Existing Mechanisms for Promoting DSM and Energy Efficiency in Selected Countries

Research Report No 1
Task VI of the International Energy Agency
Demand-Side Management Programme

Final Version
October 1998

Undertaken with Participation and Support from:
AUSTRALIA (ESAA, CITIPOWER)
DENMARK (DANISH ENERGY AGENCY)
EUROPEAN COMMISSION (DGXVII)
FINLAND (VTT ENERGY)
FRANCE (ADEME, ELECTRICITE DE FRANCE)
GREECE (PUBLIC POWER CORPORATION)
JAPAN (TOKYO ELECTRIC POWER COMPANY)
KOREA (KEMCO, MINISTRY OF COMMERCE, INDUSTRY & ENERGY)
NETHERLANDS (SEP)
NORWAY (NORWEGIAN ENERGY AND WATER ADMINISTRATION)
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Final version published October 1998

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THE IEA DSM PROGRAMME

The International Energy Agency (IEA) was established in 1974 as an autonomous agency within the framework of the Organisation for Economic Cooperation and Development (OECD) to carry out a comprehensive program of energy cooperation among its 24 member countries and the Commission of the European Communities.

An important part of the Agency's program involves collaboration in the research, development and demonstration of new energy technologies to reduce excessive reliance on imported oil, increase long-term energy security and reduce greenhouse gas emissions. The IEA's R&D activities are headed by the Committee on Energy Research and Technology (CERT) and supported by a small Secretariat staff, headquartered in Paris. In addition, three Working Parties are charged with monitoring the various collaborative energy agreements, identifying new areas for cooperation and advising the CERT on policy matters.

Collaborative programs in the various energy technology areas are conducted under Implementing Agreements, which are signed by contracting parties (government agencies or entities designated by them). There are currently 40 Implementing Agreements covering fossil fuel technologies, renewable energy technologies, efficient energy end-use technologies, nuclear fusion science and technology and energy technology information centres.

The Demand-Side Management Programme is a new collaboration. Since 1993, the 17 Member countries and the European Commission have been working to clarify and promote opportunities for DSM.

The following countries are participating in the IEA Demand-Side Management Programme:

Australia	Greece	Portugal
Austria	Italy	Spain
Denmark	Japan	Sweden
European Commission	Korea	Switzerland
Finland	Netherlands	United Kingdom
France	Norway	United States

A total of six Tasks have been initiated, two of which have been completed. Each Task is managed by an Operating Agent from one of the participating countries. Overall control of the program rests with an Executive Committee comprised of one representative from each contracting party to the Implementing Agreement. In addition, a number of special ad hoc activities—conferences and workshops—have been organized.

The Tasks of the IEA Demand-Side Management Programme, both current and completed, are as follows:

Task I *International Database on Demand-Side Management Technologies and Programmes*

Task II *Communication Technologies for Demand-Side Management*

Task III *Co-operative Procurement of Innovative Technologies for Demand-Side Management*

*Task IV *Development of Improved Methods for Integrating Demand-Side Options into Resource Planning*

*Task V *Investigation of Techniques for Implementation of Demand-Side Management Technology in the Marketplace*

Task VI *Mechanisms for Promoting DSM and Energy Efficiency in Changing Electricity Businesses*

* Completed Tasks

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FOREWORD

This report is a preliminary result of work completed within Task VI of the International Energy Agency Demand-side Management Programme.

The title of Task VI is *Mechanisms for Promoting DSM and Energy Efficiency in Changing Electricity Businesses.*

Objective

The objective of Task VI is to develop in detail a range of practical mechanisms for promoting the implementation of economically justifiable DSM and EE by changing electricity businesses, such as in restructured electricity industries and competitive electricity markets.

Task VI is organised into three subtasks as follows:

- Subtask VI/1 — Detailed development of new mechanisms and evaluation criteria.
- Subtask VI/2 — Communication of information about the mechanisms.
- Subtask VI/3 — Public policy implications.

Project team

The project team for Task VI consists of:

- Energy Futures Australia Pty Ltd based in Sydney, Australia (Operating Agent);
- SRC International ApS based in Copenhagen, Denmark (contractor responsible for this report on existing mechanisms in participating countries);
- Electric Power Research Institute based in Palo Alto, USA (contractor responsible for reports on existing mechanisms in non-participating countries);
- Ressurskonsult based in Oslo, Norway (European project manager);
- As/Tech based in Paris, France (contractor for Subtask VI/2);
- Center for Resource Solutions based in San Francisco, USA (contractor for Subtask VI/3).

ACKNOWLEDGEMENTS

The work of Task VI is supported (through cost and task sharing) by 13 participating countries plus the European Commission. Participants provide one or more Experts who are responsible for contributing to the work of the Task and to review work as it is completed.

Information for this report has been collected and the document reviewed by Experts from the organisations listed below.

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In addition, information has been collected through interviews with leading policy and planning practitioners from energy industry businesses and governments in the represented countries.

This report has been edited by Kirsten Dyhr-Mikkelsen, on behalf of the investigator SRC International (SRCI) supported by the Country Experts and the Operating Agent. Additional research and editing has been carried out by Michelle Maloney on behalf of the Operating Agent, Energy Futures Australia Pty Ltd. Any errors and omissions are the sole responsibility of the investigator and the Operating Agent.

For additional information, the reader may consult the IEA DSM Programme Internet Website **http://dsm.iea.org/.**

1. INTRODUCTION

1.1 OBJECTIVES

This report is a preliminary result of work completed within Task VI of the International Energy Agency Demand-side Management Programme. The title of Task VI is *Mechanisms for Promoting DSM and Energy Efficiency in Changing Electricity Businesses*.

Task VI is developing in detail a range of practical mechanisms for promoting the implementation of economically justifiable demand-side management (DSM) and energy efficiency (EE) by changing electricity businesses, such as in restructured electricity industries and competitive electricity markets.

Objectives of present report

The objectives of the present report are as follows:

- to prepare descriptions of the existing composition and structure of electricity industries in those countries which are participating in Task VI;
- to review and describe existing mechanisms to promote the implementation of DSM and EE by electricity businesses in countries which are participating in Task VI.

1.2 APPROACH

Data collection forms

To assist and systematise the effort of collecting up-to-date information from the different participating countries, two reporting forms were developed by the Operating Agent:

- Data Collection Form 1 — Country review of the existing composition and structure of electricity industries and the policy contexts in which they operate.
- Data Collection Form 2 — Country review of existing mechanisms for promoting the implementation of DSM and EE by changing electricity businesses.

Both forms as well as the collected information are available on the Internet in the Task VI Experts secure site http://dsm.iea.org./research/task6/securesite/. At the time of writing, access to this information is restricted to Task VI Experts.

The participating country Experts were asked to complete Form 1 and to describe five to 10 mechanisms using Form 2 — the focus being on quality rather than number. The country experts were asked to select mechanisms with one or more of the following characteristics:

- application of an innovative approach to promoting DSM and EE, especially in a competitive electricity market;
- successful mechanism, i.e. where outlined targets were reached and maybe even additional benefits registered;
- unsuccessful mechanism which may illustrate what to look out for in designing and transferring mechanisms.

Limitations

When reading the report, the reader should keep the following limitations in mind.

1. The mechanisms presented in the report have been collected randomly and do not constitute a representative selection across the participating countries. However, the mechanisms have been selected by country Experts who posses a thorough knowledge of their particular market and can assess the relevance of a given mechanism both nationally and internationally.
2. The importance of the individual mechanisms has not been weighted according to either invested funds or achieved results.
3. Furthermore, for most of the mechanisms, exhaustive evaluation of their impact has not taken place or such data is not available to the project team. In some cases the mechanism is still so new that the true impact cannot yet be assessed although evaluation is planned and monitoring ongoing.

Comparative analyses

In addition to describing existing mechanisms, this report also includes comparative analyses of the mechanisms in relation to the following issues:

- addressed market barriers;
- relationship between mechanism type and targeted actors and end-uses;
- relationship between mechanism type and the level of market intervention, environmental concern, and prevailing electricity business ownership type;
- addressed technological stages;
- funding organisation;
- implementing organisation;
- social carrier of technology elements typically enhanced.

1.3 DEFINITIONS

To clarify the following discussion some definitions are in place.

Mechanisms vs. programmes

We distinguish between mechanisms and DSM & EE programmes in that mechanisms assist the implementation of such programmes. Mechanisms are

targeted at organisations which develop and implement DSM and EE programmes and are intended to facilitate implementation of these programmes. In contrast, DSM and EE programmes are actions taken by electricity businesses and others, targeted at energy end-users, and intended to change the way in which energy is used and therefore achieve a commercial[a] outcome for the programme implementor.

The examples presented in Exhibit 1-1 illustrate the distinction between mechanisms and programmes.

Mechanisms are thus tools to overcome market imperfections which hinder pursuit of cost-effective DSM and EE activities and achievement of national energy policy goals. The mechanisms are intended to provide the framework necessary to create a commercial motive for pursuing such options.

Exhibit 1-1: Distinction between mechanisms and programmes.

Mechanism	Programme
A regulator allowing electricity businesses to increase their electricity prices to cover the cost of providing cash rebates to customers who purchase energy efficient appliances.	An electricity business providing cash rebates to customers who purchase energy efficient appliances.
A government establishing an energy efficiency funding agency such as the UK's Energy Saving Trust.	An electricity business participating in programmes directed at customers and funded by the agency.
A wholesale electricity pool establishing a protocol for demand bidding into the pool.	An electricity business offering low-priced interruptible electricity supply to customers and then bidding demand reductions into the pool.
An electricity business implementing performance contracting where the cost of services provided by the business is only paid for by customers if specified results are achieved.	An electricity business offering to provide customers with energy efficiency improvements through performance contracting where the cost of the improvements is paid for from reductions in the customer's electricity bill.

In some cases, it is difficult to distinguish clearly between a mechanism and a programme. Even so, keeping the distinction between mechanisms and programmes in mind helps focus the analysis.

[a] *In a few number of cases it can be claimed that environmental concern alone constitutes the motivating force.*

1.4 APPLIED ANALYTICAL TOOLS

Two analytical tools have been used to systematically analyse the mechanisms:

1. The technology process stages and

2. The concept of Social Carriers of Technology.

A short description of each is given below.

1.4.1 STAGES OF THE TECHNOLOGY PROCESS

Efforts to increase energy efficiency can be targeted at one or more of the three different stages of the technology process (see Exhibit 1-2). General research and development is assumed to take place before actual technology development.

Exhibit 1-2: Technology process stages.

The first stage is development of specific technology such as efficient equipment. Here technology forcing standards (i.e. standards which are tighter than achievable with current technology) and general research and development can contribute to creation of technologies of a higher energy efficiency. Technology procurement is another example but this measure also reduces the price and increases the market of the final product.

The second stage represents the choice of technology. It is not sufficient that efficient technology exists. It must also be available when the customers need it (e.g. when the washing machine or the motor breaks down) and the customers must be aware of its existence (information, energy labelling, advice). The price of the efficient technology must either be competitive or the technology must be able to offer something else and more than the average product.

After obtaining the technology, it must be used correctly to reach optimal impact (stage 3). It is for example not enough to install thermostatic valves on all radiators. The customer must also know how these are used correctly. Maybe other equipment is available which if used together with an existing technology can improve the total energy efficiency even further.

Influencing the three stages

Development of energy efficient equipment is a pre-condition for energy efficiency and therefore an important step. Several entities will have a commercial interest in participating in the latest developments and often just moderate support, typically financial support or contact to potential markets, will achieve the intended effect. Application is very difficult to influence with a lasting effect. However, if an energy efficient choice is made in the replacement situation, then the effect will last

for much longer. In the choice situation, the consumer is more open to information and is prepared to form new opinions. Suggestions of improved behaviour and use of the equipment are therefore more likely to be realised if presented in relation to the choice situation.

1.4.2 SOCIAL CARRIER OF TECHNOLOGY

The need for mechanisms and the necessary characteristics can be analysed using the concept "Social carrier of technology". The concept was developed by Anne Lorentzen, Aalborg University Centre, Denmark[a].

Carrier elements

The underlying assumption is that for a given technology (in this case various types of energy efficiency on the demand-side) to be implemented successfully a social carrier of technology must exist. A social carrier of technology is defined as an entity which possesses the following characteristics:

- **Interest** in the technology;
- **Power** (socially) and resources to pursue the interest;
- **Organisational ability** and capacity to apply the power and resources in pursuit of the interest;
- **Information** about the existence of the involved technology;
- **Access** to the technology including spare parts etc.;
- **Knowledge** about its application (education, ability).

Role of government

Typically, the role of the government/authorities in the effort to overcome the barriers to energy efficiency, is to strengthen a potential social carrier of technology, so that all necessary characteristics are present. For example, does the state often take the responsibility to make the information, necessary to make an energy efficient choice, accessible. Ideally, the government should (1) strive to create intelligent/rational customers who can make rational decisions and (2) ensure a level playing field for all actors of the energy sector be it national or international, large or small, one energy form or another.

Combined efforts

An example: Implementation of efficient motor systems.

Medium-sized *industrial customers* are typically characterised by an interest in energy efficiency since this will help reduce production costs and thus increase the competitiveness of the products. One or more persons are assigned to energy management and process operation. The industrial customer is an attractive client to a motor producer. The industrial customer, although interested in overall energy efficiency, might not be aware of the savings potential associated with energy efficient motor systems and may not have information about the latest improvements. Also, its present supplier of motors may not have a constant supply of efficient motors and spare parts and thus access is limited. Furthermore, the knowledge about optimal installation and application may not be up-to-date.

The *motor producer/supplier* which has energy efficient products is interested in gaining market shares and increasing sales, especially if large investments have been made in producing a new and more efficient product. As producer, the company has expert information, access and knowledge, however, it may be looking for ways to promote or familiarise potential customers with the new product.

The *government* is interested in overall energy efficiency due to national economic interests and a wish to reduce CO_2 emissions to a certain level. Industry makes up a significant share of the total consumption and is considered a rational customer which can be influenced to make energy efficient decisions. The government has therefore chosen to financially support the creation of an energy efficiency centre (mechanism) which main target group is industry.

The *energy centre* may be only partially financed by the government but still it would have to provide some results to justify further financing. This constitutes the interest of the energy centre. The energy centre offers several services one of which is after work hours meetings for energy management personnel within the industry. At the meetings the latest (well proven) developments within motor systems are demonstrated and explained. The participants may even receive hands-on training using equipment provide free of charge by the producers. A list of producers and suppliers of energy efficient motors is distributed to the participants. In addition, the meeting itself functions as a forum where energy management personnel can meet and discuss issues of interest and exchange good ideas. It may be possible that a couple of them agree to jointly purchase motor system so as to obtain a better price. The attraction of the after work hours meeting is that it is not as costly as a training course and takes less time.

Together these four constitute a social carrier of technology. Please note, that it may be that there are other social carriers of technology which also promote energy efficient motors. For example may customers and motor producers alone make up a social carrier of energy efficient motors.

In some cases, the government may decide that supporting potential carriers of technology so that they may make an energy efficient decision is insufficient to meet the national goals. An option is then to force the interest of the key decision makers.

Forced interest

An example: Energy consumption for space heating is considered too high and the required action is to increase the insulation levels in a significant number of buildings both new and old. Developers of new buildings have no interest in efficient insulation — only an incentive to cut costs. Once the building is completed it is more complicated to improve the insulation.

A way to overcome the problem is to provide financial incentives to building developers but another and much more often used method is simply to require by law that a certain standard of insulation is adhered to. This ensures that all buildings meet the standard

[a] *"Technological capacity - a contribution to a comprehensive understanding of technology and development in an international perspective" by Anne Lorentzen, 1988, ISBN 87-7307-400-4.*

whereas using the a financial incentive might persuade only a limited number of developers. Since all developers are subject to the same standard there is no distortion of the market.

Such a mechanism which does not provide real incentive to pursue energy efficiency is referred to as creating a "*forced interest*".

1.5 REPORT STRUCTURE

The report starts with a presentation of the existing composition and structure of electricity industries and the policy contexts in which they operate for each of the countries participating in Task VI (Chapter 2).

Chapter 3 sets out a presentation and discussion of the identified mechanisms using the analytical tools presented in Section 1.4 above.

Appendix A contains a country by country review of the existing composition and structure of electricity industries and the policy contexts in which they operate. It consists of print-outs of completed Data Collection Form 1's from the Task VI database available on the Internet to Task VI experts. The descriptions have been used as input for Chapter 2 of this report.

Appendix B contains printouts from the Internet database of completed Data Collection Form 2's. These are descriptions of the existing mechanisms for promoting DSM and EE for each participating country.

Appendix C contains a copy of the European Union Directive on the European internal electricity market.

2. COMPOSITION AND STRUCTURE OF ELECTRICITY INDUSTRIES

2.1 STATUS OF RESTRUCTURING PROCESS IN THE INDIVIDUAL COUNTRIES

Each participating country was asked to characterise the present situation of the national electricity sector and industry using a form developed by the Operating Agent (Data Collection Form 1).

The following components were used to describe the situation:

- Public policy context:
  - Level of market intervention;
  - Importance of environmental issues;
  - Other key public policy issues.
- Business environment:
  - Structure of the electricity industry;
  - Ownership of the electricity industry;
  - Level of fragmentation of the electricity industry;
  - Type of energy businesses;
  - Type of regulation applied to the electricity industry;
  - Level of competition in the electricity industry.

An overview of the country characteristics can be found in section 2.2.

2.1.1 AUSTRALIA

2.1.1.1 ELECTRICITY DEMAND AND SUPPLY

Australia is very highly dependent on fossil fuels (90%) for electricity generation. Hydro (10%) provides the remainder. Very small quantities of electricity are generated from biomass, solar thermal, solar photo-voltaic and wind. Nuclear power is not used in Australia and in some States it is actually illegal.

Electricity use in Australia is forecast to increase by 2.3% per annum to 2010. Current installed generating capacity is 38.1 GW. Peak demand is expected to increase by 4% per annum to 2010.

2.1.1.2 PUBLIC POLICY FRAMEWORK

Australia is a federation and control of the electricity industry within each State is the responsibility of the State government. The policies of State governments towards the electricity industry may differ from State to State and from those of the federal government. Environmental issues are of high importance in all jurisdictions.

Public policy on the electricity supply industry is dominated by the high carbon intensity of generation and the relatively low efficiency of the Australian economy. Large quantities of electricity are used in Australia for processing commodities for subsequent export (eg aluminium smelting). Because of this, the Australian federal government is seeking in international climate change negotiations for Australia to increase its greenhouse gas emissions.

In late 1997, the Australian federal government announced a number of initiatives aimed at encouraging federal and state coooperation in reducing Australia's greenhouse gas emissions. These initiatives include the following:

- the electricity industry will be required to increase generation from renewable resources to 2% of the total by 2010;
- efficiency standards for fossil fuel electricity generation, including for brown and black coal and gas fired plants, will be developed and implemented by the year 2000;
- an Automotive Industry Environmental Strategy will be developed to enhance the industry's environmental performance;
- voluntary energy efficiency codes and standards will be developoed for housing and commercial buildings, appliances and equipments;
- the voluntary industry greenhouse gas reduction program, 'Greenhouse Challenge' was provided additional funding to extend the program to smaller companies and to increase the number of large and medium company participants; and
- a 'Bush for Greenhouse' Program was established to encourage corporate funding of revegetation projects to act as greenhouse sinks.

2.1.1.3 KEY ISSUES AND CHALLENGES

The issue which currently is of major concern to both electricity businesses and governments in Australia is the implementation of the competitive electricity market.

The major focus of all electricity businesses involved in the competitive market is on their financial performance in the market. While most of these businesses have now had two to three years experience in various interim markets, their participation in these markets has involved radical changes in the way they operate. Most are still

feeling their way in relation to the financial implications of their contracting and bidding behaviour in the market.

Governments which are involved in the competitive electricity market are also concerned about the financial performance of the electricity businesses, especially where these are still government-owned. Government owners of electricity businesses have had to adjust to major changes in the quantity and nature of revenue streams from their electricity businesses as they enter the competitive market.

Both governments and electricity businesses are also concerned about the robustness of newly-developed market operating systems. There have been some instances where these systems have given non-optimal results.

With this overwhelming focus on practical aspects of the competitive electricity market, there is currently little attention being paid in Australia to demand management and energy efficiency. In 1994 and 1995, during the early stages of the development of the competitive market, several studies were carried out on the possible role of demand management and energy efficiency in the market. However, as the detailed development and implementation of the market proceeded, increasingly lower priority was given to demand management and energy efficiency.

The exception to this is the State of New South Wales where the legislation which restructured the electricity supply industry imposes obligations on electricity retailers to prepare one, three and five year plans for energy efficiency and DSM strategies. Retailers are also required to submit annual reports on the implementation of their energy efficiency and DSM strategies, the greenhouse gas emissions resulting from their sales of electricity, and the sources of electricity supplied by them.

2.1.1.4 BUSINESS ENVIRONMENT

STRUCTURE OF THE ELECTRICITY INDUSTRY

National competition policy in Australia requires all States to unbundle competitive electricity generation and retailing from the monopoly elements of transmission and distribution. Consequently, the structure of the electricity industry in Australia is being changed progressively from various degrees of vertical integration to separate businesses in the competitive generation sector and linked separate businesses in the monopoly distribution and competitive retail sectors. Transmission is still regarded primarily as a monopoly though provision is being made for entrepreneurial augmentation of the transmission networks.

OWNERSHIP OF THE ELECTRICITY INDUSTRY

Until recently, all electricity businesses in Australia were owned by State and/or local governments. However, the State of Victoria has privatised the electricity businesses in that State and other States will eventually also privatise their electricity businesses.

LEVEL OF FRAGMENTATION OF THE ELECTRICITY INDUSTRY

The level of fragmentation in the Australian electricity supply industry is relatively high.

TYPE OF ENERGY BUSINESSES

Most Australian electricity businesses are single energy businesses, but some also supply water and some are now starting to retail gas and diversify into telecommunications.

TYPE OF REGULATION APPLIED TO THE ELECTRICITY INDUSTRY

The predominant form of regulation of the Australian electricity supply industry is external with a national regulator replacing state-based regulators. There is also a growing move in some States towards self-regulation through industry codes of practice on issues like safety.

LEVEL OF COMPETITION IN THE ELECTRICITY INDUSTRY

In most States, both the wholesale and retail markets are becoming competitive with the retail market opening progressively, commencing with large customers. A "national" competitive electricity market will be established in mid-1998, commencing with the States of New South Wales, Victoria and South Australia. Queensland will join the national market when an interconnector is completed in 1999. Tasmania may join later, again following the construction of an interconnector. The isolated Western Australia and Northern Territory will never be interconnected with the other States and may introduce limited forms of intra-state competitive electricity markets.

2.1.2 DENMARK

2.1.2.1 ELECTRICITY DEMAND AND SUPPLY

Denmark is strongly dependent on fossil fuels for power production. Fossil fuels thus makeup more than 75% of the total energy consumption for power production. At the same time, however, wind energy and other renewable resources constitute about 11%. This is a result of the Danish government trying to diversify to limit vulnerability and to reduce CO_2 emissions. It is the intention to completely replace coal by natural gas and renewables and energy savings.

Energy consumption is expected to increase in average 0.5% per year until year 2005. The capacity was 10 GW in 1997 which is forecast to 9.5 GW in 2005.

About 40-50% of the power production is tied up to heat production in CHP[a] plants.

[a] *CHP - Combined heat and power.*

2.1.2.2 PUBLIC POLICY FRAMEWORK

Environmental issues are given high priority and is linked to a high level of market intervention. The regulation of the electricity sector is together with consumer ownership an important tool to reach the environmental goals and the state plays an active role in the detailed planning of the energy sectors in its capacity as regulator (not as owner, contrary to some other European countries).

Denmark has a high ambition level with regard to contributing to a sustainable development. Energy 21 sets the goal to reduce the emissions of CO_2 with 20% in 2005 in relation to 1988. Furthermore, the oil crisis in 1973 has security of supply an diversification an important policy goal. These have for example been combined with development of unique know-how and products as for example the wind-mill industry which today makes up more than 1% of the total national export, and contributes with about 1/2 % of the GDP. Since the 70's, the state has through a high level of intervention in the electricity sector developed a Danish market for wind-mills, which has been a platform for developing the wind-mill industry. Today the Danish industry supplies about 50% of the world market. This development was in harmony with the popular grass-root movement against nuclear power.

2.1.2.3 KEY ISSUES AND CHALLENGES

The key issues presently under consideration and debate are:

- The state is and wishes to continue being responsible for the overall planning and distribution of the resources for energy efficiency improvement. The work of the state is done in close co-operation with the energy companies.

- In accordance with the non-profit principle, Danish utilities are allowed special positive conditions for accumulating financial means for investment activities. Law no. 409 specifies how to handle the deriving "surplus capitalisation" as well as the conditions for profit generation under the implementation of the EU Directive.

- The energy minister has through Bill no. L125 (December 11, 1996) tried to ensure that consumer ownership is maintained and no incentive exists for communes or regional communes ("amtskommuner") to sell their shares in distribution utilities to improve their economic situation. Communes which sell shares must calculate the net proceeds of the sale, the calculation approved by The Electricity Price Committee, and thereafter the public subsidy available to the commune will be cut down accordingly. It is under consideration to create a fond for the incoming proceeds which will be used for the benefit of the inhabitants. However, exactly how this may be done is not yet determined.

- How can a high share of CHP and renewables be maintained without impeding the competitiveness of the Danish energy industry? It is the responsibility of the

system operator to compose the PSO[a] so that a framework which ensures an acceptable level of CHP and renewables be created. Another issue is how to determine the price of CHP produced electricity and heat so that cross-subsidisation does not occur.

2.1.2.4 BUSINESS ENVIRONMENT

STRUCTURE OF THE ELECTRICITY INDUSTRY

The eastern part of Denmark (Elkraft) is vertically integrated while the western part (Elsam) has prepared separation into a production company and a transmission company as a response to the possible opening of the power market.

OWNERSHIP OF THE ELECTRICITY INDUSTRY

The distribution companies are typically owned by the local government in built-up areas and by consumers in the rural areas. The distribution utilities in turn own the majority of the production companies. Some wind-mills are privately owned.

LEVEL OF FRAGMENTATION OF THE ELECTRICITY INDUSTRY

The level of fragmentation is high but the variation in size is great. The 10 largest production utilities produce about 85% of the consumed electricity. Also the distribution utilities vary in size but recently more and more distribution companies are merging in preparation for competition.

TYPE OF ENERGY BUSINESSES

A large share of the power is produced in CHP plants and the utilities are therefore often multi-energy businesses. In addition, some energy businesses have diversified their range of products to include energy savings and environmental activities.

CHP is considered an important element in achieving the national environmental objectives and limiting fuel consumption (and import).

TYPE OF REGULATION APPLIED TO THE ELECTRICITY INDUSTRY

The government determines the pricing principles as well as general goals and framework (external regulation). Prices are fixed according to the non-profit principle, which makes the return of the utilities identical to the costs. The regulation hinges on close co-operation between the government and the utilities.

An example of the latest effort to achieve the national goals on security and emissions reduction, is the IRP law which requires that the distribution utilities prepare DSM plans every second year and that the production utilities take these into consideration in their production planning.

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[a] *PSO - Public service obligation.*

LEVEL OF COMPETITION IN THE ELECTRICITY INDUSTRY

At present, there is no competition and the utilities are expected to participate in realisation of societal goals including energy at the lowest cost possible. Investigation is currently ongoing which has as objective to clarify how close co-operation between state and energy utilities can be maintained under partial or completely competitive market conditions. It is the opinion of the Danish government that such co-operation is vital to ensure that the electricity sector together with other sectors of the economy assist in achieving the national societal goals (e.g. environmental goals).

Trade on the Swedish/Norwegian NordPool takes place as a natural part of the Nordic co-operation. In spite of large customers having the possibility trade directly or indirectly via Dansk Kraftmægling in the pool, in reality it is only Elsam and Elkraft which do so.

It is expected that the market will be opened up for distribution companies and customers with a yearly consumption larger than 100 GWh per site before February 1999 as requested in the EU Directive. This first step means that 95% of the distribution companies and 7 large consumers will have freedom of choice — a degree of opening which, according to the government, is close to full opening of the market.

The question of how to handle the PSO of the distribution companies is not clear nor is their obligation to supply and take. Also the TPA tariffs have not yet been decided upon.

2.1.3 GREECE

2.1.3.1 ELECTRICITY DEMAND AND SUPPLY

Fossil fuel constitutes about 86% of the total energy consumption for electricity production. Hydro power contributes with 11% while CHP contributes with 2%.

The total generation capacity is 9,125 MW and the interconnected peak load 6,503 MW. Energy usage is forecast to increase 2.5% per year over the next 20 years. Peak load is expected to increase 2.55% per year.

2.1.3.2 PUBLIC POLICY FRAMEWORK

The level of market intervention is high. Given that Greece, is an island nation which is not fully interconnected, there is an interest in controlling the demand for electricity (i.e. limiting energy consumption as such and removing peak loads). This situation is enhanced by the fact that siting of new traditional power plants is difficult (as in many other countries).

The importance of environmental issues is rated high by the Greek government.

2.1.3.3 KEY ISSUES AND CHALLENGES

As mentioned above, Greece faces certain system restrictions. This has resulted in several local and national least cost planning and integrated resource activities across energy sectors.

2.1.3.4 BUSINESS ENVIRONMENT

STRUCTURE OF THE ELECTRICITY INDUSTRY

The Greek electricity system is vertically integrated with one national power company responsible for lignite mines, production, transportation and distribution, namely Public Power Corporation.

OWNERSHIP OF THE ELECTRICITY INDUSTRY

The national power company is owned by the national/regional government.

LEVEL OF FRAGMENTATION OF THE ELECTRICITY INDUSTRY

The fragmentation of the electricity industry is thus very low. The total number of electricity customers is 6,333,000.

TYPE OF ENERGY BUSINESSES

The Greek Public Power Corporation is a single energy business.

TYPE OF REGULATION APPLIED TO THE ELECTRICITY INDUSTRY

The Ministry of Development determines the external regulation of the electricity industry.

LEVEL OF COMPETITION IN THE ELECTRICITY INDUSTRY

The Greek electricity system is a monopoly system.

2.1.4 FINLAND

2.1.4.1 ELECTRICITY DEMAND AND SUPPLY

Finnish production is relatively evenly spread between five types: Nuclear power 27%, thermal condensing power 19%, CHP 18%, hydro power 17%, and industrial back pressure power 14%.

According to the estimate of a newly published proposal for the national energy strategy by the Ministry of Trade and Industry (MTI), existing capacity and that under construction as well as existing import agreements can cover an annual consumption of 85-90 TWh. Russia currently supplies power to Finland (about 8 TWh) under a power purchase agreement that expires in 1999. Upon expiration, it is not clear whether the purchase agreement will be renewed, forcing power companies to reassess their resource options.

Both energy usage and peak demand is expected to increase about 50% over the next 20 years. The estimated capacity need for the year 2010 is 90-100 TWh and for the year 2025 about 110-120 TWh depending on the prevailing energy policy in Finland and in EU. The maximum need for new capacity for year 2025 is estimated to 5,000 MW.

2.1.4.2 PUBLIC POLICY FRAMEWORK

Authorities in Finland believe that the role of the government should be limited. There has been no price control and very little government planning for power sector development in the last 15 years. In the legislation, prices are stated to "be reasonable" and complaints can be made to Electricity Market Authority (or to the Anti Trust Authority).

The main role of the MTI is to promote competition and ensure that there are no barriers for a free energy market.

There is a liberal attitude towards licensing new power stations and import/export of power — i.e., anyone commercially capable is permitted to build new generation, purchase existing generation or any energy business, or to import/export power. Nuclear power plants are an exception in that they need to be accepted by the Parliament.

The Finnish government has recently defined its target for energy policy as follows (unofficial translation):

- The aim of the Finnish energy policy is through the use of economic instruments and market economy mechanisms to create circumstances where the supply of energy is secured, the price of energy is competitive and environmental impacts fulfil the international agreements.

- The aim is also to force the development and commercialisation of new technology for energy conservation and renewable energy.

2.1.4.3 KEY CHALLENGES AND ISSUES

The options for expanding the base load capacity are somewhat limited given the constraints on production: A present moratorium on nuclear power, limited ability to increase the use of natural gas due to pipeline constraints, and limited potential for coal given its emissions and high taxation. Some are of the opinion that a fifth nuclear power plant is the only solution to meeting CO_2 reduction targets while others feel that a coal fired plant is more economically and politically acceptable.

Another possibility is to increase import. However, this raises a fundamental question: how large a share the national power consumption may be covered by import without jeopardising national security of supply and the national trade balance?

In terms of energy efficiency, an important issue is how the electricity market trade relations are best formed to allow for demand bidding. Furthermore, the national energy efficiency organ, MOTIVA, is of the opinion that a potential for ESCO activity exists. The main barrier is a financial barrier which may be lowered through the creation of a fund for energy efficiency projects. However, how such a fund is best financed is not clear.

2.1.4.4 BUSINESS ENVIRONMENT

STRUCTURE OF THE ELECTRICITY INDUSTRY

The Finnish electricity supply industry (ESI) has more than 370 power generation stations owned by power companies, local energy utilities, and industry. About 115 different enterprises are involved in the production of electricity.

Large industrial companies, both state, municipality and privately owned, play an important role in the ESI. Industry either own factory cogeneration plants or hold shares in generation companies (and also in the transmission company). The two largest power companies are IVO (publicly owned) and PVO (primarily industry owned). Both IVO and PVO account for about 40% of the Finnish generation of electricity. About 20% is mainly generated by local utilities.

Deregulation has resulted in IVO separating into a production, engineering and transmission companies. IVO has also bought some distribution companies.

A new national transmission company, Fingrid, was established in August 1997.

Transmission and distribution networks are open to all market participants.

OWNERSHIP OF THE ELECTRICITY INDUSTRY

The Finnish generation capacity is owned by national/regional government, customers or private companies.

Fingrid is owned by the government, IVO, industry, and institutional investors.

There are about 112 distribution utilities in Finland — three quarters of these are owned by local authorities, the rest by industry and private investors. There are, however, many mergers between distributors and acquisitions by producers occurring at a rapid pace.

LEVEL OF FRAGMENTATION OF THE ELECTRICITY INDUSTRY

The customers of the 115 generation businesses are mainly local utilities (retailers), large industry and traders[a].

The fragmentation of distribution companies and retailers is also high (112-150) and the number of customers 2.88 million.

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[a] *Traders as opposed to retailers, are not involved in physical delivery of electricity.*

TYPE OF ENERGY BUSINESSES

Both single and multiple energy businesses exist in Finland. Multiple energy business undertake electricity, district heat and/or in some cases natural gas activities.

TYPE OF REGULATION APPLIED TO THE ELECTRICITY SECTOR

As part of the electricity market reform a separate Electricity Market Authority (EMA) was established.

EMA has the following key objectives:

- Promote development of an effective power market — this includes to make information available regarding prices and customer choices between power suppliers.

- Control the monopoly (network) business — this includes to monitor possible cross subsidies between network and supply functions and to authorise distribution licences.

The utility regulator will require utilities to publish transmission prices, terms, and pricing criteria and will require that pricing be based on costs incurred to provide service. Thus a key tool for the regulator is to make information available regarding the cost structure, fees charged for distribution in different utilities, and how these are calculated. These currently varies extensively.

EMA does not have any authority to remove or prevent utility "over investment", but can remove from the distribution charges any identified supply related charges. EMA can only "punish" irregularities through the licence approval process.

LEVEL OF COMPETITION IN THE ELECTRICITY SECTOR

The new Electricity Market Act (effective June 1, 1995) includes the following features:

- Third party access (TPA) for customers above 500 kW started in November, 1995. In January 1, 1997, TPA was extended to all customers although small individual customers are in practice excluded from competition due to the expensive hourly metering requirements making the transaction cost too high. It has been proposed, that in 1998, small customers should be allowed to change suppliers without new meters.

- Generation and electricity trade is subject to competition, while transmission and distribution remain natural regulated monopolies.

2.1.5 FRANCE

2.1.5.1 ELECTRICITY DEMAND AND SUPPLY

The main source of electricity is nuclear power (77%). Hydro power constitutes about 14% while fossil fuels make up about 7%

Energy use is expected to grow in total 36% in the period 1995-2020 and peak load 39%. Peak load is 695 MW.

At present there is 95,632 MW thermal (including nuclear) and 25,108 MW hydro power generating capacity i.e. in total 120,740 MW. The figure is quite high because a number of these MW are only sued marginally for peak load coverage: About 67,241 MW nuclear plants produce 378 TWh and 28,391 MW classic thermal plants produce 42 TWh. The surplus capacity prescribed by the Ministry of Industry includes distinction between base- and peak-load production means: France could have avoided the construction of 11 GW nuclear provided that it would have built 3 GW classic thermal for peak demand coverage.

The surplus capacity is expected to slowly decrease and disappear between 2005 and 2008.

2.1.5.2 PUBLIC POLICY FRAMEWORK

In France, electricity is a public service. The enterprise in charge of electricity, EdF, and the State sign every four years a "Contrat d'Entreprise" defining the missions and duties of each party. The most recent of these agreements concerns the period 1997-2000 and EdF's public service missions are:

- to implement the energy policy defined by the State,
- to ensure electricity supply security in the short, medium and long term,
- to ensure equal quality of supply to all consumers,
- to reinforce the dialogue with consumers,
- to develop a range of services targeted at the consumers demand.

The agreement also specifies the amplitude of tariffs evolution (which are expected to decrease by 14% in average by the year 2000 excluding inflation) and allows a change in the tariff structure to better reflect the various generation costs.

Finally, the agreement clarifies the relationship between the State and EdF in preparation of the competitive market. EdF will pay taxes as any other company and the State will receive its remuneration as a shareholder. In 1997, the property of the transportation grid went from the State to EdF.

EdF has been active in the environmental field since 1992. Various agreements have been signed with the State and local authorities. Some of them have been annexed to the "Contrat d'Entreprise" (for the agreement 1997-2000, the annexed protocol on environment concerns inserting power lines in the landscape and progressively suppressing “black spots”).

In 1993, a framework agreement concerning the reduction of the minimum level of polluting emissions of EdF thermal power plants (sulphur dioxide and nitrogen monoxide). This represents an investment of 10 billion Francs over 10 years.

In 1993 and 1996, agreements were signed with Ademe (the French Agency for Environment and Energy Management) for promotion of DSM activities and development of renewable energies.

As far as nuclear waste is concerned, a 1991 law decided on a 12 billion Francs research programme on long term management of high activity nuclear waste. The Parliament will decide in 2006 on the techniques to be used ensuring the best security.

2.1.5.3 KEY ISSUES AND CHALLENGES

One of the main objectives guiding the French energy policy is security of supply. Two main programmes have been developed to achieve this goal (in particular after 1974): The nuclear programme and to a lesser extent an energy efficiency programme.

Another important issue is interregional solidarity in the shape of the perequation tariff and to a lesser extent employment and economic activity plans developed by EdF. Issues such as the global orientation of tariffs or special treatment for low income families, can be linked to other aspects than strictly economic reasons.

Today, the introduction of competition and the preparation of the translation into French Law of the EU directive on electricity markets is the important challenge. It will modify the current vertically integrated system in France (EDF is the biggest electricity enterprise in the world); it will have consequences on the conception of the public service obligation (which is a key element); it will also interract with Gaz de France, for gas distribution.

2.1.5.4 BUSINESS ENVIRONMENT

STRUCTURE OF THE ELECTRICITY INDUSTRY

The French electricity industry is vertically integrated.

OWNERSHIP OF THE ELECTRICITY INDUSTRY

EdF is a state owned enterprise and generates 96%, distributes 94% and transports 100% of the electricity in France.

However, as will be explained in the next section, there are small generating and distributing companies which are local government owned as well as some privately owned or public company owned (railway, coal mines) generators.

LEVEL OF FRAGMENTATION OF THE ELECTRICITY INDUSTRY

The level of fragmentation is low. There are other generating companies than EdF but their number is hard to define. Self generation from various companies reached 11,767 GWh in 1996 of which 7 TWh was produced by the coal industry and 1.5 TWh by the national railway company.

The 179 distributors, excluding EdF, distribute 5% of the electricity in cities and small towns, which represents 6% of the population (3.4 million inhabitants).

Besides EdF, the distribution companies are municipal services, various local government corporations, private/public joint stock companies, and agricultural and electricity collective interest companies (SICAE). These companies remained after the 1946 Nationalisation Law of the Electricity Sector because their generating capacity were and still is under 8,000 kVA. They are regulated by the legal framework issued by the State concerning the electricity sector.

Retailing activity as a separate activity does not exist in France. It is linked to distribution.

TYPE OF ENERGY BUSINESSES

EdF is a single energy business but is very much linked to Gaz de France. Some of their services are common (services to the general public, for example) and some are separate (generation, transport, environment). The distribution structure is at present undergoing separation.

Moreover, an EdF development project is to become a major player in the co-generation field.

TYPE OF REGULATION APPLIED TO THE ELECTRICITY INDUSTRY

The applied regulation is considered to be a mix of self and external regulation.

The "Contrat d'Entreprise" gives the State power to orient the electricity business according to the national energy policy. In particular, the State controls investment planning and the tariffs (submitted each year to the Ministry of Finance and the Ministry of Industry).

However, the decisions of the State are made in dialogue with EdF and on the basis of EdF's current work and forecasts.

LEVEL OF COMPETITION IN THE ELECTRICITY INDUSTRY

A complete monopoly exists for transport, import, and export of electricity (Law of 1946). Generation and distribution is an in-fact quasi-monopoly (see above for figures).

This situation will change radically due to the EU Directive of December 1996. The French law implementing this directive has to be voted on before the end of 1998. Precise information about the evolution and the terms of competition will be known

then. The directive requires that 30% of the market be opened to competition by 2003. This means all consumers above 9 GWh per year, distributing companies excepted.

2.1.6 JAPAN

2.1.6.1 ELECTRICITY DEMAND AND SUPPLY

Japan is dependent on fossil fuels (52%) and nuclear power (40%) for electricity production. Hydro makes up 7% and the remaining 1% is provided by a range of minor energy sources.

Electricity use in Japan is forecast to increase by 2% per annum to 2007. Current installed generating capacity is 178.0 GW of which Tokyo Electric Power Company (TEPCO) owns 53.9 GW. The difference is owned by wholesale generators, independent power producers, and other electricity companies.

Peak demand in 1997 was 166.6 GW of which TEPCO supplied 57.9 GW. The total peak demand is expected to increase by 1.6% per annum to 2007.

2.1.6.2 2.1.2.2 PUBLIC POLICY FRAMEWORK

Environmental issues are given a high priority in Japan. There is a medium level of market intervention. The Japanese Government is trying to reduce the price of electricity by 20%. This may force the electricity supply industry to restructure company activities. Lower prices may also increase electricity use.

2.1.6.3 KEY CHALLENGES AND ISSUES

At present, the main concerns of the Japanese government and electricity companies are cost reduction and global warming.

The Japanese electricity price is about 20% higher than the second highest within the OECD. In order to reduce costs two approaches are applied. One is competition and the other peak load shifting.

Basically, the Japanese electricity market is based on regional monopoly with vertically integrated private companies. But in 1996, a new electricity law was passed in Parliament. Under the new law, anyone can start electricity supply business in an authorised area including the new urban development. In addition independent power producers now have the opportunity to do bidding. In February 1998, the Japanese government started a formal discussion regarding whether they should introduce competition in the retail electricity market or not.

Peak shifting is very important for cost reduction. Electricity companies provide special discount tariffs to their customers for the off-peak period. (However, they do not have a penalty price for use of electricity within the peak period.) The governmental discussion in 1997 has concluded that a portion of the national budget should be used for subsidisation of small-scale ice storage air conditioning systems.

TEPCO intends to shift 850 MW peak load by year 2000 which is equivalent to approximately 25% of the marginal demand increase within the same period.

Japan has promised to reduce CO_2 emissions by 6% and it will not be not easy achieve it. Electricity companies are trying to reduce CO_2 emissions per produced unit by 20% by increasing the nuclear power production. It is estimated that an additional 20 nuclear power plants will be required in Japan by year 2010 to achieve the target — something which is quite difficult to implement. DSM is another means which is applied to reduce the CO_2 emissions.

2.1.6.4 BUSINESS ENVIRONMENT

STRUCTURE OF THE ELECTRICITY INDUSTRY

There are two major generation-only electricity businesses in Japan. In addition, 34 local governments have hydro generation facilities. There are 10 vertically integrated utilities which each have generation facilities plus a regional franchise monopoly to distribute and retail electricity.

OWNERSHIP OF THE ELECTRICITY INDUSTRY

With the exception of the local government hydro generating facilities, all electricity businesses in Japan are privately owned.

LEVEL OF FRAGMENTATION OF THE ELECTRICITY INDUSTRY

With the exception of the generation sector, fragmentation of the electricity supply industry in Japan is low. While there are 46 generators in Japan, giving a medium level of fragmentation, the 34 local government-owned hydro generators are each very small, accounting in total for only 7% of the installed capacity.

TYPE OF ENERGY BUSINESSES

All electricity businesses in Japan are single energy businesses except for a few small companies which also supply district heating and cooling.

Business related to electricity services include telecommunication, construction and maintenance of networks, and so forth and is carried out by subsidiaries of the electricity businesses.

TYPE OF REGULATION APPLIED TO THE ELECTRICITY SECTOR

The electricity supply industry in Japan is regulated externally by the Government through an industry-specific law.

LEVEL OF COMPETITION IN THE ELECTRICITY SECTOR

In the generation sector, those generating facilities which are not part of an vertically integrated utility sell their output to the local utility. There is no competition in the distribution and retail sectors in Japan, with the 10 utilities having regional franchise monopolies.

2.1.7 KOREA

2.1.7.1 ELECTRICITY DEMAND AND SUPPLY

Korea is dependent on fossil fuels (65%) and nuclear power (27%) of electricity production. Hydro provides 8% of production.

Electricity use in Korea is forecast to increase by 4.6% per annum to 2015. In 1996 installed generating capacity was 35.7 GW. Peak demand in 1996 was 32.4 GW and this is forecast to increase by 4.7% per annum to 2015.

2.1.7.2 PUBLIC POLICY FRAMEWORK

The importance of environmental issues in Korea is high and the focus of public policy is on reducing carbon dioxide emitted in the combustion of fossil fuel energy. KEPCO has a target of reducing emissions to 0.11 kg carbon equivalent per kilowatt-hour of electricity generated.

The Korean Government is emphasising various kinds of energy conservation policies to improve Korea's balance of trade. In 1997, 97.3% of primary energy use in Korea was dependent on overseas fuel imports. The Government is also committed to diversifying energy sources and stabilise energy demand and supply.

2.1.7.3 KEY CHALLENGES AND ISSUES

According to the long-term demand & supply plan of electricity (1998-2015) which is being established by the government, the challenges and issues which deserve to be given foremost priority are as follows.

The Korean government will try to keep the growth rate of electricity demand at the level of about 4 percent through the improvement of the tariff system and the enlargement of RD&D of electricity technology such as high-efficient technology, electronic meter, on-line direct demand control system.

Considering the advantages of nuclear power such as the economical efficiency and the stability of supply as well as improvement of trade balance and reduction of emission of CO2, Korea plans to increase the rate of nuclear power and in contrast, decrease the rate of bituminous coal and LNG for generation.

Korea Electric Power Corporation(KEPCO) has monopolized nearly all sectors of electricity industry: generation, transmission and distribution. Some portions of all sectors will be opened to private companies for the enhancement of competitiveness and efficiency of electricity industry. On account of this, electricity prices could rise in the short term, but it is expected to stabilise in time by the principle of the market.

Korea is planning to enlarge the capacity of wind power system & photovoltaic power systems and promote the distribution of clean coal power systems. In addition, small-scale cogeneration will be positively induced to be installed by private companies so that the power system may be decentralized.

The installment of equipment for de-sulphurization, de-NOx and dust collecting will be strengthened. The use of low-carbon-emitting power systems like nuclear power and hydro power systems will be increased.

2.1.7.4 BUSINESS ENVIRONMENT

STRUCTURE OF THE ELECTRICITY INDUSTRY

The electricity supply industry in Korea has a vertically integrated monopoly structure. There is only one utility, Korea Electric Power Company (KEPCO), which controls the functions of transmission, distribution, and retail sales to end users. KEPCO also owns 95% of the generation capacity., with the remainder owned by a small number of independent power producers.

The Korean Government is considering some opening of the electricity generation market. Private ownership of generation facilities for own use would be allowed with sell back arrangements from the generation owner to KEPCO.

OWNERSHIP OF THE ELECTRICITY INDUSTRY

The Korean Government owns 77.8% of KEPCO. In 1989, the Government sold 21.0 % of KEPCO's common stock to the public as part of a planned privatisation.

LEVEL OF FRAGMENTATION OF THE ELECTRICITY INDUSTRY

With only one vertically integrated utility, the level of fragmentation in the Korean electricity supply industry is very low.

TYPE OF ENERGY BUSINESSES

KEPCO's main business is electricity. However, it is currently diversifying into telecommunications.

TYPE OF REGULATION APPLIED TO THE ELECTRICITY SECTOR

The Korean electricity supply industry is regulated externally. All the important regulations concerning KEPCO's electricity business are established and implemented by the Ministry of Trade Industry and Energy. The Government also has the power to appoint and dismiss the president of KEPCO who serves for am term of three years.

LEVEL OF COMPETITION IN THE ELECTRICITY SECTOR

KEPCO has a monopoly over all sectors of the electricity supply industry except generation. KEPCO owns 95% of the generation capacity with the balance owned by a small number of independent power producers.

2.1.8 THE NETHERLANDS

2.1.8.1 ELECTRICITY DEMAND AND SUPPLY

The main source of energy for power production is natural gas (51%) followed by black coal (28%) and 13% import of power (mainly from Germany and France). A large share is produced by CHP production and cogeneration.

Both energy consumption and peak load are expected to increase about 50% over the next 20 years. The present load factor is 70% (6,100 hours). The daily load curve has more or less the same shape during a winter day and a summer day and also the height does not differ much. The reason for the more or less uniform load shape is that there is no electric heating and a significant load management programme is already in place. As a consequence no big seasonal difference in electricity consumption and peak demand is expected.

Due to the amount of new cogeneration units in the industry a surplus capacity situation has been the result. Also in the centralised generation CHP unit we present. Overall, in the Netherlands, the share of CHP is 40% in 1998. The existing law permits distribution companies and industrial companies to build cogeneration units independent from the plans of the generation companies. Decentralised generation is forecast to reach 24% in 2004.

2.1.8.2 PUBLIC POLICY FRAMEWORK

The Netherlands has a high level of market intervention.

At present (1997), both generators and distributors have monopoly and the electricity industry has a high public service obligation. In 1998, the situation will change with the implementation of a new electricity law to a more liberalised market. In 1998, the large consumers (more than 10 GWh) will be free to choose their supplier. In 2002, customers using more than 0.1 GWh will obtain free choice of supplier and the remaining consumers will follow in 2008. Approximately, in stages of 30% the market will be liberalised.

Environmental protection is given high priority and the whole society is very involved in environmental issues. The Netherlands is a very densely populated country with an energy intensive industrial sector and a large share of intensive agriculture such as green houses. Protection of the environment is therefore important to maintain a high living standard.

2.1.8.3 KEY ISSUES AND CHALLENGES

At the moment, diversity of supply of various types of fuel is important due to security of supply reasons but also to ensure low cost generation. Therefore, many production units are designed for dual firing which can take advantage of fuel price fluctuations.

Another issue debated in the Netherlands is how to uphold low cost generation under acceptable societal constraints. In a new market situation the question will be how to combine a liberalised market with the strong drive for a sustainable future.

As a result of the soon-to-be opening of the market the energy companies have to unbundle into network businesses and energy retail companies. Also the present generation company will be split up into a grid company and a generation company.

The discussion is how the network companies of various voltage level will be organised.

At the moment, the expected liberalisation does not include privatisation. The local governments will be the shareholders of the generation company either directly or indirectly via the distributors.

2.1.8.4 BUSINESS ENVIRONMENT

STRUCTURE OF THE ELECTRICITY INDUSTRY

In 1987, a law was passed which required unbundling of generation and distribution. The shareholders of the generation companies are the distribution companies (50%) and local government (50%) and the electricity industry thus consists of linked but separate businesses.

The Dutch Electricity Board (Sep) owns and operates the national high voltage grid. As a separate grid company and a generation company are formed, Sep will disappear.

OWNERSHIP OF THE ELECTRICITY INDUSTRY

While the shareholders of the generation companies are the distributors and the local government, the shareholders of the distribution companies are the municipalities or the provinces (local government).

A high level of public ownership by the local authorities is expected to continue.

LEVEL OF FRAGMENTATION OF THE ELECTRICITY INDUSTRY

Since 1987 the electricity sector has been reorganised and presently fragmentation is relatively low.

The distribution/retail industry is still a commodity seller. There are standard contracts for most of the customers. The large consumers have their own contract formats with special arrangements.

TYPE OF ENERGY BUSINESSES

Most of the energy distributors sell power and heat in the form of natural gas and electricity and some of them also water and cable television services. The tendency to entail multiple energy businesses is likely to continue and even expand to include other types of services as well to improve market position.

TYPE OF REGULATION APPLIED TO THE ELECTRICITY INDUSTRY

The Dutch electricity industry is mainly regulated through industry code of conduct and informal cooperation.

Extended use of cogeneration, waste heat exploitation, and energy efficiency improvements are levers to limit environmental impacts of electricity use.

LEVEL OF COMPETITION IN THE ELECTRICITY INDUSTRY

There is no competition in the electricity sector today - only franchise business. As of 1998, the situation will change to a partially franchised market (see above for more detail) to accommodate the EU directive.

2.1.9 NORWAY

2.1.9.1 ELECTRICITY DEMAND AND SUPPLY

Hydroelectricity provides 100% of Norway's electricity requirements, along with some net imports from thermal generators in Sweden.

Capacity is currently balanced, with a total generating capacity of 27.4 GW. For the period forward to 2005, a 1.5% pa growth in demand is expected.

2.1.9.2 PUBLIC POLICY FRAMEWORK

Market intervention is categorised as medium. Both generation and distribution are influenced through government granted concessions. Otherwise, the market is deregulated, with generation and supply (including prices) set on a commercial basis.

Environmental issues are seen as important to the government and general public, and are stressed in government policies, but to date no firm commitments or operational guidelines have been established in relation to the use of electricity.

2.1.9.3 KEY ISSUES AND CHALLENGES

2.1.9.4 BUSINESS ENVIRONMENT

STRUCTURE OF THE ELECTRICITY INDUSTRY

The structure in Norway consists of linked separate businesses, where holding companies control generation, distribution and/or retail businesses. In the deregulated market, there are independent businesses in trading, brokering and retailing.

