AUDIT II

Country Report
SWEDEN

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SUMMARY OF ENERGY AUDITING

STEM (Energimyndigheten) is Sweden's National Energy Agency and deals both with supply and use of energy. STEM became operative on 1 January 1998.

STEM was established as a part of a political decision of phasing out nuclear energy. STEM therefore work through different programmes and policy instruments to replace current nuclear energy with new energy sources and energy efficiency measures.

STEM's main task is to promote a safe, efficient and environmentally sustainable supply and use of energy. It does so by supporting research on renewable energy sources and technology procurement of energy-efficient products and by providing investment support for the development of renewable energy.

STEM administers different kinds of programmes. Each programme lasts for an agreed period of time. The EKO Energy progamme has been one of the major activities during the last four years. It will now be phased out.

Energy Audit Programmes

There are no specific energy audit programmes.

However, energy audits/energy monitoring are important elements in all Swedish energy efficiency programmes initiated by the government and operated by STEM.

Other Programmes with Energy Audits

EKO Energy Programme

The EKO Energy Programme was established in 1994 in order to support the industry's efforts in becoming more energy efficient and improving their environmental performance. The overall target of the programme is to transform the goal of Agenda 21, i.e. 20% reduction in CO_2 emissions in year 2000 compared with the 1990 level, into goals at the individual company level. In light of the Scandinavian electricity market, STEM calculates that 1 kWh corresponds to an emission of 1 kg CO_2. No subsidies are given directly to the industry. Instead STEM provides free audits, covering both energy and environmental issues.

The EKO Energy Programme has been terminated and an evaluation report will be available spring 2002. All agreements with industry have been fulfilled, which means that STEM will distribute the last EKO energy prize in 2002.

All administrational issues related to EKO Energy are undertaken by STEM. 47 Swedish companies with more than 70 plants have been involved in the programme.

The authorities have initially contacted the industries that have concluded agreements in the programme and together the authorities and all parts of the management of the enterprise have discussed the future strategy of the company.

Firstly, STEM has provided free energy and environmental audits and the company has committed itself to obtain an environmental certificate (either EMAS or ISO14000). Secondly, STEM has made a very detailed energy audit with recommendations of future energy conservation projects. The company then agrees to improve its energy efficiency. Finally, STEM gives courses in how equipment should be purchased when using the Life Cycle Cost (LCC) principle. The LCC principle is promoted through the ENEU94 programme. Managers of all EKO Energy companies have attended the courses.

All companies that are involved in EKO Energy have been followed up by STEM 2-4 years after the agreement was signed. STEM checks out which company, across business sectors, that has the best results according to accomplished measures, energy policy, EMAS/ ISO 14000, LCC methodology etc. The most successful EKO Energy company of the year is then given the EKO energy prize in a media covered ceremony.

Other Activities including Energy Audits

There are no other activities that are related to energy auditing.

