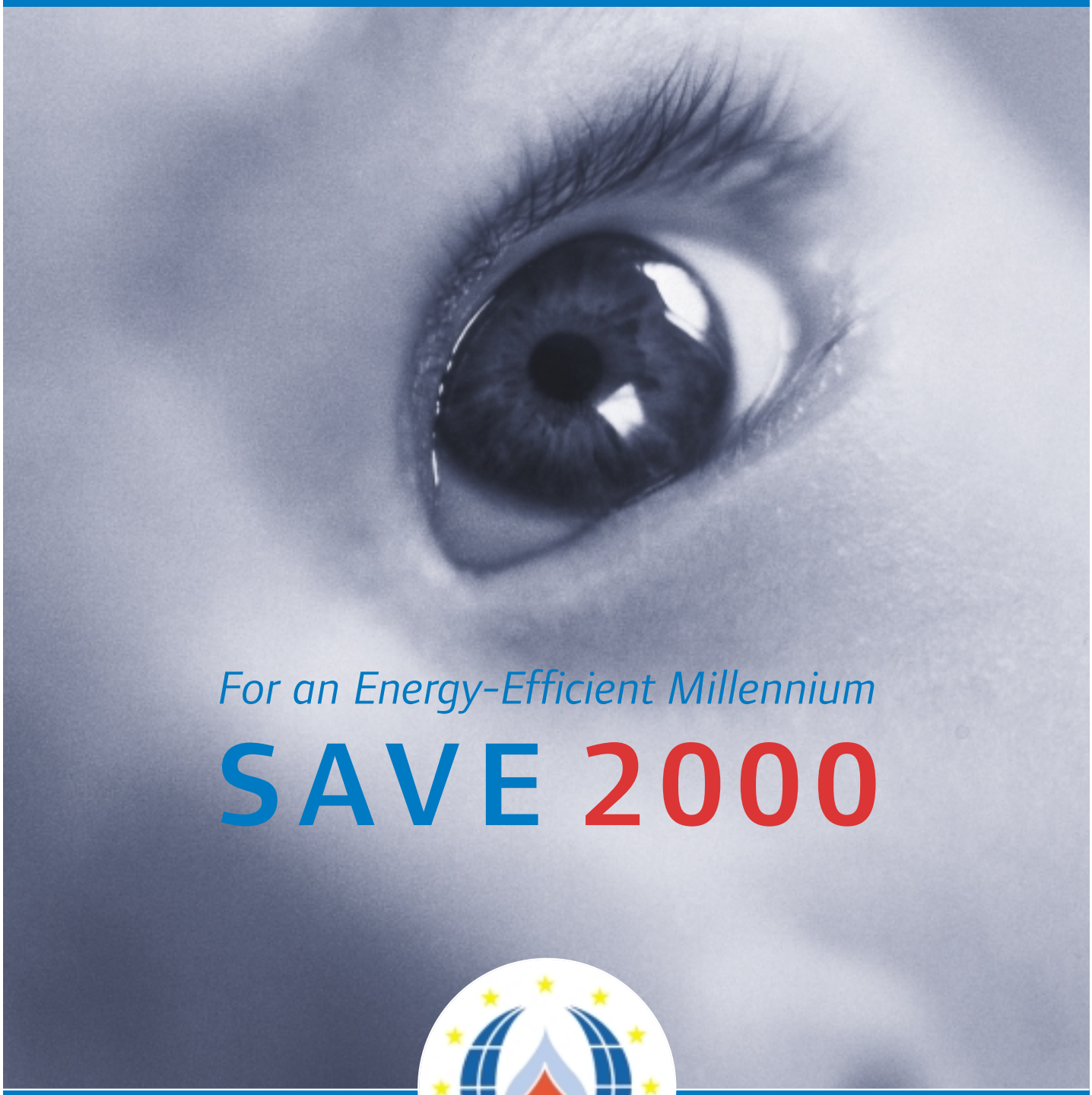
DIRECTORATE-GENERAL FOR ENERGY



For an Energy-Efficient Millennium

SAVE 2000

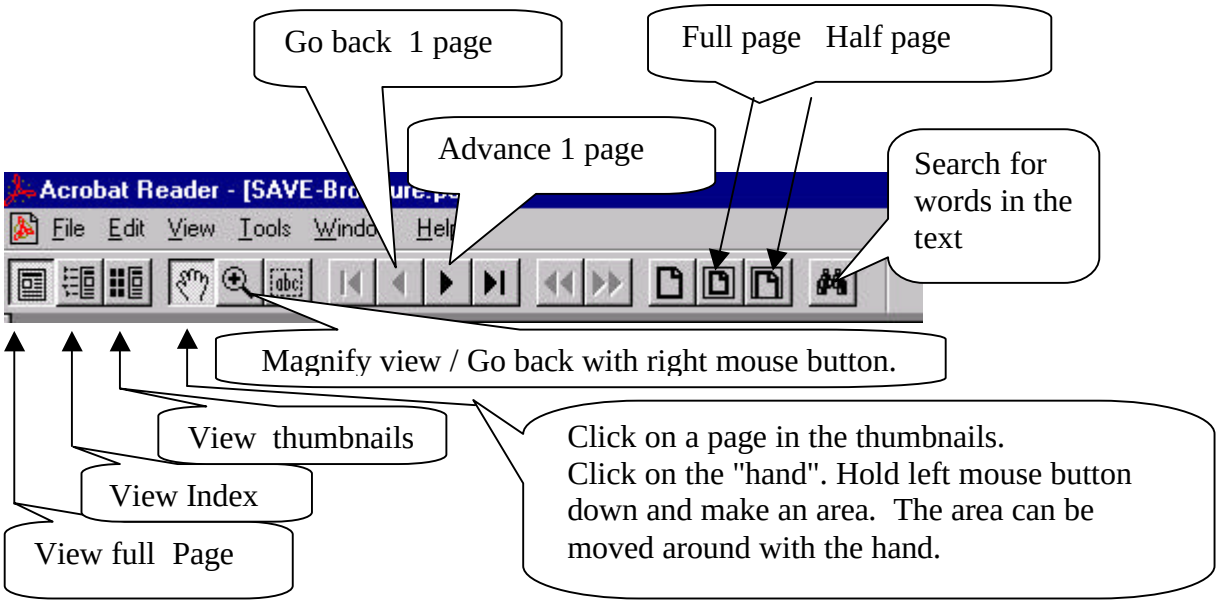
THE SAVE PROGRAMME

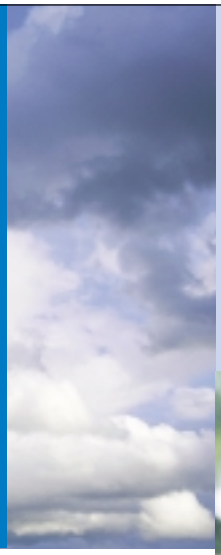
Promoting Energy Efficiency

THE SAVE BROCHURE 2000

The following Adobe Acrobat file is a copy of the SAVE Brochure describing the background and the aims of the SAVE Programme. The brochure is 24 pages.

Acrobat Reader Reminder.





FOREWORD

Loyola de Palacio, Vice-President in charge of relations with the European Parliament, Transport and Energy.
Source: European Commission Audiovisual Library 1999

Saving energy has been a key objective of the energy policies of both the European Union and the Member States since the first oil crisis in 1973. The Union, in co-operation with the Member States, has made continuous efforts to promote energy efficiency ever since, thus reducing pressure on costs and contributing to the economic competitiveness of the EU.

The original emphasis on energy efficiency was to safeguard security of supply but now significant stress is also placed on the need to protect the environment. The compatibility of energy and environmental objectives was underlined due to the major impact of the production, transport and the use of energy on the environment.

More recently, this has again been confirmed through the integration of the environmental dimension in EU energy policy which stresses the importance of energy efficiency and renewable energy sources in sustainable development.