OWNERSHIP OF THE ELECTRICITY INDUSTRY

The electricity industry in Norway comprises a mix of public and privately owned ventures. There are publicly and privately held producing units, with the largest producer being the state owned electricity business, Statkraft. Transmission

networks are also a mix of public and privately owned ventures, with the main network (Statnett) again begin state owned. 15% of retail businesses are private, with the remaining being state owned.

LEVEL OF FRAGMENTATION OF THE ELECTRICITY INDUSTRY

Fragmentation in the market is high, with 170 generators, 220 distributors and 250 retailers servicing a population of around 4 million people.

TYPE OF ENERGY BUSINESSES

Traditionally the energy business has been single type, based on either electricity or oil/gas. However there is a growing tendency towards increased integrated and mutliple energy-business approaches.

TYPE OF REGULATION APPLIED TO THE ELECTRICITY INDUSTRY

The electricity industry is based on governmental concessions and extensive legislation. However with the coming of the deregulated market, there has been a more 'hands off' policy in the generation and retail segments of the market, to allow for market forces in the pricing of electricity.

2.1.10 SPAIN

2.1.10.1 ELECTRICITY DEMAND AND SUPPLY

About 39% of the power production in based on hydro power. nuclear power production makes up 16% while about 37% is produced using fossil fuels.

The total generating capacity is 41,620 MW and peak demand 25,810 MW. The peak demand is expected to increase about 50% from year 1995 to 2010 while the utilisation of peak demand will decrease slightly.

There is about 16% surplus capacity even when taking into account the possible fluctuations in precipitation and forced outages. New capacity is thus not required.

The balance for 1995 was as follows:

Maximum net capacity	41.62 GW
Foreseeable not available capacity	4.68 GW
Total available net capacity	36.94 GW
Likely maximum peak demand	25.81 GW
Required reserve capacity	5.17 GW
Balance	5.96 GW

The foreseeable not available capacity is associated with hydro power stations since their effective capacity is heavily dependant on hydro conditions. Regarding the required capacity, studies are based on a probabilistic approach that takes into account the forced outage probability of each type of power station. Consequently, the required reserve capacity varies depending on the generation mix in existence in the various years considered.

2.1.10.2 PUBLIC POLICY CONTEXT

Environmental policy objectives are given "medium" priority.

The Spanish utilities have started specific environmental plans for their generating and distribution activities, employed environmental staffs with qualified professionals, and extended the environmental education throughout all levels of their organisations. The economic resources invested in environmental protection for the period 1996-99 is about 250,000 mio Pta (1,667 mio USD), and since 1982, the electricity industry has devoted 12,000 mio Pta to research and development for environmental protection.

The Spanish EI considers negotiated agreements and the self-commitments as efficient tools to achieve the objectives for environmental protection.

2.1.10.3 KEY ISSUES AND CHALLENGES

The fuel and energy security strategy is based on the following assumptions:

- Integration of the European energy markets;
- Diversification of supply and energy resources through enhanced relationships with power supplying countries and promotion of new energy resources and renewables;
- Increased energy demand compensated through promotion of rational energy use;
- Intensified international co-operation with non EU countries according to the EU policy objectives, especially the Euro-Mediterranean co-operation, exploiting the advantageous geographical location of Spain.

In this context there are two important events: 1) the completion of a natural gas pipeline from Algeria to Spain in November 1996 and 2) a new high voltage interconnection between Spain and Morocco across the Gibraltar Strait to the ALTUMA grid system, expected ready for operation in 1998.

The electricity businesses have agreed with the Spanish government to contribute to the competitiveness of the Spanish economy via a nominal minimum reduction of the electricity tariffs: 3% in 1997, 2% in 1998, and 1% in the period 1999-2001.

2.1.10.4 BUSINESS ENVIRONMENT

STRUCTURE OF THE ELECTRICITY INDUSTRY

In Spain, the electricity industry consists of linked separate businesses i.e., generators are also heavily involved in distribution. However, as mentioned earlier, unbundling of production, transmission, and distribution will be in place as of January 1st, 1998. Unbundling of distribution and retail sales will take place later.

OWNERSHIP OF THE ELECTRICITY INDUSTRY

Four generation groups exist (see Exhibit 2-1) - all of them privately owned since June 1998.

Exhibit 2-1: Generation groups.

Company	Generation Share	Distribution Share
ENDESA Group	50%	41%
Iberdrola	27%	40%
Unión Fenosa	14%	15%
Hidrocantábrico	5%	4%
Self Generation	4%	-

The high voltage network is owned by REE which up to now remains state controlled. However, its statutes will be modified due to the impending creation of a Network Operator and a Market Operator.

LEVEL OF FRAGMENTATION OF THE ELECTRICITY INDUSTRY

The level of fragmentation is fairly low and the main change as result of introducing competition may therefore be continued privatisation (and not necessarily further concentration of the industry).

TYPE OF ENERGY BUSINESSES

In Spain, the electricity utilities are diversifying their product range to include communication services and other services. They are also carrying out an intense process of market internationalisation investing throughout the world (mainly in Latin America).

TYPE OF REGULATION APPLIED TO THE ELECTRICITY INDUSTRY

External regulation is applied through the Commission of the National Electricity System.

Since 1987, Spanish price regulation has been organised primarily around Marco Legal Estable (MLE), which establishes "standard costs" for all elements of production in an ex-ante "yardstick" approach upon which a Base Rate for

generation of revenues collected by distribution companies is formed. This regulatory structure provides the distribution utilities with an incentive for efficiency: Revenues are fixed at a certain rate even if costs are lowered that particular year and reducing costs will thus inevitably increase profits.

As of January 1st, 1998 the regulatory framework will change. Main features of the new framework are:

- The order in which the various generation units will be run shall be established - demand bidding included.
- Ancillary services which complement the power production and are required to supply electricity to customers in compliance with quality and security standards are under consideration. The main technical service functions are: Frequency control, reactive power control, and operating/running reserve.
- To secure sufficient power capacity and availability, acknowledgement of a payment for power guarantee will be introduced.
- Free entry to generation.
- Liberalisation of primary energy supplies for generation.
- Special production facilities (cogenerators) over 50 MW will join the competitive bids scheme. Energy from producers below 50 MW will be bought at competitive price plus the power guarantee.
- A Market Operator and a Network Operator will be created.
- Distribution remains a natural monopoly with partial franchise and TPA is introduced.

The liberalisation of supply will be implemented according to the set by the Protocol of 1996 (see Exhibit 2-2).

Exhibit 2-2: Schedule for liberalisation.

Year	Annual consumption (GWh)	Customers (number)	Share of energy (%)
1998	20	360	24
2000	9	500	25
2001	5	1000	28

LEVEL OF COMPETITION IN THE ELECTRICITY INDUSTRY

Competition is planned introduced as of January 1st, 1998. The details are listed above. Generation will be fully opened up to competition while franchise in distribution remains.

2.1.11 SWEDEN

2.1.11.1 ELECTRICITY DEMAND AND SUPPLY

The Swedish power production is based on 41% nuclear, 37% hydro, 19% fossil fuels, and 3% natural gas. Renewables such as wind make up less than 1%.

Swedish forecasts are only available until the year 2010. Further, no forecasts regarding peak demand are available.

The total electricity usage is forecasted to increase by 0.4% annually. In 1995, it reached 141 TWh. In year 2000 it is expected to reach 145 TWh, year 2005 about 148 TWh, and year 2010 about 152 TWh.

Total generating capacity is 33,623 MW. Today, Sweden has a slight surplus capacity. However, it is very difficult to estimate how much since it depends on many factors for example the load on the wires and the transmission capacity in Sweden as well as in the other Nordic countries since these have a common system.

Further, the amount of rainfall any given year plays a major role for the consumption of primary energy since a large part of the electricity is generated from hydro power stations.

2.1.11.2 PUBLIC POLICY FRAMEWORK

Medium level of market intervention.

Environmental issues play a major role and are becoming more and more important both in a public policy context and in general. The current energy policy aims at:

- Reducing use of electricity for heating purposes;
- More efficient use of the existing electricity systems; and
- Increased use of renewable energy resources in production of electricity and heat.

Access to continuous and up-to-date information on price and market development is imperative for participation in the market and making well-founded decisions regarding energy use (including energy efficiency). With respect to energy efficiency, the Swedish government therefore stresses activities related to expanding the customers' and key-decision-makers' knowledge, abilities, and access to objective information.

Cooperation with the Baltic countries and internationally is also considered important in the pursuit of a sustainable development.

2.1.11.3 KEY ISSUES AND CHALLENGES

- How to compensate for the dismantling of the nuclear power stations.
- Development of a suitable information exchange system so that uneven information access is equal for all the relevant actors. Today, the distributors possess most of the information.
- How to provide customers with the information necessary to act rationally in terms of energy efficiency.

2.1.11.4 BUSINESS ENVIRONMENT

STRUCTURE OF THE ELECTRICITY INDUSTRY

The electricity industry consists of vertically integrated and linked separate businesses.

The vertical integration has been increasing over the last couple of years as a result of the competitive market. It is estimated to have increased from 26% in 1989 to about 38-40% in 1996 and will probably continue to do so while other European markets prepare for and introduce competition. However, according to a study by NUTEK[a], this does not necessarily result in unreasonably high prices. A more imperative concern is to make sure that the concentration in production or sales does not become too great. Even so, to protect especially the smaller customers, it is possible for a customer to request an investigation of the offered electricity price level.

To avoid cross-subsidisation between monopoly activities and activities exposed to competition, it is required by law that these are legally separated. Nätmyndigheten monitors that this is adhered to.

OWNERSHIP OF THE ELECTRICITY INDUSTRY

Electricity in Sweden is produced in plants owned by utilities, the state, municipalities, and industrial companies. In addition, a small proportion of electricity is generated in privately owned hydro and wind power plants. The state owns around 50% of the production capacity, the municipalities own 20%, municipal and private funds own 10% and 20% is privately owned.

Vattenfall is a state owned company. The ownership structure in other companies has changed during the past years when foreign shareholders have entered the market. The German power company Preussen Electra and Electricité de France are major foreign shareholders.

[a] *"Elmarknad i förändring - Från monopol till konkurrens", NUTEK, B 1991/6.*

Introduction of competition has fostered a new type of electricity sales businesses ("gemensamma bolag") based on the local communal electricity plant. Typically, the ownership is jointly held by the "old" communal electricity company, some industry, and/or interest organisation(s). In February 1996, there were eight of these electricity sales companies.

LEVEL OF FRAGMENTATION OF THE ELECTRICITY INDUSTRY

Out of the 300 generating companies the majority are small. Today the eight largest power companies account for just over 90% of Sweden's total electricity production. Of this amount, Vattenfall AB supplies about 50% and Sydkraft AB about 25%. This concentration of production is being monitored, but is at present considered acceptable seen from a Nordic system perspective.

The 248 distribution companies supply about 5.2 million customers. There are 227 pure retail businesses.

TYPE OF ENERGY BUSINESSES

The eight large producers are all multiple energy businesses while some of the smaller companies are single energy businesses.

TYPE OF REGULATION APPLIED TO THE ELECTRICITY INDUSTRY

Production and sales are made on competitive markets while the network activities are regulated by the state (Svenska Kraftnät). Competition legislation includes prohibition of cooperation which limits competition by impeding, curtailing, or otherwise distorting competition and of abuse of a dominant market position.

At the same time as the market is deregulated in some aspects, the parliamentary decision to restructure and develop the energy system tends to lead to increased regulation. For example, regulation is addressing the phasing out of nuclear power, as well as the protection of small scale electricity production which is typically based on hydro power or other renewable energy sources.In addition, production is regulated to achieve environmental goals and to protect smaller customers. With respect to the latter, electricity legislation requires that there is one supplier in every area who has supply concession i.e. is obligated to supply electricity for normal consumption purposes to all customers within the area.

LEVEL OF COMPETITION IN THE ELECTRICITY INDUSTRY

Regarding production, the Swedish market can be said to be competitive. Also sales to large customers are made in a competitive environment. However, small households have so far not had the possibility to change supplier since that would require a meter which has been far too expensive. Since the 1st January 1997, a new rule/law telling that meters cannot cost more than 2,500 SK came into force. This may change the situation.

Full TPA exists, however, Svenska Kraftnät must be informed of transmission export/import contracts to other countries if they stretch over more than six months.

Besides general rules regarding construction of power plants and compliance with environmental protection laws, no special permission is necessary for construction of power plant capacity. This includes foreign producers. With regard to network concession for a foreign connection, this may not be granted "if the connection would seriously detract from the possibility of maintaining Sweden's long-term electricity supply" and it is preferred that new foreign connections be owned and operated by the Swedish state.

2.1.12 UNITED KINGDOM

2.1.12.1 ELECTRICITY DEMAND AND SUPPLY

Fossil fuels make up the larger share (about 50%) of the energy resources used for power production. Natural gas and nuclear power represents 21% and 28%, respectively.

The total generating capacity is about 63 GW and is expected to grow to 75 GW by year 2000. The UK has, particularly as a result of the "dash-for-gas" surplus capacity.

Energy use is forecast to grow 46% over the next 20 years.

2.1.12.2 PUBLIC POLICY FRAMEWORK

The level of market intervention is low. Emphasis is on market forces to determine resource allocation.

There is a price control mechanism for the monopoly parts of the business only (i.e. distribution). Full competition in operation in the larger user markets since 1990, and is being phased in the residential market. There will be a price control mechanism in place in the residential sector until year 2000.

Environmental issues are given medium importance and the UK government has repeatedly made the commitment to reduce the UK's carbon dioxide emissions by 20% by 2010. This is a far higher target than that agreed at Kyoto, or is expected to be agreed by the EU. The increase in gas fired plants at the expense of coal fired plants automatically helps reduce CO_2 emissions. Still the Energy Saving Trust is charged with the task to propose, develop, and manage programmes to promote energy efficiency.

2.1.12.3 KEY ISSUES AND CHALLENGES

A concern of the British consumer organisations is potential unfair competition which could harm the poorer customers. There is therefore for the residential sector a special provision in the supply license for those persons who are of pension age or disabled or chronically sick to protect these customer groups.

An independent review of the Pool operations, pricing, and governance was recently proposed. Some of the topics suggested investigated are the possibility for consumer representation in the Pool member group and election of an independent chairman.

The government is carrying out a review of energy regulation which could have a considerable impact on the electricity industry in the UK and the way that energy efficiency is funded. This review is due to report in Spring 1997.

2.1.12.4 BUSINESS ENVIRONMENT

STRUCTURE OF THE ELECTRICITY INDUSTRY

Retailers and distributors are currently the same companies. After April 1998, new retailers (called second tier suppliers) will be allowed to enter the market. Generators are separate companies.

OWNERSHIP OF THE ELECTRICITY INDUSTRY

At the time of restructuring, the electricity industry was also privatised and today the whole electricity industry is privately owned.

LEVEL OF FRAGMENTATION OF THE ELECTRICITY INDUSTRY

The level of fragmentation is “medium”. The 42 generators sell most of their electricity into the Pool. During 1996, three generators set the pool price 86% of the time.

There are 15 distribution companies (RECs) supplying 38 retail businesses. The total number of customers is 2.6 million.

TYPE OF ENERGY BUSINESSES

A number of electricity companies have entered the competitive gas market to supply gas to users. The main gas supplier has been awarded an electricity second tier supply licence, so it may supply gas and electricity to residential customers after competition enters the residential electricity supply market after April 1998.

A number of electricity companies are part of conglomerates also supplying water. A number of electricity companies have been taken over by US companies with other interests.

TYPE OF REGULATION APPLIED TO THE ELECTRICITY INDUSTRY

The external regulator OFFER regulates the electricity industry.

The revenue for the monopoly functions is limited by a price cap formula based on kWh sold. The price cap for distribution increases in accordance with the retail price index (RPI) minus a productivity factor (X). Power supply for the franchise market is regulated according to RPI-X+Y, where Y represents the supply cost pass through. To limit the incentive of the distribution businesses to increase sales

about 75% of the revenues allowed through the price cap calculation are collected through fixed charges[a].

LEVEL OF COMPETITION IN THE ELECTRICITY INDUSTRY

The British electricity sector is strongly competitive. There is competition in the generation business while distribution is a natural monopoly. Competition exists in the above 100 kW supply market and competition will be introduced to the smaller user market from April 1998. non-franchise customers may buy power from any regional energy company, licensed supplier (including licensed generators and traders), or directly from the Pool.

The REC retains a monopoly in supply to serve its franchise customers. The REC also provides non-discriminatory distribution access, enabling competing RECs to sell power to non-franchise customers within the service territory.

2.2 SUMMARY OF RESTRUCTURING PROCESS

Exhibit 2.3 provides an overview of the present electricity sector in each of the countries participating in Task VI. It refers to the components used throughout this chapter to describe each country's electricity sector, that is:

Public Policy Context:

- Level of market intervention – high, medium, low
- Importance of environmental issues – high, medium, low

Business Environment:

- Structure of the electricity industry – vertically integrated (V), linked separate businesses (LS), fully unbundled (F);
- Ownership of the electricity industry – public national/regional (PN), public local (PL), public customers (PC), privately (PR), mixed (mix);
- Level of fragmentation of the electricity industry – high, medium, low;
- Type of energy businesses – single (S), medium (M), other (O);
- Type of regulation applied to the electricity industry – self regulation (S), industry code of conduct (I), external regulation (E), other form of regulation (O);
- Level of competition in the industry – strongly competitive (C), partial franchise (PF), monopoly (M), other (O).

[a] *Does not include Northern Ireland.*

Exhibit 2-3: Overview of present electricity sector situation.

	AU	DK	SF	FR	GR	JP	KR	NL	NO	ES	SE	UK
Public Policy Context												
Market intervention	M	H	L	H	H	M	H	H	M	M	Mix	L
Import. of env. issues	H	H	H	M	H	H	H	H	M	M	H	M
Business Environment												
Structure	LS	V/LS	LS/F	V	V	V	V	LS	LS/F	LS	V/LS	LS/F
Ownership	Mix	Mix	Mix	PN	PN/PL	PR	Mix	PL	Mix	(PR)	Mix	PR
Fragmentation	H	H	H	L	L	L	L	L	H	L	H	L
Type of business	S/M	S/M	S/M	S	S	S	S	M	S/M	O	S/M	M/O
Type of regulation	E	I/E	I/E	O	E	E	E	I	E	E	O	E
Level of competition	PF	M	C	M	M	M	M	M	C	PF	C	C

For more detail about each country, please, consult the individual country descriptions in the previous section or Appendix A.

2.2.1 ELECTRICITY DEMAND AND SUPPLY

In spite of global energy savings and greenhouse gas emission reduction targets, the demand for electricity is growing. Peak demand for some European countries is expected to grow as much as 50% over the next 20 years. Korea expects an annual increase of about 4.6% until 2015, Australia 4% until 2010, and Japan 1.6% until 2007.

Australia, Denmark, Greece, and the Netherlands all rely heavily on one particular type of fossil fuel, either coal or natural gas. The United Kingdom depends heavily on fossil fuels. Finland uses a very even spread of five different energy sources as does Korea. Spain uses the most diverse types of energy resources. Norway uses predominantly hydro power with no reliance on fossil fuels. The energy resource consumption in France is dominated by nuclear power supplemented with hydro power which explains the only moderate interest in greenhouse gas emissions reduction issues.

Exhibit 2-4 Generation mix by country (%)

	AU	DK	SF	FR	GR	JP	KR	NL	NO	ES	SE	UK
Black coal	***55.1***	***72.0***	*21.0*	*5.4*		*5.0*	***22.6***	*28.0*		*19.0*		***42.9***
Brown coal	*25.8*				***67.3***					*4.3*		
Natural gas	*8.8*	*13.0*	*10.0*	*0.2*		*31.0*	*22.0*	***51.0***		*2.9*	*3.0*	*21.6*
Fuel oil		*4.0*	*2.0*	*1.1*	*15.5*	*16.0*		*0.2*		*13.7*		*4.5*
Diesel	*0.4*				*3.5*		*20.3*					
Nuclear			**27.0**	**77.2**		**40.0**	26.6	4.0		16.2	**41.0**	28.8
CHP			18.0	1.8	2.2			(32)		4.0	7.0	(3.7)
Ind. back pressure			14.0					4.0				
Thermal condensing			19.0					(35)			12.0	
Cold condensing								(65)				
Hydro	9.9		17.0	14.3	11.4	7.0	8.5	0.1	**100.0**	**39.4**	37.0	0.4
Biomass			10.0					1.2		0.3		1.8
Solar thermal	0.1											
Solar voltaic	0.1											
Wind	0.1	4.0	2.0		0.1			0.8		0.2		
Other renewable		7.0										
Total fossil fuels	90.1	89.0	33.0	6.7	86.3	52.0	64.9	79.2	0.0	39.9	3.0	69.0

An investigation of the present generation mix shows that renewable energy resources excluding hydro power do not contribute significantly to the national energy supplies (Finland and maybe Denmark apart), although in some cases they may do so on a local level.

Natural gas and independent power producers

As the European gas interconnection expands and a competitive gas market is introduced, electricity production is likely to become increasingly linked to the wholesale gas market. More gas fired capacity (and reduced share of coal) will develop, mainly combined-cycle-gas-turbines driven by an expectation of large profits. Over the last few years the number of independent power producers and cogeneration (including all types of cogeneration from large industrial installations supplying directly into the grid to small diesel or gas driven units supplying heat and power to buildings) has grown significantly.

2.2.2 PUBLIC POLICY CONTEXT

Market intervention

In general, most countries are reducing direct government participation in the electricity market either through privatisation or introduction of competition. In countries such as Finland, Norway, UK, and to some extent Australia and Sweden, the governments have minimised their involvement to focus on creating a level playing field for a competitive market and overcoming barriers to socio-economic benefits of energy efficiency. Greece and Korea will continue to have a high market intervention level for a number of years yet. In Japan the intervention is at a medium level. However in France and Denmark, governments continue their active participation in the energy sector.

Importance of environmental Issues

All countries prioritise protection of the environment quite high as long as it does not jeopardise national concerns about protecting industrial competitiveness and national economic interests. The medium interest shown by the UK is partly due to a strong faith in the ability of market forces to provide the right signals and partly due to a substantial use of nuclear power combined with a shift from coal to gas.

Countries heavily reliant on fossil fuels for their power generation are especially keen on finding alternative solutions. In step with increasing energy market competition, the cost of protecting the environment and of not doing so is heavily debated.

Countries with an existing or forecast deficit in generation capacity (such as Sweden) are more interested in exploiting the possible benefits of pursuing end-use energy efficiency, especially, if it proves more cost-effective to do so than to import electricity from neighbouring countries.

2.2.3 KEY ISSUES AND CHALLENGES

Other common key issues of concern are:

- how to introduce competition and align the use of a competitive market with the structure of the electricity sector as well as the preferred government regulatory regime;

- how to handle the transition phase to a competitive market;
- how to meet short-term greenhouse gas emission reduction targets;
- how to ensure that the competitive market is as close as possible to a truly free competitive market (e.g. avoiding oligopoly and unfair treatment of certain customer groups);
- how to ensure that public service obligations in relation to electricity supply are still fulfilled in restructured electricity industries, especially in competitive electricity markets;
- how to fit the competitive electricity market philosophy into the strategy for a sustainable development and at the same time not jeopardise the national economy.

Australia is one of the pioneers in the introduction of competition into the electricity industry. However, it seems that a result of competition is a focus on the financial performance of the energy businesses at the expense of DSM and energy efficiency. An exception is the State of New South Wales where legislation obligates electricity retailers to prepare 1, 3, and 5 year plans for energy efficiency and DSM strategies and annual reports on actual achievements.

2.2.4 BUSINESS ENVIRONMENT

2.2.4.1 STRUCTURE OF THE ELECTRICITY INDUSTRY

Most of the European electricity businesses are establishing a clearer split between their monopoly and competition activities in accordance with the EU Directive. Even so the structure of the businesses is not necessarily fully unbundled. Both vertically integrated and linked separate businesses exist and appear to continue to do so.

Japan and Korea have vertically integrated systems.

The Australian structure is changing towards separate businesses in competitive generation sector and linked separate businesses in the monopoly distribution and competitive retail sectors. Transmission is primarily a monopoly though provision is being made for entrepreneurial augmentation of the transmission networks.

2.2.4.2 OWNERSHIP OF THE ELECTRICITY INDUSTRY

Clearer split between monopoly and competitive activities

Restructuring in preparation for a competitive market does not necessarily lead to privatisation. In Europe, the ownership form will continue to be a mixture of private, consumers, and regional/national government. As a result there is a strong discussion concerning public service obligations. The type of ownership determines to some extent which mechanisms can be used to promote energy efficiency as well as what are the risks of obstructing the functioning of a free market.

In Japan, all generation facilities except hydro power plants are privately owned.

The Korean government is considering some opening of the electricity generation market to allow private ownership of generation facilities for own use and with sell back arrangements to the national electricity company, KEPCO. In addition, KEPCO is gradually undergoing privatisation.

Until recently, also all Australian electricity businesses were state or local government owned but privatisation is ongoing.

2.2.4.3 LEVEL OF FRAGMENTATION OF THE ELECTRICITY INDUSTRY

EU Directive

As the EU Directive on the internal electricity market takes shape (see Appendix C), the European utilities try to prepare for the coming changes through market positioning. Services are split into monopoly businesses and competitive businesses and mergers and acquisitions are beginning to occur. Fragmentation is high in the Nordic countries and low to medium in the Greece, France, Netherlands, Spain, and United Kingdom (see Exhibit 2-5). As a reaction to market competition, the distribution utilities especially are merging will continue to do so for a number of years.

With only one integrated utility, the level of fragmentation is low in Korea. In Japan the fragmentation is medium in generation and low in the remaining system while the fragmentation is high in all sectors in Australia.

The table below shows the fragmentation level of the various countries[a]. Please note, that for France the level of fragmentation in distribution is considered low in spite of there being 180 distribution companies. The reason is that one of these companies supplies about 95% of all the distributed electricity.

Typically, generation is characterised by dominance by one to four businesses supplemented by production by several smaller generators which mainly produce power to cover their own demand.

Exhibit 2-5: Level of fragmentation in each country.
L-low, M-medium, H-high, n.a.- not applicable, m-million.

	AU	DK	SF	FR	GR	JP	KR	NL	NO	ES	SE	UK
Generation	H	H	H	L	L	L	L	L	M	L	M	L
Businesses	21	550	115	1	1	12	1+	4	170	4	300	42
Customers	40	120	150	596	1	10	1	15	250	-	-	1
HV transmission	7	2	2	1	1	n.a.	1	1	1	1	1	1
Distribution	H	H	H	L	L	L	L	M	M	L	H	M
Businesses	22	120	112	180	1	n.a.	1	32	220	11	248	15
Customers	7.9m	2.9m	2.9m	31m	6.3m	n.a.	13.3m	-	250	20m	5.2m	38
Retail	H	n.a.	H	n.a.	n.a.	L	L	L	M	n.a	H	H
Businesses	30	n.a.	150	n.a.	n.a.	10	1	32	250	n.a.	227	38
Customers	7.9m	n.a.	2.3m	n.a.	n.a.	72.8m	13.3m	6m	2.5m	n.a.	-	26m

[a] *When reading the above table, attention should be given to the fact that self-producers have not been included for all countries.*

2.2.4.4 TYPE OF ENERGY BUSINESSES

Various types of businesses

The energy businesses offer only electricity services, or more than one type of energy services, or a combination of different types of services (e.g. electricity, water, and waste water). No obvious link between the size of the individual business enterprise and the type of services offered exists.

2.2.4.5 TYPE OF REGULATION APPLIED TO THE ELECTRICITY INDUSTRY

No self regulation

Regulation is generally carried out through external regulation. Self regulation does not occur. However, there is in some of the Australian states a growing move from external regulation towards self-regulation trough industry codes of practice.

Initially, it was expected that with competition the need for regulation would diminish. However, this is not true. The type of required regulation may change but the amount of formal regulation is rather increasing than decreasing with the introduction of a competitive market.

A concentration of utilities is taking place in Europe and it is being monitored carefully to allow timely intervention in case the market and consumer interests is threatened.

2.2.4.6 LEVEL OF COMPETITION IN THE ELECTRICITY INDUSTRY

At present, full competition exists in Finland, Norway, and Sweden. The United Kingdom is planning to open the market to the remaining small customers in April 1998. The other European countries will follow suit, with various approaches to the opening process as a result of the EU Directive on the internal electricity market (see Appendix C). Australia is at present in transition towards a competitive market in the eastern and southern States which will be established in late 1998 or early 1999[a]. Japan and Korea remain monopolies.

[a] *The isolated Western Australia and Northern Territory will never be interconnected with the other states and may therefore introduce limited forms of intra-state competitive electricity markets.*

3. CHARACTERISTICS OF THE IDENTIFIED MECHANISMS

In this section, the identified mechanisms are described and classified. For a complete description of the individual mechanisms please consult Appendix B or the Task VI Experts secure site on the Internet.

3.1 MECHANISM TYPES

Exhibit 3-1 presents an overview of the identified existing mechanisms categorised according to 17 different types.

Exhibit 3-1: Identified mechanisms by primary type category.

	AU	DK	SF	FR	GR	JP	KR	NL	NO	ES	SE	UK	ALL
Market Intervention	*M*	*H*	*L*	*H*	*H*	*M*	*H*	*H*	*L*	*M*	*M*	*L*	-
IRP & Cooperation	1	1			5		1	1					9
Regulation/Standards/Codes of Practice	2		1	1	1	1	1		1	2			10
Tax Payable/Tax Exemption		1		3		1		1					6
Cost Recovery via Tariffs							1	1		1		1	4
Interruptible Tariffs						1	1			1			3
Green Pricing and Other Special Tariffs										1			1
Subsidies/Grants/Rebates		1	3	3	4	3	1	2		1	1	4	23
Investment/Commercialisation Funding	1		1	2				1					5
Technology Procurement			1					2			1		4
Entrepreneurial Organisation	1												1
Voluntary/Negotiated Agreements	1		2					1					4
Incentive Agreements											1		1
Energy Services Provision						1					2		3
Branding												1	1
Information Provision	1	2	1	2	1	5		1	1	2	1	2	19
Education and Training Provision	1		1			1						1	3
Competitive Sourcing of DM	1												1
Total Reported	**9**	**5**	**10**	**11**	**11**	**13**	**5**	**10**	**2**	**8**	**6**	**9**	**99**

"Cost recovery via tariffs" signifies that utilities are allowed to recover their costs incurred through DSM activity via the customer tariffs.

"Investment/commercialisation funding" is effectively, cheap capital. It is meant to cover mechanisms whe.re funding is provided (usually by government) on comparatively advantageous terms for the commercialisation of energy efficient technologies. The funding may for example be provided in return for a royalty on sales of the technology and this distinguishes it from "Grants/subsidies/rebates". Also "Grants/subsidies/rebates" are commonly provided for the end-users for purchase of technology rather than to fund the commercialisation of the technology by the technology developer.

"Entrepreneurial organisation" is an organisation set up (usually by government) to carry out entrepreneurial activities to promote energy efficiency. Examples include the Energy Saving Trust in the UK, SEDA in New South Wales, Australia, MOTIVA in Finland, and EECA in New Zealand.

"Information provision" includes energy labelling activities while "Energy services" include performance contracting.

Lack of interest and ability

So far 99 mechanisms have been described. The types of mechanisms reflect the fact that one of the most significant barriers to end-use energy efficiency is the lack of interest from the consumers and lack of ability to act upon their possible interest in energy efficiency. Most governments therefore feel that irrespective of the market structure there is a consistent need for motivating consumers to take an interest in energy efficiency issues.

Furthermore, although some experts claim that with maturity of the competitive markets will follow a greater interest in energy efficiency services both by the consumers and the utilities, the markets are still too immature to develop this interest.

Most of the identified mechanisms use some sort of subsidisation, grant, or rebates (23) or focus on the provision of information (19).

A number of the mechanisms aim at dissemination of information about energy efficiency through use of illustrative examples and demonstration projects which are expected to have a multiplication effect. Where dissemination is successful, additional benefits are gained and the cost-effectiveness of the mechanism is likely to increase.

3.2 ADDRESSED MARKET BARRIERS

Whilst society has outlined certain environmental and socio-economic goals for energy efficiency, barriers to economic energy efficiency exist inherent in the structure of the energy system.

Exhibit 3-2 presents an overview of market barriers to energy efficiency. This overview was developed in an earlier IEA DSM Programme project[a].

Exhibit 3-2: Market barriers to DSM and EE.

Barriers
Externalities are not fully included in the energy price
Pay-back gap (utility vs. customer)
Prices differ from marginal costs
Risk sheltering of utilities due to monopoly situation
Lack of information and high transaction costs (hassle)
Disconnected decision-maker
Existing mechanisms and approaches

[a] *The Averch-Johnson-Willing effect has been omitted.*

This list of market barriers is used in the first step of the mechanism analysis. However, as the mechanism analysis progresses it might prove necessary to adjust the list to reflect the barriers of restructured markets more accurately and completely.

More than one barrier is addressed

To gain an impression of which market barriers are addressed by the identified mechanisms, a primary barrier was identified for each mechanism. *Still, most of the mechanisms address more than one barrier and identifying the main barrier is not always simple.* The overview presented in Exhibit 3-3 should therefore be read with a certain amount of caution.

Exhibit 3-3: Addressed barriers by country.

	AU	DK	SF	FR	GR	JP	KR	NL	NO	ES	SE	UK	ALL
Externalities	2	1	2	1	3	1		4			1		15
Pay-back gap	3		5	5	4	4	1	1			2	3	28
Not marginal cost prices				1	3	1	3			2			10
Risk sheltering		2						2		2	2	2	10
Lack of information	4	2	2	3	1	6		2	2	2	1	4	29
Discon. decision-maker			1	1		1	1	1		2			7
Regul. disincentive to DSM													0
Total	9	5	10	11	11	13	5	10	2	8	6	9	99

Looking at the identified mechanisms they appear to especially address the "lack of information" (29) and the “pay-back gap” (28). In other words, the end-users’ interest in energy efficiency and ability to act upon that interest is a main focus.

Mechanisms such as energy tax, tax exemption, long-term/voluntary/required savings agreements, and programme requirements primarily address the fact that externalities are not fully included in the energy price (DK03, SF01, SF06, FR05, JP12, NL04, NL05, NL06, and SE04). This group of mechanisms is targeted at energy consumers and especially the larger consumers. The target groups are either given a financial incentive or submit to some sort of common agreement concerning energy reductions. Environmental regulation for electricity retailers in New South Wales, Australia (AU05) and least cost planning for Greece (GR02), on the other hand target the energy utilities.

The group “not-marginal cost prices” contains integrated resource planning, DSM services, cost-reflective tariffs, and utility activities which can be covered via the customer tariffs (FR01, GR01, GR03, GR04, JP10, KR01, KR02, KR03, ES05, ES06 and PT04). The latter is aimed at exploitation of the expert knowledge and information of the electricity businesses and their close customer relationship.

3.3 RELATIONSHIP BETWEEN MECHANISM TYPE AND TARGETED ACTORS

Successful mechanisms recognise that decisions will be made by dispersed actors with different values and preferences. The level of "freedom" built in to the mechanism must change depending on the actors and end-uses addressed. For example, are disconnected decision-makers often motivated by standards or labelling requirements set by law.

Target audience groups

The target audience for the various mechanisms may be divided in four:

- Government agency — Includes all levels of government, municipalities, and government institutions;
- Electricity business — All businesses involved in electricity service activity;
- Customers — All electricity customers, also public enterprises;
- Other — Includes disconnected decision-makers (architects, constructors, etc.), equipment producers, equipment retailers, ESCOs, research organisations, gas companies, CHP companies, and more.

Customers and other

The majority of the mechanisms by far target the customers, with 52% of the mechanisms focussed solely on customers, and a further 11% targetting combinations of customers and electricity businesses, government and others. In the cases where certain customers can not be motivated to pursue energy efficiency through financial pressure or information (for example due to lack of influence on the energy related decision), mechanisms are developed to target the end-uses in question through motivating other actors. One of the most significant methods is the application of building standards which since the oil crises has been applied in many countries. Here the most efficient way of influencing the market is to limit the freedom of choice by law. Customers, on the other hand, are to a large extent motivated through increased reliable information and financial support.

Electricity businesses

Eleven percent of the mechanisms solely target electricity businesses and a further 9% target electricity businesses along with customers and others. Most of the mechanisms targeted at the electricity businesses are some form of official/unofficial energy efficiency activity target combined with approval to recover associated costs via the customer tariffs. Unique for Denmark is the requirement that distribution utilities prepare DSM plans to be used in the IRP plans prepared by the generators. In Spain, the energy activities on both demand- and supply-side are coordinated and financially subsidised through the energy efficiency and saving plan PAEE. In the Netherlands, a formal cooperation between the electricity generation, gas production, and gas/electricity retail businesses in the shape of an integrated environmental energy sector plan is to optimise the joint efforts to increase energy efficiency. Also, Korea and Greece have applied integrated resource planning. Greece, having several not interconnected islands with

tourism as main income, has a strong incentive to conduct integrated resource planning including not only the electricity sector but also the other energy sectors.

Government agencies

The mechanisms targeted at some type of government agency (4%) are in fact targeted at the lower level of government representation, namely municipalities. These are encouraged through partial subsidisation and/or tendering of suitable demonstration projects for duplication as well as simple registration of resource consumption to increase awareness of energy issues.

No obvious link between preferred target groups and level of competition, the level of market intervention, and the environmental concern in the individual systems appear to exist (see Exhibit 3-4).

Exhibit 3-4: Targeted interest groups.

	AU	DK	SF	FR	GR	JP	KR	NL	NO	ES	SE	UK	ALL
Level of Competition	*PF*	*M*	*C*	*M*	*M*	*M*	*M*	*M*	*C*	*PF*	*C*	*C*	-
Market Intervention	*M*	*H*	*L*	*H*	*H*	*M*	*H*	*H*	*L*	*M*	*M*	*L*	-
Environmental Concern	*H*	*H*	*H*	*M*	*H*	*H*	*H*	*H*	*H*	*M*	*H*	*M/O*	-
Other		2	3	2		1		3		2	1	1	15
ElBusiness	2	1		1	4	1	2						11
ElBusiness & Other						1		1			1		3
ElBusiness & Customers	1		1	1				1	1				5
ElBusiness & Govt					1								1
Govt	1	1	1									1	4
Govt & Other													0
Govt & Customers					1								1
Customers	4	1	4	6	4	9	2	5	1	6	3	7	52
Customers & Other	1				1	1	1				1		5
All			1	1									2
TOTAL	9	5	10	11	11	13	5	10	2	8	6	9	99

The market barriers determine to a certain extent which end-uses are addressed for each of the target groups. Most of the identified mechanisms target several end-uses and it is up to the target group to decide which end-uses to improve. However, one important end-use is space heating since the involved technology has a long life time and dominating disconnected decision-makers make difficult the implementation of energy efficient building shells and heating systems.

3.4 ADDRESSED TECHNOLOGICAL STAGES

The effort to increase energy efficiency can be directed at one or more of the three different stages of the technology process. The three stages are 1) development, 2) choice, and 3) application.

The distribution of the addressed technology stages shown by the identified mechanisms is presented in the table below (Exhibit 3-5). When reading the chart it should be kept in mind that a substantial amount of general R&D development into subjects such as electric recharge-batteries is not reflected in this investigation.

Exhibit 3-5: Distribution of addressed technology process stages.

	AU	DK	SF	FR	GR	JP	KR	NL	NO	ES	SE	UK	ALL
D/C/A	2			1	3	1	1	2		1			11
D			1		4	1		1					7
D/C			2	2		1		3		1	1	1	11
C	2	3	5	7	1			3		3	3	5	32
C/A	5	2	2	1	3	10	3	1	2	1	2	2	34
A							1			2		1	4
Total	9	5	10	11	11	13	5	10	2	8	6	9	99

The majority of the identified mechanisms (34) are targeted at influencing both choice and application of technology, i.e. technology process stage C/A. In addition, 32 mechanisms seek to influence choice alone, while 11 seek to influence both choice and development. Four of these 11 mechanisms (SF07, NL07, NL08, and SE02) are related to technology procurement. In a competitive market (and maybe especially in the transition phase before the market stabilises), technology procurement appears attractive in that it attempts to use the market forces to create an efficient solution and build a market for that solution. Also it does not involve the electricity businesses nor impose constraints on their competitiveness.

Some information campaigns seek to influence both the choice of technology and the application of technology to obtain greater impact. At the time of purchase (choice) the customers are most receptive to advice concerning energy efficient use of the technology (application) and combination of the two appears to be a sound strategy. Otherwise, the outcome of a mechanism targeted at the application is easily influenced by other uncontrollable factors. Another point is that some of these mechanisms are general awareness campaigns and education of school children and the effect is not immediately recognisable. This makes it difficult to identify the actual impact of the mechanism and assess the cost-effectiveness - an important issue.

Australia (4), Norway (2), Korea (3), and especially Japan (10) appear to focus on mechanisms that address choice and application combined. For the remaining countries a tendency to focus on choice and application combined is dominant for both partial franchise markets and monopolies (see Exhibit 3-6). Only a few of the identified mechanisms address application alone (KR03, ES05, ES06, and UK02). They are interruptible tariffs, night rates, and grants for energy service companies.

It should be kept in mind, that this investigation does not attempt to give a complete list of mechanisms in each country. Thus although a type of mechanism may only be listed for some countries, similar mechanisms may well exist in the other countries as well.

Exhibit 3-6: Number of addressed stages by type of market.

	D/C/A	D	D/C	C	C/A	A
All Competitive	0%	5%	14%	**48%**	28%	5%
All Partial Franchise	18%	0%	6%	29%	**35%**	12%
All Monopoly	13%	10%	11%	28%	**36%**	2%
All Countries	11%	7%	11%	32%	**35%**	4%

3.5 MECHANISM STRATEGY AND COMPOSITION

In Exhibit 3-7 all mechanisms are listed. For more detail please consult Appendix B. Mechanisms type, addressed technology process stage, and target groups are specified. Furthermore, an overview of the social carrier of technology elements which are enhanced through the mechanism are indicated.

Based upon the contents of the table, the following can be concluded:

- The majority of the mechanisms attempt to create an interest and provide the social carrier of technology with the power necessary to pursue this interest. The power is mainly created through providing the carrier with financial support and grouping of customers with common interest to obtain more powerful representation.

- Interest may represent a financial incentive - options become cost-effective either directly (e.g. subsidies) or indirectly (tax/tax exemption) - or are forced by law. Interest may also be assumed to rise with certain types of information provision.

- Some twelve mechanisms constitute a simple obligation for the target group to consider energy efficiency by use of decree or law. Thus a “forced interest” is created. Information programs create an awareness of economic benefits and/or environmental consequences of energy consumption and thus seeks to increase the interest of the social carrier at the same time.

- The mechanisms appear to consist of three groups: 1) A group mainly enhancing interest and power; 2) a small group addressing primarily information, access, and knowledge; and 3) a more mixed group which strengthens several elements often including organisation and access.

- Some mechanisms have only one target group while others have two or three target groups whose interest and abilities together form a viable social carrier of technology such as customers and equipment producers. The latter may also just be aimed at similar user types and end-uses (e.g. building renovation targeted at residential and public buildings).

- The highest number of elements enhanced by one single mechanism is six and can be seen for JP13 — Equipment leasing by electricity business. However, it could be argued that this mechanism only provide access to the customers in that it provides the customers with a complete energy service package including equipment, operation, maintenance, and management.

- Otherwise, the highest number of elements enhanced by one mechanism is five and these mechanisms relate to technology procurement: *Organisation* - creates contacts and interest groups: provides *information* and *access* to tailored products; creates financial *interest* in that producers see possibilities for gaining market shares and developing "suitable" (sought af ter) products and customers may shape the product in more than one way. The value of teaching both producers and customers to think this way should not be underestimated. It is likely to generate new initiatives.

Although not visible in Exhibit 3-7, a number of the mechanisms from each of the involved countries apply a combination of intervention methods. A type of subsidisation/taxation scheme combined with a public tendering procedure is the most common combination followed by a combination of subsidisation and formal savings agreement. Also education and training is combined with subsidisation assumedly to provide illustrative examples which support the education and training. A financial element thus appears in all of the combined interventions.

If one applies the concept of social carrier of technology to the mechanisms and compare the results with the level of market intervention, there is a slight tendency for European countries with high and medium level of market intervention such as Denmark, the Netherlands, and Spain to strengthen only a few social carrier elements (interest and power)[a]. Finland (low), Sweden (medium), and United Kingdom (low) enforce a larger spectrum of elements. This may be due to the fact that competition breaks up some of the informal cooperation which previously helped further energy efficiency initiatives. However, the identified mechanisms were not randomly selected and given the dispersion it is not possible to draw strong conclusions concerning this matter. Furthermore, the tendency is not apparent for Australia, Korea, and Japan.

[a] *See section 3.3. for more detail on the concept of Social Carrier of Technology.*

Exhibit 3-7: Overview of enhanced social carrier elements. *XR - required by law/government without any special bonus offered*

Ref No	Title	Mechanism Category	Targeted Actors	Tech stage	Enhanced social carrier elements					
					Interest	Power	Ability	Info	Access	Knowlege
AU01	Greenhouse challenge agreements	Voluntary agreements	customers	C/A	X	X	X	X		
AU02	EE standards for buildings & equipment	Regulation/std/CoP	customers	C/A	X			X	X	X
AU03	Home energy line	Information provision	residential customers	C/A				X	X	X
AU04	EE financing by government agencies	Investment/comm funding	government agencies	C/A	X	X	X			
AU05	Environmental regulations for electricity distributors and retailers	IRP & Cooperation	electricity distributors and retailers	D/C/A	XR	X	X			
AU06	Sustainable Energy Fund	Entrepreneurial organis'n	customers and others	D/C/A	X	X	X	X	X	X
AU07	Capping network pricing	Regulation/std/CoP	electricity businesses	C			X			
AU08	Competitive sourcing of DM/peak capacity	Competitive sourcing - DM	retailers & large business customers	C	X		X			
DK01	Electricity Saving Fund	Subsidies/Grants/Rebates	district heat and natural gas companies	C	X	X				
DK02	Green municipal accounts	Information provision	municipalities	C/A	X			X		
DK03	CO2 and energy tax	Tax payable/exemption	industrial customers	C/A	X	X		X		
DK04	IRP Law	IRP & coooperation	electricity businesses	C	XR					
DK05	Labelling of household appliances	Information provision	equipment suppliers	C	XR					
SF01	Negotiated agreements: industry & utilities	Voluntary agreements	utilities & industrial customers	C	X					
SF02	Building renovation investment support	Subsidies/Grants/Rebates	residential and public buildings	C	X	X				
SF03	EE investment support for enterprises	Subsidies/Grants/Rebates	enterprise, esp industrial	C	X	X				
SF04	Information dissemination	Information provision	all customers	C/A	X			X		X
SF05	Certified energy audits	Education and Training	industry and service sect	C/A	X			X		X

Ref No	Title	Mechanism Category	Targeted Actors	Tech stage	Enhanced social carrier elements					
					Interest	Power	Ability	Info	Access	Knowlege
SF06	Negotiated agreements: public sector	Voluntary agreements	public sector, municipalities	C	X	X				
SF07	Technology procurement	Technology procurement	equipment buyers and manufacturers	D/C	X	X	X	X	X	
SF08	Demonstration of new technologies	Subsidies/Grants/Rebates	eqipment users and manufacturers	D/C	X	X		X		X
SF09	Building standards	Regulation/std/CoP	building co.s & owners	C	XR					
SF10	R&D assistance in energy sector	Investment/comm funding	energy industry, research organisations	D	X	X				
FR01	Fund for rural electrification (FACE)	Subsidies/Grants/Rebates	rural/remote customers	C/A		X			X	X
FR02	Institutional framework for energy effic'y	Information provision	general public, all customers	D/C/A	X	X	X	X	X	X
FR03	Insulation and renovation subsidies	Subsidies/Grants/Rebates	residential building owners	C	X	X		X		
FR04	Energy labelling for residential appliances	Information provision	customers and retailers	C	X	X		X		
FR05	Tax exemption for development of overseas territories	Tax payable/exemption	ESCOs in overseas territories	D/C	X					
FR06	Energy standards: residential/service sector	Regulation/std/CoP	building owners & tenants	C	XR					
FR07	Fiscal measures for EE in industrial sector	Tax payable/exemption	industrial customers	C	X	X				
FR08	Tax reduction for building renovation	Tax payable/exemption	residential customers	C	X	X				
FR09	Labelling for new residential construct'ns	Information provision	building constructors	C	X	X				
FR10	Special Fund for Large Operations	Invest/comm funding	all energy customers	D/C	X	X				
FR11	Payment of efficient bulbs on elect. bills	Invest/comm funding	residential customers	C	X	X		X		
GR01	IRP for the island of Crete`	IRP & Cooperation	utilities	D	X			X		

Ref No	Title	Mechanism Category	Targeted Actors	Tech stage	Enhanced social carrier elements					
					Interest	Power	Ability	Info	Access	Knowlege
GR02	Least cost planning for Greece	IRP & Cooperation	utilities	D	X			X		
GR03	DSM in health care facilities	IRP & Cooperation	utilities	D	X			X		
GR04	DSM plan for public sector of island cities	IRP & Cooperation	utilities & public auth's	D	X			X		
GR05	Diffusion of efficient appliances	Subsidies/Grants/Rebates	residential customers	C	X	X		X		
GR06	Energy agencies	IRP & Cooperation	Customers	D/C/A	X	X				
GR07	Energy labelling for appliances	Information Provision	Residential Customers	D/C/A				X		
GR08	Incentives for energy conservation investments	Subsidies/Grants/Rebates	Industrial and tertiary sector enterprises	C/A	X	X				
GR09	Electricity production from cogeneration and RES	Subsidies/Grants/Rebates	Independent producers of electricity	C/A	X	X				
GR10	Reduction of CO2 emissions through energy efficiency improvement in buildings	Regulation/std/CoP	Owners, users, constructors and designers of buildings	D/C/A		X				
GR11	Financial incentives for energy efficiency/RES investments	Subsidies/Grants/Rebates	Small, medium and large enterprises	C/A	X	X				
JP01	Energy efficiency standards	Regulation/std/CoP	building and factory owners; equip manuf's	C/A	XR	X	X	X		
JP02	Subsidies for investment in EE equipment	Subsidies/Grants/Rebates	business owners and managers	C/A	X	X	X			
JP03	Information about energy saving measures	Information provision	general public	C/A	X				X	X
JP04	Energy efficiency consulting service	Information provision	factory and building owners	C/A	X				X	X
JP05	International cooperation in EE technologies	Education and training	foreign electricity businesses	D/C	X	X	X	X		
JP06	Information service on energy savings provided by electricity businesses	Information provision	end use customers	C/A				X	X	X

Ref No	Title	Mechanism Category	Targeted Actors	Tech stage	Enhanced social carrier elements					
					Interest	Power	Ability	Info	Access	Knowlege
JP07	Energy efficiency consulting service provided by electricity businesses	Information provision	end use customers	C/A				X	X	X
JP08	Subsidies for investment in EE equipment provided by electricity businesses	Subsidies/Grants/Rebates	equip. manufacturers & customers	D/C/A	X	X				
JP09	Information about energy saving provided by elect businesses and other organisat'ns	Information provision	end use customers	C/A				X	X	X
JP10	Using rate systems to change customer behaviour	Interruptible tariffs	end use customers	C/A	X	X	X	X		
JP11	Tax incentives for energy efficiency	Tax payable/exemption	business owners and managers	C/A	X	X	X			
JP12	R&D subsidies for EE technologies	Subsidies/Grants/Rebates	equipment manufacturers	D	X	X	X			
JP13	Equipment leasing by electricity businesses	Energy services	customers	C/A	X	X				
KR01	IRP	IRP & cooperation	electricity businesses	D/C/A	X	X	X			
KR02	DSM cost recovery	Cost recovery via tariffs	electricity businesses	C/A	X	X	X			
KR03	Direct load control	Interruptible tariffs	commercial and industrial customers	A			X	X		
KR04	Financing for DSM and EE projects	Subsidies/Grants/Rebates	end use customers	C/A	X	X				X
KR05	Standards for cooling facilities in buildings	Regulation/std/CoP	building developers, owners & managers	C/A	X	X	X	X		
NL01	Tender process for industrial energy conservation	Subsidies/Grants/Rebates	industry	D/C/A				X	X	X
NL02	Gov't subsidisation of energy projects	Subsidies/Grants/Rebates	companies	D/C	X	X				
NL03	Govt funding for R&D on energy efficiency	Invest/comm funding	companies	D	X	X				
NL04	Fiscal tax exemption for environmental and energy efficiency targets	Tax payable/exemption	residential customers and companies	C	X	X				

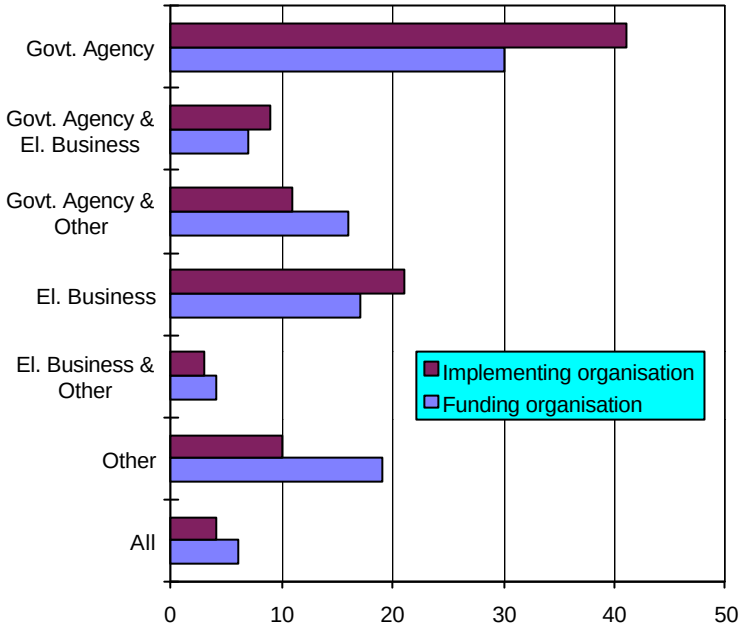
Ref No	Title	Mechanism Category	Targeted Actors	Tech stage	Enhanced social carrier elements					
					Interest	Power	Ability	Info	Access	Knowlege
NL05	Increase in electricity prices for providing EE cash rebates	Cost recovery via tariffs	residential customers retail companies	C	X	X				
NL06	Long term agreement on energy efficiency improvement	Voluntary agreements	companies and building industry	C	X					
NL07	Competition to encourage use of the exergy (energy quality) principle	Technology procurement	architects, electrical and building contractors	D/C	X		X		X	
NL08	Competition: heat pump	Technology procurement	electrical constructors, project developers	D/C	X		X		X	
NL09	Integrated Env. Plan of the Energy Sector	IRP & Cooperation	energy organisations	D/C/A	X			X		
NL10	Communication	Information Provision	general public business community	C/A	X			X		
NO01	Improving the energy bill as a carrier of information	Information Provision	households	C/A			X			X
NO02	Legally mandated DSM for local electricity distributors	Regulation/std/CoP	end users (except energy intensive industries)	C/A	X					X
ES01	Energy conservation and efficiency program (PAEE 1991-2000)	Subsidies/Grants/Rebates	all energy customers	D/C	X	X				
ES02	Building standard for thermal conditions	Regulation/std/CoP	building constructors	C	XR					
ES03	Technical directions for efficient HVAC installations	Regulation/std/CoP	residential building constructors	C	XR					
ES04	DSM and EE provisions in Electricity Act	Cost recovery via tariffs	all customers	C	X	X				
ES05	Interruptible contracts	Interruptible tariffs	distribution utilities	A	XR					
ES06	Night rate	Green pricing & other	distribution utilities	A	XR					
ES07	Info dissemination	Information provision	all customers	C/A	X					X
ES08	Various I.D.A.E activities (Institute for Energy Diversification and Saving)	Information provision	all customers	D/C/A	X			X		X

Ref No	Title	Mechanism Category	Targeted Actors	Tech stage	Enhanced social carrier elements					
					Interest	Power	Ability	Info	Access	Knowlege
SE01	Energy efficiency centres	Information provision	all end use customers	C/A	X			X		X
SE02	Technology procurement	Technology procurement	end users and manufacturers	D/C	X	X	X	X	X	
SE03	Incentive agreements to encourage market penetration of EE products & technologies	Incentive agreements	utilities, industrial companies, prop admin	C	X	X			X	
SE04	Voluntary purchasing standards providing examples of EE products and systems	Regulation/std/CoP	purchasing agents, consultants, suppliers	C	X					
SE05	Provision of energy services by utilities	Energy Services	end users	C/A					X	
SE06	Performance contracting	Energy Services	large energy users	C				X		
UK01	Centre for Research Education and Training in Energy (CREATE)	Education and Training	children and school administrations	C/A	X			X		X
UK02	Grants for the establishment of energy service companies	Subsidies/Grants/Rebates	energy service companies	A		X			X	
UK03	Grants for local authorities to comply with Home Energy Conservation Act (HECA)	Subsidies/Grants/Rebates	local authorities	C	X	X		X		
UK04	Electricity standards of performance	Regulation/std/CoP	electricity retailers	C	XR					
UK05	Energy efficiency advice centres	Information provision	residential customers small businesses	C/A				X		X
UK06	National branding and marketing of energy efficiency	Branding	customers, product retailer/producer	C	X		X	X		
UK07	Pensioner's energy plan - local govt grants + loan on property to help increase EE	Subsidies/Grants/Rebates	home owning pensioners	C		X				
UK08	Best Practice Programme to increase uptake of EE	Information provision	industry, commerce & public energy users	D/C				X	X	
UK09	Home Energy Efficiency Scheme (HEES)	Subsidies/Grants/Rebates	residential customers, esp the fuel poor	C	X	X				

3.6 FUNDING SOURCES AND IMPLEMENTING ORGANISATIONS

Exhibit 3-8 shows the distribution of applied funding organisation by type of organisation together with the implementing organisation.

