditions for new entrants in 2013 remain unclear.

(*3) Deemed savings are used to define savings values for projects with well-known and documented savings values. The use of deemed values is an agreement to accept a pre-determined value, irrespective of what actually "happens". Deemed measures and calculations are usually used for simple efficiency measures (e.g. replacement of lighting systems) whose performance characteristics and use conditions are well known and consistent, with the possibility of including site-specific inputs. Deemed values and deemed calculation approaches are often documented in a "Technical Reference Manual". For further information see the International Performance Measurement and Verification Protocol (IPMVP) at http://www.evo-world.org/

**Links and References**


**Useful reports**