The climate change debate has emphasised further the role of the rational use of energy, which is considered one of the main ways of achieving the commitments under the Kyoto Protocol, in particular in the building, domestic appliance, lighting, transport and industry sectors.

The SAVE Programme is at the core of the rational use of energy and the reduction of CO_2 emissions. It focuses on the demand side and deals with legislative measures, studies and pilot projects, monitoring and information targeted at developing energy saving behaviour in industry, commerce and the domestic sector. In the future, SAVE will enhance transparency and help coordinate the energy components of the multi-annual Framework Programme for Energy.

I consider the SAVE Programme an essential instrument of an energy policy which is also capable of promoting both environmental and employment objectives. To my mind, it is crucial that energy policy serves the needs and interests of the citizens and end-consumers. The transport sector, for which I am also responsible at EU level, has a substantial contribution to make towards efficiency and I intend to encourage greater synergy between energy and transport.

As we approach the new Millennium, it is essential that the world's resources are used sparingly and more efficiently. The SAVE programme will make a significant contribution in that direction, both in the EU and in the Accession and other Associated countries.

Loyola de Palacio
Vice-President, European Commission

SAVE is a Community-wide programme aimed at improving energy efficiency and thereby reducing the environmental impact of energy use in transport, industry, commerce and the domestic sector. It therefore plays a key role in the EU's response to the Kyoto Protocol. SAVE supports Community actions for the implementation of EU legislation, exchange of experience, dissemination of information, monitoring of energy efficiency and energy management at local and regional levels.

SAVE and the Energy Framework Programme

The SAVE Programme - «SAVE» Specific Actions for Vigorous Energy Efficiency - is the principal focus of the Community's non-technological action on energy efficiency. It is the only Union-wide programme dedicated exclusively to promoting energy efficiency and encouraging energy-saving behaviour through policy measures, information, studies and pilot actions.

The SAVE Programme contributes to the objectives of Community energy policy as stated in the Energy Framework Programme [1]:

- to guarantee the security of energy supplies,
- to ensure competitiveness,
- to promote the compatibility of energy market development with environmental objectives.

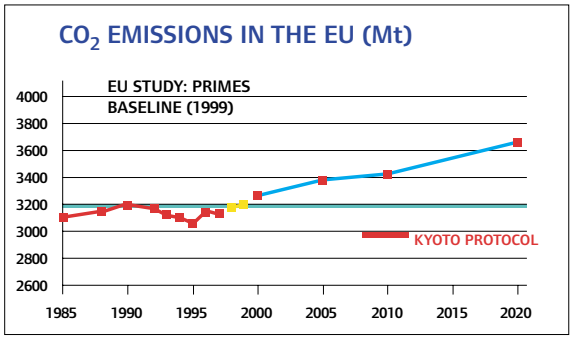
SAVE is a major component of the Energy Framework Programme which outlines the Community's energy strategy for a five-year period 1998-2002. It is based on a coherent, efficient and integrated approach through the SAVE, ALTENER and other programmes.

SAVE - a key programme for reducing CO_2 emissions

With the signing of the Kyoto Protocol, the EU and the Member States collectively committed themselves to achieving an 8% reduction of the greenhouse gases from all human activities responsible for global warming by 2008-2012. Carbon dioxide is the most important of these gases and CO2 emissions are estimated to be responsible for 80% of anticipated climate change.

Emissions of CO2 are mainly derived from the production and consumption of energy. Between 1990 and 1994, the CO2 emissions in the EU decreased by 3.3% but have since increased again. By the year 2000, CO2 emissions will be roughly the same as they were in 1990. A «business as usual» scenario forecasts an increase of 7% in CO2 emissions above the 1990 level by 2008/12 instead of the required 8% reduction.

Energy efficiency is considered to be one of the principal means of reducing the harmful impact of energy on the environment and one of the few solutions available for reducing CO2 emissions and for meeting the goals of the Kyoto Protocol.