Exhibit 3-8: Distribution of funding and implementing organisations.



Funding Source	AU	DK	SF	FR	GR	JP	KR	NL	NO	ES	SE	UK	ALL
All			2	1	2						1		6
Other	2		1	4	2	2		2	1	3	1	1	19
El. Business & Other					1	1		1			1		4
El. Business	1	1			1	5	4	1		3	1		17
Govt. Agency & Other	1	3	4	1	4						1	2	16
Govt. Agency & El. Business				3	1			2	1				7
Govt. Agency	5	1	3	2		5	1	4		2	1	6	30
Total	9	5	10	11	11	13	5	10	2	8	6	9	99

Implementing Organisation	AU	DK	SF	FR	GR	JP	KR	NL	NO	ES	SE	UK	ALL
All			1	2	1								4
Other				1	2	2	1				1	3	10
El. Business & Other				1		1		1					3
El. Business	1				1	5	4	2	1	4	2	1	21
Govt. Agency & Other	2	1	2	1	5								11
Govt. Agency & El. Business		1	1	2	2			2	1				9
Govt. Agency	6	3	6	4		5		5		4	3	5	41
Total	9	5	10	11	11	13	5	10	2	8	6	9	99

In the review of exploited funding organisations, levies are regarded as paid by the customers (and not the utilities). Standards and similar regulation do not require funding beyond the cost of development, up-dating, and administration. However, they have been assumed funded by a government agency to allow them to be included in the statistic.

Firstly, it is clear that no simple link between funding organisation and implementing organisation exists.

Overall, some type of government agency is involved in the implementation of 61 mechanisms and in funding 53 of the mechanisms. In only 2 cases, government agencies function as implementing organisation while the necessary funding is provided by electricity businesses and "other" actors.

While electricity businesses when supplying the funding also typically handle the implementation, government agencies appear to be involved in conjunction with some other actor (including electricity businesses). This reflects the fact government agencies are often perceived and intended to be facilitators in the implementation rather than solely responsible for funding and implementation.

No clear relationship between the market structure, intervention level, and environmental concern and the preferred choice of funding and implementing organisations appears. For example, the mechanisms identified in Japan, Korea, and Spain appear to involve electricity businesses to a higher extent but do not have a consistent pattern of similar market structure, intervention level, and environmental concern.

Variety of combinations

France uses the largest variety of combinations of funding and implementation in terms of organisation types, Australia, Denmark, and Korea the least. Cooperation between government and utilities can be seen for Denmark, Finland, France, and the Netherlands either because of little distance between government and state-owned electricity business or because of a tradition for close cooperation between government and utilities. Introduction of competition may for Denmark, France, and the Netherlands affect this cooperation.

For the identified mechanisms, a government agency often functions alone as motivator or facilitator for the mechanism while additional organisations are involved in the funding of the mechanism. This results in the number of cases where a government agency is the sole implementing organisation (41) being 37% higher than the number of cases where a government agency alone is funding the mechanism (30).

Funding sources

The main funding source is national and local government budgets followed by different types of taxation schemes and surcharges to the customer tariffs. In 2-3 cases equipment producers and retailers carry the cost and of course utilities carry the costs in the cases where special tariffs or energy services are offered to their customers. There are four examples of building developers carrying the costs (all - SF09, ES04; partly - FR06, FR09). Using building developers who decide upon the type of technology makes it possible for customers later to act energy efficient. The

cost of administrative and/or organisational assistance for SF09 and ES04 is covered indirectly by the government.

Innovative approaches

The most innovative approaches to funding are those collecting money based on energy consumption and re-channelling these to the consumers through a project tendering process. In this way the projects are pursued in order of cost-effectiveness and on a competitive basis. An example is the Danish Electricity Saving Fund (DK01).

Another interesting approach is the French tax exemption for investment in energy service companies in overseas territories (FR05). Here, for example, a financial company, in return for tax exemption of the invested amount, invests in an enterprise which buys solar water heaters from the producers to provide end-use customers as part of an energy service package. The customer is offered, instead of a standard electric water heater, a package where the energy service enterprise provides not only the solar water heater but also install, operates, and maintains the heater against a quarterly fee.

Energy services as opposed to electricity is also available in Japan. Mechanism JP13 describes how electricity businesses lease energy efficient equipment such as thermal storage air conditioning systems (and electric water heaters) to customers and operate and maintain the equipment. The motivation of the electricity businesses is to improve their system load factor.

A fourth approach which may be claimed to be innovative, is the use of existing market forces and only moderate external funding as is the case for technology procurement (SF07, NL07, NL08, and SE04). Only funds sufficient to cover the administrative costs of the facilitator and in some incidences also a modest subsidy to the winning producers is required. The external funding is for all the listed technology procurement mechanisms provided by a government agency.

Similar mechanisms, similar organisations?

Both information mechanisms, subsidisation, and investment mechanisms are mainly funded and implemented by a government agency. In some cases “other” actors are contributing to the funding. A Dutch (NL10-communication), a Spanish (ES07-dissemination of information), a Swedish (SE01-energy efficiency centres), and several Japanese mechanisms employing information as intervention method use electricity businesses as implementing and funding organisation.

Energy services are implemented (and financed) by the electricity businesses as are also special tariff structures.

Government involvement

An often discussed topic is the necessity of government intervention in the market. In the present investigation, one may ask whether the government involvement in at least some of the mechanisms could be lowered or replaced without influencing negatively the success of these, eg can technology procurement be implemented by private parties instead of a government agency? This discussion is relevant when considering international transfer of mechanisms since the overlying strategy for government involvement in the market varies depending on the country in question.

Still the general agreement is that some barriers are not naturally overcome and the question may be not so much whether government should intervene but rather how and to what extent. While larger consumers can be motivated by various market based methods, the smaller consumers are not easily motivated and have a low price elasticity.

One may therefore suspect that inefficiencies at the larger consumers could be adequately addressed by market forces provided that a correct price signal is given. Government assistance may, however, be needed to kick-start events as some of the listed mechanisms show.

Commercial vs. social interests

Another important barrier is that of lack of information and high transaction costs. In transition to a competitive market where cutting cost is of vital concern to the exposed electricity businesses, the uncertainty of impact and difficulty in verifying the outcome of information mechanisms will tend to make electricity businesses very wary. Other actors driven by commercial interests but placed in a more mature market such as equipment producers may be more willing to engage in such mechanisms though preferably with some form of government support. Furthermore, most governments see it as a social obligation to inform consumers about the consequences of energy consumption and provide information that will allow a competitive market to function optimally and avoid exploitation of the weaker actors.

Another argument is that in a competitive market the price signals become more complex as the range of services and service bundles increases. This means less transparency seen from the customers' point of view and could result in greater lack of customer comprehension.

To a certain extent, most countries agree that, without government involvement and regulations, disconnected decision-makers are only motivated with great difficulty.

Sustainable development

Finally, a sustainable national development strategy requires that both short- and long-term effects of energy use is taken into consideration. While commercial markets may easily reflect short-term concerns, long-term concerns are not automatically incorporated. The role of the government as a representation of public interest is therefore to intervene directly or indirectly on behalf of these long-term concerns. Examples of direct intervention are the Danish and the Dutch taxation mechanisms. Examples of indirect intervention is dissemination of information for example in the form of energy efficiency centres (SE, UK), education of school children (UK) and auditors (SF), and general information (JP. KR, and ES).

3.7 SUMMARY

The identified mechanisms were characterised in relation to the following issues:

Pay-back gap and lack of information

- Addressed market barriers — Pay-back gap and lack of information appears well addressed by the mechanisms thus attempting to motivate end-use customers;

- Targeted actors and end-uses — A variety of end-uses are being improved as a result of the mechanisms. An important end-use is space heating and cooling;

- The level of market intervention, environmental concern, and prevailing electricity business ownership in the specific market — No simple link between these and the type of applied mechanisms was shown;

- Addressed technological stages — In most cases the choice situation is influenced since important decisions at this stage may be influenced at a reasonably low risk and helps the uptake of already existing efficient technology on the market;

Funding organisation

- Funding organisation — The main funding source is government agencies but often a combination of funding sources is used;

- Implementing organisation — Also here government agencies dominate. Some electricity business activity is seen (e.g. in the form of energy services) although not widely spread;

- Enhanced social carrier of technology elements — The mechanisms appear to consist of three groups: 1) A group mainly enhancing interest and power; 2) a small group addressing primarily information, access, and knowledge; and 3) a more mixed group which strengthens several elements often including organisation and access. Disconnected decision-makers are forced to take an interest in energy efficiency through use of, for example, standards.

Mechanism cost

Some information concerning the impact and cost of the identified mechanisms was collected. It shows that cost vary from very low (e.g. standards, energy services, and special tariffs) to substantial amounts. A comparison across the different mechanisms was judged to be potentially misleading and was not made. However, indication of the costs give an impression of the magnitude of the mechanism in question and is therefore available in Appendix B.

Most of the listed mechanisms were deemed successful by the host country although in some cases the results were not available or different from the initial goal. The reasons are various. For example, the true impact of mechanisms aimed at providing information can be difficult to assess; the efforts can be identified but assessment of the impact of these is more complicated especially since it may be delayed.

Type of impact

This raises a question regarding quantitative vs. qualitative impacts and long-term vs. short-term impacts. The nature of the intended outcome will to a certain extent determine which organisations have an interest in funding and implementing the mechanism. While competitive electricity businesses in very general terms may be said to focus on short-term impacts, others such as government agencies may be interested both in quick, measurable impacts (e.g., to meet overdue CO_2 emission reduction targets) and more long-term and qualitative impacts (e.g., sustainable development). Customers and other actors are typically placed somewhere between the two.

Market intervention

It is difficult to judge the appropriate level of market intervention in the form of mechanisms. However, there seems to be a general agreement with the fact that the government must facilitate information dissemination and protect the weaker actors - even in a competitive market. The identified mechanisms substantiate this in the large number of information mechanisms and mechanisms targeted at giving smaller customers the possibility to act and for producers of new, energy efficient equipment to enter and gain hold in the market. The important question is probably not so much whether the government should intervene but rather how and to what extent.

Are the mechanisms competition neutral

Most of the identified mechanisms appear competition neutral, i.e., they do not distort the market. However, mechanisms entailing cost recovery via tariffs (KR02, NL05, and ES04) will most likely not be acceptable in a fully competitive market. Instead a levy could be directed to a public fund combined with a tendering procedure, accessible to anyone who pursues energy efficiency and given that certain criteria are met (DK01). However care must be taken to avoid punishing those who pursue energy efficiency of their own initiative and funding.

The tendency among the new mechanisms seems to be that a government agency functions as facilitator and motivator either through administration of public funds, organisation of tendering processes, or providing “neutral” expert advice. While monopoly electricity businesses previously worked closely together with the government fulfilling social duties, this approach is slowly being replaced by utility savings targets posed by government and electricity business based energy services spurred by the commercial interests of the electricity businesses.

Standards - justified mechanisms

A sound existing mechanism is the use of standards which are enforced by law to reach the decision-makers who cannot in any other cost-effective way be motivated to consider energy efficiency. This type of mechanisms will most likely remain justified also in a competitive market.

The general flexibility of the identified mechanisms to changes in the surrounding framework and context e.g., in case of transfer to another country, appears strong while the programs developed as a result of a certain mechanism may be more context sensitive. In the following section, a number of issues to be considered when transferring mechanisms (and programmes) are briefly discussed. These issues should be kept in mind when formulating evaluation criteria for mechanism assessment.

3.8 INTERNATIONAL TRANSFER OF MECHANISMS

When evaluating a mechanism or assessing the relevance of transfer of a mechanism to another country - that is when deciding which mechanism(s) will be appropriate in addressing a certain objective - the following should be considered:

Context is important

- **Societal/cultural context** — The success of a given mechanism will depend on the societal/cultural context in which they are implemented. Therefore, a comparison of the intended context and the context in which the mechanism earlier has proven successful must be made. This analysis must be made for several spheres, namely overall society, target customers, energy business, and government.

  Countries which so far have seen themselves as leading in the field of energy efficiency will most likely attempt to maintain this profile and will pursue certain energy efficiency activities more aggressively than others. A government which has a strong general support from the population will have more success in motivating customers and industry to participate in the joint effort of achieving sustainable development. In addition, it may not be as reluctant to address unpopular issues as an "unstable" government facing elections. Furthermore, the existing tradition for government involvement or not and whether policies are implemented by force or engagement is relevant.

Influence and financial situation

Also, the financial situation of the national and the customers are important. Societies where customers historically have a large influence on energy matters, are used to participation and have a fairly high environmental awareness, may be successful in applying mechanisms requiring a higher degree of active customer decision-making and action than others. International relations should also be kept in mind.

- **Demand/supply situation** — The compatibility of the technical system with the demand situation and pattern influences the relevance of the mechanism. Technical constraints (and for that matter also power export possibilities) may lead to a larger commercial interest in end-use efficiency improvement than otherwise. Also the size of the different customer segments and their consumption pattern and demand for quality, security, and flexibility determines the types of mechanisms of interest. E.g. if the main customer group is the residential sector which is not very sensitive to tariff signals and has a limited interest in uptake of energy efficient measures and behaviour, taxation and remote control may provide good opportunity for increased end-use efficiency at a low risk of failure (since decisions will be made decentralised by actors with different values and preferences). Furthermore, the prominent type of power production means can indicate certain interest fields of the power industry.

Supply versus demand

In addition, there may exist a conflict of interest between the supply-side and the demand-side improvements - not only from a utility perspective but also from a national perspective. A nation may have an economic interest in supporting development and improvement of energy efficient supply-side technology (the

most obvious examples are export of wind turbines or know-how on low-emission coal fired power plants) which can improve the national economic balance while investment in improvement of the available range of demand-side technologies may damage national industries to the benefit of imported products thus harming the national economic balance.

- **Existing energy efficiency level** — The cost-effectiveness of energy efficiency improvement measures greatly depend on the existing level of energy efficiency. So do the possibilities for improvement. In some situations, improvement of the existing tariffication or penetration of existing energy efficient technology is sufficient to achieve significant savings (e.g. in Eastern Europe). In other situations, a high level of energy efficiency already exists and new and innovative approaches and development of new, more energy efficient technologies are necessary to achieve further improvements. This in turn determines the range of suitable mechanisms.

Electricity a privilege?

- **Role of electricity** — This issue is partly addressed by the previous items, however, it is beneficial to consider this issue consciously. Does access to electricity represent a privilege or a human right? In non-industrialised countries electricity may represent a privilege for the few and electrification as a major step forward in the general development of the nation. In other countries, customers consider electricity a human right and few have experienced blackouts or limitations which results in a lack of understanding of the value and importance of access to this commodity. In both cases, the attitude towards end-use energy efficiency both from customer and national perspectives are influenced. Also, electricity and the associated industry may be a valuable source of income to the state and/or nation and therefore reducing demand constitutes not solely a benefit but also disadvantages.

While the range of potentially successful mechanisms is determined by the international, national, and local specific context, the suitable mix of mechanisms for a given country is not necessarily unique. Also, while transfer of a mechanism may be potentially successful, transfer of the associated programmes may not be so.

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Appendix A -

Country Review of Existing Composition and Structure of Electricity Industries

(Data Collection Form 1)

Country/Region Details

Country	Region
Australia	**All States**

Electricity Supply and Demand Situation

Generation Mix

Black coal	55.1 %
Brown coal	25.8 %
Natural gas	8.8 %
Diesel	0.4 %
Hydro	9.9 %
Biomass	0.1 %
Solar thermal	0.1 %
Solar photovoltaic	0.1 %
Wind	0.1 %

Electricity Forecast

Forecast growth over the next 20 Years :
In Energy Usage : 2.3
In Peak Demand : 4
Comments :
Growth per annum. energy growth between 1990 and 2010 will be 40%

Current Capacity Situation

Current Capacity Situation Need for new capacity
Total generating capacity (MW) : 38116
Peak Demand (MW) :
New Capacity Required (MW) :
Percentage overcapacity (%) :

Comments :
Refer to details for individual states

Public Policy Context

Level of Market Intervention

Level of Market Intervention : Medium
Comments :
Competitive energy market with light-handed regulation still evolving. Significant market interference is becoming evident in some states. Open markets may not be established in all states.

Importance of Environmental Issues

Importance of Environmental Issues : High
Comments :
Dominated by carbon intensity and relatively low energy efficiency of the Australian economy and subsequent greenhouse and sustainable energy response activities. Local environmental issues still dominate, including impact assessment, licensing, emission and ambient standard development.
Other Key Public Policy Issues Relevant to the Electricity Industry
Australia is unique as an island nation with most electricity based on cheap coal resources and being used for large scale aluminium and other metal refining activities. Small overall population, large distances, poor interconnected, essentially state-based grids, high carbon intensity, high energy intensity, low energy prices and low overall energy efficiency (reflecting prices) dominate policy setting

Business Environment

1.Structure of the Electricity Industry

Linked Separate Businesses

Comments :
Competition reform policy requires all states to unbundle generation and retailing from the monopoly elements of transmission and distribution. In the larger states, generation, transmission, and distribution are all in separate businesses, but not so in the smaller states. Only in Victoria has the businesses been essentially privatised, but NSW appears to be following. Other privatisation possibilities at present include distribution in Tasmania

2.Ownership of the Electricity Industry

Public Ownership - National/Regional Government

Comments :
Nearly all businesses are state-owned, except for Victoria, where 5 out of 6 generators are privately owned, as well as the 5 distributors. The transmission business is being privatised and the pool company may also be privatised. Similarly, gas distribution businesses are being privatised in Victoria.

3.Level of Fragmentation in the Electricity Industry

	Num. of Businesses	Total Num. of Customers	Level of Fragmentation
Generation	21	40	High
Distribution	22	7920000	High
Retail	30	7920000	High

Comment :
Most retail and contestable customers belong to distribution businesses which hold retail licences.

4.Single or Multiple Energy Businesses

Multiple Energy Business

Comment :
Most businesses are still single electricity businesses with strong moves towards multiple businesses certainly involving gas, but also water and telecommunications.

5.Type of Regulation Applied to the Electricity Industry

External Regulation

Comments :
Either self-regulation or light-handed external regulation with a national regulator replacing state-based regulators on the inter-connected east coast.

6.Level of Competition in the Electricity Industry

Level of Competition in the Electricity Industry : Partial Franchise Market (less competitive)

Comments:
In most jurisdictions industrial and commercial customers are or are becoming contestable. Most domestic customers will become contestable in 2001.

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Country/Region Details

Country	Region
Denmark	

Electricity Supply and Demand Situation

Generation Mix

Black coal	72 %
Natural gas	13 %
Fuel Oil	4 %
Wind	4 %

Electricity Forecast

Forecast growth over the next 20 Years :
In Energy Usage : 0.5
In Peak Demand :

Comments :
In the government's energy plan "Energy 21" it is assumed that without any new initiatives to save electricity, the consumption will increase 0.5% per year in average from 1994 to 2005.Including planned new initiatives, the consumption in 1994 is assumed to be identical to the consumption in 2005. About 40-50% of the electricity production is bound to CHP production.

Current Capacity Situation

Current Capacity Situation Balanced
Total generating capacity (MW) : 10000
Peak Demand (MW) :
New Capacity Required (MW) :
Percentage overcapacity (%) :

Comments :
The total capacity wasi in 1997 about 10 GW. "Energy 21" forecasts a capacity of 9.5 GW in 2005. "Energy 21" has as goal to replace coal by natural gas and renewable resources. The increase in capacity which has been dominated by CHP, has been driven by the need for heating. The potential production to which there has not been a local demand has been exported. The reserve capacity including old, worn out capacity in about 40-50%

Public Policy Context

Level of Market Intervention

Level of Market Intervention : High

Comments :
The prices are fixed according to the non-profit principle which makes the return identical with the costs. Denmark has a high ambition level with regard to contributing to a sustainable development. Energy 21 sets the goal to reduce the emissions of CO2 with 20% in 2005 inrelation to 1988. The regulation of the electricity sector is regarded an important tool to reach the environmental goals. Electricity sector planning is done in close cooperation between the government and the energy companies.

Importance of Environmental Issues

Importance of Environmental Issues : High

Comments :
Environmental issues are given high priority and is linked to a high level of market intervention.

Other Key Public Policy Issues Relevant to the Electricity Industry
Security of supply of energy. Integration of the high priority of environmental goals with development of for example the wind-mill industry, which today contributes with more than 1% of the total national export and about 1/2 % of GDP. When the government through sector planning for the electricity market, established the market for wind-mills the government was in harmony with a popular grass root movement against nuclear power. Also decentralised CHP production is considered important in reaching the environmental goals.

Business Environment

1.Structure of the Electricity Industry
Vertically Integrated

Comments :
The eastern part of Denmark (Elkraft) is vertically integrated while the western part (Elsam) has prepared separation into a production company and a transmission company as a response to the possible opening of the power market.

2.Ownership of the Electricity Industry
Public Ownership - Local Government
Public Ownership - Customers
Private Ownership

Comments :
The distribution companies are typically owned by the local government in built-up areas and by consumers in the rural areas. The distribution utilities in turn own the majority of the production companies. Some wind-mills are privately owned.

3.Level of Fragmentation in the Electricity Industry

	Num. of Businesses	Total Num. of Customers	Level of Fragmentation
Generation	550	120	High
Distribution	120	2900000	High
Retail			

Comment :
The 10 largest generators supply about 85% of all power. There is a big variation in the number of customers of eachdistribution company. The number of distribution companies is slowly decreasing in the expectation of increased competition.

4.Single or Multiple Energy Businesses
Single Energy Business
Multiple Energy Business
Energy Business plus other Type of Business

Comment :
A large share of the power is produced in CHP plants and the utilities are therefore often multi-energy businesses. A few energy businesses have diversified their range of products to include energy savings and environmental activities in other countries.

5.Type of Regulation Applied to the Electricity Industry

Industry Code of Conduct
External Regulation

Comments :
The government determines the pricing principles as well as general goals and framework (external regulation). Prices are fixed according to the non-profit principle, which makes the return of the utilities identical to the costs. The regulation hinges on close co-operation.

6.Level of Competition in the Electricity Industry

Level of Competition in the Electricity Industry : Monopoly

Comments :
At present, the Danish electricity market is a franchise market where the electricity industry is able to realise the societal goals, both the environmental issues and cheap energy. Since the industry fulfils the social goals, it is the opinion of the government that there is no need for competition which could force the electricity industry not to fulfil the interest of society. Investigation is currently ongoing which has as objective to clarify how close co-operation between state and energy utilities can be maintained under partial or completely competitive market conditions.

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Country/Region Details

Country	Region
Finland	

Electricity Supply and Demand Situation

Generation Mix

Black coal	21 %
Natural gas	10 %
Fuel Oil	2 %
Nuclear	27 %
Combined heat and power	18 %
Industrial back pressure power	14 %
Thermal condensing power	19 %
Hydro	17 %
Biomass	10 %
Wind	2 %

Electricity Forecast

Forecast growth over the next 20 Years :
In Energy Usage : 50
In Peak Demand : 50

Comments :
According to the estimate of the newly published proposal for the national energy strategy published by the Ministry of Trade and Industry (MTI), existing capacity and that under construction as well as existing import agreements can cover an annual consumption of 85-90 TWh. Russia currently supplies power to Finland (about 8 TWh) under a power purchase agreement that expires in 1999. Upon expiration, it is not clear whether the purchase agreement will be renewed, forcing power companies to reassess their resource options. The estimated need for the year 2010 is 90-100 TWh and for the year 2025 about 110-120 TWh depending on the prevailing energy policy in Finland and in EU. The maximum need for new capacity for year 2025 is estimated to 5,000 MW. The options are somewhat limited given the constraints on supply: a present moratorium on nuclear power, limited ability to increase the use of natural gas due to pipeline constraints, and limited potential for coal given its emissions and high taxation.

Current Capacity Situation

Current Capacity Situation Overcapacity
Total generating capacity (MW) : 16000
Peak Demand (MW) : 11500
New Capacity Required (MW) :
Percentage overcapacity (%) : 15

Comments :
See the above comments. Capacity of 16,000 MW includes the import from Russia. Without this import the capacity is in balance.

Public Policy Context

Level of Market Intervention

Level of Market Intervention : Low

Comments :
Authorities in Finland believe that the role of the government should be limited. There has historically been no price control and very little government planning for power sector development in the last 15 years. In the legislation, prices are stated to "be reasonable" and complaints can be made to Electricity Market Authority (or to the Anti Trust Authority). The main role of the Ministry is to promote competition and ensure that there are no barriers for a free energy market. There is a liberal attitude towards licensing new power stations and import/export of power — i.e., anyone commercially capable is permitted to build new generation, purchase existing generation or any energy business, or to import/export power. Nuclear power plants are an exception in that they need to be accepted by the Parliament.

Importance of Environmental Issues

Importance of Environmental Issues : High

Comments :
The Finnish government has recently defined its target for energy policy as follows (unofficial translation). The aim of the Finnish energy policy is through the use of economic instruments and market economy mechanisms to create circumstances where the supply of energy is secured, the price of energy is competitive and environmental impacts fulfil the international agreements. The aim is also to force the development and commercialisation of new technology for energy conservation and renewable energy.

Other Key Public Policy Issues Relevant to the Electricity Industry
The main activities from the governmental side will be:· to promote change in the energy production capacity into energy balance with less coal; to promote a free energy market;· to promote energy efficiency and energy conservation;· to promote the use of bioenergy and other national energy resources;· to maintain the high technological level in energy technology;· to secure diversification and economic energy supply capacity; and· to maintain the security of energy sector.

Business Environment

1.Structure of the Electricity Industry

Linked Separate Businesses

Comments :
The Finnish electricity supply industry (ESI) has more than 370 power generation stations owned by power companies, local energy utilities and industry. About 115 enterprises are involved in the production of electricity. Large industrial companies, both state, municipality and privately owned, play an important role in the ESI. Industry either own factory co-generation or hold shares in generation companies (and also in transmission company). The two largest power companies are IVO (publicly owned) and PVO (primarily industry owned). Both IVO and PVO account for about 40% of the domestic generation of electricity. About 20% is mainly generated by local utilities. Deregulation has resulted in IVO separating into a production, engineering and transmission companies. A new national transmission company Fingrid was estblished in August 1997. IVO has also bought some distribution companies. Transmission and distribution networks are opened to all market participants.

2.Ownership of the Electricity Industry

Public Ownership - National/Regional Government

Public Ownership - Customers
Private Ownership

Comments :
The ownership of generation is described above. Fingid (transmission company) is owned by the government, IVO, industry, and institutional investors. There are about 112 distribution utilities in Finland (and the number is decreasing) — three quarters of these are owned by local authorities, the rest by industry and private investors. There are many mergers between distributors and acquisitions by producers occurring at rapid pace.

3.Level of Fragmentation in the Electricity Industry

	Num. of Businesses	Total Num. of Customers	Level of Fragmentation
Generation	115	150	High
Distribution	112	2880000	High
Retail	150	2288000	High

Comment :
The customers of the generation businesses are mainly local utilities (retailers), large industry and traders (the indicated number of customers is estimated). The customers of distribution companies and retailers arethe same.The number of retailers is not known (estimated).

4.Single or Multiple Energy Businesses

Single Energy Business
Multiple Energy Business

Comment :
Multiple energy business undertake electricity, district heatand/or in some cases natural gas activities.

5.Type of Regulation Applied to the Electricity Industry

Industry Code of Conduct
External Regulation

Comments :
As part of the electricity market reform a separate Electricity Market Authority (EMA) was established. EMA has the following key objectives:· Promote development of an effective power market — this includes to make information available regarding prices and customer choices between power suppliers· Control the monopoly (network) business — this includes to monitor possible cross subsidies between network and supply functions and to authorise distribution licences The utility regulator will require utilities to publish transmission prices, terms, and pricing criteria and will require that pricing be based on costs incurred to provide service. Thus a key tool for the regulator is to make information available regarding the cost structure, fees charged for distribution in different utilities and how these are calculated. These currently varies extensively. EMA does not have any authority to remove or prevent utility "over investment", but can remove from the distribution charges any identified supply related charges. EMA can only "punish" irregularities through the licence approval process.

6.Level of Competition in the Electricity Industry

Level of Competition in the Electricity Industry : Strongly Competitive

Comments :
The new Electricity Market Act (effective June 1, 1995) includes the following features:· Third party access (TPA) for customers above 500 kW started in November, 1995. In January 1, 1997, TPA was extended to all customers although small individual customers are in practice excluded from competition due to the expensive hourly metering requirements making the transaction cost too high. It has been proposed that in 1998 small customers should be allowed to change suppliers without new meters.· Generation and electricity trade is subject to competition, while transmission and distribution remain natural regulated monopolies.

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Country	Region
France	

Electricity Supply and Demand Situation

Generation Mix

Black coal	5.4 %
Natural gas	0.2 %
Fuel Oil	1.1 %
Nuclear	77.2 %
Combined heat and power	1.8 %
Hydro	14.3 %
Wind	0.01 %

Electricity Forecast

Forecast growth over the next 20 Years :
In Energy Usage : 36
In Peak Demand : 39

Comments :
The growth figures for energy use and demand are for 2020 compared to 1995. This figure corresponds to a scenario which implies a certain support from the State to the industry.

Current Capacity Situation

Current Capacity Situation Overcapacity
Total generating capacity (MW) : 120740
Peak Demand (MW) : 695
New Capacity Required (MW) :
Percentage overcapacity (%) : 7

Comments :
The figure for the total generating capacity can be detailed as:- 95,632 MW thermal (including nuclear), and- 25,108 MW hydro. The figures are rather high because a number of these MW is used only marginally for the peak generation. The installed MW compared to the generation is: - 67,241 nuclear MW producing 378,225 GWh- 28,391 classic thermal MW producing 41,681 GWh. The over-capacity described by the Ministry of Industry includes distinction between base- and peak-load production means: France could have avoided the construction of 11 nuclear GW provided that it would have built 3 classic thermal GW for peak demand coverage. This over-capacity is expected to slowly decrease and disappear between 2005 and 2008.

Public Policy Context

Level of Market Intervention

Level of Market Intervention : High

Comments :
In France, electricity is a public service. The enterprise in charge of electricity, EdF, and the State sign every four years a "Contrat d'Entreprise" defining the missions and duties of each party. The most recent of these agreements concerns the period 1997 - 2000 and underlines EDF's public service missions: - to implement the energy policy defined by the State,- to ensure electricity supply security in the short, medium and long term,- to ensure equal quality of supply to all consumers,- to reinforce the dialogue with consumers,- to develop a range of services targeted at the consumers demand. The agreement specifies the amplitude of tariffs evolution (which are expected to decrease by 14% in

average by the year 2000 excluding inflation) and allows a change in the tariff structure to better reflect the various generation costs.The agreement also specifies the general allocation of funds. For 1997-2000, emphasis has been put on the development of EDF (including at the international level), commercial activities and eliminating debt. Finally, the agreement clarifies the relationship between the State and EDF in preparation of the competitive market. EDF will pay taxes as any other company and the State will receive its remuneration as a shareholder. In 1997, the property of the transportation grid went from the State to EDF.

Importance of Environmental Issues

Importance of Environmental Issues : Medium

Comments :

EDF has been active in the environmental field since 1992. Various agreements have been signed with the State and local authorities. Some of them have been annexed to the "Contrat d'Entreprise" (for the agreement 1997-2000, the annexed protocol on environment concerns inserting power lines in the landscape and progressively suppressing "black spots"). Already in 1990, a framework agreement was signed between EDF and the State to encourage cooperation with all the concerned partners on water and dam management. In 1992, a protocol was signed on power lines integration in the landscape. In 1993, a framework agreement concerning the reduction of the minimum level of polluting emissions of EDF thermal power plants (sulphur dioxide and nitrogen monoxide). This represents an investment of 10 billion Francs over 10 years. In 1993 and 1996, agreements were signed with Ademe (the French Agency for Environment and Energy Management) for promotion of DSM activities and development of renewable energies. As far as nuclear waste is concerned, a 1991 law decided on a 12 billion Francs research programme on long term management of high activity nuclear waste. The Parliament will decide in 2006 on the techniques to be used ensuring the best security.

Other Key Public Policy Issues Relevant to the Electricity Industry

One of the main objectives which has guided the French energy policy is supply security. Two main programmes have been developed to achieve this goal (especially after 1974): The nuclear programme, and to a less extent, an energy efficiency programme. Another important issues has been interregional solidarity (especially the “perequation” (equalisation) tariff and to a lesser extent employment and economic activity plans are developed by EDF). Issues such as the global orientation of tariffs or special treatment for low income families, can be linked to other aspects than strictly economic reasons. But today, the introduction of competition and the preparation of the translation in French Law of the EU Directive on electricity market is the important challenge. It will modify the current vertically integrated system in France (EDF is the biggest electricity enterprise in the world); it will have consequences on the conception of the public service obligation (which is a key element); it will also interact with Gaz de France, for gas distribution.

Business Environment

1.Structure of the Electricity Industry

Vertically Integrated

Comments :

2.Ownership of the Electricity Industry

Public Ownership - National/Regional Government

Comments :

EDF is a state owned enterprise and generates 96%, distributes 94% and transports 100% of the electricity in France. However, as will be explained in the next paragraph, there are small generating and distributing companies which are local government owned as well as some privately owned or public company owned (railway, coal mines) generators.

3.Level of Fragmentation in the Electricity Industry

	Num. of Businesses	Total Num. of Customers	Level of Fragmentation
Generation	1	596	Low
Distribution	180	31000000	Low
Retail			

Comment :
There are other generating companies than EDF but their number is hard to define. Self generation from various companies reached 11,767 GWh in 1996 of which 7 TWh was produced by the coal industry and 1.5 TWh by the national railway company. The 179 distributors, excluding EDF, distribute 5% of the electricity inc Cities and small towns, which represents 6% of the population (3.4 million inhabitants). Besides EDF, the distribution companies are municipal services, various local government corporation, private/public joint stock companies, and agricultural and electricity collective interest companies (SICAE). These companies remained after the 1946 Nationalisation Law of the Electricity Sector because their generating capacity were and still is under 8,000 kVA. They are regulated by the legal framework issued by the State concerning the electricity sector. Retailing activity as a separate activity does not exist in France. It is linked to distribution.

4.Single or Multiple Energy Businesses

Single Energy Business

Comment :
EDF is very much linked to Gaz de France. Some of their services are common (services to the general public for example) and some are separate (generation, transport, environment). The distribution structure is at present undergoing separation. Moreover, a EDF development project is to become a major player in the co-generation field.

5.Type of Regulation Applied to the Electricity Industry

Other Form of Regulation

Comments :
The regulation applying to EDF is considered to be a mix of self and external regulation. The "Contrat d'Entreprise" gives the State power to orientate the electricity business according to the national energy policy. In particular, the State controls investment planning and the tariffs (submitted each year to the signature of the Ministry of Finance and the Ministry of Industry). At the same time, the decisions of the State are made in dialogue with EDF and on the basis of EDF current work and forecasts.

6.Level of Competition in the Electricity Industry

Level of Competition in the Electricity Industry : Monopoly

Comments :
Complete monopoly exist for transport, import, and export of electricity (Law of 1946). Generation and distribution is an in-fact quasi-monopoly (see above for figures). This situation will change radically due to the European Directive of December 1996. The French law implementing this directive has to be voted on before the end of 1998. Precise information about the evolution and the terms of competition will be known then. The directive requires that 30% of the market be opened to competition by 2003. This means all consumers above 9 GWh per year, except distributing companies.

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Country/Region Details

Country	Region
Greece	

Electricity Supply and Demand Situation

Generation Mix

Brown coal	64 %
Natural gas	8 %
Fuel Oil	12 %
Diesel	3.5 %
Combined heat and power	1.8 %
Hydro	10.5 %
Biomass	0 %
Solar thermal	0 %
Solar photovoltaic	0 %
Wind	0.2 %

Electricity Forecast

Forecast growth over the next 20 Years :
In Energy Usage : 64
In Peak Demand : 65

Comments :
Annual growth rate for electricity demand is expected to be 2.9% on average for the next 20 years, so that sales per year reach 65200 GWh by the year 2010. The annual growth rate for peak demand is expected to be 3.5% in the same period, so that the peak-load reaches 10500 MW by the year 2010.

Current Capacity Situation

Current Capacity Situation Balanced
Total generating capacity (MW) : 10996
Peak Demand (MW) : 7364
New Capacity Required (MW) :
Percentage overcapacity (%) :

Comments :

Public Policy Context

Level of Market Intervention

Level of Market Intervention : High

Comments :
In Greece, electricity is a public service.

Importance of Environmental Issues

Importance of Environmental Issues : High

Comments :
Adaptation to EU directives.

Other Key Public Policy Issues Relevant to the Electricity Industry

Business Environment

1.Structure of the Electricity Industry
Vertically Integrated

Comments :

2.Ownership of the Electricity Industry
Public Ownership - National/Regional Government

Comments :

3.Level of Fragmentation in the Electricity Industry

	Num. of Businesses	Total Num. of Customers	Level of Fragmentation
Generation	1	1	Low
Distribution	1	6550000	Low
Retail	0	0	

Comment :
Retailing activity does not exist in Greece. It is incorporated in the distribution activities.

4.Single or Multiple Energy Businesses
Single Energy Business

Comment :
Vertically integrated electricity industry. It has to be unbundled in order to adapt to EU directive 96/92.

5.Type of Regulation Applied to the Electricity Industry

External Regulation

Comments :
By the Ministry of Development

6.Level of Competition in the Electricity Industry
Level of Competition in the Electricity Industry : Monopoly

Comments :
Complete monopoly. This situation will radically change due to the EU Directive 96/92. The directive requires that 28% of the Greek market be opened to competition by 2001. Greek legislation has been adapted to the Directive by the Greek law 2773/99.

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Country/Region Details

Country	Region
Japan	Tokyo

Electricity Supply and Demand Situation

Generation Mix

Black coal	5 %
Brown coal	0 %
Natural gas	31 %
Fuel Oil	16 %
Diesel	0 %
Nuclear	40 %
Hydro	7 %

Electricity Forecast

Forecast growth over the next 20 Years :
In Energy Usage : 2
In Peak Demand : 1.6

Comments :
The figure written above is over next 10 years. In 2005 the peak demand is estimated to be 66.48GW.

Current Capacity Situation

Current Capacity Situation Need for new capacity
Total generating capacity (MW) : 64350
Peak Demand (MW) : 62500
New Capacity Required (MW) :
Percentage overcapacity (%) :

Comments :
The figure is for this summer.

Public Policy Context

Level of Market Intervention

Level of Market Intervention : Medium

Comments :

Importance of Environmental Issues

Importance of Environmental Issues : High

Comments :

Other Key Public Policy Issues Relevant to the Electricity Industry
The government is trying to reduce the price ofelectricity by 20%. This may force the power industry to restructure the company activities. And this may increase the consumption of electricity.

Business Environment

1.Structure of the Electricity Industry

Vertically Integrated

Comments :

There are 10 electric power companies in Japan.Each has regional monopoly with a little exception.In addition, there are 2 major generation companiesand 34 local governments has generating facilitiesto sell electricity.

2.Ownership of the Electricity Industry

Private Ownership

3.Level of Fragmentation in the Electricity Industry

	Num. of Businesses	Total Num. of Customers	Level of Fragmentation
Generation	12	10	Low
Distribution			
Retail	10	72800000	Low

Comment :

There are 12 big generation companies in Japan. 10 are utilities and 2 are generation only. In addition there are 34 local government which has hydro generating facilities. Distribution and retail are carried out by one company.

4.Single or Multiple Energy Businesses

Single Energy Business

Comment :

TEPCO and some electric power companies sell heat to end-users by DHC system. But this business is very small.

5.Type of Regulation Applied to the Electricity Industry

External Regulation

Comments :

There is the law for electric power industry.

6.Level of Competition in the Electricity Industry

Level of Competition in the Electricity Industry : Monopoly

Comments :

The law for electric power industry has been slightly changed to allow anyone to be independent power utility. Two projects are carried out at the moment, but they are at the planning stage.

Person Completing the Form

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Country/Region Details

Country	Region
Korea	

Electricity Supply and Demand Situation

Generation Mix

Black coal	22.6 %
Natural gas	22 %
Diesel	20.3 %
Nuclear	26.6 %
Hydro	8.5 %

Electricity Forecast

Forecast growth over the next 20 Years :
In Energy Usage : 4.6
In Peak Demand : 4.7

Comments :
According to The Long-term Power Development Plan which is being made in 1997, annual growth rate for electricity sales is expected to be 4.6% on average from 1997 to 2015. The annual growth rate for power demand is expected to be 4.7% in the same period. The total electricity power demand will be reached 77,169MW in 2015, and electricity sales 427,052GWh in the same year.

Current Capacity Situation

Current Capacity Situation Need for new capacity
Total generating capacity (MW) : 35722
Peak Demand (MW) : 32382
New Capacity Required (MW) : 42486
Percentage overcapacity (%) : 10.7
Comments :
Total generating capacity was 35,722MW,and peak demand was 32,282MW in 1996. According to the present Long-term Power Development Plan (1995) the additional 42,486MW of the capacity is scheduled to be built to reach 78,202MW by 2010.

Public Policy Context

Level of Market Intervention

Level of Market Intervention : High
Comments :
The government(MOTIE) has the authority to decide the important issues concerning the electricity business(KEPCO, Korea Electric Power Company)such as electricity price rate, power development plan, budget, organization and so on.

Importance of Environmental Issues

Importance of Environmental Issues : High
Comments :
The efforts of global environmental preservation focused on the CO2 emitted in the combustion process of fossil fuel energy. To reduce CO2 emission, KEPCO adopted gradually the application of high efficient and advanced power generation technologies such as super-critical boilers, IGCC, FBC, etc. In the long run, the CO2 emission will be stabilized at the level of 0.11kg-c/kwh by extending the use of low carbon emitted energy resources and improving the efficiency.

Other Key Public Policy Issues Relevant to the Electricity Industry
The government is laying stress on the various kinds of energy conservation policies to improve balance of trade because 97.3% (1997) of primary energy use in Korea relies in overseas imports. To diversify the energy sources and stabilize the energy demand and supply, it has made an effort to keep balance among the generation facilities by fuel as you see the above column 1. And KEPCO plays an important role in the implementation of the national energy policy.

Business Environment

1.Structure of the Electricity Industry
Vertically Integrated

Comments :
Korea has a vertically integrated monopoly structure for its electric power industry. KEPCO controls all the functions of electricity generation, transmission, distribution and retail sales to the end users. Government is currently considering some opening of the generation market which would allow private ownership of generation facilities for their self use and sell back arrangement from the generation owner to KEPCO.

2.Ownership of the Electricity Industry
Public Ownership - National/Regional Government

Comments :
At present, the government owns directly 77.8% of the stock of KEPCO which is the only electric business. In 1989, the government sold 21.0% of the KEPCO's common stock to the public as part of a planned privatization.

3.Level of Fragmentation in the Electricity Industry

	Num. of Businesses	Total Num. of Customers	Level of Fragmentation
Generation	1	13329502	Low
Distribution	1	13329502	Low
Retail	1	13329502	Low

Comment :
KEPC0 is the only company which controlsall the functions of electricity generation, transmission, distribution and retail sales to all and end users in Korea. There is no fragmentation in each sector.

4.Single or Multiple Energy Businesses
Single Energy Business

Comment :
As of now KEPCO has done the electricity business alone .But recently, to maximize the utilization of corporate resources, KEPCO is actively engaged in CATV network, telecomnications and international power markets. The business entities in other sector(oil, gas, etc)are supplying their own energy separately.

5.Type of Regulation Applied to the Electricity Industry

External Regulation

Comments :
All the important rules concerning the electricitybusiness of KEPCO are established and ensured by the MOTIE(Ministry of Trade, Industry and Energy).And the government has the power to appointmentand dismiss the president of the utility whose term is 3 years.

6.Level of Competition in the Electricity Industry
Level of Competition in the Electricity Industry : Monopoly

Comments :
According to 'the Law of Electricity BUsiness', KEPCO is allowed as the only general electricity business by the government, then KEPCO owns 95% of the total electricity generation capacity (the remainder is owned by a few IPPs) and all T&D facilities in the Korea and monopolizes the whole market in the nation.

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Country/Region Details

Country	Region
Netherlands	

Electricity Supply and Demand Situation

Generation Mix

Black coal	28 %
Brown coal	0 %
Natural gas	51 %
Fuel Oil	0.2 %
Diesel	0 %
Nuclear	4 %
Combined heat and power	32 %
Industrial back pressure power	4 %
Thermal condensing power	35 %
Cold condensing power	65 %
Hydro	0.1 %
Biomass	1.2 %
Solar thermal	0 %
Solar photovoltaic	0 %
Wind	0.8 %

Electricity Forecast

Forecast growth over the next 20 Years :
In Energy Usage : 50
In Peak Demand : 50

Comments :
The forecast growth is about 2% per year. At the moment the load factor is 6100 hours or 70%. The daily load curve has more or less the same shape during a winter day and a summer day and also the height does not differ much. The reason is that there is no electrical heating and an important load management program is already in place. As a consequence no big difference in electricity consumption and peak demand is expected.

Current Capacity Situation

Current Capacity Situation Overcapacity
Total generating capacity (MW) : 19000
Peak Demand (MW) : 14700
New Capacity Required (MW) : 0
Percentage overcapacity (%) : 6

Comments :
Due to the amount of new cogeneration units in the industry an overcapacity situation was the result. The existing law permits distribution companies and industries to build cogeneration units independent from the plans of the generation companies.

Public Policy Context

Level of Market Intervention

Level of Market Intervention : High

Comments :
In 1997, The electricity industry has a high public service content. The generators and distributors have their monopoly. In 1998 the situation will change with a new electricity law to a more liberalized market. In 1998 the big consumers (more than 10 GWh) will be free to choose their supplier. In 2002 all customers using more than 0.1 GWh are free. The rest will follow in 2008. In stages of 30% the market becomes liberalized.

Importance of Environmental Issues

Importance of Environmental Issues : High

Comments :
The whole society is very involved in environmental issues. The Netherlands is a very crowded country with an energy intensive industry and a lot of intensive agriculture like greenhouses. A good environment is important to keep the high living standard.

Other Key Public Policy Issues Relevant to the Electricity Industry
At the moment the fuel supply diversity of different fuels for security of supply reasons is important but also for reasons of low cost generation. For this reason many units are dual firing. Another issue is the low cost generation under acceptable societal constraints.

Business Environment

1.Structure of the Electricity Industry

Linked Separate Businesses

Comments :
Since the 1987 law there is an unbundling between generators and distributors. With the new law this unbundling will remain, although the shareholders of the generation company are the distribution companies.

2.Ownership of the Electricity Industry

Public Ownership - Local Government

Comments :
The shareholders of the generation companies are the distributors (50%) or the local government (50%). The shareholders of the distributors are the municipalities or the provinces (local government).

3.Level of Fragmentation in the Electricity Industry

	Num. of Businesses	Total Num. of Customers	Level of Fragmentation
Generation	4	15	Low
Distribution	32		
Retail	32	6000000	Low

Comment :
The retail industry is still a commodity seller. There are standard contracts for most of the customers. The big consumers have their own contracts with special arrangements.

4.Single or Multiple Energy Businesses

Multiple Energy Business

Comment :
Most of the distributors, retailers sell also gas. Some of them sell also water and are involved in cable television.

5.Type of Regulation Applied to the Electricity Industry

Industry Code of Conduct

Comments :

6.Level of Competition in the Electricity Industry

Level of Competition in the Electricity Industry : Monopoly

Comments :
In 1998 the situation will change to a partial franchised market.

Person Completing the Form

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Country/Region Details

Country	Region
Norway	

Electricity Supply and Demand Situation

Generation Mix

Hydro 100 %

Electricity Forecast

Forecast growth over the next 20 Years :
In Energy Usage :
In Peak Demand :

Comments :
There are no official growth estimates for electricity supply and demand over the next 20 year period. For the period forward to 2005, a 1.5% p. a. growth in demand is expected, based on macroeconomic models. There are discussions as to how growth in demand will be matched by increases in supply.

Current Capacity Situation

Current Capacity Situation Balanced
Total generating capacity (MW) : 27418
Peak Demand (MW) : 22000
New Capacity Required (MW) :
Percentage overcapacity (%) :

Comments :
In the deregulated market, the price mechanism should reflect shortages in the capacity situation, should any occur. With the relatively stable market price observed, the supply and demand situation can be characterized as balanced. However, with an increasing demand, there have been net imports in recent years.

Public Policy Context

Level of Market Intervention

Level of Market Intervention : Medium

Comments :
There is a monopoly on distribution. Politically influenced prices on electricity to energy intensive industry. Both generation and distribution is influenced through government granted concessions. Otherwise the market is deregulated, with generation and supply (including prices) on a commercial basis.

Importance of Environmental Issues

Importance of Environmental Issues : Medium
Comments :
Environmental issues are stressed in governmental policies, but no firm commitments or operational guidelines have been established in relation to the use of electricity. As of April 1998, we are awaiting governmental reports on green taxes, policy consequences of the Kyoto treaty and a report on the energy situation forward to 2020.
Other Key Public Policy Issues Relevant to the Electricity Industry
Supply of electricity in the future, should, according to government publications, be fully based on renewables. In an international energy market, there will no longer be an objective of national self-sufficiency.

Business Environment

1.Structure of the Electricity Industry

Vertically Integrated
Linked Separate Businesses

Comments :
To a certain extent, large, energy-intensive industries also control power plants. Country structure basically consists of linked separate businesses, where holding companies control generation, distribution and/or retail businesses. In the deregulated market, there are independent businesses in trading, brokering and retailing.

2.Ownership of the Electricity Industry

Public Ownership - National/Regional Government
Public Ownership - Local Government
Private Ownership

Comments :
Stakraft (state owned) is the larges producer. Otherwise, there are both publicly and privately held producing units. Transmission network: main network state owned (Statnett), regional and local networks publicly/privately owned. Retail business also combination of public and private businesses. A total of approximately 15% is private.

3.Level of Fragmentation in the Electricity Industry

	Num. of Businesses	Total Num. of Customers	Level of Fragmentation
Generation	170	250	Medium
Distribution	220	250	Medium
Retail	250	2460000	Medium

Comment :

4.Single or Multiple Energy Businesses

Single Energy Business
Multiple Energy Business

Comment :
Traditionally the energy business has been single-type, ie based on either electricity or oil/gas, with no other types of businesses involved. There has been a tendency towards increased integrated and multiple energy-business approaches.

5.Type of Regulation Applied to the Electricity Industry

External Regulation

Comments :
The electricity industry is based on governmental concessions and extensive legislation. With the coming of the deregulated market, there has been a "hands off" policy in the generation and retail segments of the market to allow for market forces in the pricing of electricity.

6.Level of Competition in the Electricity Industry

Level of Competition in the Electricity Industry : Strongly Competitive

Comments :
Competitive pricing in the generation and retailing of electricity. The transmission/distribution of electricity has monopoly-based pricing. There is a tendency towards mergers/pooling both within sales and transmission

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Country/Region Details

Country	Region
Spain	

Electricity Supply and Demand Situation

Generation Mix

Black coal	18.95 %
Brown coal	4.25 %
Natural gas	2.9 %
Fuel Oil	13.65 %
Nuclear	16.2 %
Combined heat and power	4 %
Hydro	39.35 %
Biomass	0.3 %
Solar thermal	0.005 %
Solar photovoltaic	0.02 %
Wind	0.235 %

Electricity Forecast

Forecast growth over the next 20 Years :
In Energy Usage : 50
In Peak Demand : 50.91

Comments :
The energy usage (hours/year) is forecast to decrease 0.95% over the next 15 years while peak demand (GW) is expected to increase 50.91%.