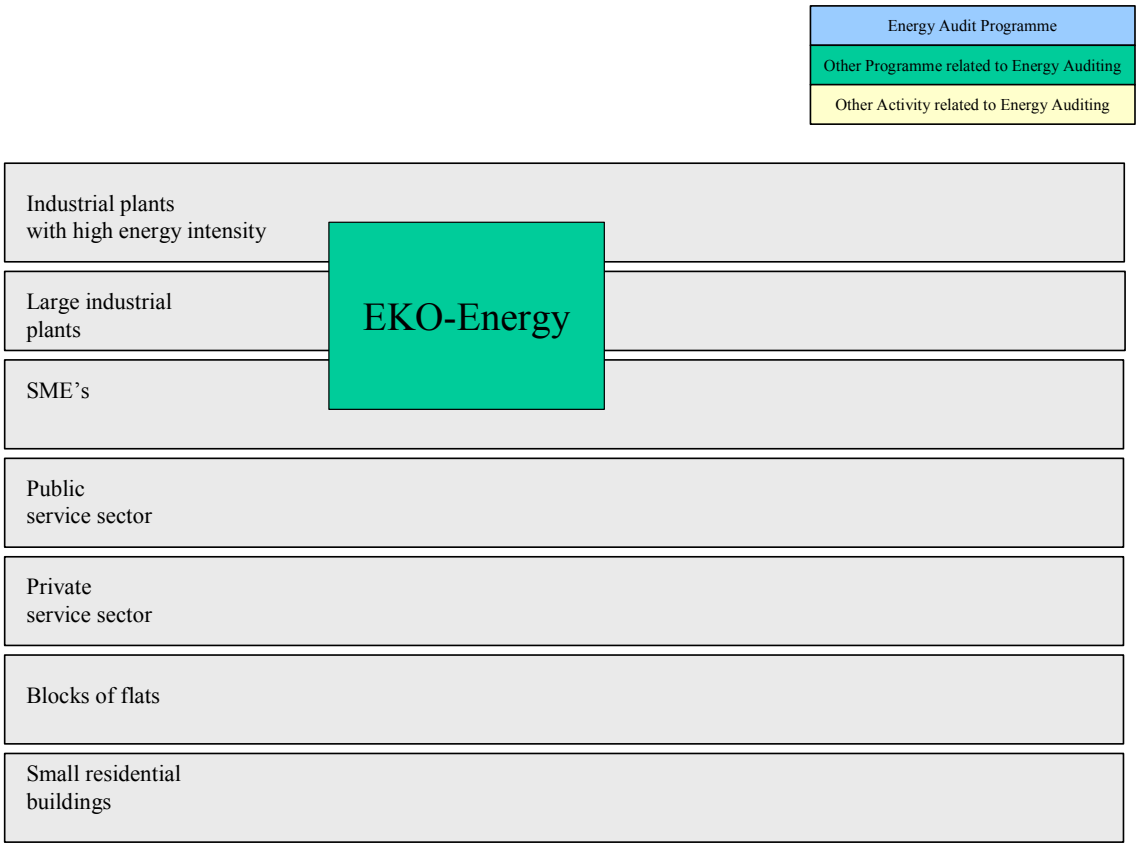

Figure 1. The Map of energy audits in Sweden

Table of EAP features coverage:

	EKO Energi
Status	1994 – 2002
Administration	Swedish Energy Agency
EA models	-
Auditors' tools	-
Training, authorisation	-
Quality control	-
Monitoring	++
Volumes, results	++
Evaluation	++

+++ = Detailed information available
++ = Some information available
+ = Very little information available
= No information available / does not exist

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Country Report

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Disclaimer

The information contained in this report has been gathered from publicly available sources and through interviews. All efforts have been made to secure the veracity of the report, however the authors cannot guarantee the content.

THE COUNTRY REPORT

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1 Background and present National Policy

Industrial companies in Sweden, like in Norway and Finland, enjoy low electricity prices compared to most other countries in Europe and USA. This has led to more use of electricity in processes, which in other countries would be managed by gas (i.e. heating of ovens) and also less efficient use of energy in buildings.

Industrial companies in Sweden have in general little knowledge about their energy consumption. However more and more industrial companies realise the importance of having a positive environmental profile.

1.1 Present National Policy and organisation

STEM was established in 1998 as a part of a political decision of phasing out nuclear energy. STEM therefore work through different programmes and policy instruments to replace current nuclear energy with new energy sources and energy efficiency measures.

STEM is Sweden's National Energy Agency and is responsible for national issues regarding supply and use of energy. STEM's main task is to promote a safe, efficient and environmentally sustainable supply and use of energy. It does so by supporting research on renewable energy sources and technology procurement of energy-efficient products and by providing investment support for the development of renewable energy.

STEM also serves a supervising function as monitoring authority of the deregulated electricity market. The Department for Structural and Market Analysis provides analyses of the linkages between energy, the environment and economic growth.

STEM administers different kinds of programmes. Each programme lasts for an agreed period of time. Over the last four years the EKO Energy programme has been one major activity. The EKO Energy programme is described in more detail in the following chapters of this report.

2 Energy Audit Programmes

There are no specific programmes exclusively dealing with energy audits.

3 Programmes with Energy Audit

3.1 EKO Energy

The EKO Energy Programme was established in 1994. In order to promote energy efficiency, the authorities couple together energy efficiency and sustainable development. Thus, the environmental considerations regarding local use of Agenda 21 will get energy issues into industry through the back door.

The EKO Energy Programme is almost terminated. Agreements made in 1998 are fulfilled, which means that STEM will distribute the last EKO energy prize in 2002.

3.1.1 Programme goals

The goal of the EKO Energy Programme is to promote increased energy efficiency and reduced emissions of CO_2 from Swedish industry. This is achieved through agreements between industry and STEM designed to increase the energy efficiency of production, the environmental performance and considerations of energy issues when buying new equipment.
The programme aims at:

- Decreasing carbon dioxide emissions. The industry sector in Sweden has a considerable potential to reduce its emissons.
- Contributing to the decision by the Swedish government to replace nuclear electricity production by increased energy efficiency and increased use of renewable energy sources.
- Following the EC Council Directive 93/76/EEC to limit carbon dioxide emissions by improving energy efficiency.
- Pinpointing energy use as one of the company's most significant sources for environmental pollution and emissions and to work with them to implement the environmental management programmes EMAS and/or ISO 14000.