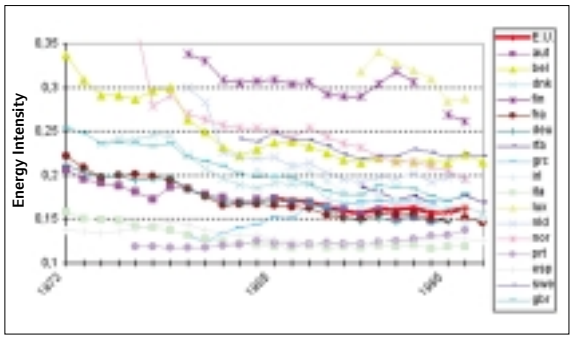


This graph shows CO2 emissions in the EU in million tonnes from 1985 to the present and forecasts for 2000-2015 assuming a «business as usual» scenario. The green line represents the stabilisation at the 1990 level.
Sources: EC - DG Energy

[1] *Proposal for a Council Decision adopting a Multiannual Framework Programme for actions in the energy sector (1998 - 2002) - COM (97) 550 final - 18/11/1997*
Council Decision of 14 December 1998 adopting a Multiannual Framework Programme for actions in the energy sector (1998-2002) (1999/21/EC, Euratom) O.J. L7 - 13/01/1999

Background to the SAVE Programme

The SAVE programme is designed to encourage and improve energy efficiency in all consumer sectors. Particular attention is paid to the electricity sector since its production accounts for around 35% of primary energy consumption and 30% of CO_2 emissions. Transport is also of major interest since the CO_2 emissions from this sector have grown dramatically during the last two decades and will continue to increase during years to come if measures are not taken to improve energy efficiency. SAVE also aims to add weight to and complement Member States' own energy efficiency policies and programmes.



EU final energy intensity has decreased steadily during the last 20 years. However, the trend in recent years has shown a marked slowing down in the rate of decline of energy intensity. The challenge for SAVE is to improve the energy intensity of final consumption by a further percentage point per annum over and above that which would have been achieved by «business as usual» approach.
Source: ADEME Energy Efficiency Indicators

The first SAVE programme was adopted by the Council in October 1991 as part of the efforts to promote energy efficiency that the Community made in the 1980s. It had an indicative budget of € 35 million and was designed to achieve 3 major objectives:

- to contribute to the stabilisation of CO_2 emissions,
- to reduce dependence on imported fuels,
- to address non-technological aspects of energy efficiency by complementing the technology-based programmes.

An evaluation of the first phase in 1995 concluded that SAVE had made «an important contribution to the Community's objectives, implementing a wide range of measures such as legislative acts, practical pilot projects, studies, the monitoring and evaluation of progress on energy efficiency, the dissemination of information and innovative mechanisms for funding and awarding contracts»[2].

The SAVE II programme was adopted by the Council in December 1996 [3] with an indicative budget of € 45 million for a 5 year-period (1996-2000). It was aimed at improving the energy intensity of final consumption by a further percentage point per annum over and above what would have otherwise been achieved. The scope of the SAVE programme was also enlarged by the addition of the local and regional energy management agencies and the electricity end-use programme.

SAVE will now form part of the Energy Framework Programme for the period 1998-2002.

[2] *ibidem*

[3] *OJL 335 - 24/12/1996 - Decision 96/737/CEE*

The target groups of the SAVE Programme :

- public and private bodies,
- schools and universities,
- urban and regional agencies and other bodies for promoting energy efficiency,
- all other sectors generally involved in promoting energy efficiency, such as consultants, manufacturers of household electrical appliances, central heating suppliers, architects,
- the general public.

Actions supported by SAVE

The overall objectives of the SAVE programme are:

– to stimulate energy efficiency measures in all sectors,
– to encourage investments in energy conservation by public and private consumers and by industry,
– to create framework conditions for improving the energy intensity of end-use consumption.