Current Capacity Situation

Current Capacity Situation Overcapacity
Total generating capacity (MW) : 41620
Peak Demand (MW) : 25810
New Capacity Required (MW) :
Percentage overcapacity (%) : 16.13

Comments :
The balance for 1995 was as follows:

Maximum net capacity	41.62 GW
Foreseeable not available capacity	4.68 GW
Total available net capacity	36.94 GW
Likely maximum peak demand	25.81 GW
Required reserve capacity	5.17 GW
Balance	5.96 GW

The foreseeable not available capacity is associated with hydro power stations since their effective capacity is heavily dependant of hydro conditions. Regarding the required capacity, studies are based on a probabilistic approach that takes into account the forced outage probability of each type of power station. Consequently, the required reserve capacity varies depending on the generation mix in existence in the various years considered.

Public Policy Context
Level of Market Intervention
Level of Market Intervention : Medium

Comments :
As of January 1st, 1998 the regulatory framework will change in Spain. The main features of the new framework are the following:

1. Generation. The order in which the various units will be run shall be established in terms of bids. The energy generated in each programming period shall be remunerated at the marginal price specified in the bid corresponding to the last unit enlisted to meet demand. The demand will be built in this mechanism of bidding.
2. Ancillary Services considered.
3. Power Capacity and Availability: Acknowledgement of a payment for power guarantee.
4. Free Entry in Generation.
5. Liberalization of primary energy supplies for generation.
6. Special production facilities (cogenerators) over 50 MW will enter in the competitive bids scheme. Energy from producers below 50 MW will be bought at competitive price plus the power guarantee.
7. There will be a Market Operator and a Network Operator.
8. Distribution remains as a natural monopoly.
9. The liberalization of the supply will be done according the following schedule:

Year	GWh	Customers	Energy
1998	20	360	24%
2000	9	500	25%
2001	5	1000	28%

Importance of Environmental Issues
Importance of Environmental Issues : Medium

Comments :
The Spanish ESI is involved in a compromise for improvement environmental protection. Regarding UNIPEDE Environmental Declaration and Environmental Conduct Code, the Spanish utilities have started specific environmental plans for their generating and distribution activities, have formed environmental staffs with qualified professionals, and have extended the environmental education throughout all levels of their organisations. Moreover, the Spanish ESI has applied important economic resources to environmental protection. The projected investment in this area for the period between 1996 and 1999 is about 250,000 millions of pesetas ($1,666.66 millions. $ 1.00 = 150 Pta.), and since 1982, the Spanish ESI has devoted 12,000 millions of pesetas to research and development for environmental protection. The Spanish ESI supports the negotiated agreements and the self-commitments as efficient tools to achieve the objectives for environmental control.

Other Key Public Policy Issues Relevant to the Electricity Industry
The fuel and energy security is based on: integrating of the European energy markets by carrying out the European energy market; diversifying supplies and sources by enhancing the relationships with supplying countries and promoting new energy sources and renewables; acting on energy demand by promoting the rational use of energy; and-intensifying international cooperation with third countries, specially the Euromediterranean cooperation taking advantage of the Spain's geographical location.

Regarding Euromediterranean cooperation, two very important actions must be mentioned.
1)To cover natural gas needs, a pipeline from Algeria to Spain across Morocco and the Gibraltar Strait has come into operation in November 1966. In its first stage, the pipeline has a capacity of 10.000 Nm3/year and it supplies natural gas to Spain. The pipeline might be enlarged if it is to be used for other European ineterested countries. In this case, the project could have a second stage to supply natural gas up to a total capacity of 20.000 Nm3/year
2) The new high voltage interconnection line between Spain and Morocco across the Strait of Gibraltar is almost ready to come into operation to interconnect the European grid with ALTUMA system. This system interconnects the networks of SONELGAZ (Algeria), STEG (Tunisia) and ONE (Morocco). In 1994, the consumption of this whole are was of 36.3 TWh, with a load peak of 6,251 MW, that is about 2.5% of the UCPTE (CENTREL included). The line has 93 km total length, laid on the sea bottom up to a depth of 615 metres, the voltage rate is 400 kV and the capacity 700 MW.

On the other hand, regarding the importance of the electricity for the national economy, the Spanish ESI is willing to participate in the collective effort to be made by the various economic agents to achieve the objectives set in connection with European Monetary Union, and has agreed with Government a contribution to the competitiveness of the Spanish economy via a reduction in nominal terms of the electricity tariffs according with the following schedule'

Year	Nominal Reduction
1997	3%
1998	2%
1999-2001	1%

Business Environment

1.Structure of the Electricity Industry

Linked Separate Businesses

Comments :

2.Ownership of the Electricity Industry

Public Ownership - National/Regional Government
Private Ownership

Comments :
One group is state owned and the three remaining groups are privately owned. But the state owned group will be privatised within the next months.

3.Level of Fragmentation in the Electricity Industry

	Num. of Businesses	Total Num. of Customers	Level of Fragmentation
Generation	4		Low
Distribution	11	20128000	Low
Retail			

Comment :
a)There is a unique utility owner and operator of the transmission network
b)The Heirfindahl-Hirschman index is about 3100 for the Spanish market.

4.Single or Multiple Energy Businesses

Energy Business plus other Type of Business

Comment :
Utilities are diversifying into communications and other type of businesses.

5.Type of Regulation Applied to the Electricity Industry

External Regulation

Comments :
There is a Regulatory Commission depending on the Ministry of Industry and Energy.

6.Level of Competition in the Electricity Industry

Level of Competition in the Electricity Industry : Partial Franchise Market (less competitive)

Comments :

Person Completing the Form

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Country/Region Details

Country	Region
Sweden	

Electricity Supply and Demand Situation

Generation Mix

Natural gas	3 %
Nuclear	41 %
Combined heat and power	7 %
Thermal condensing power	12 %
Hydro	37 %
Wind	0.08 %

Electricity Forecast

Forecast growth over the next 20 Years :
In Energy Usage :
In Peak Demand :

Comments :
Swedish forecasts are only available until the year 2010. Further no forecasts regarding peak demand are available. The total electricity usage is forecasted to increase by 0,4 % annually. In 1995 it reached 141 TWh. In the year 2000 it is expected to reach 145 TWh, the year 2005148 TWh, and the year 2010 about 152 TWh.

Current Capacity Situation

Current Capacity Situation Overcapacity
Total generating capacity (MW) : 33623
Peak Demand (MW) :
New Capacity Required (MW) :
Percentage overcapacity (%) :

Comments :
Peak demand measured in January 1987 was 26,200 TWh .Today Sweden has a slight over capacity. However it is very difficult to estimate how much since it depends on many factors, for example the load on the wires and the transmission capacity in Sweden as well as in the other Nordic countries since we have a common system. Further, the amount of rainfall any given year plays a major role for the consumption of primary energy since a large part of the electricity is generated from hydro power stations.

Public Policy Context

Level of Market Intervention

Level of Market Intervention : Medium

Comments :
See further "Type of regulation".

Importance of Environmental Issues

Importance of Environmental Issues : High
Comments :
Environmental issues play a major role and are becoming more and more important in a public policy context and in general. The current energy policy aims are:· reducing use of electricity for heating purposes;· more efficient use of the existing electricity systems; and· increased use of renewable

energy resources in production of electricity and heat. Access to continuous and up-to-date information on price and market development is imperative for participation in the market and making well-founded decisions regarding energy use (including energy efficiency). With respect to energy efficiency, the Swedish government therefore stresses activities related to expanding the customers' and key-decision-makers' knowledge, abilities, and access to objective information. Cooperation with the Baltic countries and internationally is also considered important in the pursuit of a sustainable development.

Other Key Public Policy Issues Relevant to the Electricity Industry
How to compensate for the dismantling of the nuclear power stations.· Development of a suitable information exchange system so that uneven information access is equal for all the relevant actors. Today, the distributors possess most of the information.· How to provide customers with the information necessary to act rationally in terms of energy efficiency.

Business Environment

1.Structure of the Electricity Industry

Vertically Integrated
Linked Separate Businesses

Comments :
The vertical integration has been increasing over the last couple of years as a result of the competitive market. It is estimated to have increased from 26% in 1989 to about 38-40% in 1996 and will probably continue to do so yet a while as other European markets prepare for and introduce competition. However, according to a study by NUTEK, this does not necessarily result in unreasonably high prices. A more imperative concern is to make sure that the concentration in production or sales does not become to great. Even so, to protect especially the smaller customers, it is possible for a customer to request an investigation of the offered electricity price level. To avoid cross-subsidisation between monopoly activities and activities exposed to competition, it is required by law that these are legally separated. Nätmyndigheten monitors that this is adhered to.

2.Ownership of the Electricity Industry

Public Ownership - National/Regional Government
Public Ownership - Local Government
Public Ownership - Customers
Private Ownership

Comments :
Public Ownership - Customers above only exists for retailers. Electricity in Sweden is produced in plants owned by utilities, the state, municipalities and industrial companies. In addition a small proportion of electricity is generated in privately owned hydro and windpower plants. The state owns around 50% of the production capacity, the municipalities own 20%, municipal and private funds own around 10%, and 20% is privately owned. Vattenfall is a state-owned company. The ownership structure in other companies has changed during the past years when foreign shareholders have entered the market. The German power company Preussen Electra, and Electricité de France are now major foreign shareholders. Introduction of competition has fostered a new type of electricity sales businesses ("gemensamma bolag") based on the local communal electricity plant. In some cases, the ownership is jointly held by the "old" communal electricity company, some industry, and/or interest organisation(s). In February 1996, there were eight of these electricity sales companies.

3.Level of Fragmentation in the Electricity Industry

	Num. of Businesses	Total Num. of Customers	Level of Fragmentation
Generation	300		Medium
Distribution	248	5200000	High
Retail	227		High

Comment :
Out of the 300 generating companies the majority are small. Today the eight largest companies account for just over 90%of Sweden's total electricity production. Today few retailers are independent from the producers, but the situation is rapidly changing towards greater independence.

4.Single or Multiple Energy Businesses

Single Energy Business
Multiple Energy Business

Comment :
The eight largest producers are all Multiple Energy Businesses, while some of the smaller companies are single energy businesses.

5.Type of Regulation Applied to the Electricity Industry

Other Form of Regulation

Comments :
Production and sales are made on competitive markets while the network activities are regulated by the state (Svenska Kraftnät). Competition legislation includes prohibition of cooperation which limits competition by impeding, curtailing, or otherwise distorting competition and of abuse of a dominant market position. Further, the parliamentary decision to restructure and develop the energy system tends to lead to increased regulation. For example, regarding how the electricity/energy shall be produced so as to protect small scale electricity production (typically based on hydro power or other renewable energy resources) as well as district heat and natural gas based heating. To protect the smaller customers, electricity legislation require that there is one supplier in every area who has supply concession ie is obligated to supply electricity for normal consumption purposes to all customers within the area.

6.Level of Competition in the Electricity Industry

Level of Competition in the Electricity Industry : Other Form of Competition

Comments :
Regarding production, the Swedish market can be said to be competitive. Also sales to large customers are made in a competitive environment. However, the small households have so far not had the practical possibility to change supplier since that would require a meter which has been far too expensive. On 1 July 1998 a new rule/law saying that meters can not cost more than 2500 Swedish Crowns came into force. This may change the situation. Full TPA exists, however, Svenska Kraftnät must be informed of transmission export/import contracts to other countries if they stretch over more than six months. Besides general rules regarding construction of power plants and compliance with environmental protection laws, no special permission is necessary for construction of power plant capacity. This include foreign producers. With regard to network concession for a foreign connection, this may not be granted "if the connection would seriously detract from the possibility of maintaining Sweden’s long-term electricity supply" and it is preferred that new foreign connections be owned and operated by the Swedish state.

Person Completing the Form

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Country/Region Details

Country	Region
United Kingdom	

Electricity Supply and Demand Situation

Generation Mix

Black coal	42.9 %
Natural gas	21.6 %
Fuel Oil	4.5 %
Nuclear	28.8 %
Combined heat and power	3.7 %
Hydro	0.38 %
Biomass	1.8 %
Solar thermal	0.01 %
Wind	0.05 %

Electricity Forecast

Forecast growth over the next 20 Years :
In Energy Usage : 46
In Peak Demand :

Comments :

Current Capacity Situation

Current Capacity Situation Overcapacity
Total generating capacity (MW) : 63495
Peak Demand (MW) :
New Capacity Required (MW) :
Percentage overcapacity (%) :

Comments :

Public Policy Context

Level of Market Intervention

Level of Market Intervention : Low

Comments :
There is a price control mechanism for the monopoly parts of the business only (i.e. distribution). Full competition in operation in the larger user markets, and is being phased in in the domestic market. There will a price control mechanism in place in the domestic sector until 2000.

Importance of Environmental Issues

Importance of Environmental Issues : Medium

Comments :

Other Key Public Policy Issues Relevant to the Electricity Industry
In the domestic supply sector there are is a special provision in the supply licence for those persons who are of pensionable age or disabled or chronically sick.

Business Environment

1.Structure of the Electricity Industry

Linked Separate Businesses

Comments :
Retailers and distributors are currently the same companies. After April 1998 new retailers (called second tier supplers) will be allowed to enter the market. Generators are separate companies.

2.Ownership of the Electricity Industry

Private Ownership

Comments :

3.Level of Fragmentation in the Electricity Industry

	Num. of Businesses	Total Num. of Customers	Level of Fragmentation
Generation	42	1	Low
Distribution	15	38	Medium
Retail	38	2630000	High

Comment :
During 1996, three Generators set the Pool price 86% of the time.

4.Single or Multiple Energy Businesses

Multiple Energy Business
Energy Business plus other Type of Business

Comment :
A number of electricity companies have entered the competitive gas market to supply gas to users. The main gas supplier has been awarded an electricity second tier supply licence, so it may supply gas and electricity to domestic customers after competition enters the domestic electricity supply market after April 1998. A number of electricity companies are part of conglomerates also supplying water. A number of electricity companies have been taken over by US companies with other interests.

5.Type of Regulation Applied to the Electricity Industry

External Regulation

Comments :
The external regulator OFFER regulates the electricity industry.

6.Level of Competition in the Electricity Industry

Level of Competition in the Electricity Industry : Strongly Competitive

Comments :
There is already competition in the generation business. The Distribution business is a natural monopoly. There is competition in the above 100kW supply market and competition will be introduced to the smaller user market from April 1998.

Person Completing the Form

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Appendix B -

Country Review of Existing Mechanisms for Promoting DSM and Energy Efficiency

(Data Collection Form 2)

Mechanism Description
Reference Number: AU01

Country	Region
Australia	National Application

Short Title of Mechanism
Greenhouse Challenge voluntary agreements

Status of Mechanism
In Use in this Country/Region

Brief Description of Mechanism
Description :
The Greenhouse Challenge is a voluntary business program for reducing C02 through implementing agreed action plans with quantified outcomes. It operates through voluntary agreements between business and the Commonwealth (Federal) Government. It presently has 100 signed agreements and aims to have 500 large and medium sized companies participating by 2000 and more than 1000 companies by 2005.

Target Audience : Customers
Total Funds allocated (in USD) :
Energy Saving Target :
Main Issue Addressed by Mechanism :
Year Mechanism Commenced : 1996

Indicators of Success for the Mechanism :
* number of companies signing up to join the Greenhouse Challenge* volume of CO2 reduced

Broad Policy Goal
reduction of CO2

Specific Goals for this Mechanism
to incorporate CO2 reduction activities into general business management

Type of Intervention Activity
voluntary industry agreements

Funding Source
Government Agency
Other
Details of Funding Source :
The Federal Government provides funding for the Australian Greenhouse Office (AGO) to run the 'Greenhouse Challenge Program'. Managing the program involves signing up industry partners and assisting them with the preparation of their greenhouse reduction strategies. The industry partners who sign up to the Program fund their own activities in order to achieve their greenhouse gas reduction goals.

Implementation Organisation
Government Agency
Names of Implementing Organisations :
Australian Greenhouse Office

Sources of Information about the Mechanism

Australian Greenhouse Office
GPO Box 62
Canberra ACT 2601
Australia
Phone: 02 6274 1888
Fax: 02 6274 1439

Results of Implementation

The Program commenced in 1996. To date, the program has 100 signed agreements with businesses from a range of sectors. Companies that have signed agreements account for over 45% of Australia's industrial emissions. Participants have committed themselves to reduce their forecast growth in emissions by approx 22 million tonnes of C02 equivalent by the year 2000.

Mechanism Category

Voluntary Agreements/Negotiated Agreements

Technology Stage Addressed

Choice/Application

Social Carrier Element Addressed

Interest
Power
Organisational ability
Information

Market Barriers Addressed

Lack of Information

Person Completing Form

Michelle Maloney

Mechanism Description
Reference Number: AU02

Country	Region
Australia	**National Application**

Short Title of Mechanism
Energy performance codes and standards

Status of Mechanism
Proposed for Use in this Country/Region

Brief Description of Mechanism
Description :
The Federal government is working with States, Territories and industry to develop energy efficiency codes and standards for:

1. **Domestic Appliances** - A mandatory energy efficiency program has been in place for some 10 years. A minimum energy performance standard (MEPS) program for fridges and water heaters will become effective in October 1999.
2. **Industrial Equipment** - A mandatory minimum energy performance standard (MEPS) program for some industrial equipment is proposed.
3. **Residential Dwellings** - A mandatory program for minimum energy performance of new houses and building extensions is proposed. The program will be based on the current voluntary Nationwide House Energy Rating Scheme in some states.
4. **Commercial Buildings** - A voluntary program for minimum energy performance of new and existing commercial buildings is proposed. The Federal government announced these measures in November 1997 and stated that if voluntary approaches do not achieve acceptable progress within 12 months, mandatory standards will be considered.

Target Audience : Customers
Total Funds allocated (in USD) : $US5.2 million ($AU8.8 million)
Energy Saving Target : To be determined
Main Issue Addressed by Mechanism :
Year Mechanism Commenced : 1997

Indicators of Success for the Mechanism :
Measured improvement in the efficiency of energy usage in the relevant appliances, buildings and equipment relative to the "do nothing" option.

Broad Policy Goal
To reduce C02 emissions through increasing efficiency in the building and appliances sector

Specific Goals for this Mechanism
To reduce CO2 emissions to improve energy efficiency in housing and commercial buildings, appliances and equipment

Type of Intervention Activity
Codes and standards

Funding Source

Government Agency

Details of Funding Source :

Funds will be provided predominantly by the Federal government, with some assistance from state governments.

Implementation Organisation

Government Agency

Other

Names of Implementing Organisations :

Australian Greenhouse Office (AGO) Energy Management Task Force (EMTF)

Comments :

The Australian Greenhouse Office (AGO) is responsible for advising the Australian Government on domestic greenhouse policy, and for administering and co-ordinating domestic greenhouse programs. The AGO has passed responsibility for overseeing the development of the codes and standards to the Energy Management Task Force (EMTF). The EMTF is a co-operative body comprising representatives from the State and Federal governments.

Sources of Information about the Mechanism

Australian Greenhouse Office
GPO Box 62
Canberra ACT 2601
Australia
Phone: 02 6274 1439
Fax: 02 6274 1439

Results of Implementation

To be determined

Mechanism Category

Regulation/standards/Codes of Practice

Technology Stage Addressed

Choice/Application

Social Carrier Element Addressed

Interest
Information
Access
Knowledge

Market Barriers Addressed

Lack of Information
Disconnected Decision-maker

Person Completing Form

M.Maloney/G.Jessup

Mechanism Description
Reference Number: AU03

Country	Region
Australia	**Western Australia**

Short Title of Mechanism
Home Energy Line

Status of Mechanism
In Use in this Country/Region

Brief Description of Mechanism
Description :
Home Energy Line - To provide independent energy efficiency advice to residential energy end-users

Target Audience : Residential energy end-users
Total Funds allocated (in USD) :
Energy Saving Target :
Main Issue Addressed by Mechanism :
Year Mechanism Commenced :

Indicators of Success for the Mechanism :

Broad Policy Goal

Specific Goals for this Mechanism
Provide residential energy end-users with impartial energy saving information

Type of Intervention Activity
Phone number to call for advice

Funding Source
Government Agency
Details of Funding Source :
Government agency - Office of Energy (State Government - general government revenue)

Implementation Organisation
Government Agency
Names of Implementing Organisations :
Office of Energy
5th Floor
The SGIO Atrium
170 St Georges Terrace
Perth WA 6000
Australia

Sources of Information about the Mechanism
As above

Results of Implementation
Uncertain - only operating for a short time

Mechanism Category
Information Provision

Technology Stage Addressed
Choice/Application

Social Carrier Element Addressed
Information
Access
Knowledge

Market Barriers Addressed
Lack of Information

Person Completing Form
Craig Hosking

Mechanism Description
Reference Number: AU04

Country	Region
Australia	**Western Australia**

Short Title of Mechanism
Financing of energy efficiency activities by government agencies

Status of Mechanism
In Use in this Country/Region

Brief Description of Mechanism
Description :
Government financing for Government agencies undertaking energy efficiency

Target Audience : State Government agencies in Western Australia
Total Funds allocated (in USD) : AUD500,000 per annum
Energy Saving Target :
Main Issue Addressed by Mechanism :
Year Mechanism Commenced :
Indicators of Success for the Mechanism :
This year full budget expanded. Mainly lighting retrofits/air conditioning upgrades

Broad Policy Goal

Specific Goals for this Mechanism
To facilitate improved energy efficiency of Government departments

Type of Intervention Activity
Offers funds for energy efficiency projects with less than 3 year payback. Eligibility - only Government Agencies.

Funding Source
Government Agency
Details of Funding Source :
Government consolidated revenue

Implementation Organisation
Government Agency
Names of Implementing Organisations :
Office of Energy (State Government Agency)

Sources of Information about the Mechanism
Office of Energy
5th Floor
The SGIO Atrium
170 St Georges Terrace
Perth WA 6000
Australia

Results of Implementation

Effective -- taken several years to move from energyaudits to refurbishment programs

Mechanism Category

Investment/Commercialisation Funding

Technology Stage Addressed

Choice/Application

Social Carrier Element Addressed

Interest
Power
Organisational ability

Market Barriers Addressed

Pay-back Gap
Disconnected Decision-maker

Person Completing Form

Craig Hosking

Mechanism Description
Reference Number: AU05

Country	Region
Australia	**New South Wales**

Short Title of Mechanism
Environmental regulations for electricity retailers in New South Wales

Status of Mechanism
In Use in this Country/Region

Brief Description of Mechanism
Description :
The New South Wales Government has introduced licences for the supply and distribution of electricity within the state of NSW. One objective of these licences is to address environmental issues associated with electricity supply. The licences impose requirements and operational conditions on holders to reduce greenhouse gas emissions to meet emerging state, national and international reduction targets.

Retailers Licence Conditions
In accordance with the NSW Electricity Supply Act 1995, electricity "Retailers" must:
- develop 1, 3 and 5 year plans for:- energy efficiency and demand management- purchasing energy from sustainable sources eg cogeneration, renewables etc;
- develop strategies to reduce greenhouse gas emissions (NSW customers);
- negotiate strategies with the Minister;
- obtain independent verification of emissions;
- publish and annual reports in relation to:
  - demand management strategies;
  - carbon dioxide emissions arising from electricity supply;
  - statistics of electricity supplied including sources and quantities;
- obtain Environmental Protection Authority (EPA) audits at intervals not exceeding three years;
- not refuse to supply electricity to persons engaged in alternative energy supply or use, or demand management.

Distributors Licence Conditions
In accordance with the NSW Energy Services Corporation Act 1995, electricity 'distributors' must:
- exhibit a sense of social responsibility;
- protect the environment;
- be an efficient and responsible supplier of energy and of services relating to the use and conservation of energy;
- consider all sources of energy with emphasis on renewable energy reserves;
- consider the environmental impact of energy.

Ministerial Guidelines and Requirements
To support the various legal obligations, the Minister has issued "Ministerial Guidelines and Requirements". The purpose of the guidelines and requirements is to:
- expand, clarify and specify the requirements of the Acts;
- set out mandatory obligations;
- identify policy and process intent for further detailed guidelines;

- define the manner in which certain licence conditions are to compiled with;
- define the reporting process and timetable.

Specific environmental issues are set out in Chapter 3 of the document.

Further Environmental Guidelines and Requirements -- Retail Suppliers -- Greenhouse Gas Reduction Strategies

As an extension to the "Ministerial Guidelines and Requirements", this document provides for further environmental requirements. Sections covered by the document include:

1. Background
2. The Measurement of greenhouse gas emissions
3. The guidelines emission benchmark
4. Apportioning the guidelines emission benchmark among retail suppliers
5. Program for strategy development and negotiation
6. Requirements for strategies
7. Measures to be considered by retailers in developing greenhouse emission reduction strategies
8. Verification of emissions
9. Annual reporting requirements
10. Auditing requirements
11. Greenhouse gas emission performance
12. Further development of environmental guidelines and requirements

Key issues contained in this document are:

- the "guidelines emission benchmark" established for the NSW electricity sector is the reduction in emissions of the principal greenhouse gases to 5% below the 1989-90 per capita level (NSW) by the year 2000-2001 (based on CO2, CH4, and N2O and expressed in terms of CO2 and expressed in terms of CO2 equivalent);
- the sectoral benchmark is apportioned to each "retailer" according to market share;
- market share is based on GWh sold and GWh sales foregone through energy efficiency program;
- the per capita emission rate for 1989-90 year was 7.73 tonnes;
- the per capita emission rate for the 1996-97 year was 7.87 tonnes;
- the per capita emission rate for the target year 2000-01 is 7.34 tonnes.

Requirements for Strategies Developed by Retailers

The strategy must contain the following information:

- a brief statement as to the retailer's corporate policy in relation to greenhouse gas emission reduction;
- a statement setting out, if applicable, current activities in the seven years preceding the date of the strategy to reduce greenhouse gas emissions arising from the production of electricity supplied to customers in NSW;
- estimated greenhouse emissions benchmarks until 2001, based on the DoE projected benchmarks and the approved methodology and the retail supplier's anticipated market share;
- the basis on which anticipated market share was calculated;
- an assessment of the opportunities including any relevant market assessment for reducing greenhouse gas emissions and priorities for proposed greenhouse gas emission measures;
- the measures by which the retailer proposes to fulfil the obligations imposed on it by the Act and licence conditions. Each retailer should include information as to why particular measures were selected or excluded and be prepared to advance justification of them in negotiation with the Minister or delegate;
- a description of proposed measures and action plans for each measure which identifies the organisation or officer who is responsible for implementation, and includes critical milestones and dates for implementation;
- the estimated cost of each measure, and for each measure projections of both:
  - resulting reductions in greenhouse gas emissions; and
  - estimated customer financial impacts;
- the basis on which estimated reductions of greenhouse gas emissions have been calculated;
- verification of estimated emission reductions from each measure by independent persons with appropriate qualifications;

- information to support and verify adjustments claimed by the retailer in relation to considerations accepted by the Minister as a result of the impact of measures proposed or taken not being reflected adequately in the approve methodology;
- mechanisms to be used for monitoring and reporting performance against each action plan;
- a mechanism to be used for verifying performance against action plans;
- endorsement of the strategy by the Chief Executive Officer.

Target Audience : Electricity retailers
Total Funds allocated (in USD) : None
Energy Saving Target : Greenhouse gas emissions reduction target
Main Issue Addressed by Mechanism :
Year Mechanism Commenced :

Indicators of Success for the Mechanism :
Total state greenhouse gas emissions related to electricity underset target (reduction of 5% per capita by 2001)

Broad Policy Goal

To provide an environmentally favourable outcome for the New South Wales Government's reform of the electricity supply industry.

Specific Goals for this Mechanism

Reduce greenhouse gas emissions (to be reduced by 5% per capita by 2001)

Type of Intervention Activity

Regulatory requirement for retailers

Funding Source

Other
Details of Funding Source :
No funding. Retailers must submit plans showing how they intend to comply. Can use low-greenhouse sourcing and energy efficiency

Implementation Organisation

Electricity Business
Names of Implementing Organisations :
22 x retailers
Department of Energy/Minister administers legislation

Sources of Information about the Mechanism

The *Electricity Supply Act 1995 (NSW)* is available on the Internet at http://www.austlii.edu.au/au/legis/nsw/consol_act/
"Further Environmental Guidelines" and "Greenhouse Calculation Methodology" are both available on the Internet at http://www.doe.nsw.gov.au/

Results of Implementation

The process described above for reducing greenhouse gas emissions is still in the implementation phase. The majority of organisations retailing electricity in NSW have submitted their "draft environmental strategies and plans for greenhouse gas reduction". These plans are now awaiting Ministerial negotiation.

Mechanism Category

IRP and Co-operation

Technology Stage Addressed

Development/Choice/Application

Social Carrier Element Addressed

Interest
Power
Organisational ability

Market Barriers Addressed

Externalities

Person Completing Form

Ben Kearney/David Crossley

Mechanism Description
Reference Number: AU06

Country	Region
Australia	**New South Wales**

Short Title of Mechanism
Sustainable Energy Development Fund

Status of Mechanism
In Use in this Country/Region

Brief Description of Mechanism
Description :
The Sustainable Energy Fund was created by the New South Wales government in 1995 as part of the government's commitment to ensuring environmental issues received attention in the newly deregulated electricity market. The Fund is administered by the Sustainable Energy Development Authority (SEDA), a government body created by legislation.

SEDA's mission is to reduce greenhouse gas emissions in the non-transport sector and its activities:
- focus on energy efficiency, renewable energy and cogeneration technologies;
- identify funding opportunities that transform the marketplace for sustainable energy technologies;
- support commercial or near-commercial enterprises that are beneficial to greenhouse gas emission reduction to help increase their market share;
- include entering into joint ventures, accepting royalties or other returns on investments and providing grants.

Target Audience : Customers and Others
Total Funds allocated (in USD) : $US23.4 million ($AU39 million 1996-1999 - total Authority budget, not just DSM allocation)
Energy Saving Target : varies for different programs
Main Issue Addressed by Mechanism :
Year Mechanism Commenced : 1996

Indicators of Success for the Mechanism :
There are two key indicators of success for SEDA:
- reduction in CO2 emissions;
- degree of market transformation (ie the degree to which the mainstream market place has adopted and increased its use of renewable energy, cogeneration and energy efficient technologies and practices).

Broad Policy Goal
Reduction of greenhouse gas emissions from the non-transport sector of NSW

Specific Goals for this Mechanism
Increased commercialisation and 'mainstreaming' of energy efficiency technologies and renewable energy, to reduce greenhouse gas emissions in NSW.

Type of Intervention Activity
Government funding for a range of intervention activities

Funding Source

Government Agency

Details of Funding Source :

The Sustainable Energy Development Fund was created by legislation enacted by the NSW Government in 1995 and is managed by the Sustainable Energy Development Authority (SEDA). Funding is now guaranteed to 2001.

Implementation Organisation

Government Agency

Names of Implementing Organisations :

Sustainable Energy Development Authority

Comments :

SEDA is a NSW government statutory agency that commenced operation in August 1996. Its mission is to reduce the level of greenhouse gas emissions in NSW by investing in the commercialisation and use of sustainable energy technologies. SEDA was designed from the outset to comprise a small team of core staff (around 20 people) responsible for scoping and designing programs and partnerships, with the implementation and management of specific programs and projects outsourced through open tender processes.

Sources of Information about the Mechanism

Sustainable Energy Development Authority
PO Box N442
Grosvenor Place
SYDNEY NSW 2000
AUSTRALIA
Phone: 61 2 9291 5260
Fax: 61 2 9299 1519
Email: seda@nsw.gov.au
Website: http://www.seda.nsw.gov.au

Results of Implementation

As at June 1997, it is estimated that SEDA programs assisted in reducing 490 000 life time tonnes of CO2. However this is only the first 12 months of the organisation's operations.

Mechanism Category

Entrepreneurial Organisation

Technology Stage Addressed

Development/Choice/Application

Social Carrier Element Addressed

Interest
Power
Organisational ability
Information
Access
Knowledge

Market Barriers Addressed

Externalities
Pay-back Gap
Lack of Information
Disconnected Decision-maker

Person Completing Form

M. Maloney/G.Jessup

Mechanism Description
Reference Number: AU07

Country	Region
Australia	**New South Wales**

Short Title of Mechanism
Capping network pricing

Status of Mechanism
In Use in this Country/Region

Brief Description of Mechanism
Description :
Capping the revenue from wires transmission through government regulation can achieve DSM goals by reducing the link between sales and revenue and thereby reducing incentives to sell more electricity.

In its March 1996 determination, New South Wales' Independent Pricing and Regulatory Tribunal (IPART) set caps on transmission and distribution revenue for TransGrid and the distributors respectively, up until July 1999. It is possible that by then, regulation of transmission may pass to the Australian Competition and Consumer Commission. The Tribunal also set caps on retail prices for franchise customers. As customers become contestable the extent of retail price controls will be reduced. Therefore, the medium to long term regulatory role of the Tribunal will relate to the regulation of distribution wire businesses.

Capping network pricing (also known as “revenue regulation”) can be categorised into three broad types:
- **rate-of return regulation**, where an allowed rate of return on assets is set and prices which comply with the regulated return are approved;
- **price caps**, under which the average price is directly regulated and may be linked to a general measure of Inflation such as CPI – X ;
- **revenue caps**,. where total revenue or revenue per customer is regulated directly, and may in this case as well be linked to CPI – X.

(These latter two approaches are also referred to as incentive regulation).

The form of regulation will affect the incentives for utilities to promote DSM. Both price caps and rate of return regulation introduce a bias against DSM, as the electricity business has an incentive to sell more electricity, even where DSM may reduce the total costs of meeting the customer's energy needs. A regulatory focus on prices rewards increases in sales. Caps on revenue reduce the link between sales and revenue, and remove this bias against DSM - incentives to sell more electricity are reduced. Revenue regulation provides a balance of reducing the bias against DSM, and avoiding excessive compliance costs.

Environmental objectives are also addressed by other agencies in NSW:
- explicit licence conditions on verification and reduction of greenhouse emissions, purchasing of sustainable energy, and other energy efficiency and DSM guidelines;
- establishment of the Sustainable Energy Development Agency whose mission is to reduce the level of greenhouse emissions by investing in the commercialisation and use of sustainable energy technologies.

Impacts on Customers and Electricity Businesses

Under the network business's revenue cap, the distributors have the freedom to structure prices within the cap. However, a number of supplementary controls have been put in place by the Tribunal to avoid excessive adverse effects on customers, and to limit the capacity for gaming and anti-competitive behaviour.

These supplementary measures include:

- IPART reviews of proposed network prices and underlying cost allocation modelling;
- publication of network prices;
- notification to IPART of negotiated prices;
- accounting separation between wires and retail businesses of distributors;
- constraints on increases in retail prices for franchise customers.

Target Audience : Electricity businesses
Total Funds allocated (in USD) : N/A
Energy Saving Target : N/A
Main Issue Addressed by Mechanism :
Year Mechanism Commenced : 1996

Indicators of Success for the Mechanism :
IPART has not proposed any specific measures. Licencing conditions provide for the NSW Government to set targets for DSM, renewables and reductions in greenhouse gas emissions.

Broad Policy Goal

Reduce bias against energy efficiency and DSM.

Specific Goals for this Mechanism

Efficient service provision
Protection of customers from any abuse of monopoly power
Protection of the environment through pricing policies

Type of Intervention Activity

Regulation of electricity pricing

Funding Source

Not Applicable

Implementation Organisation

Other
Names of Implementing Organisations :
Independent Pricing and Regulatory Tribunal (IPART)(energy regulator for NSW)

Comments :
In New South Wales, the Independent Pricing and Regulatory Tribunal (IPART) is responsible for the price regulation of:

- electricity non-contestable retail services
- electricity distribution services
- electricity transmission services (until July 1999).

In making its price determinations for these services, the Tribunal has to consider:

- the need to promote competition in the supply of services concerned;
- the need to maintain ecologically sustainable development;
- the appropriate rate of return on assets, including appropriate payment of dividends;
- the social impact of its determinations;
- standards of quality, reliability and safety of services concerned.

With respect to managing the environmental consequences of energy generation and use, and assisting in achieving ecologically sustainable development, the Tribunal's role is to ensure that prices and the form of regulation used do not contribute to any bias against energy efficiency and renewables.

Sources of Information about the Mechanism

Various IPART reports available at - http://www.ipart.nsw.gov.au
Information on licencing conditions for the electricity supply industry in NSW is available from the NSW Department of Energy via a link from the IPART website.

Results of Implementation

Implementation of demand management and energy efficiency initiatives
Increased adoption of renewable energy generation sources
Reductions in customer prices

Mechanism Category

Regulation/standards/Codes of Practice

Technology Stage Addressed

Choice

Social Carrier Element Addressed

Organisational ability

Market Barriers Addressed

Pay-back Gap
Existing Approaches

Person Completing Form

A. McCawley/M.Maloney

Mechanism Description
Reference Number: AU08

Country	Region
Australia	**Victoria**

Short Title of Mechanism
Capacity Support for Peak Period

Status of Mechanism
Formerly Used in this Country/Region
Reasons why is no longer used:
Mechanism used from December 1997 to March 1998 to meet the capacity requirements of that specific summer load.

Brief Description of Mechanism
Description :
An electricity supply and demand management scheme was put in place to meet peak demand in the state of Victoria during the summer months (1997/98) by contracting for demand reduction or new electricity supply. A possible system shortfall of 660 MW was projected. Approximately 185 MW was supplied by another state by way of contracted demand interruptibility and additional generation supply. The remaining shortfall was provided by way of the pool company calling competitive tenders for the provision of capacity support. These contracts were for additional generation capacity, or demand reduction offers, which would otherwise not have been available to the market on a commercial basis during the summer. Retailers carried the cost of any additional contracted capacity support. Retailers were not able to recover these costs from franchised customers, but through existing contract mechanisms may be able to recover some costs from the contestable customers.

Target Audience : retailers and large business customers
Total Funds allocated (in USD) :
Energy Saving Target : 0
Main Issue Addressed by Mechanism :
Year Mechanism Commenced :

Indicators of Success for the Mechanism :

Broad Policy Goal
intervention into early stage of market

Specific Goals for this Mechanism
Ensure peak demand was met during summer

Type of Intervention Activity
Competitive sourcing of DSM/peak capacity

Funding Source
Electricity Business
Details of Funding Source :
Costs were passed to electricity retailers

Implementation Organisation

Government Agency

Names of Implementing Organisations :

Victorian Power Exchange

Comments :

The Victorian Power Exchange brokered the mechanism, and the costs passed to electricity retailers

Sources of Information about the Mechanism

Results of Implementation

The mechanism successfully assisted with the management of summer peak demand. However it demonstrated that the market, at this early stage, was unable to provide peak demand and intervention was required.

Mechanism Category

Voluntary Agreements/Negotiated Agreements

Technology Stage Addressed

Choice

Social Carrier Element Addressed

Interest

Organisational ability

Market Barriers Addressed

Pay-back Gap

Lack of Information

Person Completing Form

M.Maloney/H.Schaap

Mechanism Description
Reference Number: AU09

Country	Region
Australia	**National Application**

Short Title of Mechanism
Industry efficiency benchmarking and best practice

Status of Mechanism
Proposed for Use in this Country/Region

Brief Description of Mechanism
Description :
The measure involves industry associations and government working together to:
- identify types, extent and patterns of energy use within sectors;
- achieve the improvement potential of enterprises within that sector based on best practice; and
- work on strategies to implement best practice and to monitor the progress of such strategies.

The benchmarks and best practice indicators will be provided for use by the Greenhouse Challenge programme to assist in formulating cooperative agreements.

Target Audience : industry
Total Funds allocated (in USD) : $6.18 million (($AU10.1 million)
Energy Saving Target : to be determined
Main Issue Addressed by Mechanism :
Year Mechanism Commenced :

Indicators of Success for the Mechanism :
Measured improvement in the efficiency of energy usage in the relevant industries, relative to the "do nothing" option.

Broad Policy Goal
To reduce CO2 emissions

Specific Goals for this Mechanism
improve the efficiency of energy use by industry

Type of Intervention Activity
Demonstration and education/information

Funding Source
Government Agency
Details of Funding Source :
Funds will be provided predominantly by the Federal government, with some assistance from State governments.

Implementation Organisation

Government Agency

Names of Implementing Organisations :

Australian Greenhouse Office (AGO) via the Energy Management Task Force (EMTF)

Comments :

The Australian Greenhouse is responsible for advising the Australian Government on domestic greenhouse policy, and for administering and co-ordinating domestic greenhouse programs. The AGO has passed carriage of the benchmarking and best practice program to the EMTF. The EMTF is a cooperative Federal-State body, comprising bureaucrats from the energy portfolios of each Australian jurisdiction.

Sources of Information about the Mechanism

The Australian Greenhouse Office
GPO Box 62
Canberra ACT 2601
Australia
Phone: 02 6274 1888
Fax: 02 6274 1439

Results of Implementation

Yet to be determined

Mechanism Category

Education and Training Provision

Technology Stage Addressed

Choice/Application

Social Carrier Element Addressed

Interest
Information

Market Barriers Addressed

Lack of Information

Person Completing Form

M.Maloney/G.Jessup

Mechanism Description
Reference Number: DK01

Country
Denmark

Region

Short Title of Mechanism
Electricity Saving Fund (ESF)

Status of Mechanism
In Use in this Country/Region

Brief Description of Mechanism
Description :
The Electricity Savings Fund (ESF) is established by law. ESF identifies and supports savings projects especially concerning conversion from electric heating to CHP and natural gas based heating. Tenderers, i.e. any private company or electricity company, are invited to realise the projects. The companies which offer the highest reduction of CO2 emissions at the lowest cost are nominated to realise the project.

Highest priority is given to:
- areas with CHP based on biomass or renewables; and
- areas where the heating company will pay a high amount in contribution to the converting customers.

Afterwards areas with other kinds of CHP and with natural gas will be taken into account. ESF contributes to project cost coverage and rewards customers who convert from electric heating financially. This mechanism combines the societal goals with the market forces through disciplining market forces to achieve the societal goals.

Target Audience : District heat and natural gas companies
Total Funds allocated (in USD) : 60 million DKK (1997)
Energy Saving Target : No specific value for 1997
Main Issue Addressed by Mechanism :
Year Mechanism Commenced :
Indicators of Success for the Mechanism :
Number of conversions

Broad Policy Goal
Reduction of CO2 emissions

Specific Goals for this Mechanism
To reduce the CO2 emissions by about 3 million tonnes by 2008, which is about 5% of the CO2 emission of today, through converting electric heating into district heating and natural gas.

Assumptions concerning CO2 emissions:
- 200 kg/GJ electricity;
- 0-100 kg/GJ district heat (on average 30);
- 70 kg/GJ natural gas;
- 90-100 kg/GJ oil furnace.

Type of Intervention Activity

Subsidisation of project identification

Funding Source

Government Agency
Other
Details of Funding Source :
In 1997, ESF was financed by the state. However, as of 1998, ESF will be financed by a 0.6 øre/kWh surcharge on residential and public service sector tariffs. In addition, CHP and natural gas companies will contribute with a certain amount related to the estimated market value of obtaining new customers.

Implementation Organisation

Government Agency
Other
Names of Implementing Organisations :
The Electricity Savings Fund (ESF)

Comments :
The Minister of Environment and Energy nominates the members of the executive committee.

Sources of Information about the Mechanism

Contact:
The Electricity Savings Fund (ESF)
Att. Gøran Wilke
The Danish Energy Agency
Amaliegade 44
1256 Copenhagen K
Denmark
Phone: + 45 33 92 67 00

Results of Implementation

The Electricity Savings Fund (ESF) started functioning in the summer of 1997. It is therefore not possible to make an assessment yet.

Mechanism Category

Subsidies/Grants/Rebates

Technology Stage Addressed

Choice

Social Carrier Element Addressed

Interest
Power

Market Barriers Addressed

Risk Sheltering

Person Completing Form

Ole Thorbek

Mechanism Description
Reference Number: DK02

Country
Denmark

Region

Short Title of Mechanism
Green municipal accounts

Status of Mechanism
In Use in this Country/Region

Brief Description of Mechanism
Description :
As part of AGENDA 21 each municipality is encouraged to prepare annual green accounts - that is to register the total consumption of energy and water and a.o. calculate the related CO2 emissions. The involved local governments typically establish a consumer council which will participate in the debate on which actions to take to save energy and in other ways protect the environment.

Target Audience : Municipalities
Total Funds allocated (in USD) : No specific amount
Energy Saving Target : Not applicable - process oriented
Main Issue Addressed by Mechanism :
Year Mechanism Commenced :

Indicators of Success for the Mechanism :
Number of communes participating.

Broad Policy Goal
Reduction of CO2 emissions

Specific Goals for this Mechanism
To stimulate the local society to realise savings and environmental goals. The intention is to stimulate a process rather than to achieve specific energy savings.

Type of Intervention Activity
Information. Provides statistical information useful in policy planning. Forces registration and acknowledgement of resource consumption.

Funding Source
Other
Details of Funding Source :
Local government

Implementation Organisation
Other
Names of Implementing Organisations :
Local government

Comments :
Albertslund Commune with about 300,000 inhabitants is one of the Danish communes which has reached the best results.

Sources of Information about the Mechanism

Albertslund Commune
Contact:Ms Gitte Hemstra
Rådhuset
DK-2620 Albertslund
Denmark
Phone: + 45 43 68 68 68

Results of Implementation

From 1986 to 1995 the reduction of CO2 emissions has been about 30% in Albertslund Commune.

Mechanism Category

Information Provision

Technology Stage Addressed

Choice/Application

Social Carrier Element Addressed

Interest
Information

Market Barriers Addressed

Lack of Information

Person Completing Form

Ole Thorbek

Mechanism Description
Reference Number: DK03

Country
Denmark

Region

Short Title of Mechanism
CO2 and energy tax

Status of Mechanism
In Use in this Country/Region

Brief Description of Mechanism
Description :
The government has implemented a CO2 and energy tax. For the industrial sector it is possible to obtain a reduction in tax provided that a voluntary agreement is entered with the state to reduce energy consumption. The voluntary agreement includes a detailed energy audit of the facilities and preparation of an energy saving action plan by an authorised energy consultant.

The proceeds from the taxation scheme are used to support investment in energy efficiency within the sector. An industrial company can thus apply for financial support to implementation of some of the energy savings action identified in the company energy plan.

Financial support is provided for:
- typical standard improvements;
- larger activities such as industrial CHP;
- R&D and demonstration;
- information activity;
- employment of an energy counsellor or staff.

Target Audience : Industrial customers
Total Funds allocated (in USD) : 700 million DKK (1997)
Energy Saving Target : 4% of the consumption of the commercial sector
Main Issue Addressed by Mechanism :
Year Mechanism Commenced :

Indicators of Success for the Mechanism :
Specific energy savings.

Broad Policy Goal
Reduction of CO2 emission

Specific Goals for this Mechanism
To reduce the CO2 emissions of the industrial sector by 2.4 million tonnes by 2005 through providing the industrial sector with an incentive to participate in reducing CO2 emission without damaging the competitiveness of the sector. The idea is that the most cost-effective measures will be pursued first.

Type of Intervention Activity

Taxation and voluntary agreements

Funding Source

Government Agency
Other
Details of Funding Source :
The industry pay a contribution to the state which in turn invests this money in energy savings measures within the industrial sector.

Implementation Organisation

Government Agency
Names of Implementing Organisations :
Danish Energy Agency

Sources of Information about the Mechanism

Danish Energy Agency
Ministry of Environment and Energy
Amiliegade 44
DK-1256 Copenhagen K
Denmark
Contact:Mr. Henrik Lawetz
Phone:+45 33 92 78 30
Fax:+45 33 11 47 43

Results of Implementation

The mechanism will be evaluated in 1998.

Mechanism Category

Tax Payable/Tax Exemption

Technology Stage Addressed

Choice/Application

Social Carrier Element Addressed

Interest
Power
Information

Market Barriers Addressed

Externalities

Person Completing Form

Ole Thorbek

Mechanism Description
Reference Number: DK04

Country
Denmark

Region

Short Title of Mechanism
IRP law

Status of Mechanism
In Use in this Country/Region

Brief Description of Mechanism
Description :
In 1994, an IRP law was introduced for the electricity sector. It requires that the distribution companies prepare DSM plans every second year and that the production utilities in cooperation with the distribution companies develop a collective integrated resource plan weighing the different supply side options (different types of new capacity) and demand side options (savings) a.o. from a societal view point.

The first DSM plans were prepared in 1995. The plans are reported to the Danish Energy Agency (DEA). The distribution companies must map the demand and the technical potential for electricity savings within their supply area together with the associated cost and required implementation means. Secondly, they must develop a 20 year plan on efficient electricity use showing different alternatives such as conservation, small CHP and renewables.

Target Audience : Electricity businesses
Total Funds allocated (in USD) : 300 million DKK for DSM plans
Energy Saving Target : After 5 years, 5% of the total electricity consumption.
Main Issue Addressed by Mechanism :
Year Mechanism Commenced :

Indicators of Success for the Mechanism :
Assessment by the Danish Energy Agency.

Broad Policy Goal
Optimum resource allocation

Specific Goals for this Mechanism
Optimum resource allocation through coordinated integrated resource planning which encourages energy efficiency through all available means provided it entails better socio-economics than further energy production within the political framework of society (energy and environmental policies). IRP is considered the optimal way to do long-term planning. Specifically, the goal for the DSM plans is to realise all the savings which are relevant seen from a societal point of view and which the distribution company is able to realise given the available mechanisms.

Type of Intervention Activity
Law-enforced planning method.

Funding Source

Electricity Business

Details of Funding Source :

In general the distribution companies are funding the mechanism through a tariff surcharge of 0.6 øre/kWh. This is justified in that the portfolio of saving programs is made so that all types of customers are provided with savings opportunities. Monitoring and approval of the plans is done by DEA and financed by DEA's own budget.

Implementation Organisation

Government Agency

Electricity Business

Names of Implementing Organisations :

Danish Energy Agency, Various utilities

Sources of Information about the Mechanism

Danish Energy Agency
The Ministry of Environment and Energy
Amaliegade 44
DK-1256 Copenhagen K
Denmark
Contact:Mr. Ole Thorbek
Phone: +45 33 92 77 97
Fax: +45 33 11 47 43

Results of Implementation

The energy companies are saving about 1 TWh which is about 3% of the total consumption.

Mechanism Category

IRP and Co-operation

Technology Stage Addressed

Choice

Social Carrier Element Addressed

Interest

Market Barriers Addressed

Risk Sheltering

Person Completing Form

Ole Thorbek

Mechanism Description
Reference Number: DK05

Country
Denmark

Region

Short Title of Mechanism
Labelling of household appliances

Status of Mechanism
In Use in this Country/Region

Brief Description of Mechanism
Description :
The suppliers of household appliances are obliged by law to equip each appliance with a clear label indicating the electricity consumption so that this factor can be taken into consideration by the buyer.

Target Audience : Equipment suppliers
Total Funds allocated (in USD) : Small amount (government share)
Energy Saving Target : The difference between the best appliances and the original average.
Main Issue Addressed by Mechanism :
Year Mechanism Commenced :

Indicators of Success for the Mechanism :
Market share of most efficient products.

Broad Policy Goal
Limited energy consumption

Specific Goals for this Mechanism
To influence the market for household appliances so that appliances with a low energy consumption to a higher degree will dominate the market.

Type of Intervention Activity
Labelling which ensures and provides user friendly information available at the moment when a purchase decision is made.

Funding Source
Government Agency
Other
Details of Funding Source :
The appliance producers and the retail sector pay the cost of labelling. The 3rd office of DEA oversees the labelling activity and prepares overview list.

Implementation Organisation
Government Agency
Names of Implementing Organisations :
The Danish Energy Agency

Sources of Information about the Mechanism

Danish Energy Agency
The Ministry of Environment and Energy
Amaliegade 44
DK-1256 Copenhagen K
Denmark
Contact:Ms. Antte Gydesen
Phone: +45 33 92 67 26
Fax: +45 33 11 47 43

Results of Implementation

An investigation of the retail market for refrigerators and freezers shows that in the period 1993-96 the market share of the most efficient products increased from 40% to 85%.

Mechanism Category

Information Provision

Technology Stage Addressed

Choice

Social Carrier Element Addressed

Interest

Market Barriers Addressed

Lack of Information

Person Completing Form

Ole Thorbek

Mechanism Description
Reference Number: SF01

Country
Finland

Region

Short Title of Mechanism
Negotiated agreements with industry and utilities

Status of Mechanism
In Use in this Country/Region

Brief Description of Mechanism
Description :
Agreements are negotiated between government and actors to achieve specific energy efficiency targets. Targets are defined for use of electricity and heat, and also the general means to be used by participants are defined in the agreements. However, this general agreement is not binding for individual enterprises. The first agreements with central industrial organisations were negotiated in 1992. New agreements with industry and utility organisations have been signed in 1997/98.

Target Audience : Process and small and medium size industry, utilities
Total Funds allocated (in USD) : No specific funding
Energy Saving Target : Decrease in specific consumption (see below)
Main Issue Addressed by Mechanism :
Year Mechanism Commenced :

Indicators of Success for the Mechanism :
Various product specific follow-up reporting systems and indicators were developed and used.

Broad Policy Goal
Limited energy consumption

Specific Goals for this Mechanism
The goals for the reduction of specific consumption compared with the year 1990 were the following:

- process industry:
  - reduction in heat 5% in 1996 and 12% in 2005;
  - reduction in electricity 3% in 1996 and 8% in 2005;
- small and medium-scale industry:
  - reduction in heat 6% in 1996 and 15% in 2005;
  - reduction in electricity 4% in 1996 and 10% in 2005.

Type of Intervention Activity
Increase the knowledge on energy consumption through follow-up

Funding Source
Other
Details of Funding Source :
No central funding. Each organisation is funding its own work.

Implementation Organisation

Government Agency
Other

Names of Implementing Organisations :

Agreements were made between the Ministry of Trade and Industry and the Industrial Energy Association (TELI). Another agreement was made with the steel producer Rautaruukki Oy. Agreement with electricity supply industry is under preparation.

Comments :

The goal was to make more agreements, but it has failed until now.

Sources of Information about the Mechanism

Pentti Puhakka
Ministry of Trade and Industry
Energy Department
pentti.puhakka@ktm.vn.fi
Fax: +358 9 160 3997

Results of Implementation

The general goals were not achieved. Main reason was that the agreement was too general. Also the implementing organisation TELI no longer exists. New agreements are now signed.