3.1.2 Target sectors for EKO Energy

In the past, the target group of the programme was the big industries in Sweden, i.e. firms with more than 500 employees, consuming around 60% of the industrial energy consumption. However, STEM has also approached the small and medium-sized enterprises.

3.1.3 Administration

All administrational issues related to EKO Energy are undertaken by STEM. The administration of the programme grew, especially when the small and medium-sized enterprises were involved.

3.1.4 Implementing instruments

Energy audits are a vital part of the EKO Energy programme.
Three principles form the basis of the programme:

1. The overall target of the programme is to transform the goal of Agenda 21, i.e. 20% reduction in CO_2 emission in year 2000 compared with the 1990 level, into goals at the individual company level. In light of the opened Scandinavian electricity market, STEM calculates that 1 kWh corresponds to 1 kg CO_2.

2. No subsidies are given directly to the industrial companies, instead STEM provides free audits covering both energy- and environmental aspects.

3. Joining an environmental certificate goes hand in hand with profitable energy efficiency investments.

The authorities have initially contacted the industries that have concluded agreements in this programme, and together the authorities and all parts of the management of the enterprise have discussed the future strategy of the company. For each enterprise, STEM has used approximately half a day on the meeting. The contents of the agreements include three main elements, illustrated in Table 3.1.

Responsibility of STEM	**Responsibility of the company**
Provide energy and environmental audits	Adapt an energy policy
Identify energy conservation projects	Invest in identified energy conservation measures
Educate the management in ENEU94[1]	Implement ENEU94

Table 3.1 Responsibility of STEM and the individual companies in the EKO Energy agreements

Firstly, STEM provides free energy and environmental audits and the industry commits itself to obtain an environmental certificate (either EMAS or ISO14000).

Secondly, STEM makes a very detailed energy audit with recommendations of future energy conservation projects. The company agrees to improve energy efficiency.

Finally, STEM provides courses on how (procedures) to purchase equipment using the Life Cycle Cost principle (ENEU94). Managers of all EKO Energy companies have attended these courses. The procurement procedure entails that the enterprise should calculate life-cycle costs for use of the equipment, i.e. cost of the equipment, cost of maintenance, and cost of energy. For standard equipment, e.g. pumps, energy consumption typically amounts to 90% of the life-cycle costs. The company have to promise to follow the procurement procedure in its operations.

[1] The ENEU94 programme is a programme that promotes procurement of energy efficient equipment.

Financing/subsidies
The support volume for consultant and ENEU 94 differs from company to company, the average amount is however 300 000 SEK. However, huge companies may get as much as 1 mill. SEK. The total budget of the EKO Energy programme is 20 mill SEK. In addition comes the administration cost for STEM which is 1-2 mill SEK.

3.1.5 Energy Audit Models

There are no formal models for the Energy audits undertaken within EKO Energy as such.

3.1.6 Auditors' tools

There are no official auditors tools.

3.1.7 Auditing Volumes

47 Swedish companies with more than 70 plants have been involved in EKO Energy activities. No company has yet found that they could afford not to follow the expert advise on energy efficiency measures given in the auditing process. However, some companies have been sold and the new owners did not want to continue the company's involvement in the programme. The authorities granted these companies permission not to fulfil their obligations and did not impose any sanctions on them.

3.1.8 Results

Out of the ten companies that had fulfilled the programme by 1997, an average energy saving of 12 % and electricity saving of 4 % was achieved. The estimated potential for total energy savings is about 110 GWh, where about 60 GWh is achieved. The estimated potential for electric energy savings for the 10 companies is about 20 GWh, where about 5 GWh is achieved.

In 1998 Scania Partner, which produces trucks, won the contest. Scania Partner won because of the following reasons:

- The energy consumption was reduced by 18 %.
- In addition structure and routines for energy efficient work are established within the mill, which probably will lead to further savings.
- ENEU 94 is implemented in the company.
- The company has a goal of reducing the energy consumption by 10 more per cent within 4 years.

3.1.9 Training and authorisation of the auditors

There are no formal training and authorisation procedures for auditors within EKO Energy.

3.1.10 Monitoring

All companies that are involved in EKO Energy are followed up by STEM 2-4 years after the sign the agreement. Every year STEM checks which company, across business sectors, that has the best results according to accomplished measures, energy policy, EMAS/ ISO 14000, LCC methodology etc. The most successful EKO Energy Company of the year is then awarded a prize in a media covered ceremony.

3.1.11 Evaluation

The EKO Energy programme is presently being evaluated and the evaluation report will be ready in spring 2002 (not yet available).

4 References

Web-sites

- www.stem.se

Currency

1 SEK ≈ 0,11 €, 1 € ≈ 9,15 SEK (July 2002)