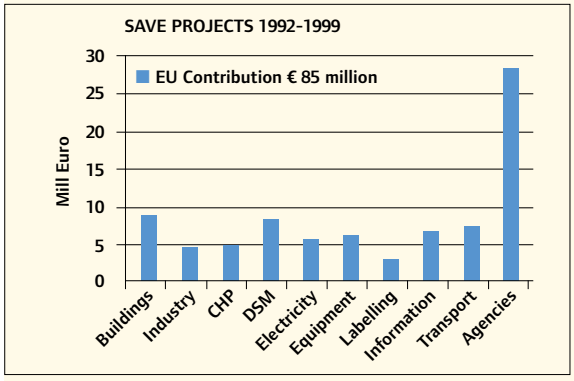
To achieve these aims, SAVE supports the following schemes and measures:

– studies and measures designed to implement and supplement Community schemes such as voluntary agreements, mandates accorded to standardisation bodies, co-operative procurement, legislation aimed at improving energy efficiency and studies intended to establish energy efficiency as a criterion within Community programmes;
– targeted sectoral pilot [4] projects aimed at speeding up investment in energy efficiency and/or improving energy use patterns. These are carried out by public and private firms or organisations, by existing Community-wide networks and by temporary Community-wide groupings of organisations and/or firms that have been set up to carry out these schemes;
– measures for fostering exchange of experience aimed at improving co-ordination between international, Community, national, regional and local activities;
– monitoring of improvements in energy efficiency within the Community and in each Member State; on-going evaluation and monitoring of the schemes and measures carried out under the programme;
– specific measures to improve energy management at urban and regional levels with a view to achieving greater cohesion between Member States and regions in the field of energy efficiency.

[4] A study differs from a pilot action in that it covers all EU and EEA Member States. Further, a study is of an analytical nature while a pilot action will have, in addition, an operational side.

What has been achieved by SAVE ?

SAVE has invested € 85 million in projects and other measures to improve energy efficiency in the EU over the period 1992-2000, with an average EU funding of 37% of the total cost per project. The SAVE programme is particularly focused on helping to create and extend capacity building for energy efficiency and improving policy analysis. This is the case for industry, in particular, which has thus been sufficiently motivated to invest 60% in project co-funding.



Grants have been more or less equally allocated to the various sectors of the programme. However, emphasis has been placed on the setting up of 206 energy management agencies thanks to an EU contribution of € 29 million. Indeed, SAVE agencies are considered to be an effective means of disseminating the results of projects supported under SAVE, of reaching the end-users of energy and of generally encouraging energy saving behaviour. Dissemination of information to consumers is a priority of the SAVE programme as it is an important factor in promoting awareness about energy saving. SAVE has provided support of over € 6 million to information/education projects. SAVE I and II have shown that the effectiveness of energy efficiency measures increases with proximity to the consumer. The dissemination of SAVE projects affects all sectors covered by SAVE and the SAVE energy management agencies form an effective local network for dissemination to end-users. **Sources:** EC - DG Energy

Sectors covered by the SAVE Programme

Buildings

Rational use of energy in buildings is a crucial sector for the SAVE programme because it accounts for 40% of EU energy demand. Community legislation relating to the building sector is mainly based on three Directives: the so-called «SAVE Directive» to limit carbon dioxide emissions by improving energy efficiency [5], the «Boilers Directive» [6] and the «Construction Products Directive» [7].
The achievement of energy savings is hampered by a lack of incentives and information and limited awareness of energy efficiency. Therefore, SAVE focuses on promoting specific measures to ensure that heating, cooling and hot water systems and building components are energy efficient, and in co-operation with Member States, on finding ways to promote energy efficiency when buildings are renovated. This is achieved for example through local information schemes, the certification of installations and by informing installers about energy efficiency requirements.

Transport

Transport is a priority area for energy efficiency since it accounts for 30% of total energy consumption. Carbon dioxide emissions from the transport sector are expected to register increases compared to the 1990 level of 22% in 2000 and 39% in 2010.
The gradual implementation of the ACEA (Association des Constructeurs Européens d'Automobiles) agreement will reduce those estimates by several percentage points. Road traffic is of particular concern in this context since it accounts for the largest share of overall CO_2 emissions from transport [8]. SAVE has identified several priorities. These include measures to increase the use of energy-efficient transport in European cities for both passengers and freight, including the optimal occupancy of vehicles (both public and private), promotion of new and alternative infrastructure, management alternatives to air transport and changing behaviour. For the period 2000-2002, emphasis will be placed on information dissemination and reducing the use of private cars, encouraging collective transport modes and seriously considering how to reduce the need for transport.