Mechanism Category

Voluntary Agreements/Negotiated Agreements

Technology Stage Addressed

Choice

Social Carrier Element Addressed

Interest

Market Barriers Addressed

Externalities

Person Completing Form

Seppo Kärkkäinen

Mechanism Description
Reference Number: SF02

Country
Finland

Region

Short Title of Mechanism
Support to building renovation investments

Status of Mechanism
In Use in this Country/Region

Brief Description of Mechanism
Description :
Before 1987 special support was given to energy renovation. After 1987 general support to investments (usually 10 %) and loans with lower interest rates were given.

Target Audience : Single and multi-family houses, public buildings
Total Funds allocated (in USD) : About 1 billion FIM for energy renovation before 1987 and small fraction (not exactly known) from 70 billion FIM used for general renovation of buildings after 1987.
Energy Saving Target : Not specified
Main Issue Addressed by Mechanism :
Year Mechanism Commenced :

Indicators of Success for the Mechanism :
The general indicator is saved energy per year.

Broad Policy Goal
Increased employment and renovation activity

Specific Goals for this Mechanism
Before 1987, the goals for the direct support of energy renovation were energy conservation and reduction of oil consumption. For the general support of building renovation (after 1987), the main goals is to increase employment and renovation activity. Energy saving is only a secondary goal.

Type of Intervention Activity
Subsidisation.

Funding Source
Government Agency
Details of Funding Source :
Ministry of Environment. Municipalities for their own public buildings.

Implementation Organisation
Government Agency
Names of Implementing Organisations :
Ministry of Environment.

Sources of Information about the Mechanism

Pentti Puhakka
Ministry of Trade and Industry
Energy Department
pentti.puhakka@ktm.vn.fi
Fax: + 358 9 160 3997

Results of Implementation

About 10 TWh savings per year of which about 4.5 TWh per year is a result of the energy policy. The mechanism has helped further significant total energy savings. The effect on the electricity sector is, however, quite small.

Mechanism Category

Subsidies/Grants/Rebates

Technology Stage Addressed

Choice

Social Carrier Element Addressed

Interest
Power

Market Barriers Addressed

Pay-back Gap

Person Completing Form

Seppo Kärkkäinen

Mechanism Description
Reference Number: SF03

Country	Region
Finland	

Short Title of Mechanism
Support to energy efficiency investments in enterprises

Status of Mechanism
In Use in this Country/Region

Brief Description of Mechanism
Description :
Support to investment in energy efficiency improvements which from a national economy point of view are cost-effective but not from the enterprise point of view.

Target Audience : Enterprises, especially industry
Total Funds allocated (in USD) : About 40 million FIM
Energy Saving Target : Not specified
Main Issue Addressed by Mechanism :
Year Mechanism Commenced :
Indicators of Success for the Mechanism :
Saved primary energy. The price of saved energy.

Broad Policy Goal
Limited energy consumption

Specific Goals for this Mechanism
To ensure (through financial support) that energy efficiency improvements which from a national economy point of view are cost-effective but not from the enterprise point of view are implemented.

Type of Intervention Activity
Subsidisation.

Funding Source
Government Agency
Details of Funding Source :
Ministry of Trade and Industry

Implementation Organisation
Government Agency
Names of Implementing Organisations :
Ministry of Trade and Industry.

Sources of Information about the Mechanism
Pentti Puhakka
Ministry of Trade and Industry
Energy Department
pentti.puhakka@ktm.vn.fi
Fax: +358 9 160 3997

Results of Implementation

Total investments since 1985 amounts to 430 million FIM of which the state provided 19.5 %. The total number of investment is about 250. About 90 Mtoe primary energy has been saved per year in the period 1985-93. The price of saved energy for the state is 70 FIM/toe. The results have been positive although the available funds have been modest and cannot be increased considerably.

Mechanism Category

Subsidies/Grants/Rebates

Technology Stage Addressed

Choice

Social Carrier Element Addressed

Interest
Power

Market Barriers Addressed

Pay-back Gap

Person Completing Form

Seppo Kärkkäinen

Mechanism Description
Reference Number: SF04

Country
Finland

Region

Short Title of Mechanism
Information dissemination

Status of Mechanism
In Use in this Country/Region

Brief Description of Mechanism
Description :
MOTIVA's own information on energy conservation
Information aiming to change consumer attitudes
Information of the other activities of MOTIVA
Sector specific information (households, transport, industry and service sector).

Target Audience : All energy users
Total Funds allocated (in USD) : About 3 million FIM since 1993
Energy Saving Target : Not specified
Main Issue Addressed by Mechanism :
Year Mechanism Commenced :

Indicators of Success for the Mechanism :
Follow-up of newspaper
Readers' studies of MOTIVA Xpress newsletter
Responses from seminars, exhibitions etc.
Market studies of equipment and methods
In specific cases energy consumption.

Broad Policy Goal
Limited energy consumption and reduced CO2 emission

Specific Goals for this Mechanism
To influence the decisions of the energy-users.

Type of Intervention Activity
Information dissemination

Funding Source
Government Agency
Other
Details of Funding Source :
MOTIVA has financed about 25-40% of the cost of the information dissemination projects.

Implementation Organisation
Government Agency
Names of Implementing Organisations :
MOTIVA

Sources of Information about the Mechanism

Seppo Silvonen
MOTIVA
seppo.silvonen@motiva.fi
Fax: +358 9 456 7008

Results of Implementation

The mechanism information dissemination has been useful and will be expanded by increased resources. An example of the results achieved: an energy labelling campaign increased the share of high efficiency equipment from 52% to 62% and the importance of energy consumption in the decision-making of the equipment buyers increased from 35% to 53%.

Mechanism Category

Information Provision

Technology Stage Addressed

Choice/Application

Social Carrier Element Addressed

Interest
Information
Knowledge

Market Barriers Addressed

Lack of Information

Person Completing Form

Seppo Kärkkäinen

Mechanism Description
Reference Number: SF05

Country	Region
Finland	

Short Title of Mechanism
Certified energy audits

Status of Mechanism
In Use in this Country/Region

Brief Description of Mechanism
Description :
Since 1993 MOTIVA has facilitated training of auditors, provided a format for performing audits and approved audits upon which usually 30-40% of the audit cost is paid by government.

Target Audience : Industry and service sector
Total Funds allocated (in USD) : 11 million FIM per year + support for investments
Energy Saving Target : Energy saving in 2005 15 % in heat and 5 % in electricity in specific consumption
Main Issue Addressed by Mechanism :
Year Mechanism Commenced :

Indicators of Success for the Mechanism :
Volume of activities
Saving potential and its realisation

Broad Policy Goal
Limited energy consumption

Specific Goals for this Mechanism
As a part of general energy saving programme to decrease the energy consumption.

Type of Intervention Activity
Training of auditors, quality control of audits and financial support

Funding Source
Government Agency
Other
Details of Funding Source :
30-40% of auditing costs are paid by the government and the rest by customers (industry, service buildings)

Implementation Organisation
Government Agency
Names of Implementing Organisations :
MOTIVA

Sources of Information about the Mechanism

Heikki Väisänen
MOTIVA
heikki.vaisanen@motiva.fi
Fax: +358 9 456 7008

Results of Implementation

Total volume until now 15% from potential, activity decreasing
Observed conservation potential 20-22% heat and 5-7% electricity
65-80% from this potential realized in 3 years
Total decrease in end-use energy 1 TWh/year.

Mechanism Category

Education and Training Provision

Technology Stage Addressed

Choice/Application

Social Carrier Element Addressed

Interest
Information
Knowledge

Market Barriers Addressed

Pay-back Gap

Person Completing Form

Seppo Kärkkäinen

Mechanism Description
Reference Number: SF06

Country	Region
Finland	

Short Title of Mechanism
Negotiated agreements with the public sector

Status of Mechanism
In Use in this Country/Region

Brief Description of Mechanism
Description :
As part of the general energy savings programme in the public sector, agreements on energy savings were planned to be made with the key public organisations. In 1993, agreements with the Association of Municipalities and with the City of Helsinki were made. The agreements are intended to spur on increased knowledge and awareness of energy consumption.

Target Audience : Public sector, municipalities
Total Funds allocated (in USD) : Not specified
Energy Saving Target : 10% heat and 15% electricity by year 2005 compared to 1990 level.
Main Issue Addressed by Mechanism :
Year Mechanism Commenced :

Indicators of Success for the Mechanism :
Reduction in specific energy consumption.

Broad Policy Goal
Limited energy consumption

Specific Goals for this Mechanism
To reduce public energy consumption by 10% heat and 15% electricity by year 2005 compared to 1990 level.

Type of Intervention Activity
Negotiated agreements. Through these more knowledge on energy consumption and increased use of local energy advisors and electricity billing data as an information source to customers occur.

Funding Source
Government Agency
Electricity Business
Other
Details of Funding Source :
Some governmental funding for audits, other funding from the minicipalities (Helsinki, etc.) and from local utilities

Implementation Organisation

Government Agency
Electricity Business
Other

Names of Implementing Organisations :

Agreements between the Ministry of Trade and Industry and the association of municipalities (Suomen Kuntaliitto) as well as with the city of Helsinki (local utility Helsinki Energy as a part of that). MOTIVA is coordinating the energy conservation

Sources of Information about the Mechanism

Pentti Puhakka
Ministry of Trade and Industry
Energy Department
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Results of Implementation

In Helsinki the goals have been achieved until now. In other municipalities the general trend in specific consumption of heat has been decreasing until 1995, but after that the development has been stopped. The specific consumption of electricity is generally still increasing.

Mechanism Category

Voluntary Agreements/Negotiated Agreements

Technology Stage Addressed

Choice

Social Carrier Element Addressed

Interest
Power

Market Barriers Addressed

Externalities

Person Completing Form

Seppo Kärkkäinen

Mechanism Description
Reference Number: SF07

Country
Finland

Region

Short Title of Mechanism
Technology Procurement

Status of Mechanism
In Use in this Country/Region

Brief Description of Mechanism
Description :
Technology procurement has been in use since 1993 and includes:

- market identification;
- setting up buyers' groups;
- specification of new technologies;
- support for procurement process.

Target Audience : Equipment buyers and manufacturers
Total Funds allocated (in USD) : 7 million FIM
Energy Saving Target : Not specified
Main Issue Addressed by Mechanism :
Year Mechanism Commenced :

Indicators of Success for the Mechanism :
Number of procurement activities. Customer energy bill savings.

Broad Policy Goal
Limited energy consumption

Specific Goals for this Mechanism
To accelerate the development and market penetration of new energy efficient products.

Type of Intervention Activity
Technology procurement.

Funding Source
Government Agency
Other
Details of Funding Source :
So far 4 projects have been carried out at a total cost of 32 million FIM of which MOTIVA provided about 7 million FIM. The remaining cost is covered by the involved manufacturers.

Implementation Organisation
Government Agency
Other
Names of Implementing Organisations :
MOTIVA, manufacturers

Sources of Information about the Mechanism

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Results of Implementation

Four projects have been carried out having a target potential of about 4-5 TWh/year. However, it is too early to estimate the effects on the market.

Mechanism Category

Technology Procurement

Technology Stage Addressed

Development/Choice

Social Carrier Element Addressed

Interest
Power
Organisational ability
Information
Access

Market Barriers Addressed

Pay-back Gap

Person Completing Form

Seppo Kärkkäinen

Mechanism Description
Reference Number: SF08

Country
Finland

Region

Short Title of Mechanism
Demonstration of new technologies

Status of Mechanism
In Use in this Country/Region

Brief Description of Mechanism
Description :
The main focus is on field demonstrations of new energy efficient equipment and methods. MOTIVA assists in planning, financing and follow-up of the projects as well as dissemination of the project information. The mechanism has been in use since 1993.

Target Audience : Equipment users and manufacturers
Total Funds allocated (in USD) : 1-2 million FIM
Energy Saving Target : Not specified
Main Issue Addressed by Mechanism :
Year Mechanism Commenced :

Indicators of Success for the Mechanism :
Decrease in specific energy consumption. Increase in the market share of efficient equipment.

Broad Policy Goal
Limited energy consumption

Specific Goals for this Mechanism
To speed up the market penetration of new energy efficient products and methods.

Type of Intervention Activity
Subsidisation and information. MOTIVA's role is to help manufacturers and users in organising, planning and follow-up of field demonstrations. MOTIVA also helps financing and disseminate information on the results of field tests.

Funding Source
Government Agency
Other
Details of Funding Source :
MOTIVA, Ministry of Trade and Industry and manufacturers.

Implementation Organisation
Government Agency
Names of Implementing Organisations :
MOTIVA

Sources of Information about the Mechanism

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Results of Implementation

About 25 projects have been carried out. The savings have been 10-30% of the specific end-uses in question. The share of public funding varied between 0 and 100%. It is too early to estimate effects on market

Mechanism Category

Subsidies/Grants/Rebates

Technology Stage Addressed

Development/Choice

Social Carrier Element Addressed

Interest
Power
Information
Knowledge

Market Barriers Addressed

Lack of Information

Person Completing Form

Seppo Kärkkäinen

Mechanism Description
Reference Number: SF09

Country	Region
Finland	

Short Title of Mechanism
Normative instruments for buildings

Status of Mechanism
In Use in this Country/Region

Brief Description of Mechanism
Description :
Use of building standards and recommendations.

Target Audience : Building companies and owners
Total Funds allocated (in USD) : Not applicable
Energy Saving Target : Not specified
Main Issue Addressed by Mechanism :
Year Mechanism Commenced :

Indicators of Success for the Mechanism :
Reduction in energy consumption for space heating.

Broad Policy Goal
Limited energy consumption

Specific Goals for this Mechanism
To reduce the energy consumption for space heating and improve indoor climate.

Type of Intervention Activity
Standards and norms

Funding Source
Government Agency
Details of Funding Source :
None.

Implementation Organisation
Government Agency
Names of Implementing Organisations :
Ministry of Environment

Sources of Information about the Mechanism
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Ministry of Trade and Industry
Energy Department
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Results of Implementation

In the period 1975-95, about 7 TWh/year has been saved through improved insulation and 4 TWh/year through changes in ventilation and heat recovery. At present, there is no need for tightening of the recommendations.

Mechanism Category

Regulation/Standards/Codes of Practice

Technology Stage Addressed

Choice

Social Carrier Element Addressed

Interest

Market Barriers Addressed

Disconnected Decision-maker

Person Completing Form

Seppo Kärkkäinen

Mechanism Description
Reference Number: SF10

Country
Finland

Region

Short Title of Mechanism
Financial support for R&D in the energy sector

Status of Mechanism
In Use in this Country/Region

Brief Description of Mechanism
Description :
Ministry of Trade and Industry has supported the R&D working the energy sector since the first energy crisis. Support is given to both energy industry and research organisations. The state owned research institute VTT Energy also supports R&D through its own R&D work in energy sector.

Target Audience : Energy industry, research organisations
Total Funds allocated (in USD) : Public funding is about 100 million FIM per year
Energy Saving Target : Not specified (long term effects expected)
Main Issue Addressed by Mechanism :
Year Mechanism Commenced :

Indicators of Success for the Mechanism :
General energy consumption development. New energy efficient products in the market. Export of energy technology.

Broad Policy Goal
Limited energy consumption

Specific Goals for this Mechanism
In the long term, to reduce energy consumption and increase security and safety of energy systems. To accelerate the development of new energy efficient products in the energy industry.

Type of Intervention Activity
Investment support.

Funding Source
Government Agency
Electricity Business
Other
Details of Funding Source :
The state typically provides 10-50% of the necessary funding for energy industry and 50-70% for research organisations.

Implementation Organisation
Government Agency
Electricity Business
Names of Implementing Organisations :
Technology Development Centre TEKES, VTT Energy, other research organisations, and the energy industry.

Sources of Information about the Mechanism

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Results of Implementation

Export by the energy sector (equipment and knowledge) has increased very rapidly during the last years.

Mechanism Category

Investment/Commercialisation Funding

Technology Stage Addressed

Development

Social Carrier Element Addressed

Interest
Power

Market Barriers Addressed

Pay-back Gap

Person Completing Form

Seppo Kärkkäinen

Mechanism Description
Reference Number: FR01

Country	Region
France	

Short Title of Mechanism
FACE - Fund for rural electrification

Status of Mechanism
In Use in this Country/Region

Brief Description of Mechanism
Description :
FACE is a fund for depreciating electricity expenses in rural areas.

In 1995, its Council decided to allocate 70 million French Francs per year to promotion of DSM and decentralised generation based on renewable energies in rural and remote areas. For the 3 years 1995-96-97, this allocation was only half-used. The share of decentralised renewable generation was about 80%, and 20% for DSM programs.

FACE encourages alternative solutions to network upgrading (DSM) and to network expansion (renewable energies). DSM programs are implemented in order to avoid, or delay, reinforcements of overloaded feeders. Therefore the main interest is to limit the peak demand, and not energy consumption.

The first step is to identify the end-uses and devices responsible for the peak load on the part of the grid needing reinforcement. Then, propositions are made according to their cost effectiveness and their acceptability by the consumers. The essential element to be taken into account is the DSM project's impacts on the grid peak load - not of each consumer separately.

Examples of peak load reduction programmes are some electric devices, to reduce the power consumption of devices used during peak load (CFLs), to substitute electric heating by another type of heating, etc.

For decentralised electrification activities, the first step is to identify the electricity needs and to elaborate different possible technical solutions according to local resources. The final choice will be made in accordance with the consumer. An autonomous generating capacity based on renewable energy is acceptable if its cost is lower than the one implied by connection to the existing grid.

For example, a family living far from the existing grid maybe proposed a combination of measures: electricity (photovoltaic) generation, batteries to store electricity in case of bad weather, transformer to pass from direct to alternating current, efficient end-use equipment (CFLs, white goods, etc.), generator for limited use of high voltage equipment.

Target Audience : Consumers in rural and remote areas
Total Funds allocated (in USD) : 70 million FRF per year
Energy Saving Target : Not specified
Main Issue Addressed by Mechanism :
Year Mechanism Commenced : 1995

Indicators of Success for the Mechanism :
Number of projects. Money invested in the projects.

Broad Policy Goal

Rational management of electricity generation and distribution in rural areas

Specific Goals for this Mechanism

The mechanism aims to provide good quality service at an inferior cost for the community by controlling the investment in the grid (for transportation and distribution) and in the electricity generation (reduction of consumption).

Type of Intervention Activity

Subsidisation (to avoid a more costly extension of the grid) thanks to a fund financed by a contribution on electricity prices

Funding Source

Other

Details of Funding Source :

FACE - Fonds d'Amortissement des Charges d'Electrification (Fund for the Depreciation of Electrification Expenses). Financing of FACE is made by a contribution of city consumers (2% of bill) and rural consumers (0.5% of bill). FACE subsidies: 70% of the project cost. VAT refunding: 18% of project cost. (Thus local subsidies and/or consumer participation cost: 12%).

Implementation Organisation

Government Agency

Other

Names of Implementing Organisations :

FACE.Regional authorities.

Comments :

The grid owners (local communities) submit their project proposals 3 times a year to the FACE Restricted Committee. Several institutions participate in this Committee : the Ministry of Agriculture, the Ministry of Industry, rural electrification unions, EDF, FACE and ADEME. About 80% of projects are accepted by the Committee. In the future, it is expected that this ex-ante control will be replaced by an ex-post control of the fund use.

Sources of Information about the Mechanism

ADEME brochure : "Aides financières du FACE", collection: Données et références, Juin 1995

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Results of Implementation

Around 500 projects in 3 years. About 150 million FRF invested in the projects.

Mechanism Category

Subsidies/Grants/Rebates

Technology Stage Addressed

Choice/Application

Social Carrier Element Addressed

Power
Access
Knowledge

Market Barriers Addressed

Not Marginal Cost Pricing

Person Completing Form

JP Tabet / L. Fox

Mechanism Description
Reference Number: FR02

Country	Region
France	

Short Title of Mechanism
Institutional framework supporting energy efficiency

Status of Mechanism
In Use in this Country/Region

Brief Description of Mechanism
Description :
Various types of institutions have a role in the promotion of rational use of energy and/or renewable energy sources.

At the national level, ADEME was created in 1992 as a state industrial and commercial body, under the supervision of three ministries: Environment, Industry, and Research. ADEME has various means of actions at the regional, national and international level:

- research and planning studies:
  - data collection on energy and environment;
  - definition and implementation of applied research projects;
  - economical, technical, sociological, and juridical studies;
- expert advice and consultancy services:
  - to local authorities (where are the stakes and what to do);
  - to enterprises (help them anticipate market changes, new standards and regulations, and integrate energy efficiency and environment in their development strategies),
  - to consumers and citizens (to improve life quality);
  - to consultancy firms (to keep them informed on new technologies); and
  - to government bodies (future legislation and standards, evaluation of public policies);
- Information and awareness campaigns – ADEME implements sectorial programs in industry, agriculture and bio-energy, building and local authorities, transportation and renewable energy sectors.

ADEME also has six cross discipline programmes:

- DSM in all sectors and co-generation;
- development and promotion of green products;
- reduction of CFCs and promotion of replacement products;
- noise pollution control;
- partnership programme with medium-sized towns;
- environmental criteria and decision aids.

At the national level, EDF, the national utility has four main actions for promotion of rational use of electricity:

- research support for new clean and efficient techniques;
- industrial guidance (to orient the market towards more efficiency);
- tariff structure;
- information and awareness campaign.

ADEME and EDF have signed DSM agreements in 1993 and 1996 for a budget of 100 million French Francs each 3 years. These agreements concern the implementation of DSM programs in the 5 following fields:

- industry;
- rural electrification;
- building and commercial sector;
- lighting; and
- domestic appliances.

At the regional government level, Regional Energy and Environment Agencies have been created in about half the 26 administrative French regions. These agencies offer advice and technical assistance to local communities, small and medium-sized companies and industries, the world of agriculture, associations, and individuals. Their global missions are to promote effectively demand and local supply for energy and environment, and to strive for a regionalization of national and European policies in these fields. Their task centres on skilful and fast implementation of public policies. Their means of action are setting up of new projects, assistance to development and research, awareness exercise, information and training.

The regional agencies have created a Network (RAREE - Réseau des Agences Régionales de l'Energie et de l'Environnement - Network of Regional Energy and Environment Agencies) to enhance their synergy and effectiveness by gathering their means while conserving individual autonomy. At the local and city level, different structures have been created, either local agencies, cities agencies or a part of the municipal services dealing especially with energy efficiency.

A number of these structures have been created with the support of the European Commission. Budgets: 1.6 billion French Francs for total ADEME's program support budget in 1997 (including research and development). The budget of Regional Energy Agencies varies from around 1,740 million French Francs for the big Ile-de-France Region to 45 million French Francs in the smaller Poitou-Charentes Region. These budgets include all public energy and environment actions. The total share of environment should be more than 80%; DSM is only a part of the energy budget.

Target Audience : All economic sectors and the general public.
Total Funds allocated (in USD) : 1.6 billion French Francs for total Ademe's programme support budget in 1997 (including research and development).The budget of regional agencies varies from around 1,740 Million French Francs for the big Ile de France Region to 45 million French Francs.
Energy Saving Target :
Main Issue Addressed by Mechanism :
Year Mechanism Commenced :

Indicators of Success for the Mechanism :

Broad Policy Goal

Rational use of energy.

Specific Goals for this Mechanism

The goal of the institutional framework is, through the different existing structures, to design and implement various mechanisms to create favourable conditions so that all kinds of economic agents carry out themselves projects for the improvement of energy efficiency (including DSM), the protection of the environment and the use of renewable energies.

Type of Intervention Activity

Information targeted at different kinds of consumers. Subsidies to projects and research activities. Support to public authorities and legislators. Socio-economic and planning studies and dissemination of the results to concerned operators. Valuation of French competencies at the international level. Organisation of dialogues with different partners and at different levels.

Funding Source

Government Agency
Other

Details of Funding Source :

ADEME's general budget in 1997 come from three different sources:

- State budget allocations from the 3 supervising ministries (21%);
- revenue from four taxes collected and administered by Ademe. The revenue of these taxes is respectively allocated to their environment field;
  - tax on municipal and industrial solid waste (53%);
  - tax on atmospheric pollution (12%);
  - tax on aircraft noise (2%);
  - tax on spent oil (7%);
- own financial resources: around 5% of the budget come from services provided mainly at the European level and sales of ADEME publications.

The budget for energy efficiency (in all sectors) is around 1 million French Francs per year. Regional Energy Agencies are financed on their respective regional budget. Local energy agencies are financed through different level of public budget, and subsidies from the European Commission.

Implementation Organisation

Government Agency
Electricity Business
Other

Names of Implementing Organisations :

ADEME, EDF, Regional, local, city level agencies for energy management and protection. Various associations in all energy consuming sectors.

Sources of Information about the Mechanism

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Results of Implementation

Mechanism Category

Information Provision

Technology Stage Addressed

Development/Choice/Application

Social Carrier Element Addressed

Interest
Power
Organisational ability
Information
Access
Knowledge

Market Barriers Addressed

Externalities
Lack of Information

Person Completing Form

JP Tabet / L. Fox

Mechanism Description
Reference Number: FR03

Country	Region
France	

Short Title of Mechanism
Subsidies to support insulation and building renovation.

Status of Mechanism
In Use in this Country/Region

Brief Description of Mechanism
Description :
The following mechanism addresses all heated dwellings, and not only those using electricity for heating purposes. However, given the importance of electric heating in France for the last 25 years (30% of the energy used for heating purposes in the residential sector, 41% penetration in new residential construction, presence in older dwellings, often poorly insulated), general measures can have important effects on the electricity demand.

Subsidies for different types of housing:
- premiums for housing improvement (Prime à l'amélioration de l'habitat - PAH): 20% of the investment (including heating, energy efficiency, insulation) for low income owners resident in their house for at least 20 years. Expenses for energy efficiency are estimated at 115 million French Francs per year on average (between 1982 and 1993);
- subsidy to overcome insalubrity (Subvention pour la sortie d'insalubrité - SSI): 50% subsidy of the investment, under a certain a limit, for low income owners, if the Prefect issues an Insalubrity Act;
- subsidies from the National Agency for Housing Improvement (Agence Nationale pour l'Amélioration de l'Habitat - ANAH, created in 1971 by the Ministry of Finance) for carrying out audits (up to 50%) and for improvement investment (preferably to install new equipment where there was nothing before). Estimated expenses are, on average, per year 530 million French Francs (between 1980 and 1994). The share of energy efficiency actions in 1993 was around 18%;
- subsidies for improvement of social housing (PALULOS): 20% of the investment (including energy efficiency) in buildings owned by HLM companies (managing social housing). Estimated expenses, on average, per year, are around 1 000 million French Francs (between 1982 and 1993).

Information:
- National Federation for Rural Housing (Fédération Nationale de l'Habitat Rural - FNHR) informs, trains and provides administrative advice to rural population on how to repair their houses, change heating systems, etc. and benefit from various subsidy schemes;
- Pact Arim Associations: Around 150 centres providing technical and administrative advice for improvement and transformation of housing.

Target Audience : House and building owners (private and public) in the residential sector.
Total Funds allocated (in USD) : (see above for each measure)
Energy Saving Target : Not specified
Main Issue Addressed by Mechanism :
Year Mechanism Commenced :

Indicators of Success for the Mechanism :
Energy saved in the residential sector in the long term.

Broad Policy Goal

Limited electricity consumption.

Specific Goals for this Mechanism

To reduce the energy (and therefore electricity) consumption in the residential sector, mainly for heating purposes.

Type of Intervention Activity

Subsidy. Information.

Funding Source

Other

Details of Funding Source :

There are different funding sources : - The State, for tax reduction,- Ministry of Housing,- ANAH (for more detail see "Description" above).

Implementation Organisation

Government Agency

Names of Implementing Organisations :

Ministry of Housing, ANAH, Pact Arim associations, FNHR.

Sources of Information about the Mechanism

Ademe Paris
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75015 Paris
France
Phone: +33.1.47.65.20.00

Results of Implementation

On the general level, this mechanism seems to have been effective since energy consumption for heating purposes in the residential sector has strongly decreased between 1973 and 1994 (the unit consumption went down from 379 kWh/m2 in 1973 to 247 kWh/m2 in 1994).

Mechanism Category

Subsidies/Grants/Rebates

Technology Stage Addressed

Choice

Social Carrier Element Addressed

Interest
Power
Information

Market Barriers Addressed

Pay-back Gap

Person Completing Form

JP Tabet / L. Fox

Mechanism Description
Reference Number: FR04

Country	Region
France	

Short Title of Mechanism
Energy labelling for residential appliances

Status of Mechanism
In Use in this Country/Region

Brief Description of Mechanism
Description :
Labelling of residential appliances according to a European Directive has been mandatory in France since October 1995 (first for white goods). In France, white goods represented in 1993, 5% (18 TWh) of the total electricity consumption. It was one of the largest shares of electricity consumption for households (36% - without electric heating).

Information provided by the EU label to the consumer concerns:
- brand, model;
- energy classification (from A-efficient to G-non-efficient);
- the electricity consumption in kWh/year;
- volume of refrigerators and freezers;
- the freezing capacity;
- the noise level.

The new EU label replaced a former French label which was not particularly helpful to consumers. It was small, not explicit (consumption given in kWh/24h), sometimes with incorrect information, and more or less hard to find, if present. Consumers and salesmen were ignoring it, underestimating the electric consumption cost of white goods.

Some regions have taken the opportunity of this labelling mechanism and of the DSM Ademe / EDF Agreement (other mechanism) to launch projects implying retailers. (There is now a national campaign going on). These projects allowed to identify under which conditions this labelling mechanism can be best used. The idea was to accompany the new label and make its use more effective by helping retailers willing to participate to modify their range of products, and shift it towards more energy efficient products - through a work on product data base to guide the purchase staff, training for salesmen, and an information campaign to the general public.

Target Audience : Consumers of appliances, in some cases retailers
Total Funds allocated (in USD) : Not specified
Energy Saving Target : Not specified
Main Issue Addressed by Mechanism :
Year Mechanism Commenced : 1995

Indicators of Success for the Mechanism :
Consumer awareness of the label. Energy saved. Market share of efficient appliances.

Broad Policy Goal
Limited electricity consumption.

Specific Goals for this Mechanism

To influence the residential appliance market by informing consumers at the time of purchase so that they are able to compare the energy consumption of different products. Eventually, to change the behaviour of consumers towards buying more energy efficient products.

Type of Intervention Activity

Information (the label is seen as support for decision-making).

Funding Source

Government Agency
Electricity Business
Other

Details of Funding Source :

Retailers are responsible for the presence of the label on every product they display. Retailers are also supporting and will support the logistic efforts that may be linked to this task. In the case of support to retailers in the introduction of the label, complementary funding sources for awareness campaigns, communication tools and training come from regional authorities (in the framework of regional projects), Ademe, and EDF.

Implementation Organisation

Government Agency
Electricity Business
Other

Names of Implementing Organisations :

In the case of support to retailers to accompany the introduction of the label, implementing organisations are regional authorities, including Regional Energy Agencies, Ademe and EDF, and their regional offices.

Comments :

If such a support is not organised, retailers have to implement themselves the labelling of their products.

Sources of Information about the Mechanism

Information about the label and accompanying activities can be obtained from the ARE which inititally developed the project, as well as from Ademe and EDF, today in charge of the national campaign.

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Contact person: Christine Collaert

Results of Implementation

Not available yet. An evaluation of the first pilot project implemented in the Region Nord Pas de Calais is ongoing (January 1998). It will allow the estimation of the saved energy and the cost of the saved kWh during the campaign.

Mechanism Category

Information Provision

Technology Stage Addressed

Choice

Social Carrier Element Addressed

Interest
Power
Information

Market Barriers Addressed

Lack of Information

Person Completing Form

JP Tabet / L. Fox

Mechanism Description
Reference Number: FR05

Country	Region
France	Overseas territories (DOM)

Short Title of Mechanism
Tax exemption for development of overseas territories.

Status of Mechanism
In Use in this Country/Region

Brief Description of Mechanism
Description :
In order to support the economic development of overseas territories, a law targeting income tax payers allows to exempt from taxation the share of the income which is invested in "productive activities" in the overseas territories (DOM - Guadeloupe, Martinique, Reunion and Guyane). The tax is calculated on the income; the money invested in the DOM is blocked for a certain number of years but then free of tax. Financial companies have been created in order to collect this money and invest it into businesses authorised by the Ministry of Finance (most often tourism activities). As a result a solar water heater initiative has been developed in the DOM with participation of DOM local authorities (mainly Guadeloupe and Martinique), Ademe, and EDF.

Because of the "perequation" tariff (geographical tariff equalisation) on all the French territory, the kWh in overseas territories is sold at half the price of its generation cost. Non specific uses of electricity such as heating water are thus highly subsidised and the electricity consumption is growing fast (+ 4 to 8% per year). The scheme used in the DOM as follows. A financial firm invests - with the income exempted from taxation - in an enterprise which buys solar water heaters from producers and installs them for a price comparable to that of an electric device. This enterprise also manages the solar water heater systems by collecting the consumer's quarterly rent and organising the maintenance service. For the consumer, the solar solution is then quite comparable to the electric water heater.

Target Audience : Energy service companies in the overseas territories
Total Funds allocated (in USD) : Not specified
Energy Saving Target : Not specified
Main Issue Addressed by Mechanism :
Year Mechanism Commenced : 1996

Indicators of Success for the Mechanism :
Number of solar water heaters installed. Societal savings (community level).

Broad Policy Goal
Diffusion of energy efficient technologies.

Specific Goals for this Mechanism
This mechanism does not promote DSM activities but can be used as a new financing mechanism. It overcomes the investment barrier at consumer level of an equipment for the consumer and the community. The investment is fully recovered over the equipment life time. Furthremore, it provides a service (in this case, hot water) instead of equipment (a water heater).

Type of Intervention Activity
Tax exemption. Information to consumers (by ADEME, EDF and local authorities).

Funding Source

Government Agency
Electricity Business

Details of Funding Source :

The State, by renouncing some fiscal revenue. Ademe, EDF and regional authorities, by providing subsidies to the operation - at least at the beginning of the operation - and organising an awareness campaign.

Implementation Organisation

Government Agency
Electricity Business

Names of Implementing Organisations :

ADEME Guadeloupe and Martinique. EDF Guadeloupe and Martinique.

Sources of Information about the Mechanism

Information is available from Ademe and EDF.

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EDF Guadeloupe
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Fax: +33.590.82.41.80

Results of Implementation

This tax exemption has been severely criticised as a fiscal tool. However, it remains an interesting tool. It seems that this mechanism is costly for the state. The fiscal cost for the state is higher than the cost of installed solar water heaters. There is an advantage compared to electric water heaters for the user (even if the consumer is not the one profiting the most from the public support). Solar water heaters cost 500 FRF less for installation compared to electric heaters in the framework of this specific law and the monthly operation cost is 83 FRF compared to a 100 FRF electricity bill. This mechanism has made the orders for solar water heaters in the overseas territories jump from 1,500 to 5,500 pieces per year. Economic evaluation has not yet been validated: The forecasted savings are 12 GWh/year and 600 GWh for the next 10 cumulative years (assuming 6,000 pieces installed per year).

Mechanism Category

Tax Payable/Tax Exemption

Technology Stage Addressed

Development/Choice

Social Carrier Element Addressed

Interest

Market Barriers Addressed

Externalities
Pay-back Gap

Person Completing Form

JP Tabet / L. Fox

Mechanism Description
Reference Number: FR06

Country	Region
France	

Short Title of Mechanism
Energy standard in the residential & service sector

Status of Mechanism
In Use in this Country/Region

Brief Description of Mechanism
Description :
The following mechanism addresses all heated dwellings, and not only those using electricity for heating purposes. However, given the importance of electric heating in France for the last 25 years (30% of the total energy used for residential heating purposes in the residential sector and 41% penetration in new residential constructions), general measures can have important effects on the electricity demand.

In France, thermal standard concerns all the energy sources used in new construction in the residential and service sector. Following the first oil shock in 1974, the French public authorities began to establish an evolutional legal and regulatory frame. On the one hand in 1974 a set of standards concerning energy use in new and existing buildings were introduced (covering energy control and distribution, temperature limitation, remuneration for heating exploitation, heat metering and energy equipment insulation). On the other hand, thermal standards for new buildings were successively established in 1974, 1982, and 1988 (targeting heating and water heating consumption through the improvement of the building envelope).

The law is a performance-based type of law, which takes into consideration that there are different ways to obtain good results for a fixed level of efficiency. The law states that there are four means to prove that the building will not consume more than the determined level:

- for small constructors, the law is rather normative since they often construct the same type of building: regarding orientation, space heating, thickness of the insulation, etc.;
- the constructor can show that he will respect the reference "GV coefficient", which represents the level of heat losses through the envelope, and the energy needed to heat the air for sanitary purposes;
- the same idea exists for the "BV coefficient", which concentrates on heat losses;
- finally the constructor can chose any option provided the building will not consume more than a reference consumption. However, these are ante-theoretical calculation which are not checked ex-post.

A new standard is now under preparation which will increase the minimum levels of insulation and simplify the standard for service sector premises.

Target Audience : New construction in the residential and service sector (owners and tenants).
Total Funds allocated (in USD) : Not specified.
Energy Saving Target : In 1980, the objective for 1985 was to cut the consumption in new houses by half compared to those built before 1974. In 1988, the aim was to reduce energy consumption for heating and hot water by 50% compared to new housing under the 1974 regulation.
Main Issue Addressed by Mechanism :
Year Mechanism Commenced : 1974

Indicators of Success for the Mechanism :
Energy saved in residential and service sector buildings.

Broad Policy Goal

Overall energy savings

Specific Goals for this Mechanism

Energy saved in residential and service sector buildings.

Type of Intervention Activity

Standard, i.e. mandatory global performance standard for residential and service sector buildings.

Funding Source

Other
Details of Funding Source :
Building owner or tenant carry the incremental costs, if any.

Implementation Organisation

Government Agency
Names of Implementing Organisations :
Ministry of Housing.

Sources of Information about the Mechanism

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Contact person: Mr. Seror

EDF
Direction du Developpement
21 rue Louis Murat
75 008 Paris
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Fax: +33.1.40.42.30.26
Contact person: Mr. Berhondo

Results of Implementation

The general standard was judged positive because:

- by the end of 1985, the construction sector achieved an annual improvement of energy savings of 1.125 Mtoe compared to the desired figure of 1.8Mtoe. In 1988, the aim was to reduce energy consumption for space and hot water heating by 50% compared with new housing 1974 standard. The result was a 40% energy saving;
- based on demonstration cases (experimental anticipation of the regulation), it was elaborated in partnership with market operators to evaluate the extra cost of insulated buildings acceptable by building contractors (+1.5% was seen as reasonable);
- choice was made in favour of performance-based regulation instead of a normative standard, leaving freedom of initiative to contractors;
- the standard was enforced step by step, market operators being informed of the evolution and having time to prepare themselves;
- the government at first provided subsidies to help the duplication of successful demonstration cases, to ensure the durability of the standard's implementation.

However, from the report "Evaluation of the Energy Conservation Policy in France", it appears that:

- the standard has been respected in the social and collective housing sector and less applied in the private construction sector;
- the potential of the standard is not used (it seems that calculations are made to justify a construction more than to direct it);
- the standard achieved its global saving goals and is thus economically justified, but did not succeed in installing a relative flexibility concerning technical choices.

Mechanism Category

Regulation/standards/Codes of Practice

Technology Stage Addressed

Choice

Social Carrier Element Addressed

Interest

Market Barriers Addressed

Disconnected Decision-maker

Person Completing Form

JP Tabet / L. Fox

Mechanism Description
Reference Number: FR07

Country
France

Region

Short Title of Mechanism
Fiscal measures to encourage energy efficiency in the industrial sector

Status of Mechanism
In Use in this Country/Region

Brief Description of Mechanism
Description :
Three fiscal mechanisms have been elaborated by the State to promote energy efficiency in the industrial sector:

- fiscal advantages are given to authorised companies (SOFERGIEs) which finance energy savings. This scheme was enforced in 1980. These companies are exempted of tax under certain conditions and they benefit from a specific depreciation system;
- a special regime for depreciation of energy efficient equipment (this mechanism resulted in a 2-5% subsidy over the life time of the installation) - Laws of 1997 and 1991;
- a specific 50% reduction of the professional tax on energy efficient or environmentally friendly equipment purchased between 1992 and 1998 (if local authorities agree, this tax deduction can reach 100%).

Target Audience : Small and medium size industrial enterprises that do not have an easy access to capital
Total Funds allocated (in USD) : Not specified
Energy Saving Target : Not specified
Main Issue Addressed by Mechanism :
Year Mechanism Commenced :

Indicators of Success for the Mechanism :

Broad Policy Goal
Limited energy consumption

Specific Goals for this Mechanism
Create favourable conditions for energy efficiency through creating a the legal framework allowing SOFERGIEs to exist (the advantageous tax regime will support SOFERGIEs in providing "third party financing" offer that can identify, study, carry out and finance energy saving investments and pay itself on the resulting savings), and encouraging industrial enterprises to purchase energy efficient equipment.

Type of Intervention Activity
Indirect subsidy by tax reduction and special fiscal regimes.

Funding Source
Government Agency
Details of Funding Source :
The State. In some cases, local authorities.

Implementation Organisation

Government Agency

Names of Implementing Organisations :

Ademe

Comments :

Mainly regional offices of ADEME because they are close to the field and industrial customers, and manufacturers of energy efficient equipment inform industrial customers on the existence of these fiscal regimes. SOFERGIEs handle their own promotion.

Sources of Information about the Mechanism

Ademe Paris
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75015 Paris
France
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Results of Implementation

According to a recent report "Evaluation on the energy conservation policy in France", there are at present 22 SOFERGIEs (but 7 companies carried out 81% of the production in 1993). It seems that they had until now a very limited role, and their fiscal advantages do not show in the financing conditions they offer. The oil counter shock and the decreasing prices of energy stopped almost all third party financing initiatives. For the special regimes for equipment depreciation and tax deduction, it was not possible to evaluate this modest support, which is nevertheless considered to be a commercial argument for manufacturers of energy efficient and environmental friendly equipment for which this mechanism apply.

Mechanism Category

Tax Payable/Tax Exemption

Technology Stage Addressed

Choice

Social Carrier Element Addressed

Interest
Power

Market Barriers Addressed

Pay-back Gap

Person Completing Form

JP Tabet / L. Fox

Mechanism Description
Reference Number: FR08

Country
France

Region

Short Title of Mechanism
Tax reduction to support building renovation.

Status of Mechanism
In Use in this Country/Region

Brief Description of Mechanism
Description :
The mechanism addresses all heated dwellings, and not only those using electric heating. However, given the importance of electric heating in France for the last 25 years (30% of the energy used for heating purposes in the residential sector, 41% penetration in new residential constructions, presence in older dwellings, often poorly insulated), general measures can have important effects on the electricity demand.

The mechanism provides fiscal incentives through tax reduction for energy efficiency investments in the residential sector. Between 1974 and 1997, the scheme of fiscal incentives was modified 15 times. Until 1985, fiscal deductions were accepted in the specific case of energy efficiency investments up to a certain amount. After 1985, no distinction is made between "energy efficiency works" and "important repair works" and does thus not allow evaluation of the impact of these works in term of energy savings. The estimated cost for the State of this fiscal scheme, concerning "energy investments" and not specifically "energy efficiency investments", was around 13,150 million French Francs between 1975 and 1993.

Target Audience : Residential sector
Total Funds allocated (in USD) : (See above)
Energy Saving Target : Not specified
Main Issue Addressed by Mechanism :
Year Mechanism Commenced :

Indicators of Success for the Mechanism :
Energy saved in the residential sector in the long term

Broad Policy Goal
Limited energy consumption.

Specific Goals for this Mechanism
To reduce the energy (and therefore electricity) consumption in the residential sector, mainly for heating purposes.

Type of Intervention Activity
Tax reduction.

Funding Source
Government Agency
Details of Funding Source :
The State.

Implementation Organisation

Other

Names of Implementing Organisations :

Various constructors/renovators.

Sources of Information about the Mechanism

Ademe Sophia Antipolis
Direction du Bâtiment
Phone: +33.4.93.95.79.47
Contact Person: Mr. Herant

Results of Implementation

The fiscal scheme applied today is viewed more as a tool to support the constructors/renovators than as an energy efficiency mechanism supporting building owners and tenants. The expected share of free riders is around 100% in the situation of unavoidable investments. However, it remains a rare occasion to speak of energy efficiency in the specialised press.

Mechanism Category

Tax Payable/Tax Exemption

Technology Stage Addressed

Choice

Social Carrier Element Addressed

Interest
Power

Market Barriers Addressed

Pay-back Gap

Person Completing Form

JP Tabet / L. Fox

Mechanism Description
Reference Number: FR09

Country	Region
France	

Short Title of Mechanism
Endorsement labels for new constructions in the residential sector

Status of Mechanism
In Use in this Country/Region

Brief Description of Mechanism
Description :
The mechanism addresses mainly dwellings using electricity for heating and cooling purposes. Given the importance of electric heating in France for the last 25 years (30% of the energy used for heating purposes in the residential sector, 41% penetration in new residential constructions), general measures can have important effects on the electricity demand.

Several endorsement labels have been created in order to certify mainly new residential buildings. These endorsement labels are different from the ones found for example on appliances. They are not meant to push people to buy. They certify three elements that have consequences on the electricity consumption:

- safety of electric installation;
- insulation level (sometimes higher than the level demanded by law); and
- use of efficient equipment.

Moreover, the endorsement labels give access to a subsidy; important premiums and supports are granted by EDF to encourage people to ask for these endorsement labels. The EDF label "Vivrelec" targets 4 aspects in new constructions: guarantee of a high level thermal insulation, high quality electric devices for heating and cooling, energy management equipment & specific tariff, and associated services. The label "Promotelec" has been developed with support from EDF to encourage consumers and building contractors to build electricity safe, well insulated and well equipped new houses (there are different versions of the label depending on the type of buildings and level of comfort). A premium is given if the new construction respects a list of parameters concerning insulation and installation of efficient electric devices, especially for heating purposes.

In the overseas territories, the standard adapted to metropolitan climate does not apply. However, there are 20,000 new buildings per year, generally poorly insulated against heat. Tenants often equip themselves with inefficient device for cooling and/or hot water production purposes. Because of the "perequation" tariff (geographical equalisation tariff) on all the French territory, the kWh in overseas territories is sold at half the price of its generation and transportation cost. Electricity use is thus highly subsidised and electricity consumption is growing fast (+ 10% per year). Therefore, Ademe and EDF have created a label for new constructions, "ECODOM", which specifies insulation levels adapted to the climatic and economic situation of overseas territories.

Target Audience : Constructors of residential buildings.
Total Funds allocated (in USD) : Not specified
Energy Saving Target : Not specified
Main Issue Addressed by Mechanism :
Year Mechanism Commenced :

Indicators of Success for the Mechanism :
Number of labels granted

Broad Policy Goal

Safety and quality of installations.

Specific Goals for this Mechanism

Energy safety, good insulation, and therefore, savings in residential buildings (mainly heating).

Type of Intervention Activity

Endorsement labelling which may be used as a promotion tool for building contractors.

Funding Source

Government Agency
Electricity Business

Details of Funding Source :
For "Vivrelec" and the "Promotelec" label, premiums and supports are granted by EDF. For the "ECODOM" label, Ademe and EDF co-operate.

Implementation Organisation

Electricity Business
Other

Names of Implementing Organisations :
EDF and building contractors for Vivrelec. Promotelec (Association for the Promotion of Quality Electric Installation) and building contractors for Promotelec labels.

Sources of Information about the Mechanism

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EDF Paris
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21 rue Louis Murat
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Contact Person: Mr. Berhondo

For the overseas territories label ECODOM
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630 Bd du Marquisat de Houlebourg
97122 Baie Mahault
Guadeloupe
Phone: +33.590.26.78.05
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EDF Guadeloupe
Direction commerciale et Maîtrise de l'Energie
Rue Euvremont-Gène
Bergerin
BP 45397164
Pointe-à-Pitre Cedex
Guadeloupe
Phone: +33.590.82.40.37
Contact person: François Claire

Results of Implementation

A total of 257 building obtained the ECODOM label in 1997 (but it is still is too early to estimate the associated savings).

Mechanism Category

Subsidies/Grants/Rebates

Technology Stage Addressed

Choice

Social Carrier Element Addressed

Interest
Power

Market Barriers Addressed

Lack of Information

Person Completing Form

JP Tabet / L. Fox

Mechanism Description
Reference Number: FR10

Country
France

Region

Short Title of Mechanism
Special Fund for Large Operations (Fonds Special de Grands Travaux)

Status of Mechanism
Formerly Used in this Country/Region
Reasons why is no longer used:
The mechanism was abandoned in 1986 because of state budget restrictions and a wish to reduce the public debt.

Brief Description of Mechanism
Description :
In use 1982-86. The Special Fund for Large Operations (FSGT) was created as a national body in 1982, with the general mission to contribute to equipment works in different fields: infrastructure for public transportation, road traffic, and energy savings. In the field of energy savings, it consisted of subsidies proportional to the amount of the considered investment in the industrial sector, commercial sector, agricultural sector, public buildings, etc. For example, the guideline in the industrial sector was to support investments for introduction of innovative and "risky" technologies bringing energy savings.

Target Audience : For the energy saving part - all energy consumers.
Total Funds allocated (in USD) : 3.3 billion FRF (1982-1985 included)
Energy Saving Target : 3 MTOE distributed on 28,000 operations.
Main Issue Addressed by Mechanism :
Year Mechanism Commenced :

Indicators of Success for the Mechanism :
Tonne oil equivalent (TOE) savings. Number of projects receiving suppport. Invested capital.

Broad Policy Goal
General energy efficiency.

Specific Goals for this Mechanism
The goal of this mechanism, within the energy sector, was to disseminate massively the technologies and know how for rational use of energy in the economic system (in a context of high energy prices). The main objective was to help each consumers to reduce the relative share of energy costs in their budget, whether it led to a gain in competitiveness by cutting the production cost (in industry) or to reduced operating cost to the advantage of other priority budgetary items (in the service and commercial sectors).

Type of Intervention Activity
Investment support.

Funding Source
Other
Details of Funding Source :
The FSGT was financed by a specific tax on oil products and public loans (which were to be progressively reimbursed by the income of the specific tax).

Implementation Organisation

Government Agency

Names of Implementing Organisations :

The FSGT was a public body, with a financial autonomy under the responsibility of the Ministry of Finance. The financial contributions were allocated in the form of subsidies to public bodies, among which, for the energy saving part, various ministries and AFME (The French Agency for Energy Management - this agency merged with two other agencies dealing with air pollution and waste management to create ADEME in 1992).

Comments :

The funds strictly concerning energy efficiency were mainly allocated by the regional teams of AFME which favoured the "door-to-door" approach, technical assistance to the definition of projects, and project monitoring for the least structured economic actors.

Sources of Information about the Mechanism

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France
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Fax: +33 1 46 45 52 36

Results of Implementation

From August 1982 to December 1985, out of the 18 billions Francs which the FSGT represented, 7.9 billions were dedicated to energy savings. Of these 4.6 billions were put to various projects with "energy goals" in the residential sector, public buildings, and construction of a dam while 3.3 billions were managed by AFME in the form of investment support. These 3.3 billions led to a total investment of 16.5 billions Francs (the majority in the industrial sector). The average investment per saved tonne oil equivalent was 5,400 Francs. The average subsidy per saved tonne oil equivalent was 1,050 Francs.

The rules guiding the FSGT's allocations were:

- promotion of profitable investments (maximum price to the tonne oil equivalent saved or substituted);
- maximisation of the multiplier effect for public funds;
- assurance of consistency with other existing funding procedures.

Another interest - in addition to its decentralised management (see above) - is that the FSGT was conditioned to a detailed calculation of the pay-back period (which was to be above 5 years), in order to exclude operations with high profitability for which the consumer would have invested anyway (in order to avoid free-riders).

A relatively low profitability of subsidised projects was the sign of selectivity of the projects benefiting from non-reimbursable funds (presenting an innovative character and a cost reduction perspective in the frame of a larger dissemination), the most profitable projects being oriented towards more adapted procedures, less costly for the community.

Mechanism Category

Investment/Commercialisation Funding

Technology Stage Addressed

Development/Choice

Social Carrier Element Addressed

Interest
Power

Market Barriers Addressed

Pay-back Gap

Person Completing Form

J.P. Tabet / L. Fox

Mechanism Description
Reference Number: FR11

Country	Region
France	Overseas Départements

Short Title of Mechanism
Payment of low consumption bulbs on electricity bills

Status of Mechanism
Formerly Used in this Country/Region
Reasons why is no longer used:
During this action, about 700,000 lamps were sold to 130,000 customers. The cost of modifying the billing system to accommodate gradual customer payment of the lamp cost was relatively high. Still, the mechanism was attractive in overseas French departments due to their high cost of electricity. In the metropolitan territory, extension of this action was economically unjustified due to a more complex and sophisticated computerised billing system and lower generation cost.

Brief Description of Mechanism
Description :
In use 1989-92. In two French overseas Départements of the French West Indies (Guadeloupe and Martinique), consumers were offered to buy one or more low consumption bulbs (LCB) from regular commercial distributors (the maximum was 8 bulbs). With an agreement between EDF, ADEME, manufacturers, and distributors, the price of the LCBs was kept the same. The consumers paid a quarter of the price directly and the remaining three quarters via their next six electricity bills (12 months). EDF, the French national utility responsible for the distribution and billing, paid back the distributors on presentation of a buying proof. In addition, ADEME, EDF, and local government paid for a large awareness campaign.

Target Audience : All residential customers (200,000)
Total Funds allocated (in USD) : 1,000,000 FRF (excl. billing system costs)
Energy Saving Target : 8 MW peak load and 50 GWh/year
Main Issue Addressed by Mechanism :
Year Mechanism Commenced :

Indicators of Success for the Mechanism :
Peak load savings. Energy savings, Number of sold LCBs.

Broad Policy Goal
Electricity price reduction

Specific Goals for this Mechanism
The goals of this mechanism was to overcome the barrier of the high price of LCBs compared to incandescent bulbs (90 F compared to 6 F). Even if the pay-back time of LBS is around 3-4 years with a lifetime of 8 years, consumers are more concerned about the purchase price than potential future savings and do therefore not to a significant extent use this product. Charging the main part of the incremental cost to the electricity bill makes the savings more visible since the costs are counteracted by electricity savings during the period of the six payment instalments.

Type of Intervention Activity
Free credit for investment.

Funding Source

Government Agency
Electricity Business
Details of Funding Source :
ADEME, EDF and local government:

- negotiation with manufacturers and distributors;
- advertising campaign;
- evaluation study.

EDF:

- extra billing process costs
- 12 months free credit.

Implementation Organisation

Government Agency
Electricity Business
Names of Implementing Organisations :
EDF, ADEME, Conseil Régional de Guadeloupe, and Conseil Régional de Martinique.

Sources of Information about the Mechanism

ADEME
Délégation Régionale Guadeloupe
Forum Jarry
rue Ferdinand Forest
97122 Baie Mahault
Guadeloupe
Phone: +590 26 78 05
Fax: +590 26 87 15

ADEME
Délégation Régionale Martinique
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Martinique
Phone: +596 63 51 42
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Centre EDF-GDF Service Guadeloupe

Centre EDF-GDF Service Martinique

Results of Implementation

8 MW reduction of the 133 MW peak load and 50 GWh saving on the annual consumption in the Guadeloupe Département.

Mechanism Category

Investment/Commercialisation Funding

Technology Stage Addressed

Choice

Social Carrier Element Addressed

Interest
Power
Information

Market Barriers Addressed

Pay-back Gap

Person Completing Form

J.P. Tabet / L. Fox

Mechanism Description
Reference Number: GR01

Country	Region
Greece	Crete

Short Title of Mechanism
IRP for the Island of Crete

Status of Mechanism
Proposed for Use in this Country/Region

Brief Description of Mechanism
Description :
Development of an Energy Plan for the island of Crete based on the IRP Planning Methodology and proposal of the appropriate implementation strategy. Under the IRP, DSM options will be examined and their potential penetration rate will be estimated.

Target Audience : Utilities
Total Funds allocated (in USD) : Not specified
Energy Saving Target : Not specified
Main Issue Addressed by Mechanism :
Year Mechanism Commenced : 1996

Indicators of Success for the Mechanism :
IRP plan for Crete. Avoided supply capacity expansion.

Broad Policy Goal
Secure and cost-effective resource exploitation

Specific Goals for this Mechanism
IRP plan for Crete. Avoided supply capacity expansion i.e. construction of a conventional power unit. Assessment of the possibilities for exploiting renewable energy resources and demand-side management.

Type of Intervention Activity
Integrated resource planning activity which will review not only traditional supply opportunities but also the possibilities for exploiting renewable energy resources and demand-side management.

Funding Source
Government Agency
Other
Details of Funding Source :
The project is financed by EU SAVE I and the Regional Energy Agency of Crete.

Implementation Organisation
Government Agency
Other
Names of Implementing Organisations :
The project is implemented by the Regional Energy Agency of Crete with support from the Centre for Renewable Energy Sources, Greece and SRC International ApS, Denmark in cooperation with the local utilities.

Sources of Information about the Mechanism

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Koundourioti sq.71202
Heraklion
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Contact: Mr. Nicolas Zografakis

Results of Implementation

The IRP plan is under development.

Mechanism Category

IRP and Co-operation

Technology Stage Addressed

Development

Social Carrier Element Addressed

Interest
Information

Market Barriers Addressed

Not Marginal Cost Pricing

Person Completing Form

K. Anastasopoulos

Mechanism Description
Reference Number: GR02

Country	Region
Greece	

Short Title of Mechanism
Least Cost Planning for Greece

Status of Mechanism
Proposed for Use in this Country/Region

Brief Description of Mechanism
Description :
Using integrated resource methodology a medium-term least cost energy plan is developed for Greece including all energy sectors.

Target Audience : Utilities
Total Funds allocated (in USD) : Not specified
Energy Saving Target : Not specified
Main Issue Addressed by Mechanism :
Year Mechanism Commenced : 1994

Indicators of Success for the Mechanism :
Integrated Resource Plan. Implementation of plan recommendations.

Broad Policy Goal
Socio-economically cost-effective energy exploitation

Specific Goals for this Mechanism
Integrated Resource Plan. Assessment of the possibilities for exploiting renewable energy resources and demand-side management.

Type of Intervention Activity
Least cost planning activity which includes all energy sectors and the possibilities for exploiting renewable energy resources and demand-side management.

Funding Source
Government Agency
Electricity Business
Other
Details of Funding Source :
The project is financed by EU SAVE I and The Public Power Corporation of Greece, The Public Petroleum Corporation of Greece S.A., The Public Gas Corporation, and The National Energy Board.

Implementation Organisation

Government Agency
Electricity Business
Other

Names of Implementing Organisations :

The Centre of Renewable Energy Sources (prime contractor), The Public Power Corporation of Greece, The Public Petroleum Corporation of Greece S.A., The Public Gas Corporation, and The National Energy Board

Sources of Information about the Mechanism

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Contact: Mr. P. Gavrielides

Results of Implementation

The least cost plan is under implementation.

Mechanism Category

IRP and Co-operation

Technology Stage Addressed

Development

Social Carrier Element Addressed

Interest
Information

Market Barriers Addressed

Externalities

Person Completing Form

K. Anastasopoulos

Mechanism Description
Reference Number: GR03

Country
Greece

Region

Short Title of Mechanism
DSM in Health Care Facilities

Status of Mechanism
Proposed for Use in this Country/Region

Brief Description of Mechanism
Description :
Identification of the energy consumption pattern and need of health care facilities and analysis of the potential for demand side management measures using pilot sites. Based on the collected information an action plan for reducing and shifting the consumption of the health care facilities is drawn up and implemented.

Target Audience : Utilities
Total Funds allocated (in USD) : Not specified
Energy Saving Target : Not specified
Main Issue Addressed by Mechanism :
Year Mechanism Commenced : 1996

Indicators of Success for the Mechanism :
Pilot site activity. Action plan.

Broad Policy Goal
Secure and cost-effective resource exploitation

Specific Goals for this Mechanism
Establishment of a solid database on the energy consumption and need of health care facilities.
Identification of the possibilities for reducing energy consumption or shifting power load the facilities.
Action plan for implementation of cost-effective measures.

Type of Intervention Activity
DSM planning

Funding Source
Government Agency
Other
Details of Funding Source :
The project is funded by EU SAVE II.

Implementation Organisation
Other
Names of Implementing Organisations :
Strategic Planning, Effective Engineering & Development Ltd, Greece, Agence Regionale de l'Energie Provence-Alpes-Cote d'Azur, France (prime contractor), Universidade de Coimbra, Portugal.

Sources of Information about the Mechanism

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France
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Fax: +33 4 9191 9436
Contact: Ms. Dominique Flahaut

Results of Implementation

Not available since the project is still being implemented.

Mechanism Category

IRP and Co-operation

Technology Stage Addressed

Development

Social Carrier Element Addressed

Interest
Information

Market Barriers Addressed

Not Marginal Cost Pricing

Person Completing Form

K. Anastasopoulos

Mechanism Description
Reference Number: GR04

Country	Region
Greece	Greek Islands

Short Title of Mechanism
DSM Action Programme for the Public Sector of Island Cities

Status of Mechanism
In Use in this Country/Region

Brief Description of Mechanism
Description :
Development of a DSM Action Programme for the island cities of Corfu, Mykonos, Crete (Chania) and Chios. The programme will identify the most economical and environmentally friendly DSM options for the local authorities and public energy needs in particular and specify a realistic implementation strategy. The islands face special energy problems such as high energy costs, energy and capacity shortage, difficulties in licensing new thermal power plants, and pollution.

Target Audience : Utilities and public authorities
Total Funds allocated (in USD) : Not specified
Energy Saving Target : Not specified
Main Issue Addressed by Mechanism :
Year Mechanism Commenced : 1996

Indicators of Success for the Mechanism :
DSM Action Programme. Implementation of the DSM Action Programme.

Broad Policy Goal
Secure and cost-effective resource exploitation

Specific Goals for this Mechanism
DSM Action Programme. Implementation of the DSM Action Programme.

Type of Intervention Activity
Development of a DSM Action Plan for the most critical energy needs.

Funding Source
Other
Details of Funding Source :
The project is financed by EU (SAVE II), the Municipalities of the islands Mykonos and Chios and the Municipal Enterprise for Water and Sewerage of Chania (Crete).

Implementation Organisation
Other
Names of Implementing Organisations :
The project is implemented by the municipalities of the islands Chios and Mykonos, the Development Corporation of the municipality of island Corfu, the Municipal Corporation for Water and Sewerage of Chania (Crete), the Energy Offices of Crete, Cyclades and Ionian Islands, ANEDK of Corfu and local experts of Corfu and Chania.

Sources of Information about the Mechanism

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Results of Implementation

Not available since the project is under implementation.

Mechanism Category

IRP and Co-operation

Technology Stage Addressed

Development

Social Carrier Element Addressed

Interest
Information

Market Barriers Addressed

Not Marginal Cost Pricing

Person Completing Form

K. Anastasopoulos

Mechanism Description
Reference Number: GR05

Country	Region
Greece	**Islands not interconnected with the mainland**

Short Title of Mechanism
Diffusion of energy efficient appliances (residential customers)

Status of Mechanism
In Use in this Country/Region

Brief Description of Mechanism
Description :
Diffusion of energy efficient appliances (at present energy efficient lamps). Support to the various stakeholders (customers, producers, retailers etc.) by using action research in such a way that the appropriate "social carrier of technology" is developed. PPC sends the residential customers a voucher which entitles them to buy efficient appliances in retail shops without paying. The retailers who are guaranteed a certain profit in accordance with an agreement with the producers, then bring the vouchers to the PPC offices and receive the amount in question. PPC then incorporates the amount into the customers electricity bill in smaller rates without charging interest. The producers lower their product prices in return for an expected increase in sales. A step-by-step approach (action research) is used to analyse the views of all stake holders in order to improve the conditions of participation.

Target Audience : Residential customers on the Greek islands not interconnected with the mainland
Total Funds allocated (in USD) : Not specified
Energy Saving Target : Not specified
Main Issue Addressed by Mechanism :
Year Mechanism Commenced : 1996

Indicators of Success for the Mechanism :
Number of residential customers participating to the programme.

Broad Policy Goal
Optimal resource exploitation

Specific Goals for this Mechanism
To motivate residential customers to change their preferences as far as appliances are concerned. In the future, energy efficiency will be an important criterion dominating their choices.

Type of Intervention Activity
Customers are provided financial incentives. The energy efficient appliances are financed by the achieved energy savings. Furthermore, appropriate conditions for the producers of energy efficient appliances is developed so that the production costs are lowered.

Funding Source
Electricity Business
Details of Funding Source :
In the period from summer 1996 till the end of 1998, the Greek Public Power Corporation will be funding the activity.

Implementation Organisation

Electricity Business

Names of Implementing Organisations :

The Greek Public Power Corporation (PPC), energy agencies (Crete).

Comments :

The energy agency of Crete has supported PPC in the implementation of the campaign and customer research.

Sources of Information about the Mechanism

"The Greek Public Power Corporation's Strategy for theImplementation of DSM in Crete and the Aegean Islands", Paper in the conference proceedings from the DA/DSM Conference 1997 in Amsterdam.

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Results of Implementation

Not yet available, as only the first steps of the mechanism have been developed.

Mechanism Category

Subsidies/Grants/Rebates

Technology Stage Addressed

Choice

Social Carrier Element Addressed

Interest
Power
Information

Market Barriers Addressed

Pay-back Gap

Person Completing Form

Ch. Tselentis

Mechanism Description
Reference Number: GR06

Country	Region
Greece	

Short Title of Mechanism
Energy Agencies

Status of Mechanism
In Use in this Country/Region

Brief Description of Mechanism
Description :
Regional/local energy agencies are established throughout Greece. Their task is to develop local/regional energy plans and to initiate and coordinate projects and actions aiming at the full exploitation of the local/regional RES (renewable energy sources) and RUE (rational use of energy) potential.

Target Audience : End users, local organizations, companies, industries.
Total Funds allocated (in USD) : Not specified
Energy Saving Target : Not specified
Main Issue Addressed by Mechanism :
Year Mechanism Commenced : 1994

Indicators of Success for the Mechanism :
Number of projects initiated and actions taken.

Broad Policy Goal
Reduction of the consumption of conventional fuels and CO2 emissions.

Specific Goals for this Mechanism
Development of local/regional energy plans which take the local RES and RUE potential into account and their implementation.

Type of Intervention Activity
Increase of the local society's overall benefit through intervention in the conventional way of production and end use of electricity.

Funding Source
Government Agency
Electricity Business
Other
Details of Funding Source :
In most of the projects 40% EU funding exists. Some projects are co-financed by CRES (Centre of Renewable Energy Sources) or/and the Public Power Corporation and by municipalities.

Implementation Organisation

Government Agency
Other

Names of Implementing Organisations :

CRES (Centre for Renewable Energy Sources), Municipality of Trikala, Municipality of Kallithea, Region of Crete, Region of North Aigaio, Region of South Macedonia, Region of Thesalia, Region of Thrace, Region of Ionian islands, Region of South Greece, Region of Central Macedonia, District of Karditsa, District of Kilkis, District of South Cyclades, District of Dodekanisa

Sources of Information about the Mechanism

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Results of Implementation

Not yet available.

Mechanism Category

IRP and Co-operation

Technology Stage Addressed

Development/Choice/Application

Social Carrier Element Addressed

Interest
Power

Market Barriers Addressed

Externalities
Not Marginal Cost Pricing
Lack of Information

Person Completing Form

Ch. Tselentis

Mechanism Description
Reference Number: GR07

Country	Region
Greece	

Short Title of Mechanism
Energy labelling for appliances .

Status of Mechanism
In Use in this Country/Region

Brief Description of Mechanism
Description :
Coordinated actions are taken aiming at Greece's compliance with the European Community Directive 92/75/EC. While the Ministry of Development monitors the market for the application of energy labelling of electric domestic appliances, the Centre for Renewable Energy Sources (CRES), the Institute for Consumers (INKA) and Public Power Corporation (PPC) jointly advertise labelling. For example CRES and INKA issue a leaflet explaining to consumers the benefits for them, which is distributed in PPC's service bureaus throughout the country or is mailed to all consumers by PPC with the electricity bill.

Target Audience : Residential consumers.
Total Funds allocated (in USD) : Not specified.
Energy Saving Target : Not specified.
Main Issue Addressed by Mechanism :
Year Mechanism Commenced : 1995

Indicators of Success for the Mechanism :
Consumer awareness

Broad Policy Goal
Energy efficient domestic appliances.

Specific Goals for this Mechanism
Increase of consumer awareness and change of their attitude towards energy efficient appliances.

Type of Intervention Activity
Support to consumers to reduce their electricity bill. The utility avoids investments.

Funding Source
Government Agency
Electricity Business
Other
Details of Funding Source :

Implementation Organisation

Government Agency
Electricity Business
Other

Names of Implementing Organisations :

Ministry of Development, Centre for Renewable Energy Sources, Institute for Consumers, Public Power Corporation

Sources of Information about the Mechanism

European Union Directives and respective harmonized Greek legislation published in the Official Journal of the Greek Government (Vol 114/7.7.1994, Vol 943/21.12.1994, Vol 234/9.4.1996, Vol 247/11.4.1996, Vol 386/13.5.1997, Vol 591/16.6.1998)

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Results of Implementation

Results not yet available.

Mechanism Category

Information Provision

Technology Stage Addressed

Development/Choice/Application

Social Carrier Element Addressed

Information

Market Barriers Addressed

Lack of Information

Person Completing Form

Ch. Tselentis

Mechanism Description
Reference Number: GR08

Country	Region
Greece	

Short Title of Mechanism
Incentives for energy conservation investments. (Development Law 2601/98)

Status of Mechanism
In Use in this Country/Region

Brief Description of Mechanism
Description :
Law 2601/98 (which replaced previous Law 1892/90), regulating issues concerning the Greek government's financial support to private investments aiming at Greece's economic and regional development, provides up to 40% subsidies to industrial and tertiary sector's enterprises for energy efficiency or RES investments (40% for electricity production from RES or Cogeneration). Issued in 1998, it replaced the previous similar Law 1892/90.

Target Audience : Industrial and tertiary sector's enterprises
Total Funds allocated (in USD) : Total budget of energy efficiency investments approved and realised during the time period 1993-1998 : 32 million USD. Total national subsidies from Law 1892/90 : 13,5 million USD.
Energy Saving Target : Not specified
Main Issue Addressed by Mechanism :
Year Mechanism Commenced : 1998

Indicators of Success for the Mechanism :
Degree of participation and energy saved.

Estimated total impact from the implementation of energy efficiency investments approved and realised during the time period 1993-1998:
- Primary Energy Conservation: 306 GWh/y
- Substitution of electricity and liquid fuels with gas fuels or biomass: 435 GWh/y

Broad Policy Goal
Decrease of primary and final energy consumption and environmental benefits.

Specific Goals for this Mechanism
Support to industrial and tertiary sector's enterprises to invest in energy efficiency and RES projects.

Type of Intervention Activity
As far as electricity is concerned:
- decrease in the final electricity consumption and/or the primary conventional fuels consumption for the production of electricity, by means of investments in the sectors;
- final electricity saving;
- cogeneration;
- substitution of electricity with natural gas or LPG;
- electricity generation through RES.

Funding Source

Government Agency
Other

Details of Funding Source :

Greek national funds up to 40% of the investment. The remaining percentage of the investment is funded by means of private funds.

Implementation Organisation

Government Agency
Other

Names of Implementing Organisations :

Ministry of National Economy, Ministry of Development

Sources of Information about the Mechanism

Law 2601/98 published in the Official Journal of the Greek Government (Vol 81/15.4.98).

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Results of Implementation

Estimated total impact from the implementation of energy efficiency investments approved and realised during the time period 1993 to 1998:

- Primary Energy Conservation: 306 GWh/y
- Substitution of electricity and liquid fuels with gas fuels or biomass: 435 GWh/y

Mechanism Category

Subsidies/Grants/Rebates

Technology Stage Addressed

Choice/Application

Social Carrier Element Addressed

Interest
Power

Market Barriers Addressed

Pay-back Gap
Risk Sheltering

Person Completing Form

Ch. Tselentis

Mechanism Description
Reference Number: GR09

Country	Region
Greece	

Short Title of Mechanism
Electricity production from Cogeneration and RES. Price regulation. (Law 2244/94).

Status of Mechanism
In Use in this Country/Region

Brief Description of Mechanism
Description :
Law 2244/94 allows for the electricity production by the private sector from RES and/or Cogeneration. Furthermore it ensures sales of electricity produced from independent producers or autoproducers (surplus) to the Greek electricity monopoly Public Power Corporation (PPC) at given prices. The prices are determined as a percentage of the current PPC tariffs, ranging from 60% (Cogeneration autoproducers) and 70% (Cogeneration independent producers, RES autoproducers) to 90% (RES independent producers).

Ongoing since 1994. The law is amended to be adapted to the new electricity market liberalization status of the European Union, to which Greece is due to comply by the year 2001. The new reformed law is expected to maintain (and most probably reinforce) the privileged status and prices for electricity production from RES and Cogeneration (and most probably to extend it to electricity generation from treated industrial and urban wastes).

Target Audience : Independent producers and autoproducers of electricity.
Total Funds allocated (in USD) : Not specified
Energy Saving Target : Not specified
Main Issue Addressed by Mechanism :
Year Mechanism Commenced : 1994

Indicators of Success for the Mechanism :
Demand for electricity generation from Cogeneration and RES. The Law acts in combination with the Development Law 2601/98 (1892/90) (see Mechanism GR08 "Incentives for energy conservation investments") or the Operational Energy Programme (see Mechanism GR11 "Financial incentives for energy efficiency/RES investments").

As a result of this combination we have had the following demand for electricity generation:
- Cogeneration from conventional fuels: 142 Mwe
- Cogeneration from biomass: 43 Mwe
- Wind turbines: 2243 MWe (almost all of them in Greek islands)
- Small hydroelectrics: 290 MWe

Broad Policy Goal
Energy efficiency improvement in the electricity production through exploitation of RES and Cogeneration.

Specific Goals for this Mechanism

To increase penetration of electricity production from Cogeneration and RES into the Greek electricity market.

Type of Intervention Activity

By providing incentives at the side of prices to private electricity producers (independent and auto-producers) for investments promoting electricity production from RES and Cogeneration. Financial implications could be said positive for both sides (electricity producers and PPC) since in main terms PPC benefits from lower prices than their cost (especially in the islands where they run diesel fired generators with high cost) and electricity producers benefit from the difference between prices determined in the law (or prices paid to PPC for autoproducers) and their actual cost.

Funding Source

Electricity Business
Other
Details of Funding Source :
Independent producers and autoproducers of electricity from RES or Cogeneration fund the respective investments (usually taking advantage of the subsidization through the Operational Energy Programme (see Mechanism GR11 "Financial incentives for energy efficiency/RES investments") or the Development Law (see Mechanism GR08 "Incentives for energy conservation investments").

Implementation Organisation

Government Agency
Electricity Business
Other
Names of Implementing Organisations :
Producers of electricity, The Greek Public Power Corporation, The Greek Government (as far as the investments subsidization is concerned).

Sources of Information about the Mechanism

Law 2244/94 published in the Official Journal of the Greek Government (Vol. 168/A/7.10.94)

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Results of Implementation

The Law acts in combination with the Development Law 2601/98 (1892/90) or the Operational Energy Programme.

As a result of this combination we have had the following demand for electricity generation:

- Cogeneration from conventional fuels: 142 Mwe
- Cogeneration from biomass: 43 Mwe
- Wind turbines: 2243 MWe (almost all of them in Greek islands)
- Small hydroelectrics: 290 MWe

Mechanism Category

Subsidies/Grants/Rebates

Technology Stage Addressed

Choice/Application

Social Carrier Element Addressed

Interest
Power

Market Barriers Addressed

Pay-back Gap

Person Completing Form

Ch. Tselentis

Mechanism Description
Reference Number: GR10

Country
Greece

Region

Short Title of Mechanism
Reduction of CO2 emissions through energy efficiency improvement in buildings.

Status of Mechanism
In Use in this Country/Region

Brief Description of Mechanism
Description :
A Joint-Ministerial Decision provides the framework of measures and procedures for energy conservation in buildings, especially in the areas of energy classification, certification and energy auditing of new and existing buildings and their energy consuming installations. Furthermore it deals with energy management and TPF investments in public buildings, as well as with the setting of minimum energy efficiency standards for new buildings and with the establishment of a new integrated energy study for the thermal requirements of new buildings (comprising the contribution of both thermal insulation and bioclimatic and passive/active energy systems). It was issued in August 1998, in the framework of the European Community SAVE Directive 93/76/EEC and of a global action plan "Energy 2001" (which is now under way) for energy conservation in buildings, expected to give also financial incentives (mostly in the form of tax reduction) for the promotion of energy efficiency and RES, mainly in existing buildings.

Target Audience : Owners, users, constructors and designers of public and private buildings.
Total Funds allocated (in USD) : Not specified
Energy Saving Target : Not specified
Main Issue Addressed by Mechanism :
Year Mechanism Commenced : 1998

Indicators of Success for the Mechanism :

Broad Policy Goal
Energy efficiency improvement in buildings and decrease of CO2 emissions.

Specific Goals for this Mechanism
To establish measures and procedures for energy conservation in buildings especially in the area of::
- energy classification and certification;
- energy auditing of new and existing buildings and their energy consuming installations;
- energy management and TPF investments in public buildings;
- energy efficiency standards for new buildings;
- energy study for the calculation of the total integrated energy demand of the building (comprising the contribution of bioclimatic and passive/active energy systems).

Type of Intervention Activity
Decrease of the electricity demand through both compulsory energy conservation measures (energy efficiency standards etc) for new buildings and financial incentives (mostly in the form of tax reduction) and energy labelling for existing buildings.

Funding Source

Other

Details of Funding Source :

Constructors of buildings, private owners of buildings

Implementation Organisation

Government Agency

Other

Names of Implementing Organisations :

Ministry for the Environment and Public Works, Ministry of Development, Prefectural energy and environmental authorities, registered energy auditors

Sources of Information about the Mechanism

Joint Ministerial Decision for the reduction of CO2 emissions by means of energy efficiency improvement in buildings published in the Official Journal of the Greek Government (Vol 880/19.8.98)

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Results of Implementation

For the application of these measures it is necessary to issue regulations and specifications regarding the energy certification model and scheme, the energy efficiency standards for new buildings, the determination of the new elements and calculations required for the energy study of the new buildings etc, which are foreseen to be issued within 1999-2000.

Mechanism Category

Regulation/standards/Codes of Practice

Technology Stage Addressed

Development/Choice/Application

Social Carrier Element Addressed

Power

Market Barriers Addressed

Externalities

Lack of Information

Person Completing Form

Ch. Tselentis

Mechanism Description
Reference Number: GR11

Country	Region
Greece	

Short Title of Mechanism
Financial incentives for energy efficiency/RES investments. (Operational Energy Programme 1994-1999).

Status of Mechanism
In Use in this Country/Region

Brief Description of Mechanism
Description :
The Operational Energy Programme of Greece co-financed by the 2nd Community (E.U.) Support Framework, provides incentives through financial support in the form of subsidies to enterprises making investments in energy efficiency or RES projects. The financial support by subsidies up to 45% for energy efficiency investments (Cogeneration 35%) and up to 55% for RES investments is granted to selected enterprises after competitive bidding.

The support is granted for investments in the following sectors:
- energy conservation;
- cogeneration of electricity and heat;
- substitution of electricity or of conventional fuels with natural gas or LPG;
- renewable energy sources (RES).

The criteria for selection are specified in the guidelines issued by the Ministry of Development and are the following:
- return on investment – discounted pay back period (DPB);
- annual saving of primary energy in relation to the total cost of the investment;
- ratio of decrease in annual specific energy consumption
- environmental benefits;
- social impacts;
- reliability of the proposed technology;
- effectiveness of the Implementation Plan;
- use of third party financing in the financial scheme;
- financial and organisational ability of the investor to realise the project.

Target Audience : Small-medium and especially large enterprises
Total Funds allocated (in USD) : Total budget of investments: 615 million USD. Total funds allocated 254 million USD (average subsidy rate 41,3%).
Energy Saving Target : 900 KTOE annually after the year 2000
Main Issue Addressed by Mechanism :
Year Mechanism Commenced : 1994

Indicators of Success for the Mechanism :
Degree of participation with projects fulfilling the abovementioned criteria. Two calls for investment proposals were announced in 1996 and 1997. The submitted proposals overbooked the respective budget of the programme. After evaluation according to the techno-economic criteria described above, the selected investment proposals are now under implementation.

Broad Policy Goal

Decrease of primary and final energy consumption and environmental benefits.

Specific Goals for this Mechanism

Support to private enterprises decision-makers to invest in energy efficiency and RES projects.

Type of Intervention Activity

As far as the electricity is concerned:

- decrease in the final electricity consumption and/or the primary conventional fuels consumption for the production of electricity, by means of investments in the sectors;
- final electricity saving;
- cogeneration;
- substitution of electricity with natural gas or LPG;
- electricity generation through RES.

Funding Source

Government Agency
Other
Details of Funding Source :
Subsidies ranging from 30% to 55% funded by the Greek Government (National funds) by 1/4 and the European Union (2nd Community Support Framework) by 3/4. Private enterprises investing in the projects (45%-70% of the total budget).

Implementation Organisation

Government Agency
Names of Implementing Organisations :
Ministry of Development with assistance of a management consultant and the support of a selected intermediate organisation for the monitoring of the investments realisation in technical and financial terms.

Sources of Information about the Mechanism

Guidelines for investments financially supported by the Operational Energy Programme issued by the Ministry of Development with the assistance of the Programme's management consultant.

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Results of Implementation

The mechanism approved effective since the proposals for investments submitted, after the call for proposals, overbooked by far the respective budget of the Programme.

Mechanism Category

Subsidies/Grants/Rebates

Technology Stage Addressed

Choice/Application

Social Carrier Element Addressed

Interest
Power

Market Barriers Addressed

Pay-back Gap
Risk Sheltering

Person Completing Form

Ch. Tselentis

Mechanism Description
Reference Number: JP01

Country	Region
Japan	**Japan**

Short Title of Mechanism
Energy Efficiency Standards

Status of Mechanism
In Use in this Country/Region

Brief Description of Mechanism
Description :
Guidance will be given as to those cases of non-compliance with the energy conservation standards specified in the Law Concerning Rationalization of Energy Uses (Energy Conservation Law).

Target Audience : Owners and managers of factories, commercial buildings and equipment manufacture
Total Funds allocated (in USD) :
Energy Saving Target :
Main Issue Addressed by Mechanism :
Year Mechanism Commenced :

Indicators of Success for the Mechanism :

Broad Policy Goal

Specific Goals for this Mechanism
To promote energy conservation by virtue of statutory regulation.

Type of Intervention Activity
Guidance will be provided in accordance with the publicly announced energy conservation standards concerning designated factories, specified buildings and specified machinery and equipment which are subject to energy management.

Funding Source
Government Agency
Details of Funding Source :

Implementation Organisation
Government Agency
Names of Implementing Organisations :
Factories, machinery and equipment are under the control of the Ministry of International Trade and Industry, while buildings are within the jurisdiction of the Construction Ministry.

Sources of Information about the Mechanism

Energy Conservation Center (ECC)
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Japan
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Fax: +81-3-5543-3022

Results of Implementation

The Energy Conservation Law was revised in 1993 for the first time in fifteen years. The revisions involved an overhaul of the energy conservation standards (tightening of numerical standards) and an inclusion of additional facilities in the list in order to secure appropriate and effective energy conservation.

Mechanism Category

Regulation/standards/Codes of Practice

Technology Stage Addressed

Choice/Application

Social Carrier Element Addressed

Interest
Power
Organisational ability
Information

Market Barriers Addressed

Disconnected Decision-maker

Person Completing Form

Tetsuya MAEKAWA

Mechanism Description
Reference Number: JP02

Country	Region
Japan	Japan

Short Title of Mechanism
Subsidies for investment in energy-saving equipment provided by other than electricity businesses

Status of Mechanism
In Use in this Country/Region

Brief Description of Mechanism
Description :
Low interest financing, loan guarantee and interest subsidy will be made available to provide support for the introduction of energy-saving facilities.

Target Audience : Business owners and managers
Total Funds allocated (in USD) :
Energy Saving Target :
Main Issue Addressed by Mechanism :
Year Mechanism Commenced :

Indicators of Success for the Mechanism :

Broad Policy Goal

Specific Goals for this Mechanism
To encourage and support business operators' independent efforts toward energy conservation.

Type of Intervention Activity
Support in accordance with the Energy Conservation and Recycling Support Law (low interest financing, loan guarantees, and interest subsidy).

Funding Source
Government Agency
Details of Funding Source :
Special Accounts for Coal, Petroleum and Energy Supply and Demand Structure Improvement

Implementation Organisation
Government Agency
Names of Implementing Organisations :
The Energy Conservation and Recycling Support Law comes under the control of the Ministry of International Trade and Industry.

Sources of Information about the Mechanism

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Results of Implementation

Mechanism Category

Subsidies/Grants/Rebates

Technology Stage Addressed

Choice/Application

Social Carrier Element Addressed

Interest
Power
Organisational ability

Market Barriers Addressed

Pay-back Gap

Person Completing Form

Tetsuya MAEKAWA

Mechanism Description
Reference Number: JP03

Country	Region
Japan	**Japan**

Short Title of Mechanism
Information service on energy saving provided by other than electricity businesses

Status of Mechanism
In Use in this Country/Region

Brief Description of Mechanism
Description :
Information service is provided to ensure that energy-saving measures in summer and winter, decided by the Council for Promotion of Energy and Resources Conservation Measures, are widely known, and activities of the Energy Conservation Center (ECC) and other organizations are being promoted.

Target Audience : General public
Total Funds allocated (in USD) :
Energy Saving Target :
Main Issue Addressed by Mechanism :
Year Mechanism Commenced :

Indicators of Success for the Mechanism :

Broad Policy Goal

Specific Goals for this Mechanism
To stimulate energy conservation by making energy-saving techniques widely known and by popularizing energy-saving systems and equipment.

Type of Intervention Activity
Promotion of various measures, including "energy-saving measures in summer and winter," and popularization and publicity activities by the Energy Conservation Center (ECC) and Institute of Building Energy Conservation

Funding Source
Other
Details of Funding Source :
Membership dues from supporting members, etc.

Implementation Organisation
Other
Names of Implementing Organisations :
Energy Conservation Center (ECC), Institute of Building Energy Conservation

Sources of Information about the Mechanism

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Results of Implementation

Mechanism Category

Information Provision

Technology Stage Addressed

Choice/Application

Social Carrier Element Addressed

Information
Access
Knowledge

Market Barriers Addressed

Lack of Information

Person Completing Form

Tetsuya MAEKAWA

Mechanism Description
Reference Number: JP04

Country	Region
Japan	**Japan**

Short Title of Mechanism
Consulting service on energy saving opportunities provided by other than electricity businesses

Status of Mechanism
In Use in this Country/Region

Brief Description of Mechanism
Description :
Energy consumption and current facilities will be surveyed and analyzed for each one of the factories and buildings, the survey and analysis results will be reported, and suggestions for improvement of energy efficiency will be given.

Target Audience : Owners and managers of factories and buildings
Total Funds allocated (in USD) :
Energy Saving Target :
Main Issue Addressed by Mechanism :
Year Mechanism Commenced :

Indicators of Success for the Mechanism :

Broad Policy Goal

Specific Goals for this Mechanism
To promote energy conservation by giving suggestions about specific energy-saving measures for each property.

Type of Intervention Activity
Energy efficiency improvement diagnostic service is being provided by the Energy Conservation Center (ECC). Preliminary diagnosis will be given free of charge, while detailed diagnosis will be available for payment.

Funding Source
Other
Details of Funding Source :

Implementation Organisation
Other
Names of Implementing Organisations :
Energy Conservation Center (ECC)

Sources of Information about the Mechanism

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Results of Implementation

Mechanism Category

Information Provision

Technology Stage Addressed

Choice/Application

Social Carrier Element Addressed

Information
Access
Knowledge

Market Barriers Addressed

Lack of Information

Person Completing Form

Tetsuya MAEKAWA

Mechanism Description
Reference Number: JP05

Country	Region
Japan	**Japan**

Short Title of Mechanism
International cooperation in energy-saving technologies

Status of Mechanism
In Use in this Country/Region

Brief Description of Mechanism
Description :
International cooperation (through sending of experts to foreign countries and receiving of trainees from abroad)

Target Audience : Foreign electricity businesses
Total Funds allocated (in USD) :
Energy Saving Target :
Main Issue Addressed by Mechanism :
Year Mechanism Commenced :

Indicators of Success for the Mechanism :

Broad Policy Goal

Specific Goals for this Mechanism
Increase the capability of overseas countries in energy-saving technologies

Type of Intervention Activity
International cooperation. International organizations such as IEA and APEC. International projects for rationalization of energy uses, etc.

Funding Source
Government Agency
Details of Funding Source :

Implementation Organisation
Government Agency
Names of Implementing Organisations :
New Energy and Industrial Technology Development Organization (NEDO)

Sources of Information about the Mechanism

New Energy and Industrial Technology Development Organization (NEDO)
Sunshine 601-1 3-chome
Higasi-Ikebukuro
Toshima-ku
Tokyo 170
Japan
Phone: +81-3-3987-9311

Results of Implementation

Mechanism Category

Education and Training Provision

Technology Stage Addressed

Development/Choice

Social Carrier Element Addressed

Interest
Power
Organisational ability
Information

Market Barriers Addressed

Lack of Information

Person Completing Form

Tetsuya MAEKAWA

Mechanism Description
Reference Number: JP06

Country	Region
Japan	Tokyo

Short Title of Mechanism
Information service on energy saving provided by electricity businesses

Status of Mechanism
In Use in this Country/Region

Brief Description of Mechanism
Description :
Use of media. Useful hints in everyday life, information about electricity rate options and about systems and equipment conducive to energy conservation and load leveling will be presented through TV networks, radio commercials, newspapers, magazines, the Internet, and brochures.

Use of meter reading slip. Electricity consumption for the same month of the previous year will be indicated in a meter reading slip to allow the customer to check on how electricity is consumed (by comparing monthly electricity consumption with that of the same month of the previous year).

Showrooms, campaigns and seminars. Stimulation to the introduction of recommended systems and equipment through exhibition and display of latest models. Explanation and consulting services based on latest models and actual data.

Target Audience : Customers of electricity businesses
Total Funds allocated (in USD) :
Energy Saving Target :
Main Issue Addressed by Mechanism :
Year Mechanism Commenced :

Indicators of Success for the Mechanism :

Broad Policy Goal

Specific Goals for this Mechanism
Diffusion of information about the benefits of energy conservation and load leveling and related systems among end-users and sub-users. Improvement of corporate activities. Improvement of energy management for end-users. Increased popularization and expanded opportunity of introduction through provision of latest information on DSM to end-users and sub-users.

Type of Intervention Activity

Media. Provision of information to users and sub-users through TV, radio and newspapers

Meter reading slip. Energy consumption for the same month of the preceding year printed on the slip.

Showrooms. Exhibition of latest models and explanation based on actual data.

Campaigns. Equipment publicity and sales promotion campaigns for limited period of time.

Seminars. Introduction of latest models and specific cases at lecture meetings

Funding Source

Electricity Business
Details of Funding Source :
Revenue from electric power sales

Implementation Organisation

Electricity Business
Names of Implementing Organisations :
Tokyo Electric Power Company (TEPCO)

Sources of Information about the Mechanism

Tokyo Electric Power Company (TEPCO)
1-3 Uchisaiwai-cho 1-chome
Chiyoda-ku
Tokyo 100-0011
Japan
Phone: +81-3-3501-8111
Fax : +81-3-3596-8517

Results of Implementation

Popularization of the energy-saving character. Improvement of corporate image.

Mechanism Category

Information Provision

Technology Stage Addressed

Choice/Application

Social Carrier Element Addressed

Information
Access
Knowledge

Market Barriers Addressed

Lack of Information

Person Completing Form

Tetsuya MAEKAWA

Mechanism Description
Reference Number: JP07

Country	Region
Japan	**Tokyo**

Short Title of Mechanism
Consulting service on energy saving opportunities provided by electricity businesses

Status of Mechanism
In Use in this Country/Region

Brief Description of Mechanism
Description :
Load levelling. Indicating estimated economical benefits from DSM-promoting options, including thermal storage air conditioning systems, to individual customers to convince them to take service under those innovations.

Energy conservation. Introducing energy-saving techniques through self-diagnosis to individual customers, making them conscious of energy management, and providing them with information on energy management.

Save-Energy Clinical Chart. This chart graphically shows each individual customer's energy consumption over the past year in comparison with data on average energy consumption among customers in the same contract category.

Target Audience : Customers of electricity businesses
Total Funds allocated (in USD) :
Energy Saving Target :
Main Issue Addressed by Mechanism :
Year Mechanism Commenced :

Indicators of Success for the Mechanism :

Broad Policy Goal

Specific Goals for this Mechanism
Improvement of load factor (introduction of thermal storage and night time systems and equipment and increase in the number of customers taking service under rate options conducive to load levelling). Creating opportunity to initiate load leveling promotion activities. Improvement of energy management by showing energy consumption to individual customers.

Type of Intervention Activity

Encouraging end-users and sub-users to come under DSM rate options by explaining benefits of such options through interviews.

Self-diagnosis based on self-check sheet and introduction of energy-saving techniques; suggestions about possible improvements based on measured data on equipment.

Save-Energy Clinical Chart, graphically comparing customer's monthly energy consumption over the past year with that of average household

Funding Source

Electricity Business
Details of Funding Source :
Revenue from electric power sales

Implementation Organisation

Electricity Business
Names of Implementing Organisations :
Tokyo Electric Power Company (TEPCO)

Sources of Information about the Mechanism

Tokyo Electric Power Company (TEPCO)
1-3 Uchisaiwai-cho 1-chome
Chiyoda-ku
Tokyo 100-0011
Japan
Phone: +81-3-3501-8111
Fax : +81-3-3596-8517

Results of Implementation

(a)	Maximum peak saving (1995)	7.2 GW [Japan]	3.1 GW [TEPCO]
(b)	Summer system peak load (1995)	169.92 GW[Japan]	58.65 GW[TEPCO]
(a)/(b)		4.2%[Japan]	5.3%[TEPCO]

Mechanism Category

Information Provision

Technology Stage Addressed

Choice/Application

Social Carrier Element Addressed

Information
Access
Knowledge

Market Barriers Addressed

Lack of Information

Person Completing Form

Tetsuya MAEKAWA

Mechanism Description
Reference Number: JP08

Country	Region
Japan	**Tokyo**

Short Title of Mechanism
Subsidies for investment in energy-saving equipment provided by electricity businesses

Status of Mechanism
In Use in this Country/Region

Brief Description of Mechanism
Description :
Incentive payments for popularisation:
- To manufacturers: Subsidy for ice storage air conditioning system and automatic canned drink vendors;
- To customers, engineering firms, designers, and sellers: Electric water heaters - reduction in initial cost burdens on end-users, incentive for designers

Target Audience : Equipment manufacturers and customers of electricity businesses
Total Funds allocated (in USD) :
Energy Saving Target :
Main Issue Addressed by Mechanism :
Year Mechanism Commenced :

Indicators of Success for the Mechanism :

Broad Policy Goal

Specific Goals for this Mechanism
To improve load factor through the spreading use of systems and equipment conducive to load leveling by providing assistance and support for equipment by end-users and sub-users.

Type of Intervention Activity
Subsidy to manufacturers and customers (end-users): Subsidy to cover increased initial costs associated with addition of load-leveling function.
Assistance to engineering firms, designers, and vendors (sub-users): Compensation for doing some service for the utility.

Funding Source
Electricity Business
Details of Funding Source :
Revenue from electric power sales

Implementation Organisation
Electricity Business
Names of Implementing Organisations :
Tokyo Electric Power Company (TEPCO)

Sources of Information about the Mechanism

The Tokyo Electric Power Company (TEPCO)
1-3 Uchisaiwai-cho 1-Chome
Chiyoda-ku
Tokyo 100-0011
Japan
Phone: +81-3-3501-8111
Fax : +81-3-3596-8517

Results of Implementation

(a)	Maximum peak saving (1995)	7.2 GW [Japan]	3.1 GW [TEPCO]
(b)	Summer system peak load (1995)	169.92 GW[Japan]	58.65 GW[TEPCO]
(a)/(b)		4.2%[Japan]	5.3%[TEPCO]

Mechanism Category

Subsidies/Grants/Rebates

Technology Stage Addressed

Development/Choice/Application

Social Carrier Element Addressed

Interest
Power

Market Barriers Addressed

Pay-back Gap

Person Completing Form

Tetsuya MAEKAWA

Mechanism Description
Reference Number: JP09

Country	Region
Japan	**Tokyo**

Short Title of Mechanism
Information on energy saving provided by electricity businesses in cooperation with other organisations

Status of Mechanism
In Use in this Country/Region

Brief Description of Mechanism
Description :
Providing seminars and exhibitions, preparing, purchasing and distributing brochures in cooperation with non-profit organization, public corporations and local governments

Target Audience : Customers of electricity businesses
Total Funds allocated (in USD) :
Energy Saving Target :
Main Issue Addressed by Mechanism :
Year Mechanism Commenced :

Indicators of Success for the Mechanism :

Broad Policy Goal

Specific Goals for this Mechanism
Diffusion of information about the benefits of energy conservation and load leveling and related systems among end-users and sub-users.
Improvement of corporate image and enhanced understanding of corporate activities.
Improvement of energy management for end-users.
Increased popularization and expanded opportunity to introduce the latest information on DSM to end-users and sub-users.

Type of Intervention Activity
Seminars: Introduction of latest models and specific cases at lecture meetings.

Funding Source
Electricity Business
Other
Details of Funding Source :
Revenue from electric power sales + taxes + membership dues of non-profit organizations

Implementation Organisation

Electricity Business
Other

Names of Implementing Organisations :

Implementing organizations to hold seminars: Japan Heat Pump and Thermal Storage Center, Committee for Rationalization of Electric Energy Uses, Japan Electroheat Association, etc.

Implementing organizations for preparation and distribution of brochures: Household Electricity Culture Association and Committee for Rationalization of Electric Energy Uses

Sources of Information about the Mechanism

As above

Results of Implementation

Mechanism Category

Information Provision

Technology Stage Addressed

Choice/Application

Social Carrier Element Addressed

Information
Access
Knowledge

Market Barriers Addressed

Lack of Information

Person Completing Form

Tetsuya MAEKAWA

Mechanism Description
Reference Number: JP10

Country	Region
Japan	**Tokyo**

Short Title of Mechanism
Using rate systems to change customer behaviour

Status of Mechanism
In Use in this Country/Region

Brief Description of Mechanism
Description :
Gaps between day and night and between seasons to be rectified through rate incentives.

Yearly load management contracts. Achieving a shift in load from day to night throughout the year.

Interruptible contracts. Adjusting loads upon request from the electric utility in case of shortage of supply.

Scheduled load adjustment contracts. Inducing load adjustment in summer by requesting industrial customers to change summer holidays or factory operation schedules.

Thermal storage load adjustment contracts. Achieving a shift in load by virtue of thermal storage systems and equipment, including thermal storage air conditioning systems.

Seasonal, time-of-use power service. Applying differentiated electric charge rates in two seasons and for three different time periods to bring about a shift in loads to night time.

Midnight power service. Supplying only late at night and applying lower electricity rates to increase demand during late-night period.

Target Audience : Customers of electricity businesses
Total Funds allocated (in USD) :
Energy Saving Target :
Main Issue Addressed by Mechanism :
Year Mechanism Commenced :

Indicators of Success for the Mechanism :

Broad Policy Goal

Specific Goals for this Mechanism
By applying discount electricity rates:
- to improve the load factor through the spreading use of systems and equipment conducive to load leveling among end-users and sub-users; and
- to encourage industrial customers to change the production process and thereby improve the load factor.

Type of Intervention Activity

Providing attractive rate options to convince customers to come under such rate systems

Funding Source

Electricity Business

Details of Funding Source :

Revenue from electric power sales

Implementation Organisation

Electricity Business

Names of Implementing Organisations :

Tokyo Electric Power Company (TEPCO)

Sources of Information about the Mechanism

The Tokyo Electric Power Company (TEPCO)
1-3 Uchisaiwai-cho 1-chome
Chiyoda-ku
Tokyo 100-0011
Japan
Phone: +81-3-3501-8111
Fax : +81-3-3596-8517

Results of Implementation

(a)	Maximum peak saving (1995)	7.2 GW [Japan]	3.1 GW [TEPCO]
(b)	Summer system peak load (1995)	169.92 GW[Japan]	58.65 GW[TEPCO]
(a)/(b)		4.2%[Japan]	5.3%[TEPCO]

Mechanism Category

Interruptible Tariffs

Technology Stage Addressed

Choice/Application

Social Carrier Element Addressed

Interest
Power
Organisational ability
Information

Market Barriers Addressed

Not Marginal Cost Pricing

Person Completing Form

Tetsuya MAEKAWA

Mechanism Description
Reference Number: JP11

Country	Region
Japan	Japan

Short Title of Mechanism
Tax Incentives for Energy Efficiency

Status of Mechanism
In Use in this Country/Region

Brief Description of Mechanism
Description :
Tax credit and accelerated depreciation for tax purposes will be made available to provide support for the introduction of energy-saving.

Target Audience : Business owners and managers
Total Funds allocated (in USD) :
Energy Saving Target :
Main Issue Addressed by Mechanism :
Year Mechanism Commenced :

Indicators of Success for the Mechanism :

Broad Policy Goal

Specific Goals for this Mechanism
To encourage and support business operators' independent efforts toward energy conservation.

Type of Intervention Activity
Either a tax credit or accelerated depreciation is available under the tax system for promotion of investment in a reform of the energy supply and demand structure.

Funding Source
Government Agency
Details of Funding Source :
Special Accounts for Coal, Petroleum and Energy Supply and Demand Structure Improvement

Implementation Organisation
Government Agency
Names of Implementing Organisations :
The tax system for promotion of investment in a reform of the energy supply and demand structure is being enforced by the Ministry of Finance.

Sources of Information about the Mechanism

Energy Conservation Center (ECC)
3-19-9 Hachobori
Chuo-ku
Tokyo 104-0032
Japan
Phone: +81-3-5543-3011
Fax : +81-3-5543-3022

Results of Implementation

Mechanism Category

Tax Payable/Tax Exemption

Technology Stage Addressed

Choice/Application

Social Carrier Element Addressed

Interest
Power
Organisational ability

Market Barriers Addressed

Pay-back Gap

Person Completing Form

Tetsuya MAEKAWA

Mechanism Description
Reference Number: JP12

Country	Region
Japan	**Japan**

Short Title of Mechanism
Subsidies for research and development of energy-saving technologies

Status of Mechanism
In Use in this Country/Region

Brief Description of Mechanism
Description :
Subsidies for research and development of energy-saving technologies in accordance with the Energy Conservation and Recycling Support law and development of technologies by the New Energy and Industrial Technology Development Organization (NEDO)

Target Audience : Equipment manufacturers
Total Funds allocated (in USD) :
Energy Saving Target :
Main Issue Addressed by Mechanism :
Year Mechanism Commenced :

Indicators of Success for the Mechanism :

Broad Policy Goal

Specific Goals for this Mechanism
Research and development of related technologies for promotion of energy conservation

Type of Intervention Activity
Technology development
Subsidies in accordance with the Energy Conservation and Recycling Support Law

Funding Source
Government Agency
Details of Funding Source :

Implementation Organisation
Government Agency
Names of Implementing Organisations :
New Energy and Industrial Technology Development Organization (NEDO)

Sources of Information about the Mechanism

Energy Consevation Center (ECC)
3-19-9 Hachobori
Chuo-ku
Tokyo 104-0032
Japan
Phone: +81-3-5543-3011
Fax : +81-3-5543-3022

New Energy and Industrial Technology Development Organization (NEDO)
Sunshine 60 1-1 3-chome
Higashi-Ikebukuro
Toshima-ku
Tokyo 170
Japan
Phone: +81-3-3987-9311

Results of Implementation

Mechanism Category

Subsidies/Grants/Rebates

Technology Stage Addressed

Development

Social Carrier Element Addressed

Interest
Power
Organisational ability

Market Barriers Addressed

Externalities

Person Completing Form

Tetsuya MAEKAWA

Mechanism Description
Reference Number: JP13

Country	Region
Japan	**Tokyo**

Short Title of Mechanism
Equipment leasing by electricity businesses

Status of Mechanism
In Use in this Country/Region

Brief Description of Mechanism
Description :
Thermal storage service program. Leasing of thermal storage air conditioning systems and operation monitoring service.

Rental and leasing. Electric water heaters.

Target Audience : Customers of electricity businesses
Total Funds allocated (in USD) :
Energy Saving Target :
Main Issue Addressed by Mechanism :
Year Mechanism Commenced :

Indicators of Success for the Mechanism :

Broad Policy Goal

Specific Goals for this Mechanism
To improve load factor through the spreading use of systems and equipment conducive to load leveling by providing assistance and support for equipment by end-users and sub-users

Type of Intervention Activity
Electric utility to rent or lease systems and equipment to customers, operate and manage systems and equipment for customers (thermal storage air conditioning)

Funding Source
Electricity Business
Details of Funding Source :
Revenue from electric power sales

Implementation Organisation
Electricity Business
Names of Implementing Organisations :
Tokyo Electric Power Company (TEPCO)

Sources of Information about the Mechanism

The Tokyo Electric Power Company (TEPCO)
1-3 Uchisaiwai-cho 1-chome
Chiyoda-ku
Tokyo 100
Japan
Phone: +81-3-3501-8111
Fax : +81-3-3596-8517

Results of Implementation

(a)	Maximum peak saving (1995)	7.2 GW [Japan]	3.1 GW [TEPCO]
(b)	Summer system peak load (1995)	169.92 GW[Japan]	58.65 GW[TEPCO]
(a)/(b)		4.2%[Japan]	5.3%[TEPCO]

Mechanism Category

Energy Services Provision

Technology Stage Addressed

Choice/Application

Social Carrier Element Addressed

Interest
Power

Market Barriers Addressed

Pay-back Gap

Person Completing Form

Tetsuya MAEKAWA

Mechanism Description
Reference Number: KR01

Country	Region
Korea	Korea

Short Title of Mechanism
Integrated Resource Planning

Status of Mechanism
Proposed for Use in this Country/Region

Brief Description of Mechanism
Description :
Today's Korean electricity industry is confronted with the complex environment such as the uncertainty of the electricity supply and demand, investment burden, siting difficulties, environmental problem etc. Accordingly the government is planning to incorporate the IRP process into the Power Development Plan. It is also pursuing to establish the evaluation method and integrated analysis system of supply/demand-side alternatives.

Target Audience : Electricity businesses
Total Funds allocated (in USD) :
Energy Saving Target :
Main Issue Addressed by Mechanism :
Year Mechanism Commenced :

Indicators of Success for the Mechanism :

Broad Policy Goal

Specific Goals for this Mechanism

Type of Intervention Activity

Funding Source
Electricity Business
Details of Funding Source :
Electricity business revenue

Implementation Organisation
Electricity Business
Names of Implementing Organisations :
KEPCO

Sources of Information about the Mechanism

Results of Implementation

Mechanism Category
IRP and Co-operation

Technology Stage Addressed
Development/Choice/Application

Social Carrier Element Addressed
Interest
Power
Organisational ability

Market Barriers Addressed
Not Marginal Cost Pricing

Person Completing Form
Soonkee Park

Mechanism Description
Reference Number: KR02

Country	Region
Korea	**Korea**

Short Title of Mechanism
DSM cost recovery

Status of Mechanism
In Use in this Country/Region

Brief Description of Mechanism
Description :
In this system, the cost of DSM activities such as rebates, price reduction, and administration is counted in the operating expenses account to compensate the utility for part of lost revenue.

DSM activities covered by this mechanism include:
- load management tariff system (summer vacation adjustment, voluntary curtailment);
- ice storage cooling system;
- high efficient appliances (high efficient lighting, high efficient vending machine) etc.

Target Audience : Electricity businesses
Total Funds allocated (in USD) : 2341 million Won (in '97)
Energy Saving Target : 1477 MW Peak reduction(result in '97)
Main Issue Addressed by Mechanism :
Year Mechanism Commenced :

Indicators of Success for the Mechanism :
Ensuring enough appropriate revenue for encouraging investment in DSM

Broad Policy Goal

Specific Goals for this Mechanism
- Encouraging the DSM activity and covering the loss
- Overall improvement of efficiency of electric appliances and enlargement of high efficient appliances diffusion
- Reduced price of electricity and electric services to the customer base
- Reduced costs and deferred capital investments by the utility
- Curtailment in the growth of adverse environmental impact

Type of Intervention Activity
Provides compensation to the electricity business for lost revenue

Funding Source
Electricity Business
Details of Funding Source :
Revenue from electricity sales

Implementation Organisation

Electricity Business

Names of Implementing Organisations :

KEPCO - DSM team in Business & Service Division

Sources of Information about the Mechanism

There are publication, TV ads, Newspaper ads about each subordinate program

Results of Implementation

This mechanism is not enough for the utility to initiate various kind of programs and compensate for the loss by these activities. The reason is summarized as below. But regardless of the effect of the mechanism, KEPCO is forced to practice the DSM programs focused on load management. The compensation of the loss by the DSM is limited to a part of the whole. The adjustment of the electricity price based on the rate base is very rigid because of the governmental political consideration for the national economy.

Mechanism Category

Cost Recovery via Tariffs

Technology Stage Addressed

Choice/Application

Social Carrier Element Addressed

Interest
Power
Organisational ability

Market Barriers Addressed

Not Marginal Cost Pricing

Person Completing Form

Soonkee Park

Mechanism Description
Reference Number: KR03

Country	Region
Korea	**Korea**

Short Title of Mechanism
Direct Load Control

Status of Mechanism
Proposed for Use in this Country/Region

Brief Description of Mechanism
Description :
KEPCO has been implementing the Discount for Requested Load Adjustment to stabilize the supply and demand of the electric power at an emergency. This is a form of interruptible tariff. But this service has not frequently been implemented for fear of customers' concept of 'power shortage'.

KEPCO is now getting under way for the new direct load control program by CATV network service which it is participating in. KEPCO has already started a pilot program of detailed control opportunity audits for large customers.

Target Audience : Commercial and industrial customers of electricity businesses
Total Funds allocated (in USD) :
Energy Saving Target :
Main Issue Addressed by Mechanism :
Year Mechanism Commenced :

Indicators of Success for the Mechanism :

Broad Policy Goal

Specific Goals for this Mechanism

Type of Intervention Activity
Lower tariffs will be available for customers who agree to have their loads controlled directly by KEPCO.

Funding Source
Electricity Business
Details of Funding Source :
Electricity business revenue

Implementation Organisation
Electricity Business
Names of Implementing Organisations :
KEPCO

Sources of Information about the Mechanism

Results of Implementation

Mechanism Category

Interruptible Tariffs

Technology Stage Addressed

Application

Social Carrier Element Addressed

Organisational ability
Information

Market Barriers Addressed

Not Marginal Cost Pricing

Person Completing Form

Soonkee Park

Mechanism Description
Reference Number: KR04

Country	Region
Korea	Korea

Short Title of Mechanism
Financing for DSM and energy efficiency projects

Status of Mechanism
In Use in this Country/Region

Brief Description of Mechanism
Description :
Financing for the rationalization of energy utilization to encourage both installation of energy efficient equipment and construction of energy efficient facilities. Examples of projects funded include:

- CHP facility, waste heat recovery facility, energy saving facilities in industry, building, transportation;
- electricity DSM facility;
- process improvement project in industry;
- gas absorption cooling system;
- home envelope and retrofit etc.

Target Audience : Customers of electricity businesses
Total Funds allocated (in USD) : 288900 million Won(in '97) * Funding maximum : 90-100% of the total required cost * Interest rate : 5-7% per year
Energy Saving Target :
Main Issue Addressed by Mechanism :
Year Mechanism Commenced :

Indicators of Success for the Mechanism :
Selection of reasonable target. Precise review of proposal.

Broad Policy Goal

Specific Goals for this Mechanism
- Energy conservation through financing energy saving facilities in industry, building and transportation
- Load shifting through financing the heat storage and cooling system and envelope retrofit in residential buildings

Type of Intervention Activity
Stimulate the end-users and DSM market by way of direct installation of targeted facilities

Funding Source
Government Agency
Details of Funding Source :
Petroleum business fund. High pressure gas safety management fund.

Implementation Organisation

Other

Names of Implementing Organisations :

Korea Energy Management Corporation

Sources of Information about the Mechanism

Publications, newspaper ads. Guide book to support finance and taxation (yearly).

Results of Implementation

This mechanism has been playing a major role in improving both energy efficiency and saving energy consumption in this nation

Mechanism Category

Subsidies/Grants/Rebates

Technology Stage Addressed

Choice/Application

Social Carrier Element Addressed

Interest
Power
Knowledge

Market Barriers Addressed

Pay-back Gap

Person Completing Form

Soonkee Park

Mechanism Description
Reference Number: KR05

Country	Region
Korea	Korea

Short Title of Mechanism
Standards for cooling facility in buildings

Status of Mechanism
In Use in this Country/Region

Brief Description of Mechanism
Description :
By the "standard for cooling facility in buildings", new, rebuilt and expanded buildings have been mandated to install ice storage or gas cooler to more than 60% of their floor space cooling system. This standard applies for 10000m³ and over (building with centralized space cooling and heating system), for 3000m³ and over (commercial & research building), for 2000m³ and over (lodging, youth hostel, hospital), for 1000m³ and over (public bath, swimming pool).

Target Audience : Building developers, owners and managers
Total Funds allocated (in USD) :
Energy Saving Target : 38MW(1997)
Main Issue Addressed by Mechanism :
Year Mechanism Commenced :

Indicators of Success for the Mechanism :
To minimize initial investment and shorten pay back period

Broad Policy Goal

Specific Goals for this Mechanism
- To shift the cooling load from daytime to off-peak hours.
- To switch the cooling load from electricity to gas.

Type of Intervention Activity
To switch electricity into gas and develop midnight demand.

Funding Source
Electricity Business
Details of Funding Source :
Electricity business revenue

Implementation Organisation
Electricity Business
Names of Implementing Organisations :
DSM team in business & Service Division of KEPCO

Sources of Information about the Mechanism

There are publications, TV ads, Newspaper ads about the program

Results of Implementation

By 1997, this mechanism has made a significant contribution by cutting the peak load 114 MW (cumulated) by ice storage and 539 MW (cumulated) substituted electricity by gas

Mechanism Category

Regulation/standards/Codes of Practice

Technology Stage Addressed

Choice/Application

Social Carrier Element Addressed

Interest
Power
Organisational ability
Information

Market Barriers Addressed

Disconnected Decision-maker

Person Completing Form

Soonkee Park

Mechanism Description
Reference Number: NL01

Country
Netherlands

Region

Short Title of Mechanism
Tender Industrial Energy Conservation

Status of Mechanism
In Use in this Country/Region

Brief Description of Mechanism
Description :
The mechanism consists of project identification and subsidisation of the promising projects. A call for proposals for energy conservation study projects and investment projects is made to start a bidding process. New ideas and views in the processes play an important role. The selection criterium of the projects is the degree of success in achieving energy conservation and the transferability of the results. The main criterium is the possibility for transfer of the energy conservation method. Therefore, all projects are described and published as far as confidentiality allows.

Target Audience : Industry
Total Funds allocated (in USD) : NLG 25 million per year in the last 8 years. started in 1990 and will continue.
Energy Saving Target : Part of the overall targets
Main Issue Addressed by Mechanism :
Year Mechanism Commenced :

Indicators of Success for the Mechanism :
Repeatability of the energy saving projects. Adaptation by the industry of study and investment results. Over-subscription of total subsidies.

Broad Policy Goal
Limited energy consumption

Specific Goals for this Mechanism
To simplify the investment decisions concerning energy conservation in industrial processes. To lower the initial product cost for the customers (i.e. at the time of market introduction) to make the efficient product more competitive. To describe the projects as a possibility for others.

Type of Intervention Activity
Project identification and subsidisation

Funding Source
Government Agency
Details of Funding Source :
In the last 6 years, 217 demonstration and market introduction projects and 169 studies were completed. The demonstration and market introduction projects cost NLG 429 million and the studies NLG 25 million. The subsidy amount was NLG 125 million.

Implementation Organisation

Government Agency

Names of Implementing Organisations :

NOVEM

Sources of Information about the Mechanism

NOVEM
Tenderbureau
PO Box 8242
3503 RE Utrecht
The Netherlands
Tel + 3130 2393555
Fax + 3130 2316491

Results of Implementation

About 84 % of the expected energy conservation has been realised. A total of 440 projects received a subsidy over the last 6 years and the associated energy conservation is 39 PJ. The mechanism is effective and has a lot of success in the industry.

Mechanism Category

Subsidies/Grants/Rebates

Technology Stage Addressed

Development/Choice/Application

Social Carrier Element Addressed

Information
Access
Knowledge

Market Barriers Addressed

Lack of Information

Person Completing Form

Jan van den Berg

Mechanism Description
Reference Number: NL02

Country
Netherlands

Region

Short Title of Mechanism
Governmental budget for subsidisation of energy projects.

Status of Mechanism
In Use in this Country/Region

Brief Description of Mechanism
Description :
The government offers the possibility for subsidisation of certain programs which are targeted at reducing energy consumption. Subsidy is provided to programs involving application of efficiency, cogeneration, solar boilers, and for construction of sustainable dwellings and offices. Moreover, programs which emphasise the relation between economy, ecology and technology may receive a subsidy.

Target Audience : Companies (industry, wholesale and retail)
Total Funds allocated (in USD) : NLG 49 million per year for a period of four years
Energy Saving Target : Contribution to the overall target to reduce consumption by 10% in 2000 and 33% in 2020 in comparison to 1990
Main Issue Addressed by Mechanism :
Year Mechanism Commenced :

Indicators of Success for the Mechanism :
Market share of the technologies in question. Over subscription of the amount of projects.

Broad Policy Goal
Optimal resource exploitation

Specific Goals for this Mechanism
The government subsidises the implementation because those systems have not been implemented sufficiently due to technical and economic risks. Subsidies and assistance are given to enlarge the familiarity and to promote the application of these systems.

Type of Intervention Activity
Project identification and subsidisation

Funding Source
Government Agency
Details of Funding Source :
Governmental budget. No particular tax, but general funding via all taxpayers. Subsidy is given to those who at own risk build a demonstration project. The subsidy varies from 30% of the project cost for cogeneration to 62.5% for projects which entail integration of environment, ecology and technology in product innovation or transport. The projects must be large scale projects. The total amount is NLG 49 million.

Implementation Organisation

Government Agency

Names of Implementing Organisations :

Senter, Novem.

Comments :

Subsidy is given to those who at own risk build a demonstration project. The subsidy varies from 30% of the project cost for cogeneration to 62.5% for projects which entail integration of environment, ecology and technology in product innovation or transport. The projects must be large scale projects. The total amount is NLG 49 million.

Sources of Information about the Mechanism

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Tel. + 31 70 34 740 81

And the Internet website of the Ministry of Economic Affairs: http://info.minez.nl/

Results of Implementation

The mechanism is considered effective since the total subsidy amount is limited. The number of projects applying for subsidies is not higher than the available budget. Requests are treated in order of priority.

Mechanism Category

Subsidies/Grants/Rebates

Technology Stage Addressed

Development/Choice

Social Carrier Element Addressed

Interest
Power

Market Barriers Addressed

Risk Sheltering

Person Completing Form

Jan van den Berg

Mechanism Description
Reference Number: NL03

Country
Netherlands

Region

Short Title of Mechanism
Governmental budget for research on energy efficiency and renewables

Status of Mechanism
In Use in this Country/Region

Brief Description of Mechanism
Description :
The government provides funding for various programs to stimulate renewable energy with financial incentives and subsidies. Especially for research and development to promote sustainable energy in the Dutch energy system. Implementation of programs concerning energy conservation in the industrial, household and commercial sector, wind energy, solar energy, biomass and heat pumps.

Target Audience : Companies (industrial, wholesale and retail)
Total Funds allocated (in USD) : NLG 200 million per year 1998-2002
Energy Saving Target : Contribution to the overall target to increase the share of renewables to 17% by 2020
Main Issue Addressed by Mechanism :
Year Mechanism Commenced :

Indicators of Success for the Mechanism :
Market share of renewables.

Broad Policy Goal
Reduction of CO2 emission and limited energy consumption

Specific Goals for this Mechanism
A more sustainable energy system (i.e. higher energy efficiency and larger share of renewables). The target is 17% renewables in 2020 and an efficiency improvement of 33% in 2020 in comparison to 1990.

Type of Intervention Activity
Investment support. Governmental promotion with special rules for each program. Project identification and subsidisation.

Funding Source
Government Agency
Details of Funding Source :
Funding via the governmental budget. No particular tax, but a general funding via all tax payers.

Implementation Organisation

Government Agency

Names of Implementing Organisations :

Novem, TNOECN

Comments :

The research programs are distributed over various programme areas like sustainable energy, energy studies and energy optimisation. Also the contribution to European programmes like SAVE (energy conservation), ALTENAIR (R&D sustainable), Joule (R&D) and THERMIE (technical demonstration) fits into the programmes.

Sources of Information about the Mechanism

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Results of Implementation

The mechanism is considered effective because also small companies have the chance to profit from this mechanism. Not only big companies with R&D departments but especially smaller companies were able to put forward new concepts on the market. Some costs barriers for renewables have been removed. The government will continue the funding.

Mechanism Category

Investment/Commercialisation Funding

Technology Stage Addressed

Development

Social Carrier Element Addressed

Interest
Power

Market Barriers Addressed

Risk Sheltering

Person Completing Form

Jan van den Berg

Mechanism Description
Reference Number: NL04

Country
Netherlands

Region

Short Title of Mechanism
Fiscal tax exemption for environmental and energy efficiency targets

Status of Mechanism
In Use in this Country/Region

Brief Description of Mechanism
Description :
Various fiscal instruments are used:

- **green investments** - residents who invest in a Green Fund have exemption of tax on the interest;
- **green VAT** - the standard VAT (17.5%) is reduced to 6% if sustainable electricity or sustainable energy appliances are bought;
- **exemption of energy tax for the distribution companies** - the distribution companies collect the energy tax on behalf of the Treasury. However, they may keep the energy tax on renewable energy (i.e. not give it to the Treasury) if the amount is spent on renewable energy. In this way it is a surcharge on the electricity bill;
- **green mortgage** - lower interest rates for sustainable buildings;
- **deduction of investment costs** - costs are deducted from the taxable profit provided that the investments were in energy conservation and renewable energy.

Target Audience : Residential customers and companies
Total Funds allocated (in USD) : -
Energy Saving Target : Contribution to overall target
Main Issue Addressed by Mechanism :
Year Mechanism Commenced :

Indicators of Success for the Mechanism :
Use of the fiscal instruments.

Broad Policy Goal
Reduction of CO2 emission and limited energy consumption

Specific Goals for this Mechanism
Stimulation of energy conservation and sustainable energy systems.

Type of Intervention Activity
Tax exemption

Funding Source

Not Applicable

Details of Funding Source :

Treasury gives deduction in tax rates. The amount of money available is NLG 215 million and is distributed in the following manner:

- green investments: NLG 20 million
- green V.A.T: NLG 6 million
- exemption energy tax: NLG 30 million
- green mortgage: NLG 7.5 million
- investment deduction tax rebate: NLG 150 million

Implementation Organisation

Government Agency

Names of Implementing Organisations :

Sources of Information about the Mechanism

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Energiebesparing en Diversificatie
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Tel. + 31 70 37 989 11
Tel. + 31 70 34 740 81
Website: http://info.minez.nl/

Results of Implementation

The measures are effective. Especially the instrument concerning green investments needs more funding, because the demand for financing is much higher than the budgeted 20 million NLG.

Mechanism Category

Tax Payable/Tax Exemption

Technology Stage Addressed

Choice

Social Carrier Element Addressed

Interest
Power

Market Barriers Addressed

Externalities

Person Completing Form

Jan van den Berg

Mechanism Description
Reference Number: NL05

Country
Netherlands

Region

Short Title of Mechanism
Increase in electricity prices for providing cash rebates

Status of Mechanism
In Use in this Country/Region

Brief Description of Mechanism
Description :
The government allows the electricity businesses to increase their electricity prices for households and the tertiary sector to cover the cost of providing cash rebates to customers who purchase energy efficient appliances.

Target Audience : Residential customers and retail companies
Total Funds allocated (in USD) : Approx. NLG 275 million per year . Started in 1994 till the year 2000.
Energy Saving Target : 17 million tonnes CO2
Main Issue Addressed by Mechanism :
Year Mechanism Commenced :

Indicators of Success for the Mechanism :
Existence of mechanism and related programs, the important issue being to make sure that energy efficient options are available to the interested customers and not exact energy savings. Government wants that the utilities continue with programs for the captive customers.

Broad Policy Goal
Reduction of CO2 emission

Specific Goals for this Mechanism
The electricity companies wish to contribute to the CO2 reduction. The plan is, according to the Environmental Action Plan (MAP) to reduce CO2 emission by 17 million tonnes by year 2000 compared to the 1990 level.

Type of Intervention Activity
Surcharge on the electricity tariff for households and the commercial sector.

Funding Source
Other
Details of Funding Source :
Surcharge on tariffs with average 1%, with a maximum per utility of 2.5%

Implementation Organisation

Electricity Business

Names of Implementing Organisations :

All electricity and gas retail companies.

Comments :

The money received by the distributors has been used for rebates, investments in renewables, subsidies for wind power campaigns etc. With the introduction of an energy tax, this surcharge will disappear and part of the energy tax funding will be used for energy conservation and renewables.

Sources of Information about the Mechanism

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Results of Implementation

The mechanism is considered effective because it generated a lot of money. The targets have almost been reached. In the future liberalised market green tariffs and an energy tax will replace the surcharge on the franchise market.

Mechanism Category

Cost Recovery via Tariffs

Technology Stage Addressed

Choice

Social Carrier Element Addressed

Interest
Power

Market Barriers Addressed

Externalities

Person Completing Form

Jan van den Berg

Mechanism Description
Reference Number: NL06

Country
Netherlands

Region

Short Title of Mechanism
Long term agreement on energy efficiency improvement

Status of Mechanism
In Use in this Country/Region

Brief Description of Mechanism
Description :
Since 1991, long-term agreements (LTA) or negotiated agreements have been made with 29 industrial sectors and 9 tertiary sectors to improve energy efficiency. The advantage of a long-term agreement is that a whole industrial branch or group of organisations is bound by the agreement. The agreement is always based on an analysis of the realistic energy savings potential as well as the expected technological developments in that particular branch. The branch specifies which new techniques will be introduced and which existing techniques will be improved.

Target Audience : Companies (industrial and wholesale and building) via branch organisations
Total Funds allocated (in USD) : N.A.
Energy Saving Target : 20 % energy efficiency in 2000 in comparison to 1990
Main Issue Addressed by Mechanism :
Year Mechanism Commenced :

Indicators of Success for the Mechanism :
Degree of participation. Improvement in energy efficiency.

Broad Policy Goal
Limited energy consumption

Specific Goals for this Mechanism
An 20% improvement in energy efficiency between 1989 and 2000.

Type of Intervention Activity
Sector commitments by sector agreements. The government agency approaches the business sector for a preliminary assessment of its energy efficiency potential. Then may follow a letter of intent to improve the energy efficiency. After an inventory of possibilities a LTA will be signed.

Funding Source
Government Agency
Details of Funding Source :
No other funding than administrative assistance by the government agency.

Implementation Organisation
Government Agency
Names of Implementing Organisations :
Novem.

Sources of Information about the Mechanism

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Results of Implementation

The mechanism is considered effective. There has been a huge participation. The interim goal was achieved by the end of 1995 (10% energy efficiency improvement in most of the targeted sectors). Based on monitoring reports from 22 LTA's in 1992, the Energy Efficiency Index turns out to be 90%. The 22 LTA's from which monitoring reports are available cover more than 70% of the industrial energy consumption. Industry sectors demonstrate a positive attitude towards the LTA approach.

Mechanism Category

Voluntary Agreements/Negotiated Agreements

Technology Stage Addressed

Choice

Social Carrier Element Addressed

Interest

Market Barriers Addressed

Externalities

Person Completing Form

Jan van den Berg

Mechanism Description
Reference Number: NL07

Country
Netherlands

Region

Short Title of Mechanism
Competition Exergy dwelling

Status of Mechanism
In Use in this Country/Region

Brief Description of Mechanism
Description :
The mechanism aims to reach via a competition and a call for proposals the explicit use of the exergy principle (energy quality) to develop new possibilities for energy conservation in affordable dwellings. The dwelling of the winner will be built by the organizers. The most important critera were:

- the use of the exergy principle;
- the maintenance possibilities of the dwelling;
- the cost price.

Target Audience : Architects, electrical and building contractors
Total Funds allocated (in USD) : NLG 1.5 million
Energy Saving Target : A dwelling with an energy use of 200 m3 gas
Main Issue Addressed by Mechanism :
Year Mechanism Commenced :

Indicators of Success for the Mechanism :
Market acceptance of the proposals for energy efficient dwellings. Number of energy efficient dwelling types in the new cities under construction.

Broad Policy Goal
Limited energy consumption

Specific Goals for this Mechanism
To stimulate energy conservation via procurement of a dwelling type with a low energy consumption. To assist in the market introduction of one dwelling type (the winner of the competition) which will be an example for others.

Type of Intervention Activity
Technology procurement

Funding Source
Government Agency
Electricity Business
Details of Funding Source :
Novem (the Dutch energy agency), EnergieNed (the umbrella organisation for the distribution utilities), Sep, and two local distributors work together.

Implementation Organisation

Government Agency
Electricity Business
Names of Implementing Organisations :
Novem, EnergieNed, Sep, GGRgas, NUON

Sources of Information about the Mechanism

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Sep
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Results of Implementation

Now, October 1997, the winner is known. The dwelling will be built in the Arnhem region. No further results are available at present.

Mechanism Category

Technology Procurement

Technology Stage Addressed

Development/Choice

Social Carrier Element Addressed

Interest
Organisational ability
Access

Market Barriers Addressed

Pay-back Gap

Person Completing Form

Jan van den Berg

Mechanism Description
Reference Number: NL08

Country
Netherlands

Region

Short Title of Mechanism
Competition heat pump

Status of Mechanism
In Use in this Country/Region

Brief Description of Mechanism
Description :
The aim is to promote large scale introduction of heat pumps since the existing cooperation between the relevant parties to introduce heat pumps is insufficient. Via procurement the utilities and the agency try to give an incentive for cooperation in consortia to stimulate system thinking. Suppliers of heat pumps, advisors, and constructors are therefore invited to participate in a competition with the target to show that heat pumps are an energy efficient method of covering heat demand. The utilities will then implement 400 systems of the winning concepts. The competition aims to cooperate in consortia with various disciplines.

Target Audience : Electrical constuctors, project developers
Total Funds allocated (in USD) : NLG 1.3 million
Energy Saving Target : 35% heat demand reduction per dwelling
Main Issue Addressed by Mechanism :
Year Mechanism Commenced :

Indicators of Success for the Mechanism :
Increased market share of heat pumps. Higher consideration of the whole heat system (heat pumps, tubes, radiators) when improving energy efficiency.

Broad Policy Goal
Limited energy consumption

Specific Goals for this Mechanism
Energy conservation via the use of heat pumps.

Type of Intervention Activity
Technology procurement.

Funding Source
Government Agency
Electricity Business
Details of Funding Source :
Novem, EnergieNed, Sep and 4 large utilities.

Implementation Organisation
Government AgencyElectricity Business
Names of Implementing Organisations :
Novem, Sep, EnergieNed, NUON, REMU, ENECO, Energie Noord West

Sources of Information about the Mechanism

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Results of Implementation

No results yet.

Mechanism Category

Technology Procurement

Technology Stage Addressed

Development/Choice

Social Carrier Element Addressed

Interest
Organisational ability
Access

Market Barriers Addressed

Disconnected Decision-maker

Person Completing Form

Jan van den Berg

Mechanism Description
Reference Number: NL09

Country
Netherlands

Region

Short Title of Mechanism
Integrated Environmental Plan of the Energy Sector (IMES)

Status of Mechanism
In Use in this Country/Region

Brief Description of Mechanism
Description :
The three involved organisations are: Gasunie in the gas production sector, Sep in the electricity generation sector, and EnergieNed in the retail sector for gas and electricity. IMES consists of a formalised cooperation between these three organisations the purpose being to prevent double work and counterproductive activities plus to further cooperation in the energy chain where this is necessary from an environmental point of view.

Target Audience : Umbrella energy organisations
Total Funds allocated (in USD) : Low
Energy Saving Target : Part of the overall Dutch target= 33% in 2020
Main Issue Addressed by Mechanism :
Year Mechanism Commenced :

Indicators of Success for the Mechanism :
Awareness of the plans of the other organisations. The degree to which the activities and plans of the other organisations are taken into consideration. Coordination of parallel activities between the three organisations.

Broad Policy Goal
Optimal resource exploitation and reduction of CO2 emission

Specific Goals for this Mechanism
Harmonisation of environmental policies. To offer a framework for joint discussions with the Ministry of Housing, Civil Planning, and Environment, the Ministry of Economic Affairs, and the local governments. Stronger joint market position.

Type of Intervention Activity
Cooperation between umbrella organizations.

Funding Source
Electricity Business
Other
Details of Funding Source :
Almost no funding; cooperation.

Implementation Organisation

Electricity Business
Other
Names of Implementing Organisations :
Sep, EnergieNed, Gasunie

Sources of Information about the Mechanism

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Results of Implementation

Earlier the companies competed against each other in offering measures for the campaign "Who is the greenest?". Now, however, a more holistic approach is used which furthers the implementation of the most cost-effective measures irrespective of which energy actor/sector is involved. The mechanism is thus considered effective.

Mechanism Category

IRP and Co-operation

Technology Stage Addressed

Development/Choice/Application

Social Carrier Element Addressed

Interest
Information

Market Barriers Addressed

Externalities

Person Completing Form

Jan van den Berg

Mechanism Description
Reference Number: NL10

Country
Netherlands

Region

Short Title of Mechanism
Communication

Status of Mechanism
In Use in this Country/Region

Brief Description of Mechanism
Description :
Continuous national communication campaigns to endeavour and secure the involvement of the business community and the general public. Key campaigns to keep energy conservation a public topic and to promote energy conscious behaviour by communicating information and advice on ways to cut energy costs. The broadened key campaign was intended to raise the profile of the energy company as an independent expert source of information about energy conservation.

Target Audience : General public and business community
Total Funds allocated (in USD) : Some million NLG
Energy Saving Target : Part of reduction 17 Million ton CO2
Main Issue Addressed by Mechanism :
Year Mechanism Commenced :

Indicators of Success for the Mechanism :
A high level of familiarity with energy conservation.

Broad Policy Goal
Reduction of CO2 emission

Specific Goals for this Mechanism
To establish and keep environmentally motivated energy conservation high on the public agenda and to communicate specific items of information regarding energy conscious behaviour.

Type of Intervention Activity
Information and communication

Funding Source
Electricity Business
Details of Funding Source :
The communication costs are covered by the levy on the tariff for the captive customers (residential and retail).

Implementation Organisation
Electricity Business
Names of Implementing Organisations :
EnergieNed Environmental Group

Sources of Information about the Mechanism

Environmental Group
EnergieNed
PO Box 9042
6800 GD Arnhem
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Fax +31 26 4428007

Results of Implementation

Energy conservation is now rated as the top environmental priority by more than 80% of the Dutch population. A high level of latent familiarity with energy-saving measures and products exists and more than 80%of the public spontaneously identify their local energy company as the most obvious and reliable source of information.

Mechanism Category

Information Provision

Technology Stage Addressed

Choice/Application

Social Carrier Element Addressed

Interest
Information

Market Barriers Addressed

Lack of Information

Person Completing Form

Jan van den Berg

Mechanism Description
Reference Number: NO01

Country
Norway

Region

Short Title of Mechanism
Improving the energy bill as a carrier of information

Status of Mechanism
Proposed for Use in this Country/Region

Brief Description of Mechanism
Description :

Target Audience : Final target group is households, though the target of the regulation is the distribution utilities
Total Funds allocated (in USD) :
Energy Saving Target :
Main Issue Addressed by Mechanism :
Year Mechanism Commenced : 1999

Indicators of Success for the Mechanism :
The mechanism has been thoroughly tested. Groups who have received the improved bill have saved around 9% compared to the general population. In addition, the bill is popular among recipients. Surveys show that recipients are more aware of energy use issues.

Broad Policy Goal
Encourage energy efficiency

Specific Goals for this Mechanism
By improving awareness of energy costs and consumption, the end user has a better basis for decisions about how to most efficiently use energy.

Type of Intervention Activity
A regulation has been published which will require all electric utilities to bill at least 4 times a year for actual consumption (as opposed to once a year currently), and to put a graphic on the bill which compares consumption in a given period this year with the same period last year.

Funding Source
Government Agency
Electricity Business
Details of Funding Source :
All of the pre-tests have been jointly funded by the government (the Ministry of Oil and Energy and NVE) and utilities, mainly Oslo Energi and Stavanger Energi

Implementation Organisation
Electricity Business
Names of Implementing Organisations :
The new regulation requires that all utilities change their billing systems in 1999. Funding will be provided by the utilities.

Sources of Information about the Mechanism

For details on publications and other reports, contact:

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Results of Implementation

The only results so far are from the pre-tests, but these were done with large representative populations. The savings potential in Norway appears to be in the vicinity of 5 - 10 %.

Mechanism Category

Information Provision

Technology Stage Addressed

Choice/Application

Social Carrier Element Addressed

Organisational ability
Knowledge

Market Barriers Addressed

Lack of Information

Person Completing Form

Hal Wilhite

Mechanism Description
Reference Number: NO02

Country
Norway

Region

Short Title of Mechanism
Legally mandated DSM for local electricity distributors

Status of Mechanism
In Use in this Country/Region

Brief Description of Mechanism
Description :
There is a legal obligation to engage in energy efficiency activities built into all concessions for local electricity distribution since 1991. There is an optional level of the levy of up to NOK 0.003/kWh/year. Distribution companies are encouraged to undertake energy efficiency activities through the regional energy efficiency centers, but this is optional. However, NOK 0.001/kWh/year of the above has to be used through the regional centers.

Target Audience : End users, except for energy intensive industries
Total Funds allocated (in USD) : Maximum NOK 28,000,000 per year
Energy Saving Target : None
Main Issue Addressed by Mechanism :
Year Mechanism Commenced : 1991

Indicators of Success for the Mechanism :
- Rational choice among end users
- Full information
- Skilled counsellors/advisors/operating personnel
- Individual energy audits with savings per invested counselling hour
- Number of schools visited
- Energy efficiency projects with quantifies savings

Broad Policy Goal
Improve information on potential energy efficiency solutions

Specific Goals for this Mechanism
This mechanism creates funding and institutions which will be active in informing end users on energy efficiency options

Type of Intervention Activity
It provides information and education, encouraging rational energy decisions.

Funding Source
Other
Details of Funding Source :
There is a levy on the distribution fee, based on the actual consumption of electricity in a given area. The levy is collected by the distributor of electricity.

Implementation Organisation

Government Agency
Electricity Business

Names of Implementing Organisations :

The mechanism is in the form of a law. The implementing organization is the local distribution utility and/or regional energy efficiency center.

Sources of Information about the Mechanism

1. The Energy Act of June 29, 1990.
2. Provisions to the Energy Act, Dec. 7, 1990.
3. Regulations for energy efficiency, February 1994.

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Results of Implementation

The regional centers, which have now been established in close to all of the regions of Norway, now undertake more than half of all legal-based energy efficiency activities. The network of regional centers is now being marketed and activities are increasing. Since most activities are based on information/education, strict measures of effectiveness/efficiency are hard to obtain.

Mechanism Category

Regulation/standards/Codes of Practice

Technology Stage Addressed

Choice/Application

Social Carrier Element Addressed

Information
Knowledge

Market Barriers Addressed

Lack of Information

Person Completing Form

Terje Wahl

Mechanism Description
Reference Number: ES01

Country
Spain

Region

Short Title of Mechanism
Comprehensive energy conservation and efficiency program (PAEE 1991-2000)

Status of Mechanism
In Use in this Country/Region

Brief Description of Mechanism
Description :
PAEE is a comprehensive energy conservation and efficiency program included in the national energy plan PEN 1991-2000, approved in July 1991, and updated in March 1995. It establishes a portfolio of grants for energy conservation and efficiency projects related to exploitation of renewable energy resources (small hydro, wind, solar, biomass, and waste).

Target Audience : All energy customers
Total Funds allocated (in USD) : Variable
Energy Saving Target : 7.6% reduction of the projected energy demand for year 2000.
Main Issue Addressed by Mechanism :
Year Mechanism Commenced :

Indicators of Success for the Mechanism :
Energy demand change. Fuel switch. Number of applications for grants. Number of initiated programs.

Broad Policy Goal
Rational use of energy.

Specific Goals for this Mechanism
The purpose of PAEE is to foster efficiency in the energy system. The issues that PAEE addresses fall under what has come to be known as Integrated Resource Planning, as they include demand-side management and non-conventional production along with more classical approaches, such as supply-side planning.

Type of Intervention Activity
The PAEE is articulated around a series of action programs intended to stimulate end-use savings and energy substitution in each sector as well as to provide incentives for certain production alternatives which, while highly efficient, are nonetheless not well positioned to penetrate the market.

Funding Source

Government Agency

Details of Funding Source :

Grants provided by MIE. Financially speaking, the 7,719 undertakings recorded accounted for a total investment of MPta 552,423, MPta 76,870 or 14% of which was publicly funded. Approximately 65% of such public funding went to subsidies, 30% to direct investment via third-party financing (FTP) or Economic Interest Groupings (EIG), 2% to the national government's investment in energy savings in its own buildings and 3% to administration, follow-up and promotional expenses. The percentages that public funding represented over the total investment varied depending on the project, with the Savings Programme accounting for the highest (20.8%) and Cogeneration (10.3%) for the lowest figures.

Implementation Organisation

Government Agency

Names of Implementing Organisations :

IDAE (Government Agency), MIE (Ministry of Industry and Energy)

Sources of Information about the Mechanism

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Results of Implementation

The results achieved under the PAEE at the half-way mark are satisfactory, generally speaking. The results indicate that substantially greater progress was made in the area of electricity production than in areas of savings and substitution. The results associated with the industrial sector were likewise closer to the anticipated figures than those related to the buildings and transport sector.

The performance levels reached by the cogeneration sector program and the electricity related areas of the renewables energy program continued to be high, due specially to the rapid development of self-production facilities in recent years. The price incentives for production sold to the electric system and the firm backing for these programs provided by public bodies and authorities were largely responsible for the progress made.

The results of the PAEE activities fully implemented or in progress 31 December 1995, can be summarised as follows:

- 980 ktoe/year in final power savings;
- 626 ktoe/year substituted by natural gas;
- 117 ktoe/year substituted by renewable sources;
- 12,780 GWh/year of electricity produced by cogeneration;
- 3,878 GWh/year of electricity generated from renewable sources;
- 552,423 MPta total associated investment;
- 76,870 MPta public funding.

The above values represent the following performance rates over the targets initially set for the end of the period:

- Savings 20.3%;
- Substitution 26.0%;
- Independent Power Production 121.6%;
- Investment 54.2%;
- Public Funding 40.5%.

Counting both operational projects implemented in the last five years and those in progress at year-end 1995, CO2 emission was estimated to be down by 8,860 KTm, NOx by 29 KTm and SO2 by 206 KTm, figures which represent 34%, 29% and 51%, respectively, of the final targets.

In view of these results, the MIE decided to implement what has been called its "new impetus for the energy savings and efficiency policy", which is intended to reinforce its efforts in the areas where work is already under way and to promote specific activities, demo projects and technological alternatives in the areas and sectors where power consumption has grown fastest. The new strategy includes, among other things, greater public funding, reinforcement for the programmes where performance has been lowest, the establishment of voluntary arrangements with certain industrial and commercial sectors and prioritisation of SME-related projects.

Mechanism Category

Subsidies/Grants/Rebates

Technology Stage Addressed

Development/Choice

Social Carrier Element Addressed

Interest
Power

Market Barriers Addressed

Risk Sheltering

Person Completing Form

Jesus Martin Giraldo

Mechanism Description
Reference Number: ES02

Country
Spain

Region

Short Title of Mechanism
Building standard (NBE-CT-79)

Status of Mechanism
In Use in this Country/Region

Brief Description of Mechanism
Description :
Building Basic Standard on Thermal Conditions in Buildings. Mandatory standard for all new buildings approved in July 1979 or later. It includes a comprehensive collection of prescriptions oriented towards energy saving.

Target Audience : Building constructors
Total Funds allocated (in USD) : None
Energy Saving Target : Not specified
Main Issue Addressed by Mechanism :
Year Mechanism Commenced :

Indicators of Success for the Mechanism :
Number of buildings which meet the new standard. Increase in the average energy consumption of buildings.

Broad Policy Goal
Rational use of energy.

Specific Goals for this Mechanism
Improved thermal standard of buildings so that energy consumption is reduced.

Type of Intervention Activity
Mandatory standards

Funding Source
Other
Details of Funding Source :
Building constructors carry the full incremental cost, if any.

Implementation Organisation
Government Agency
Names of Implementing Organisations :
MIE (Ministry of Industry and Energy), MF (Ministry of Civil Infrastructure)

Sources of Information about the Mechanism

Union Fenosa
Capitan Haya, 53
28020 Madrid
Spain
Contact: Mr. Jesus Martin Giraldo
Phone: +34 1 567 60 00
Fax: +34 1 570 43 49
Email: UF420400@uef.es

Results of Implementation

Statistics are not available.

Mechanism Category

Regulation/standards/Codes of Practice

Technology Stage Addressed

Choice

Social Carrier Element Addressed

Interest

Market Barriers Addressed

Disconnected Decision-maker

Person Completing Form

Jesus Martin Giraldo

Mechanism Description
Reference Number: ES03

Country	Region
Spain	

Short Title of Mechanism
Efficient HVAC systems (IT.IC)

Status of Mechanism
In Use in this Country/Region

Brief Description of Mechanism
Description :
Technical Directions and Complementary Directions for HVAC installations in order to rationalise their consumption. Approved in March 1985 and targeted at the residential sector.

Target Audience : Building constructors (residential buildings)
Total Funds allocated (in USD) : None
Energy Saving Target : Not specified
Main Issue Addressed by Mechanism :
Year Mechanism Commenced :

Indicators of Success for the Mechanism :
Number of efficient systems installed. Sales of efficient systems. Reduction in residential energy consumption.

Broad Policy Goal
Rational use of energy.

Specific Goals for this Mechanism
Higher penetration/use of energy efficient HVAC systems.

Type of Intervention Activity
Mandatory standard

Funding Source
Other
Details of Funding Source :
Building constructors carry the full incremental cost, if any

Implementation Organisation
Government Agency
Names of Implementing Organisations :
MIE (Ministry of Industry and Energy), MF (Ministry of Civil Infrastructure)

Sources of Information about the Mechanism

Union Fenosa
Capitan Haya, 53
28020 Madrid
Spain
Contact: Mr. Jesus Martin Giraldo
Phone: +34 1 567 60 00
Fax: +34 1 570 43 49
Email: UF420400@uef.es

Results of Implementation

Statistics are not available.

Mechanism Category

Regulation/standards/Codes of Practice

Technology Stage Addressed

Choice

Social Carrier Element Addressed

Interest

Market Barriers Addressed

Disconnected Decision-maker

Person Completing Form

Jesus Martin Giraldo

Mechanism Description
Reference Number: ES04

Country
Spain

Region

Short Title of Mechanism
DSM and EE provisions in Electricity Act

Status of Mechanism
In Use in this Country/Region

Brief Description of Mechanism
Description :
10 DSM programs have been carried out throughout the whole Spanish market in the period 1995-97. The programs were:

- Domoluz: high efficiency lamps (residential), high performance fridges (residential);
- Actano: heat & water storage (residential), heat pumps (residential);
- Dosaluz: lamps in public services (services), public lighting (services), ice storage (services), generating sets (services);
- Revem: speed motor regulation (industrial), reactive control (industrial).

Target Audience : Residential, commercial and industrial customers
Total Funds allocated (in USD) : Not fixed - 5,862 MPta in 1995.
Energy Saving Target : Not specified
Main Issue Addressed by Mechanism :
Year Mechanism Commenced :

Indicators of Success for the Mechanism :

Broad Policy Goal
Limited energy consumption & reduction of CO2 emissions.

Specific Goals for this Mechanism
Energy conservation and efficient use of energy and better service to the electricity customers.

Type of Intervention Activity
Cost recovery via tariffs.

Funding Source
Other
Details of Funding Source :
Program costs are recovered through a surcharge to the Standard Cost Base Rate. In 1995, about 5,862 MPta was spent on DSM programs in form of promotion, management, and incentives. The distribution was 57% for residential programs (4 progams), 34% for service sector programs (4 programs), and 9% for industrial programs (2 programs).

Implementation Organisation

Electricity Business

Names of Implementing Organisations :

Electricity distribution companies monitored by the Ministry of Industry.

Sources of Information about the Mechanism

Union Fenosa
Capitan Haya, 53
28020 Madrid
Spain
Contact: Mr. Jesus Martin Giraldo
Phone: +34 1 567 60 00
Fax: +34 1 570 43 49
Email: UF420400@uef.es

Results of Implementation

Higher acceptance/dissemination than planned for some of the measures. The total benefits are estimated to 35,725 MWh/year energy savings, 52 Mwh peak reduction, and 21,625MWh/year off-peak shift.

The specific results so far are as follows:

- Domoluz: high efficiency lamps - 100,500 lcl, high performance fridges (res) - 4,200 pieces (very successful);
- Actano: heat & water storage - 41 MWh peak & 21,000 MWh off-peak (7,800 heat storage pieces and 50 water storage pieces), heat pumps - 100 pieces;
- Dosaluz: lamps in public services - 56,800 points, public lighting - 4,500 MWh energy, ice storage – 3 MWh peak & 25 MWh off-peak, generating sets - analysis and design completed;
- Revem: speed motor regulation - 14,000 MWh energy, reactive control - 1,500 pieces & 75,000 kVAr (very successful).

Mechanism Category

Cost Recovery via Tariffs

Technology Stage Addressed

Choice

Social Carrier Element Addressed

Interest
Power

Market Barriers Addressed

Risk Sheltering

Person Completing Form

Jesus Martin Giraldo

Mechanism Description
Reference Number: ES05

Country
Spain

Region

Short Title of Mechanism
Interruptible contracts

Status of Mechanism
In Use in this Country/Region

Brief Description of Mechanism
Description :
All HV customers over 5MW can request interruptible contracts from their distributor which cover a period of at least 5 years. An interruptible contract is an agreement between the utility and a customer which defines the conditions under which the customer accepts interruption of supply to help the utility reduce peak load. The customer is compensated for the interruptions by a discount consisting of a fixed element (typically 22.8%) and a variable element which depends on the number of interruptions (typically 13.7%).

Target Audience : HV customers with more than 5 MW load
Total Funds allocated (in USD) : None
Energy Saving Target : Not specified
Main Issue Addressed by Mechanism :
Year Mechanism Commenced :

Indicators of Success for the Mechanism :
Peak load reduction. Number of contracts.

Broad Policy Goal
Rational use of energy & customer bill reduction.

Specific Goals for this Mechanism
Short-term peak reduction possibility (134 MW distributed between 19 customers).

Type of Intervention Activity
Interruptible tariffs

Funding Source
Electricity Business
Details of Funding Source :
No special funds are available - commercial agreement between the utility and a customer.

Implementation Organisation
Electricity Business
Names of Implementing Organisations :
REE (Red Electrica de Espana)

Sources of Information about the Mechanism

Red Eléctrica de Espana
P° Conde de los Gaitanes 144
Alcobendas (Madrid) 28109
Spain
Contact: Ms. Lourdes Santiago
Phone: +34 1 650 20 12
Fax: +34 1 650 76 77

Results of Implementation

Short term peak reduction of up to 134 MW has been made possible through 19 contracts.

Mechanism Category

Interruptible Tariffs

Technology Stage Addressed

Application

Social Carrier Element Addressed

Interest

Market Barriers Addressed

Not Marginal Cost Pricing

Person Completing Form

Jesus Martin Giraldo

Mechanism Description
Reference Number: ES06

Country
Spain

Region

Short Title of Mechanism
Night rate

Status of Mechanism
In Use in this Country/Region

Brief Description of Mechanism
Description :
Residential night tariff which consists of a 3% price increase during peak and partial peak hours (16 hours/day) and 55% discount during off-peak hours (23-07 winter, 00-08 summer). The tariff is targetted at customers who can store energy for hot water and space heating.

Target Audience : Low voltage customers with less than 15 kW contracted power.
Total Funds allocated (in USD) : None
Energy Saving Target : Not specified
Main Issue Addressed by Mechanism :
Year Mechanism Commenced :

Indicators of Success for the Mechanism :
Load curve changes. Number of night tariff contracts.

Broad Policy Goal
Rational us of energy and customer bill reduction.

Specific Goals for this Mechanism
"Valley-filling" i.e. to move load from peak hours to off-peak hours.

Type of Intervention Activity
Other special tariffs

Funding Source
Electricity Business
Details of Funding Source :
No special funds are available - Commercial agreement between the utility and a customer.

Implementation Organisation
Electricity Business
Names of Implementing Organisations :
Utilities

Sources of Information about the Mechanism

Union Fenosa
Capitan Haya, 53
28020 Madrid
Spain
Contact: Mr. Jesus Martin Giraldo
Phone: +34 1 567 60 00
Fax: +34 1 570 43 49
Email: UF420400@uef.es

Results of Implementation

Example: Union Fenosa is the enterprise which has had most success in promoting this product holds 21% of all Spanish night tariff contracts. Union Fenosa has 64,000 customers with 323 MW contracted power and 128 GWh annual electricity consumption. About 67% of the total consumption of these customers takes place during off-peak hours.

Mechanism Category

Green Pricing and Other Special Tariffs

Technology Stage Addressed

Application

Social Carrier Element Addressed

Interest

Market Barriers Addressed

Not Marginal Cost Pricing

Person Completing Form

Jesus Martin Giraldo

Mechanism Description
Reference Number: ES07

Country
Spain

Region

Short Title of Mechanism
Dissemination of information

Status of Mechanism
In Use in this Country/Region

Brief Description of Mechanism
Description :
The mechanism indirectly supports the uptake of for example energy efficiency programs initiated by the distribution companies. It includes:

- publications (important element);
- educational tools;
- assessments;
- advice on appliances and tools;
- conferences;
- public campaigns.

Target Audience : All electricity customers
Total Funds allocated (in USD) : (ADAE budget)
Energy Saving Target : Not specified
Main Issue Addressed by Mechanism :
Year Mechanism Commenced :

Indicators of Success for the Mechanism :
Customer interest in ADAE publications. Participation in conferences. Customer awareness of energy efficiency issues addressed by ADAE.

Broad Policy Goal
Limited energy consumption.

Specific Goals for this Mechanism
Promotion and dissemination of rational use of electricity.

Type of Intervention Activity
Information

Funding Source
Electricity Business
Details of Funding Source :
ADAE (Association for Electricity Applications), owned by the electric utilities.

Implementation Organisation
Electricity Business
Names of Implementing Organisations :
ADAE (Association for Electricity Applications)- utility agency

Sources of Information about the Mechanism

ADAE
Orense 37
28020 Madrid
Spain
Contact: Mr. César Gaya
Phone: +34 1 555 21 11
Fax: +34 1 597 14 95

Results of Implementation

Results are not available.

Mechanism Category

Information Provision

Technology Stage Addressed

Choice/Application

Social Carrier Element Addressed

Information
Knowledge

Market Barriers Addressed

Lack of Information

Person Completing Form

Jesus Martin Giraldo

Mechanism Description
Reference Number: ES08

Country
Spain

Region

Short Title of Mechanism
Various IDAE activities

Status of Mechanism
In Use in this Country/Region

Brief Description of Mechanism
Description :
Includes:
- publications and educational tools;
- characterisation of DSM programs in 1995;
- working group with involved associations and companies;
- assessment prepared for MIE and utilities;
- promotional activities e.g. on efficient lighting;
- implementation of new funding sources for efficient equipment.

Target Audience : End-use customers
Total Funds allocated (in USD) :
Energy Saving Target :
Main Issue Addressed by Mechanism :
Year Mechanism Commenced :

Indicators of Success for the Mechanism :
Electricity savings. Increased sale of energy efficient equipment.

Broad Policy Goal
Limited electricity consumption.

Specific Goals for this Mechanism
Electricity savings. Improved market for efficient equipment and thus lower equipment costs.

Type of Intervention Activity
Information, investment, and funding.

Funding Source
Government Agency
Details of Funding Source :
Government

Implementation Organisation
Government Agency
Names of Implementing Organisations :
IDAE (Institute for Energy Diversification and Saving)

Sources of Information about the Mechanism

Union Fenosa
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28020 Madrid
Spain
Contact: Mr. Jesus Martin Giraldo
Phone: +34 1 567 60 00
Fax: +34 1 570 43 49
Email: UF420400@uef.es

Results of Implementation

About 92% of the targeted sale/installation of efficient equipment was achieved.

Mechanism Category

Information Provision

Technology Stage Addressed

Development/Choice/Application

Social Carrier Element Addressed

Interest
Information
Knowledge

Market Barriers Addressed

Lack of Information

Person Completing Form

Jesus Martin Giraldo

Mechanism Description
Reference Number: SE01

Country
Sweden

Region

Short Title of Mechanism
Energy Efficiency Centres

Status of Mechanism
In Use in this Country/Region

Brief Description of Mechanism
Description :
A series of regional energy efficiency centres are being formed throughout Sweden. The centres are working with initiation and co-ordination of projects and dissemination of information within two key areas: energy efficiency and alternative energy sources. The centres are co-operating and co-ordinating their activities with other European countries.

Target Audience : End users, local organisations, companies, industries
Total Funds allocated (in USD) : 400,000 ECU per centre
Energy Saving Target : No specific target
Main Issue Addressed by Mechanism :
Year Mechanism Commenced :

Indicators of Success for the Mechanism :
Measures taken and activities started.

Broad Policy Goal
Limited energy consumption & reduced CO2 emissions.

Specific Goals for this Mechanism
The overall aim of the centres is to encourage and facilitate local initiatives within the key areas (see above).

Type of Intervention Activity
Information and other types of intervention.

Funding Source
Other
Details of Funding Source :
50% comes from different local sources and the European Union is contributing with 50% (i.e. 200.000 ECU) for the first three years of operation. After this period the centres have to be functioning financially independent of this support.

Implementation Organisation
Other
Names of Implementing Organisations :
Västerbottens energikontor, Kommunförbundet Örebro län, Västerbottens energikontor, Bodens kommun, Miljöaktion värmland, Falkenberg energi. (Other organisations may be included as the work progresses.)

Sources of Information about the Mechanism

Information about the energy efficiency centres can be obtained from;
Barbro Fransson
Kommunförbundet
S - 118 82 Stockholm
Sweden
Phone: + 46 8 772 42 00
Fax: + 46 8 641 51 85
E-mail: barbro.fransson@mailbox.swipnet.se

Results of Implementation

Not available yet.

Mechanism Category

Information Provision

Technology Stage Addressed

Choice/Application

Social Carrier Element Addressed

Interest
Information
Knowledge

Market Barriers Addressed

Lack of Information

Person Completing Form

Anna Engleryd

Mechanism Description
Reference Number: SE02

Country
Sweden

Region

Short Title of Mechanism
Technology procurement

Status of Mechanism
In Use in this Country/Region

Brief Description of Mechanism
Description :
The basic idea is to gather purchasers of a specific product and together with them identify improvements of the product that the existing ones on the market are unable to fulfill, and issue a specification. Manufacturers are then free to end in tenders. These are compared and evaluated and the selected winner is ensured a certain initial order. It is important that the purchasers are big and/or influential enough to encourage the suppliers to take up the challenge and enter the competition. The mechanism does not include any rules, but is meant to work with the market creating incentives for the market actors to act in favour of energy efficiency.

Target Audience : End users and to some extent manufacturers
Total Funds allocated (in USD) : Not applicable, part of a programme
Energy Saving Target : Initially 10TWh 1988 - 89.
Main Issue Addressed by Mechanism :
Year Mechanism Commenced :

Indicators of Success for the Mechanism :
1. Number of bids received.
2. Supply/ availability of the product on the market.
3. Market shares for the product in question.
4. End-user awareness of the product and its qualities.

Broad Policy Goal
Limited energy consumption & reduced CO2 emissions.

Specific Goals for this Mechanism
There can be said to be three goals;
- to speed up the development process and bring about more energy efficient products on the market more quickly than would otherwise have been the case;
- to accelerate the market penetration allowing distribution of the product to be made faster; and
- to enlarge the market for the product in question.

Type of Intervention Activity
See above. Technology procurement brings about more efficient products and increases their market penetration. This is meant to lead to a reduced energy consumption.

Funding Source

Government Agency
Other
Details of Funding Source :
The Program for Energy Efficiency under which technology procurement falls, obtains funding from the state budget. The participating companies and the buyers also contribute to the financing.

Implementation Organisation

Government Agency
Names of Implementing Organisations :
The Swedish National Board for Industrial and Technical Development, NUTEK (Department of Energy Efficiency). From January 1st, 1998 the new Swedish Energy Agency.

Sources of Information about the Mechanism

Information about technology procurement can be obtained from:
Egil Ofverholm
Head of Department
Department for Transformation of the Energy System
Statens Energimyndighet
Box 310
S-631 04 Eskilstuna
Sweden
Phone: + 46 16 544 2000
Fax: + 46 16 544 2260
E-mail: egil.ofverholm@stem.se

Results of Implementation

About 35 technology procurements in favour of energy efficiency have to date been carried out covering a wide range of products. The mechanism has been evaluated many times, latest in 1996 when a Finnish study team investigated five procurements: HF ballasts, fridge/freezers, monitors, heat pumps, and windows. The procured products reached on average a 30% increase of energy efficiency compared to existing products. As the market penetration progressed, effects like reduced price could be noticed. The mechanism was on the whole regarded as successful by the Finnish study team.

Mechanism Category

Technology Procurement

Technology Stage Addressed

Development/Choice

Social Carrier Element Addressed

Interest
Power
Organisational ability
Information
Access

Market Barriers Addressed

Pay-back Gap

Person Completing Form

Anna Engleryd

Mechanism Description
Reference Number: SE03

Country
Sweden

Region

Short Title of Mechanism
Incentive agreements

Status of Mechanism
In Use in this Country/Region

Brief Description of Mechanism
Description :
Incentive agreements are signed with industrial companies, property administrators and energy utilities. The agreements imply that the organisation/company in question promises to buy and install good energy efficient products and techniques, specified by NUTEK, when constructing new buildings or refurbishing. Grants are available to cover a specified portion of the additional cost that may arise when choosing these products instead of conventional ones. The incentive agreements can be seen as a complement to Technology Procurement. The resulting installations must be available for demonstrations.

Target Audience : Industrial companies, property administrators, Utilities
Total Funds allocated (in USD) : Not applicable, part of a programme
Energy Saving Target : Not applicable
Main Issue Addressed by Mechanism :
Year Mechanism Commenced :

Indicators of Success for the Mechanism :
1. Number of contracts signed.
2. To what extent the ideas contained in the agreements have been taken into consideration in the companies' policy and activities.
3. Measuring (not done to date).

Broad Policy Goal
Limited energy consumption & reduced CO2 emissions

Specific Goals for this Mechanism
To speed up the market penetration of good energy efficient products and techniques.

Type of Intervention Activity
By promoting installations of more energy efficient products the mechanism is meant to lead to a sustainable reduction in energy use.

Funding Source
Government Agency
Electricity Business
Other
Details of Funding Source :
The Grants are financed through Sweden's Program for Energy Efficiency, which obtains funding from the state budget. The party signing the contract with NUTEK bears the rest of the cost (electricity businesses, industrial companies, property administrators).

Implementation Organisation

Government Agency

Names of Implementing Organisations :

The Swedish National Board for Industrial and Technical Development, NUTEK. From January 1st, 1998 the new Swedish Energy Agency.

Sources of Information about the Mechanism

Information about incentive agreements can be obtained from:

Egil Ofverholm
Head of Department
Department for Transformation of the Energy System
Statens Energimyndighet
Box 310
S-631 04 Eskilstuna
Sweden
Phone: + 46 16 544 2000
Fax: + 46 16 544 2260
E-mail: egil.ofverholm@stem.se

Results of Implementation

The mechanism has been successful. In the period 1995-96, 178 incentive agreements were signed with a total economic value of 192 million SEK.

Mechanism Category

Incentive Agreements

Technology Stage Addressed

Choice

Social Carrier Element Addressed

Interest
Power
Access

Market Barriers Addressed

Pay-back Gap

Person Completing Form

Anna Engleryd

Mechanism Description
Reference Number: SE04

Country
Sweden

Region

Short Title of Mechanism
Programme requirements

Status of Mechanism
In Use in this Country/Region

Brief Description of Mechanism
Description :
Programme requirements are a set of voluntary purchasing standards giving examples of good and energy efficient products and systems and contains calculations on gains and effects. The requirements can be used by for example purchasing agents and "fiery spirits" as a help in convincing the management of a company to choose these solutions.

Target Audience : Purchasing agents, consultants, suppliers
Total Funds allocated (in USD) : Not applicable, part of a programme
Energy Saving Target : Not applicable
Main Issue Addressed by Mechanism :
Year Mechanism Commenced :

Indicators of Success for the Mechanism :
1. Contacts and interest from the target audience.
2. Concrete actions carried out by the target group.

Broad Policy Goal
Limited energy consumption & reduced CO2 emissions.

Specific Goals for this Mechanism
The aim is to inspire purchase of energy efficient solutions.

Type of Intervention Activity
See above.

Funding Source
Government Agency
Other
Details of Funding Source :
The production of the program requirements is paid by the Swedish National Program for Energy Efficiency that obtains funding from the state budget. Eventual installations or purchases are paid by the company/organisation in question.

Implementation Organisation
Government Agency
Names of Implementing Organisations:
The Swedish National Board for Industrial and Technical Development, NUTEK.(Department of Energy Efficiency).

Sources of Information about the Mechanism

Information about programme requirements can be obtained from:
Egil Ofverholm
Head of Department
Department for Transformation of the Energy System
Statens Energimyndighet
Box 310
S-631 04 Eskilstuna
Sweden
Phone: + 46 16 544 2000
Fax: + 46 16 544 2260
E-mail: egil.ofverholm@stem.se

Results of Implementation

Not available yet.

Mechanism Category

Regulation/standards/Codes of Practice

Technology Stage Addressed

Choice

Social Carrier Element Addressed

Interest

Market Barriers Addressed

Externalities

Person Completing Form

Anna Engleryd

Mechanism Description
Reference Number: SE05

Country
Sweden

Region

Short Title of Mechanism
Energy Services

Status of Mechanism
Proposed for Use in this Country/Region

Brief Description of Mechanism
Description :
Utilities are designing different concepts to offer energy services rather than electricity. For example an indoor climate of 20°C or good ventilation for a whole building etc. The price of the service is fixed which means that if the utility manages to save energy they get the benefit from the saving if it falls outside the level calculated when signing the service agreement.

Target Audience : End users
Total Funds allocated (in USD) : Not applicable, proposed for use
Energy Saving Target : Not applicable, proposed for use
Main Issue Addressed by Mechanism :
Year Mechanism Commenced :

Indicators of Success for the Mechanism :
1. Number of service contracts signed.
2. Measured savings resulting from these contracts.
3. Financial savings.

Broad Policy Goal
Increase/maintain profit and market shares.

Specific Goals for this Mechanism
From a utility point of view, to try to win more customers by offering new interesting concepts and at the same time save electricity.

Type of Intervention Activity
See above.

Funding Source
Electricity Business
Details of Funding Source :

Implementation Organisation
Electricity Business
Names of Implementing Organisations :
Göteborg energi

Sources of Information about the Mechanism

Information about the idea of Energy Services can be obtained from;
Göteborg Energi
Box 53
S - 401 20 Göteborg
Sweden
Phone: + 46 31 62 60 00
Fax: + 46 31 62 60 04

Results of Implementation

Not available.

Mechanism Category

Energy Services Provision

Technology Stage Addressed

Choice/Application

Social Carrier Element Addressed

Access

Market Barriers Addressed

Risk Sheltering

Person Completing Form

Anna Engleryd

Mechanism Description
Reference Number: SE06

Country
Sweden

Region

Short Title of Mechanism
Performance contracting

Status of Mechanism
In Use in this Country/Region

Brief Description of Mechanism
Description :
Contracts between a customer and a utility that intends to meet customer needs through providing customised solutions with respect to building, personnel, machinery characteristics etc. The price of the service is based on to what degree the specified results are achieved.

Target Audience : Large energy users, i.e industries
Total Funds allocated (in USD) : Not applicable
Energy Saving Target : Not applicable
Main Issue Addressed by Mechanism :
Year Mechanism Commenced :

Indicators of Success for the Mechanism :
1. Number of agreements signed.
2. Measured savings resulting from the agreements.
3. Financial savings.

Broad Policy Goal
Increase/maintain profit and market share.

Specific Goals for this Mechanism
From a utility point of view the aim is to attract foremost larger customers. The carrot for the customer is a possibility to reduce energy use and thereby energy costs. If a large number of contracts are signed and the utilities are successful in meeting the specified results, an overall reduction of energy use will result.

Type of Intervention Activity
Energy services: Performance contracting

Funding Source
Electricity Business
Other
Details of Funding Source :
Commercial agreement between the service provider and the customer.

Implementation Organisation
Electricity Business
Names of Implementing Organisations :
Göteborg Energi

Sources of Information about the Mechanism

Information about performance contracting can be obtained from;
Göteborg Energi
Box 53
S - 401 20 Göteborg
Sweden
Phone: + 46 31 62 60 00
Fax: + 46 31 62 60 04

Results of Implementation

Some activity experienced, but it is still too early to draw any conclusions about the effectiveness of the mechanism.

Mechanism Category

Energy Services Provision

Technology Stage Addressed

Choice

Social Carrier Element Addressed

Information

Market Barriers Addressed

Risk Sheltering

Person Completing Form

Anna Engleryd

Mechanism Description
Reference Number: UK01

Country
United Kingdom

Region

Short Title of Mechanism
Centre for Research Education and Training in Energy.

Status of Mechanism
In Use in this Country/Region

Brief Description of Mechanism
Description :
CREATE is an organisation which produces educational material about energy efficiency for use with all ages in schools, and administers the refund programme for schools who invest in their buildings to cut their energy use.

Target Audience : Children and schools
Total Funds allocated (in USD) : Not available
Energy Saving Target : Not available
Main Issue Addressed by Mechanism :
Year Mechanism Commenced :

Indicators of Success for the Mechanism :
Reduction in school energy bills.

Broad Policy Goal
Limited energy consumption & reduced CO2 emissions.

Specific Goals for this Mechanism
Reduced energy consumption in schools. Education of the energy consumers of the future. It has also become apparent that children are surprisingly good at taking the message home and affecting the energy consumption of their families.

Type of Intervention Activity
Education and subsidisation

Funding Source
Government Agency
Other
Details of Funding Source :
Central and local government (DETR). Local companies donations. Earnings from projects and consultancies.

Implementation Organisation
Other
Names of Implementing Organisations :
CREATE, The Energy Saving Trust

Sources of Information about the Mechanism

CREATE
Kenley House
25, Bridgeman Terrace
Wigan WN1 1TD
United Kingdom

Results of Implementation

Investigation ongoing.

Mechanism Category

Education and Training Provision

Technology Stage Addressed

Choice/Application

Social Carrier Element Addressed

Interest
Information
Knowledge

Market Barriers Addressed

Lack of Information

Person Completing Form

Juliette Smith

Mechanism Description
Reference Number: UK02

Country
United Kingdom

Region

Short Title of Mechanism
Energy Services

Status of Mechanism
In Use in this Country/Region

Brief Description of Mechanism
Description :
Grants are given to companies to set up energy service companies to supply energy and energy services, including energy efficiency.

Target Audience : Residential customers
Total Funds allocated (in USD) : 541,000 GBP in 1996/97
Energy Saving Target : n/a
Main Issue Addressed by Mechanism :
Year Mechanism Commenced :
Indicators of Success for the Mechanism :
Commercially viable energy service companies operating in the residential sector.

Broad Policy Goal
Limited energy consumption & reduced CO2 emissions.

Specific Goals for this Mechanism
To create viable ESCOs.

Type of Intervention Activity
Grants from central government are given to establish ESCOs.

Funding Source
Government Agency
Details of Funding Source :
Central government

Implementation Organisation
Government Agency
Names of Implementing Organisations :
Energy Saving Trust

Sources of Information about the Mechanism
The Energy Saving Trust
21 Dartmouth Street
London SW1H 9BP
United Kingdom
Phone: + 44 20 7222 0101
Fax: + 44 20 7654 2444

Results of Implementation
Investigation ongoing

Mechanism Category
Subsidies/Grants/Rebates

Technology Stage Addressed
Application

Social Carrier Element Addressed
Power
Access

Market Barriers Addressed
Risk Sheltering

Person Completing Form
Juliette Smith

Mechanism Description
Reference Number: UK03

Country
United Kingdom

Region

Short Title of Mechanism
HECA (Home Energy Conservation Act) Action

Status of Mechanism
In Use in this Country/Region

Brief Description of Mechanism
Description :
HECA Action is a three year competitive program for local authorities. Local councils are given grants to fulfil their obligations under the Home Energy Conservation Act (HECA). They are invited to submit plans for energy saving in their area to a central body and the plans judged by a set criteria. Criteria includes: Sustainability, innovation, employment creation, energy services, addressing fuel poverty, and dynamic effects. The winning plans are then awarded pump-priming funding and results are shared with other authorities.

Target Audience : Local authorities
Total Funds allocated (in USD) : 5.6 million GBP in 1996/7
Energy Saving Target : 5,500 GWh
Main Issue Addressed by Mechanism :
Year Mechanism Commenced :

Indicators of Success for the Mechanism :
Number of participating authorities.

Broad Policy Goal
Limited energy consumption & reduced CO2 emissions.

Specific Goals for this Mechanism
For local authorities to create innovative energy saving techniques that can be shared, for duplicating, where possible in other local authorities.

Type of Intervention Activity
Subsidisation. HECA Action is not supposed to be a long term funding strategy, rather it should be a one off payment to "Kick-Start" long term energy efficiency projects.

Funding Source
Government Agency
Details of Funding Source :
Government grants awarded through the EST, and a minimum 30% gearing from local sources.

Implementation Organisation
Government Agency
Names of Implementing Organisations :
The Energy Saving Trust.

Sources of Information about the Mechanism

The Energy Saving Trust
21 Dartmouth Street
London SW1H 9BP
United Kingdom
Phone: + 44 20 7222 0101
Fax: + 44 20 7654 2444

Results of Implementation

Investigation ongoing.

Mechanism Category

Subsidies/Grants/Rebates

Technology Stage Addressed

Choice

Social Carrier Element Addressed

Interest
Power
Information

Market Barriers Addressed

Pay-back Gap

Person Completing Form

Juliette Smith

Mechanism Description
Reference Number: UK04

Country
United Kingdom

Region

Short Title of Mechanism
Electricity Standards of Performance

Status of Mechanism
In Use in this Country/Region

Brief Description of Mechanism
Description :
Electricity retailers are allowed to claim a levy equivalent to one GBP per franchise customer to fund energy efficiency measures for their customers to achieve energy savings targets set by regulator in the franchise market.

Target Audience : Residential customers and small businesses
Total Funds allocated (in USD) : 25 million GBP a year over 4 years
Energy Saving Target : 6,100 GWh
Main Issue Addressed by Mechanism :
Year Mechanism Commenced :

Indicators of Success for the Mechanism :
6,100 GWh savings spread over all energy efficiency measures. Each electricity supplier will have its own target set by the regulator.

Broad Policy Goal
Limited energy consumption & reduced CO2 emissions.

Specific Goals for this Mechanism
6,100 GWh savings across all electricity suppliers.

Type of Intervention Activity
Cost recovery via tariffs. Allows electricity retailers to collect 1GBP per year from each customer to fund energy efficiency measures.

Funding Source
Other
Details of Funding Source :
Customers pay equivalent of 1 GBP per year.

Implementation Organisation
Electricity Business
Names of Implementing Organisations :
All electricity retailers to the franchise market.

Comments :
Monitored by Energy Saving Trust and the regulator OFFER.

Sources of Information about the Mechanism

The Energy Saving Trust
21 Dartmouth Street
London SW1H 9BP
United Kingdom
Phone: + 44 20 7222 0101
Fax: + 44 20 7654 2444

Results of Implementation

Effective at achieving targets:

- Customer benefited by 5 GBP for every 1 GBP invested;
- Cost of saving energy less than supply price to PES. Saving = 1.7 pence/kWh. PES purchase price for electricity = 4 pence/kWh.

Mechanism Category

Regulation/standards/Codes of Practice

Technology Stage Addressed

Choice

Social Carrier Element Addressed

Interest

Market Barriers Addressed

Risk Sheltering

Person Completing Form

Juliette Smith

Mechanism Description
Reference Number: UK05

Country
United Kingdom

Region

Short Title of Mechanism
Energy Efficiency Advice Centres

Status of Mechanism
In Use in this Country/Region

Brief Description of Mechanism
Description :
A network of independent centres set up to offer free, impartial and credible energy efficiency advice to householders and small businesses. Currently there are 45 centres throughout the country.

Target Audience : Residential customers and small businesses
Total Funds allocated (in USD) : 2.4 million GBP in 1996/7
Energy Saving Target : 2,000 GWh
Main Issue Addressed by Mechanism :
Year Mechanism Commenced :

Indicators of Success for the Mechanism :
Number of people receiving advice (110,000 in 1996/7). Customer energy bill savings (an average of 57 GBP). Cost-effectiveness of mechanism (the ratio between the amount spent by consumers and partners and the amount invested by the Energy Saving Trust is 10:1).

Broad Policy Goal
Limited energy consumption & reduced CO2 emissions.

Specific Goals for this Mechanism
To give customers a source of energy efficiency advice that they can trust.

Type of Intervention Activity
Subsidisation i.e., matched government funding with locally sourced money to increase the implementation of energy efficiency measures, cutting overall energy consumption.

Funding Source
Government Agency
Other
Details of Funding Source :
Central Government core funding matched by local business, local Councils.

Implementation Organisation

Government Agency

Names of Implementing Organisations :

The Energy Saving Trust

Comments :

A franchise system has been created, so a number of more independent centres are being established. These will be solely financed from outside the government, although core funding for support activities from the Trust will still be provided.

Sources of Information about the Mechanism

A comprehensive list of energy efficiency advice centres, and information about the whole network is available from the Energy Saving Trust. The Trust also publishes a report on the results of the three year pilot programme. "Local Energy Advice Centres; encouraging energy efficiency".

The Energy Saving Trust
21 Dartmouth Street
London SW1H 9BP
United Kingdom
Phone: + 44 20 7222 0101
Fax: + 44 20 7654 2444

Results of Implementation

The scheme has been highly effective at increasing the implementation of energy saving measures thus reducing energy use and CO2 emissions:

- March 1996 - March 1997: 110,000 people contacted their local EEAC[
- over 70% of people are installing energy saving measures or becoming more energy conscious as a result;
- the average domestic annual bill is reduced by 2,634 kWh, saving 745 kg CO2 emissions and 57 GBP;
- total life-time savings from measures encouraged by EEACs are currently estimated to exceed 600,000 tonnes CO2.

Mechanism Category

Information Provision

Technology Stage Addressed

Choice/Application

Social Carrier Element Addressed

Information
Knowledge

Market Barriers Addressed

Lack of Information

Person Completing Form

Juliette Smith

Mechanism Description
Reference Number: UK06

Country
United Kingdom

Region

Short Title of Mechanism
Branding - Energy Efficiency

Status of Mechanism
In Use in this Country/Region

Brief Description of Mechanism
Description :
A long-term programme for the national branding and marketing of energy efficiency. An integrated campaign to promote energy efficiency as a modern and socially acceptable way in which to save money.

Target Audience : Residential sector
Total Funds allocated (in USD) : 5 million GBP in 1997
Energy Saving Target : N/A
Main Issue Addressed by Mechanism :
Year Mechanism Commenced :

Indicators of Success for the Mechanism :
Increase in residential energy efficiency.

Broad Policy Goal
Limited energy consumption & reduced CO2 emissions.

Specific Goals for this Mechanism
Increased awareness of energy efficiency at all points when purchasing energy consuming products leading to a 20% increase in residential energy efficiency over a 5 year period.

Type of Intervention Activity
Branding to increase customer understanding of the market, thus increasing investment in energy efficient goods.

Funding Source
Government Agency
Details of Funding Source :
Government

Implementation Organisation
Other
Names of Implementing Organisations :
The Energy Saving Trust

Sources of Information about the Mechanism

Marketing Department
The Energy Saving Trust
21 Dartmouth Street
London SW1H 9BP
United Kingdom
Phone: + 44 20 7222 0101
Fax: + 44 20 7654 2444

Results of Implementation

The branding has been a success.

- 16% logo recognition in first 6 months;
- 20 major retailers have become partners;
- 9 million GBP of "in kind" funding committed;
- 130,000 staff from partnership organisations trained in energy efficiency;
- 80 Local authorities committed;
- significant shift in demand for ABC rated appliances noted.

Mechanism Category

Branding

Technology Stage Addressed

Choice

Social Carrier Element Addressed

Interest
Organisational ability
Information

Market Barriers Addressed

Lack of Information

Person Completing Form

Juliette Smith

Mechanism Description
Reference Number: UK07

Country
United Kingdom

Region

Short Title of Mechanism
Pensioners Energy plan

Status of Mechanism
In Use in this Country/Region

Brief Description of Mechanism
Description :
Designed to combine local authority grants with a loan on the property which can significantly improve the building fabric and comfort, and at the same time save energy. Releases equity tied up in pensioners' homes to fund energy efficient improvements to their homes.

Target Audience : Home owning pensioners
Total Funds allocated (in USD) : 48,000 GBP in 1996/7
Energy Saving Target : Not available
Main Issue Addressed by Mechanism :
Year Mechanism Commenced :

Indicators of Success for the Mechanism :

Broad Policy Goal
Limited energy consumption & reduced CO2 emissions.

Specific Goals for this Mechanism
To allow those who are asset rich - in that they own their own home - but cash poor, to afford installation of energy efficiency measures in their homes.

Type of Intervention Activity
Mortgage scheme. Allows those who would not otherwise have been able to, to reduce their energy consumption.

Funding Source
Government Agency
Details of Funding Source :
Central and local Government: DETR, Local authorities

Implementation Organisation
Government Agency
Names of Implementing Organisations :
The Energy Saving Trust

Sources of Information about the Mechanism

The Energy Saving Trust
21 Dartmouth Street
London SW1H 9BP
United Kingdom
Phone: + 44 20 7222 0101
Fax: + 44 20 7654 2444

Results of Implementation

Ongoing

Mechanism Category

Subsidies/Grants/Rebates

Technology Stage Addressed

Choice

Social Carrier Element Addressed

Power

Market Barriers Addressed

Pay-back Gap

Person Completing Form

Juliette Smith

Mechanism Description
Reference Number: UK08

Country
United Kingdom

Region

Short Title of Mechanism
Best Practice Programme

Status of Mechanism
In Use in this Country/Region

Brief Description of Mechanism
Description :
The programme aims to stimulate the uptake of energy efficiency. It has four main programme elements:

- improving market intelligence by producing energy consumption guides within specific industrial sectors, including action plans of energy saving measures;
- stimulating replication by promoting good practice by producing guides which detail the best practice currently associated with energy use in a particular industry, process or building type;
- New Practice. Providing information on new energy efficiency measures which are just becoming available;
- Future Practice. Provides financial support for basic R&D into new energy efficiency measures which may become the good practice of the future.

Target Audience : Industry, commerce and public energy users
Total Funds allocated (in USD) :
Energy Saving Target : Carbon dioxide savings of 18 million tonnes pa in 10 years
Main Issue Addressed by Mechanism :
Year Mechanism Commenced :

Indicators of Success for the Mechanism :
The programme started in March 1989. The objective is to stimulate energy savings worth £800 million per year by the year 2000, with associated reduction in carbon dioxide emissions of 18 million tonnes per year.

Broad Policy Goal
Limited energy consumption & reduced CO2 emissions.

Specific Goals for this Mechanism
The objective is to stimulate energy savings worth £800 million pa by the year 2000, with associated reduction in carbon dioxide emissions of 18 million tonnes pa.

Type of Intervention Activity
By overcoming the three main barriers to energy efficiency in this sector:

- the limited understanding of the potential benefits of energy efficiency technologies and techniques;
- the lack of objective information on both existing and novel energy efficiency technologies and techniques;
- institutional barriers.

Funding Source

Government Agency

Details of Funding Source :

Government funded

Implementation Organisation

Other

Names of Implementing Organisations :

Energy Technology Support Unit (ETSU), Building Research Energy Conservation Support Unit (BRECSU)

Sources of Information about the Mechanism

For industrial processes:
Energy Efficiency Enquiries Bureau
ETSU
Harwell
Oxfordshire OX11 0RAF
United Kingdom

For buildings related matters:
Enquiries Bureau
BRECSU
Building Research Establishment
Garston
Watford.WD2 7JR
United Kingdom

Results of Implementation

Still in progress.

Mechanism Category

Information Provision

Technology Stage Addressed

Development/Choice

Social Carrier Element Addressed

Information
Access

Market Barriers Addressed

Lack of Information

Person Completing Form

Juliette Smith

Mechanism Description
Reference Number: UK09

Country	Region
United Kingdom	

Short Title of Mechanism
Home Energy Efficiency Scheme (HEES)

Status of Mechanism
In Use in this Country/Region

Brief Description of Mechanism
Description :
The Scheme funded by the Government offers loft, tank and pipe insulation, draught proofing, CWI or heating controls plus energy efficiency advice to householders in receipt of a range of welfare benefits.

Target Audience : The Fuel Poor
Total Funds allocated (in USD) : £75 million per annum
Energy Saving Target : No such target
Main Issue Addressed by Mechanism :
Year Mechanism Commenced :

Indicators of Success for the Mechanism :
In 1998/9, the target is for 400,000 houses to gain measures

Broad Policy Goal
Limited energy consumption & reduced CO2 emissions.

Specific Goals for this Mechanism
To increase comfort and reduce energy bills for fuel poor

Type of Intervention Activity
Offering energy efficiency measures to the fuel poor

Funding Source
Government Agency
Details of Funding Source :
The Government funds all grants

Implementation Organisation
Government Agency
Names of Implementing Organisations :
EAGA Ltd

Sources of Information about the Mechanism
EAGA Ltd
Eldon Court
Eldon Square
Newcastle upon Tyne NE1 7HA
United Kingdom

Results of Implementation

Since the scheme started nearly 3 million households have benefited from the measures.

Mechanism Category

Subsidies/Grants/Rebates

Technology Stage Addressed

Choice

Social Carrier Element Addressed

Interest
Power

Market Barriers Addressed

Pay-back Gap

Person Completing Form

Juliette Smith

Appendix C -

European Union Directive Concerning Common Rules for the Internal Market in Electricity

DIRECTIVE 96/92/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL OF 19 DECEMBER 1996 CONCERNING COMMON RULES FOR THE INTERNAL MARKET IN ELECTRICITY

Official Journal NO. L 027 , 30/01/1997 P. 0020 – 0029

THE EUROPEAN PARLIAMENT AND THE COUNCIL OF THE EUROPEAN UNION,

Having regard to the Treaty establishing the European Community, and in particular Article 57 (2), Article 66 and Article 100a thereof,

Having regard to the proposal from the Commission (1),

Having regard to the opinion of the Economic and Social Committee (2),

Acting in accordance with the procedure laid down in Article 189b of the Treaty (3),

(1) Whereas it is important to adopt measures to ensure the smooth running of the internal market; whereas the internal market is to comprise an area without internal frontiers in which the free movement of goods, persons, services and capital is ensured;

(2) Whereas the completion of a competitive electricity market is an important step towards completion of the internal energy market;

(3) Whereas the provisions of this Directive should not affect the full application of the Treaty, in particular the provisions concerning the internal market and competition;

(4) Whereas establishment of the internal market in electricity is particularly important in order to increase efficiency in the production, transmission and distribution of this product, while reinforcing security of supply and the competitiveness of the European economy and respecting environmental protection;

(5) Whereas the internal market in electricity needs to be established gradually, in order to enable the industry to adjust in a flexible and ordered manner to its new environment and to take account of the different ways in which electricity systems are organized at present;

(6) Whereas the establishment of the internal market in the electricity sector must favour the interconnection and interoperability of systems;

(7) Whereas Council Directive 90/547/EEC of 29 October 1990 on the transit of electricity through transmission grids (4) and Council Directive 90/377/EEC of 29 June 1990 concerning a Community procedure to improve the transparency of gas and electricity prices charged to industrial end-users (5), provide for a first phase for the completion of the internal market in electricity;

(8) Whereas it is now necessary to take further measures with a view to establishing the internal market in electricity;

(9) Whereas, in the internal market, electricity undertakings must be able to operate, without prejudice to compliance with public service obligations, with a view to achieving a competitive market in electricity;

(10) Whereas Member States, because of the structural differences in the Member States, currently have different systems for regulating the electricity sector;

(11) Whereas, in accordance with the principle of subsidiarity, general principles providing for a framework must be established at Community level, but their detailed implementation should be left to Member States, thus allowing each Member State to choose the regime which corresponds best to its particular situation;

(12) Whereas, whatever the nature of the prevailing market organization, access to the system must be open in accordance with this Directive and must lead to equivalent economic results in the States and hence to a directly comparable level of opening-up of markets and to a directly comparable degree of access to electricity markets;

(13) Whereas for some Member States the imposition of public service obligations may be necessary to ensure security of supply and consumer and environmental protection, which, in their view, free competition, left to itself, cannot necessarily guarantee;

(14) Whereas long-term planning may be one means of carrying out those public service obligations;

(15) Whereas the Treaty lays down specific rules with regard to restrictions on the free movement of goods and on competition;

(16) Whereas Article 90 (1) of the Treaty, in particular, obliges the Member States to respect these rules with regard to public undertakings and undertakings which have been granted special or exclusive rights;

(17) Whereas Article 90 (2) of the Treaty subjects undertakings entrusted with the operation of services of general economic interest to these rules, under specific conditions;

(18) Whereas the implementation of this Directive will have an impact on the activities of such undertakings;

(19) Whereas the Member States, when imposing public service obligations on the undertakings of the electricity sector, must therefore respect the relevant rules of the Treaty as interpreted by the Court of Justice;

(20) Whereas, in establishing the internal market in electricity, full account should be taken of the Community objective of economic and social cohesion, particularly in sectors such as the infrastructures, national or intra-Community, which are used for the transmission of electricity;

(21) Whereas Decision No 1254/96/EC of the European Parliament and of the Council of 5 June 1996 laying down a series of guidelines for trans-European energy networks (6) has contributed to the development of integrated infrastructures for the transmission of electricity;

(22) Whereas it is therefore necessary to establish common rules for the production of electricity and the operation of electricity transmission and distribution systems;

(23) Whereas there are two systems which may be applied for opening up the production market, an authorization procedure or a tendering procedure, and these must operate in accordance with objective, transparent and non-discriminatory criteria;

(24) Whereas the position of autoproducers and independent producers needs to be taken into consideration within this framework;

(25) Whereas each transmission system must be subject to central management and control in order to ensure the security, reliability and efficiency of the system in the interests of producers and their customers; whereas a transmission system operator should therefore be designated and entrusted with the operation, maintenance, and, if necessary, development of the system; whereas the transmission system operator must behave in an objective, transparent and non-discriminatory manner;

(26) Whereas the technical rules for the operation of transmission systems and direct lines must be transparent and must ensure interoperability;

(27) Whereas objective and non-discriminatory criteria must be established for the dispatching of power stations;

(28) Whereas, for reasons of environmental protection, priority may be given to the production of electricity from renewable sources;

(29) Whereas, at the distribution level, customers located in a given area may be granted supply rights and a manager must be designated to manage, maintain and, if necessary, develop each distribution system;

(30) Whereas, in order to ensure transparency and non-discrimination, the transmission function of vertically integrated undertakings should be operated independently from the other activities;

(31) Whereas a single buyer must operate separately from the generation and distribution activities of vertically integrated undertakings; whereas the flow of information between the single buyer activities and these generation and distribution activities needs to be restricted;

(32) Whereas the accounts of all integrated electricity undertakings should provide for maximum transparency, in particular to identify possible abuses of a dominant position, consisting for example in abnormally high or low tariffs or in discriminatory practices relating to equivalent transactions; whereas, to this end, the accounts must be separate for each activity;

(33) Whereas it is also necessary to provide for access by the competent authorities to the internal accounts of undertakings with due regard for confidentiality;

(34) Whereas, owing to the diversity of structures and the special characteristics of systems in Member States, there should be different options for system access operating in accordance with objective, transparent and non-discriminatory criteria;

(35) Whereas provision should be made for authorizing the construction and use of direct lines;

(36) Whereas provision must be made for safeguards and dispute settlement procedures;

(37) Whereas any abuse of a dominant position or any predatory behaviour should be avoided;

(38) Whereas, as some Member States are liable to experience special difficulties in adjusting their systems, provision should be made for recourse to transitional regimes or derogations, especially for the operation of small isolated systems;

(39) Whereas this Directive constitutes a further phase of liberalization; whereas, once it has been put into effect, some obstacles to trade in electricity between Member States will nevertheless remain in place; whereas, therefore, proposals for improving the operation of the internal market in electricity may be made in the light of experience; whereas the Commission should therefore report to the Council and the European Parliament on the application of this Directive,

HAVE ADOPTED THIS DIRECTIVE:

CHAPTER I

SCOPE AND DEFINITIONS

ARTICLE 1

This Directive establishes common rules for the generation, transmission and distribution of electricity. It lays down the rules relating to the organization and functioning of the electricity sector, access to the market, the criteria and procedures applicable to calls for tender and the granting of authorizations and the operation of systems.

ARTICLE 2

For the purposes of this Directive:

1. ‘generation’ shall mean the production of electricity;

2. ‘producer’ shall mean a natural or legal person generating electricity;

3. ‘autoproducer’ shall mean a natural or legal person generating electricity essentially for his own use;

4. ‘independent producer’ shall mean:

(a) a producer who does not carry out electricity transmission or distribution functions in the territory covered by the system where he is established;

(b) in Member States in which vertically integrated undertakings do not exist and where a tendering procedure is used, a producer corresponding to the definition of point (a), who may not be exclusively subject to the economic precedence of the interconnected system;

5. ‘transmission’ shall mean the transport of electricity on the high-voltage interconnected system with a view to its delivery to final customers or to distributors;

6. ‘distribution’ shall mean the transport of electricity on medium-voltage and low-voltage distribution systems with a view to its delivery to customers;

7. ''customers’ shall mean wholesale or final customers of electricity and distribution companies;

8. ‘wholesale customers’ shall mean any natural or legal persons, if the Member States recognize their existence, who purchase or sell electricity and who do not carry out transmission, generation or distribution functions inside or outside the system where they are established;

9. ‘final customer’ shall mean a customer buying electricity for his own use;

10. ‘interconnectors’ shall mean equipment used to link electricity systems;

11. ''interconnected system' shall mean a number of transmission and distribution systems linked together by means of one or more interconnectors;

12. 'direct line' shall mean an electricity line complementary to the interconnected system;

13. 'economic precedence' shall mean the ranking of sources of electricity supply in accordance with economic criteria;

14. 'ancillary services' shall mean all services necessary for the operation of a transmission or distribution system;

15. 'system user' shall mean any natural or legal person supplying to, or being supplied by, a transmission or distribution system;

16. ''supply' shall mean the delivery and/or sale of electricity to customers;

17. 'integrated electricity undertaking' shall mean a vertically or horizontally integrated undertaking;

18. 'vertically integrated undertaking' shall mean an undertaking performing two or more of the functions of generation, transmission and distribution of electricity;

19. 'horizontally integrated undertaking' shall mean an undertaking performing at least one of the functions of generation for sale, or transmission or distribution of electricity, and another non-electricity activity;

20. 'tendering procedure' shall mean the procedure through which planned additional requirements and replacement capacity are covered by supplies from new or existing generating capacity;

21. 'long-term planning' shall mean the planning of the need for investment in generation and transmission capacity on a long-term basis, with a view to meeting the demand for electricity of the system and securing supplies to customers;

22. 'single buyer' shall mean any legal person who, within the system where he is established, is responsible for the unified management of the transmission system and/or for centralized electricity purchasing and selling;

23. 'small isolated system' shall mean any system with consumption of less than 2500 GWh in the year 1996, where less than 5% of annual consumption is obtained through interconnection with other systems.

CHAPTER II

GENERAL RULES FOR THE ORGANIZATION OF THE SECTOR

ARTICLE 3

1. Member States shall ensure, on the basis of their institutional organization and with due regard for the principle of subsidiarity, that, without prejudice to paragraph 2, electricity undertakings are operated in accordance with the principles of this Directive, with a view to achieving a competitive market in electricity, and shall not discriminate between these undertakings as regards either rights or obligations. The two approaches to system access referred to in Articles 17 and 18 must lead to

equivalent economic results and hence to a directly comparable level of opening-up of markets and to a directly comparable degree of access to electricity markets.

2. Having full regard to the relevant provisions of the Treaty, in particular Article 90, Member States may impose on undertakings operating in the electricity sector, in the general economic interest, public service obligations which may relate to security, including security of supply, regularity, quality and price of supplies and to environmental protection. Such obligations must be clearly defined, transparent, non-discriminatory and verifiable; they, and any revision thereof, shall be published and notified to the Commission by Member States without delay. As a means of carrying out the abovementioned public service obligations, Member States which so wish may introduce the implementation of long-term planning.

3. Member States may decide not to apply the provisions of Articles 5, 6, 17, 18 and 21 insofar as the application of these provisions would obstruct the performance, in law or in fact, of the obligations imposed on electricity undertakings in the general economic interest and insofar as the development of trade would not be affected to such an extent as would be contrary to the interests of the Community. The interests of the Community include, inter alia, competition with regard to eligible customers in accordance with this Directive and Article 90 of the Treaty.

CHAPTER III

GENERATION

ARTICLE 4

For the construction of new generating capacity, Member States may choose between an authorization procedure and/or a tendering procedure. Authorization and tendering must be conducted in accordance with objective, transparent and non-discriminatory criteria.

ARTICLE 5

1. Where they opt for the authorization procedure, Member States shall lay down the criteria for the grant of authorizations for the construction of generating capacity in their territory. These criteria may relate to:

(a) the safety and security of the electricity system, installations and associated equipment;

(b) protection of the environment;

(c) land use and siting;

(d) use of public ground;

(e) energy efficiency;

(f) the nature of the primary sources;

(g) characteristics particular to the applicant, such as technical, economic and financial capabilities;

(h) the provisions of Article 3.

2. The detailed criteria and procedures shall be made public.

3. Applicants shall be informed of the reasons, which must be objective and non-discriminatory, for any refusal to grant an authorization; the reasons must be well founded and duly substantiated; they shall be forwarded to the Commission for information. Appeal procedures must be made available to the applicant.

ARTICLE 6

1. Where they opt for the tendering procedure, Member States or any competent body designated by the Member State concerned shall draw up an inventory of new means of production, including replacement capacity, on the basis of the regular estimate referred to in paragraph 2. The inventory shall take account of the need for interconnection of systems. The requisite capacity shall be allocated by means of a tendering procedure in accordance with the procedure laid down in this Article.

2. The transmission system operator or any other competent authority designated by the Member State concerned shall draw up and publish under State supervision, at least every two years, a regular estimate of the generating and transmission capacity which is likely to be connected to the system, of the need for interconnectors with other systems, of potential transmission capacity and of the demand for electricity. The estimate shall cover a period defined by each Member State.

3. Details of the tendering procedure for means of production shall be published in the Official Journal of the European Communities at least six months prior to the closing date for tenders. The tender specifications shall be made available to any interested undertaking established in the territory of a Member State so that it has sufficient time in which to submit a tender. The tender specifications shall contain a detailed description of the contract specifications and of the procedure to be followed by all tenderers and an exhaustive list of criteria governing the selection of tenderers and the award of the contract. These specifications may also relate to the fields referred to in Articles 5 (1).

4. In invitations to tender for the requisite generating capacity, consideration must also be given to electricity supply offers with long-term guarantees from existing generating units, provided that additional requirements can be met in this way.

5. Member States shall designate an authority or a public body or a private body independent of electricity generation, transmission and distribution activities to be responsible for the organization, monitoring and control of the tendering procedure. This authority or body shall take all necessary steps to ensure confidentiality of the information contained in the tenders.

6. However, it must be possible for autoproducers and independent producers to obtain authorization, on the basis of objective, transparent and non-discriminatory criteria as laid down in Articles 4 and 5, in Member States which have opted for the tendering procedure.

CHAPTER IV

TRANSMISSION SYSTEM OPERATION

ARTICLE 7

1. Member States shall designate or shall require undertakings which own transmission systems to designate, for a period of time to be determined by Member States having regard to considerations of efficiency and economic balance, a system operator to be responsible for operating, ensuring the

maintenance of, and, if necessary, developing the transmission system in a given area and its interconnectors with other systems, in order to guarantee security of supply.

2. Member States shall ensure that technical rules establishing the minimum technical design and operational requirements for the connection to the system of generating installations, distribution systems, directly connected consumers' equipment, interconnector circuits and direct lines are developed and published. These requirements shall ensure the interoperability of systems and shall be objective and non-discriminatory. They shall be notified to the Commission in accordance with Article 8 of Council Directive 83/189/EEC of 28 March 1983 laying down a procedure for the provision of information in the field of technical standards and regulations (7).

3. The system operator shall be responsible for managing energy flows on the system, taking into account exchanges with other interconnected systems. To that end, the system operator shall be responsible for ensuring a secure, reliable and efficient electricity system and, in that context, for ensuring the availability of all necessary ancillary services.

4. The system operator shall provide to the operator of any other system with which its system is interconnected sufficient information to ensure the secure and efficient operation, coordinated development and interoperability of the interconnected system.

5. The system operator shall not discriminate between system users or classes of system users, particularly in favour of its subsidiaries or shareholders.

6. Unless the transmission system is already independent from generation and distribution activities, the system operator shall be independent at least in management terms from other activities not relating to the transmission system.

ARTICLE 8

1. The transmission system operator shall be responsible for dispatching the generating installations in its area and for determining the use of interconnectors with other systems.

2. Without prejudice to the supply of electricity on the basis of contractual obligations, including those which derive from the tendering specifications, the dispatching of generating installations and the use of interconnectors shall be determined on the basis of criteria which may be approved by the Member State and which must be objective, published and applied in a non-discriminatory manner which ensures the proper functioning of the internal market in electricity. They shall take into account the economic precedence of electricity from available generating installations of interconnector transfers and the technical constraints on the system.

3. A Member State may require the system operator, when dispatching generating installations, to give priority to generating installations using renewable energy sources or waste or producing combined heat and power.

4. A Member State may, for reasons of security of supply, direct that priority be given to the dispatch of generating installations using indigenous primary energy fuel sources, to an extent not exceeding in any calendar year 15 % of the overall primary energy necessary to produce the electricity consumed in the Member State concerned.

ARTICLE 9

The transmission system operator must preserve the confidentiality of commercially sensitive information obtained in the course of carrying out its business.

CHAPTER V

DISTRIBUTION SYSTEM OPERATION

ARTICLE 10

1. Member States may impose on distribution companies an obligation to supply customers located in a given area. The tariff for such supplies may be regulated, for instance to ensure equal treatment of the customers concerned.

2. Member States shall designate or shall require undertakings which own or are responsible for distribution systems to designate a system operator to be responsible for operating, ensuring the maintenance of and, if necessary, developing the distribution system in a given area and its interconnectors with other systems.

3. Member States shall ensure that the system operator acts in accordance with Articles 11 and 12.

ARTICLE 11

1. The distribution system operator shall maintain a secure, reliable and efficient electricity distribution system in its area, with due regard for the environment.

2. In any event, it must not discriminate between system users or classes of system users, particularly in favour of its subsidiaries or shareholders.

3. A Member state may require the distribution system operator, when dispatching generating installations, to give priority to generating installations using renewable energy sources or waste or producing combined heat and power.

ARTICLE 12

The distribution system operator must preserve the confidentiality of commercially sensitive information obtained in the course of carrying out its business.

CHAPTER IV

UNBUNDLING AND TRANSPARENCY OF ACCOUNTS

ARTICLE 13

Member States or any competent authority they designate as well as the dispute settlement authorities referred to in Article 20 (3) shall have right of access to the accounts of generation, transmission or distribution undertakings which they need to consult in carrying out their checks.

ARTICLE 14

1. Member States shall take the necessary steps to ensure that the accounts of electricity undertakings are kept in accordance with paragraphs 2 to 5.

2. Electricity undertakings, whatever their system of ownership or legal form, shall draw up, submit to audit and publish their annual accounts in accordance with the rules of national law concerning the annual accounts of limited liability companies adopted pursuant to the fourth Council Directive 78/660/EEC of 25 July 1978 based on Article 54 (3) (g) of the Treaty on the annual accounts of certain types of companies (8). Undertakings which are not legally obliged to publish their annual accounts shall keep a copy of these at the disposal of the public in their head office.

3. Integrated electricity undertakings shall, in their internal accounting, keep separate accounts for their generation, transmission and distribution activities, and, where appropriate, consolidated accounts for other, non-electricity activities, as they would be required to do if the activities in question were carried out by separate undertakings, with a view to avoiding discrimination, cross-subsidization and distortion of competition. They shall include a balance sheet and a profit and loss account for each activity in notes to their accounts.

4. Undertakings shall specify in notes to the annual accounts the rules for the allocation of assets and liabilities and expenditure and income which they follow in drawing up the separate accounts referred to in paragraph 3. These rules may be amended only in exceptional cases. Such amendments must be mentioned in the notes and must be duly substantiated.

5. The annual accounts shall indicate in notes any transaction of a certain size conducted with affiliated undertakings, within the meaning of Article 41 of the seventh Council Directive 83/349/EEC of 13 June 1983 based on Article 54 (3) (g) of the Treaty on consolidated accounts (9), or with associated undertakings, within the meaning of Article 33 (1) thereof, or, with undertakings which belong to the same shareholders.

ARTICLE 15

1. Member States which designate as a single buyer a vertically integrated electricity undertaking or part of a vertically integrated electricity undertaking shall lay down provisions requiring the single buyer to operate separately from the generation and distribution activities of the integrated undertaking.

2. Member States shall ensure that there is no flow of information between the single buyer activities of vertically integrated electricity undertakings and their generation and distribution activities, except for the information necessary to conduct the single buyer responsibilities.

CHAPTER VII

ORGANIZATION OF ACCESS TO THE SYSTEM

ARTICLE 16

For the organization of access to the system, Member States may choose between the procedures referred to in Article 17 and/or in Article 18. Both sets of procedure shall operate in accordance with objective, transparent and non-discriminatory criteria.

ARTICLE 17

1. In the case of negotiated access to the system, Member States shall take the necessary measures for electricity producers and, where Member States authorize their existence, supply undertakings and eligible customers either inside or outside the territory covered by the system to be able to negotiate access to the system so as to conclude supply contracts with each other on the basis of voluntary commercial agreements.

2. Where an eligible customer is connected to the distribution system, access to the system must be the subject of negotiation with the relevant distribution system operator and, if necessary, with the transmission system operator concerned.

3. To promote transparency and facilitate negotiations for access to the system, system operators must publish, in the first year following implementation of this Directive, an indicative range of prices for use of the transmission and distribution systems. As far as possible, the indicative prices published for subsequent years should be based on the average price agreed in negotiations in the previous 12-month period.

4. Member States may also opt for a regulated system of access procedure, giving eligible customers a right of access, on the basis of published tariffs for the use of transmission and distribution systems, that is at least equivalent, in terms of access to the system, to the other procedures for access referred to in this Chapter.

5. The operator of the transmission or distribution system concerned may refuse access where he lacks the necessary capacity. Duly substantiated reasons must be given for such refusal, in particular having regard to Article 3.

ARTICLE 18

1. In the case of the single buyer procedure, Member States shall designate a legal person to be the single buyer within the territory covered by the system operator. Member States shall take the necessary measures for:

(i) the publication of a non-discriminatory tariff for the use of the transmission and distribution system;

(ii) eligible customers to be free to conclude supply contracts to cover their own needs with producers and, where Member States authorize their existence, with supply undertakings outside the territory covered by the system;

(iii) eligible customers to be free to conclude supply contracts to cover their own needs with producers inside the territory covered by the system;

(iv) independent producers to negotiate access to the system with the transmission and distribution systems operators so as to conclude supply contracts with eligible customers outside the system, on the basis of a voluntary commercial agreement.

2. The single buyer may be obliged to purchase the electricity contracted by an eligible customer from a producer inside or outside the territory covered by the system at a price which is equal to the sale price offered by the single buyer to eligible customers minus the price of the published tariff referred to in paragraph 1 (i).

3. If the purchase obligation under paragraph 2 is not imposed on the single buyer, Member States shall take the necessary measures to ensure that the supply contracts referred to in paragraph 1 (ii) and (iii) are implemented either via access to the system on the basis of the published tariff referred to in paragraph 1 (i) or via negotiated access to the system according to the conditions of Article 17. In the latter case, there would be no obligation for the single buyer to publish a non-discriminatory tariff for the use of the transmission and distribution system.

4. The single buyer may refuse access to the system and may refuse to purchase electricity from eligible customers where he lacks the necessary transmission or distribution capacity. Duly substantiated reasons must be given for such refusal, in particular having regard to Article 3.

ARTICLE 19

1. Member States shall take the necessary measures to ensure an opening of their electricity markets, so that contracts under the conditions stated in Articles 17 and 18 can be concluded at least up to a significant level, to be notified to the Commission on an annual basis. The share of the national market shall be calculated on the basis of the Community share of electricity consumed by final consumers consuming more than 40 GWh per year (on a consumption site basis and including autoproduction). The average Community share shall be calculated by the Commission on the basis of information regularly provided to it by Member States. The Commission shall publish this average Community share defining the degree of market opening in the Official Journal of the European Communities before November each year, with all appropriate information clarifying the calculation.

2. The share of the national market referred to in paragraph 1 will be increased progressively over a period of six years. This increase will be calculated by reducing the Community consumption threshold of 40 GWh, referred to in paragraph 1 from 40 GWh to a level of 20 GWh annual electricity consumption three years after the entry into force of this Directive and to a level of 9 GWh annual electricity consumption six years after the entry into force of this Directive.

3. Member States shall specify those customers inside their territory representing the shares as specified in paragraphs 1 and 2 which have the legal capacity to contract electricity in accordance with Articles 17 and 18, given that all final consumers consuming more than 100 GWh per year (on a consumption site basis and including autoproduction) must be included in the above category. Distribution companies, if not already specified as eligible customers under this paragraph, shall have the legal capacity to contract under the conditions of Articles 17 and 18 for the volume of electricity being consumed by their customers designated as eligible within their distribution system, in order to supply those customers.

4. Member States shall publish by 31 January each year the criteria for the definition of eligible customers which are able to conclude contracts under the conditions stated in Articles 17 and 18. This information, together with all other appropriate information to justify the fulfilment of market opening under paragraph 1, shall be sent to the Commission to be published in the Official Journal of the European Communities. The Commission may request a Member State to modify its specifications, as mentioned in paragraph 3, if they create obstacles to the correct application of this Directive as regards the smooth functioning of the internal market in electricity. If the Member State concerned does not comply with this request within a period of three months, a final decision shall be taken in accordance with Procedure I of Article 2 of Council Decision 87/373/EEC of 13 July 1987 laying down the procedures for the exercise of implementing powers conferred on the Commission (10).

5. To avoid imbalance in the opening of electricity markets during the period referred to in Article 26:

(a) contracts for the supply of electricity under the provisions of Articles 17 and 18 with an eligible customer in the system of another Member State shall not be prohibited if the customer is considered as eligible in both systems involved;

(b) in cases where transactions as described in subparagraph (a) are refused because of the customer being eligible only in one of the two systems, the Commission may oblige, taking into account the situation in the market and the common interest, the refusing party to execute the requested electricity supply at the request of the Member State where the eligible customer is located.

In parallel with the procedure and the timetable provided for in Article 26, and not later than after half of the period provided for in that Article, the Commission shall review the application of subparagraph (b) of the first subparagraph on the basis of market developments taking into account the common interest. In the light of experience gained, the Commission shall evaluate this situation and report on possible imbalance in the opening of electricity markets with regard to this paragraph.

ARTICLE 20

1. Member States shall take the necessary measures to enable:

(i) independent producers and autoproducers to negotiate access to the system so as to supply their own premises and subsidiaries in the same Member State or in another Member State by means of the interconnected system;

(ii) producers located outside the territory covered by the system to conclude a supply contract following a call for tender for new generating capacity, and to have access to the system to perform the contract.

2. Member States shall ensure that the parties negotiate in good faith and that none of them abuses its negotiating position by preventing the successful outcome of negotiations.

3. Member States shall designate a competent authority, which must be independent of the parties, to settle disputes relating to the contracts and negotiations in question. In particular, this authority must settle disputes concerning contracts, negotiations and refusal of access or refusal to purchase.

4. In the event of cross-border disputes, the dispute settlement authority shall be the dispute settlement authority covering the system of the single buyer or the system operator which refuses use of, or access to, the system.

5. Recourse to this authority shall be without prejudice to the exercise of rights of appeal under Community law.

ARTICLE 21

1. Member States shall take measures under the procedures and rights referred to in Articles 17 and 18 to enable:

- all electricity producers and electricity supply undertakings, where Member States authorize their existence, established within their territory to supply their own premises, subsidiaries and eligible customers through a direct line;

- any eligible customer within their territory to be supplied through a direct line by a producer and supply undertakings, where such suppliers are authorized by Member States.

2. Member States shall lay down the criteria for the grant of authorizations for the construction of direct lines in their territory. These criteria must be objective and non-discriminatory.

3. The possibility of supplying electricity through a direct line as referred to in paragraph 1 shall not affect the possibility of contracting electricity in accordance with Articles 17 and 18.

4. Member States may make authorization to construct a direct line subject either to the refusal of system access on the basis, as appropriate, of Article 17 (5) or Article 18 (4) or to the opening of a dispute settlement procedure under Article 20.

5. Member States may refuse to authorize a direct line if the granting of such an authorization would obstruct the provisions of Article 3. Duly substantiated reasons must be given for such refusal.

ARTICLE 22

Member States shall create appropriate and efficient mechanisms for regulation, control and transparency so as to avoid any abuse of dominant position, in particular to the detriment of consumers, and any predatory behaviour. These mechanisms shall take account of the provisions of the Treaty, and in particular Article 86 thereof.

CHAPTER VIII

FINAL PROVISIONS

ARTICLE 23

In the event of a sudden crisis in the energy market and where the physical safety or security of persons, apparatus or installations or system integrity is threatened, a Member State may temporarily take the necessary safeguard measures.

Such measures must cause the least possible disturbance in the functioning of the internal market and must not be wider in scope than is strictly necessary to remedy the sudden difficulties which have arisen.

The Member State concerned shall without delay notify these measures to the other Member States, and to the Commission, which may decide that the Member State concerned must amend or abolish such measures, insofar as they distort competition and adversely affect trade in a manner which is at variance with the common interest.

ARTICLE 24

1. Those Member States in which commitments or guarantees of operation given before the entry into force of this Directive may not be honoured on account of the provisions of this Directive may apply for a transitional regime which may be granted to them by the Commission, taking into

account, amongst other things, the size of the system concerned, the level of interconnection of the system and the structure of its electricity industry. The Commission shall inform the Member States of those applications before it takes a decision, taking into account respect for confidentiality. This decision shall be published in the Official Journal of the European Communities.

2. The transitional regime shall be of limited duration and shall be linked to expiry of the commitments or guarantees referred to in paragraph 1. The transitional regime may cover derogations from Chapter IV, VI and VII of this Directive. Applications for a transitional regime must be notified to the Commission no later than one year after the entry into force of this Directive.

3. Member States which can demonstrate, after the Directive has been brought into force, that there are substantial problems for the operation of their small isolated systems, may apply for derogations from the relevant provisions of Chapter IV, V, VI, VII, which may be granted to them by the Commission. The latter shall inform the Member States of those applications prior to taking a decision, taking into account respect for confidentiality. This decision shall be published in the Official Journal of the European Communities. This paragraph shall also be applicable to Luxembourg.

ARTICLE 25

1. The Commission shall submit a report to the Council and the European Parliament, before the end of the first year following entry into force of this Directive, on harmonization requirements which are not linked to the provisions of this Directive. If necessary, the Commission shall attach to the report any harmonization proposals necessary for the effective operation of the internal market in electricity.

2. The Council and the European Parliament shall give their views on such proposals within two years of their submission.

ARTICLE 26

The Commission shall review the application of this Directive and submit a report on the experience gained on the functioning of the internal market in electricity and the implementation of the general rules mentioned in Article 3 in order to allow the European Parliament and the Council, in the light of experience gained, to consider, in due time, the possibility of a further opening of the market which would be effective nine years after the entry into force of the Directive taking into account the coexistence of systems referred to in Articles 17 and 18.

ARTICLE 27

1. Member States shall bring into force the laws, regulations and administrative provisions necessary to comply with this Directive not later than 19 February 1999. They shall forthwith inform the Commission thereof.

2. Belgium, Greece and Ireland may, due to the specific technical characteristics of their electricity systems, have an additional period of respectively 1 year, 2 years and 1 year to apply the obligations ensuing from this Directive. These Member States, when making use of this option, shall inform the Commission thereof.

3. When Member States adopt these provisions, they shall contain a reference to this Directive or shall be accompanied by such reference on the occasion of their official publication. The methods of making such reference shall be laid down by Member States.

ARTICLE 28

This Directive shall enter into force on the 20th day following that of its publication in the Official Journal of the European Communities.

ARTICLE 29

This Directive is addressed to the Member States.

Done at Brussels, 19 December 1996.

For the European Parliament
The President
K. HÄNSCH

For the Council
The President
S. BARRETT