Industry

More flexible instruments for improving energy efficiency such as negotiated and long-term agreements (LTAs) are often preferred to legislation. A Communication on Environmental Agreements [9] encourages the setting of measurable targets for energy efficiency directed at industrial trade associations. LTAs are encouraged by SAVE and will be expanded to include further industry sectors, in particular the energy supply industry.
Results in some Member States show that energy audits produce a measurable improvement in energy efficiency, CO_2 reduction, employment and industrial competitiveness. SAVE promotes energy audits, in particular by allowing comparisons to be made between and cost effectiveness analysis to be made of different energy audit models.

Combined Heat and Power

The Commission Communication on Combined Heat and Power (CHP) published in 1997 [10] identified a large potential for improving energy efficiency and reducing CO_2 emissions by increasing the use of CHP. Therefore, an indicative target has been set to double the share of CHP in EU electricity production from 9% in 1994 to 18% in 2010. Together with various initiatives at Member State level, CHP is actively promoted under the SAVE programme with a view to meeting this target for market penetration. Important areas include the monitoring of structural and legislative barriers related to the liberalised gas and electricity markets, investments in CHP through third-party financing, and collection of CHP statistics.

[5] Directive 93/76/EEC of 13 September 1993 to limit carbon dioxide emissions by improving energy efficiency (SAVE)

[6] 92/42/EEC

[7] 89/106/EEC

[8] The long-term EU target, as expressed in the 5th EU Framework Programme, is 50% reduction in CO_2 emissions per passenger-kilometer and per payload-kilometer. In shorter term, the aim is 5 to 10% energy savings in order to achieve aggregate reductions in CO_2 emissions. Another technical target consists of improving hydrocarbon and alternative transport fuel and stopping harmful emissions.

[9] COM (96) 561

[10] Communication on a Community strategy to promote combined heat and power (CHP) and to dismantle barriers to its development. – COM (97) 514 final

Demand-Side Management and energy Services

Individual consumers, including those in industry and the commercial sector, enter the market to buy heating, cooling, lighting, power and other energy services rather than energy for its own sake. For this reason, the SAVE programme promotes the development of the concept of energy services and energy service companies. It thereby fosters the initiation and implementation of energy efficiency investments by utilities in many different ways, including information, voluntary agreements and co-ordinated procurement. These activities are particularly relevant in the context of the internal market for energy. SAVE supports demand-side management through studies and pilot actions, by providing useful comparisons between cost-effective demand-side and supply-side options, and by developing practical mechanisms whereby economically justifiable DSM and energy efficiency measures may be incorporated into the rapidly changing electricity and gas environments.

Equipment

SAVE and its predecessor, the PACE programme, have supported the improvement of the energy efficiency of end-use equipment for several years now. The action of SAVE in this sector has mainly been focused on labelling and efficiency standards. Several Commission proposals for Directives have now been adopted for domestic appliances. The scope of action will now be extended to fixed equipment (water heaters, air conditioners, central heating boilers) and to assisting Member States in improving enforcement of the labelling scheme. Measures designed to promote energy consumption labels will be encouraged, in particular, information databases. These will involve equipment installers and inform the consumer. Two negotiated agreements have been reached to date and others will follow. However for other equipment such as ballast for fluorescent lighting, where agreements are not possible or desirable, the Commission will propose Directives to introduce minimum efficiency requirements.

SAVE energy management agencies in regions, islands and cities

It is vital to decentralise energy management if the final consumer of energy is to be informed and educated regarding energy efficiency in order to encourage energy efficient behaviour. Setting up SAVE Agencies in regions, islands and cities helps to promote energy efficiency and renewable energy sources. SAVE Agencies offer considerable potential for disseminating information on energy efficiency and promoting sustainable development on both local and more widespread scales, and their creation will therefore continue to be supported. Furthermore, the network of SAVE Agencies together with other networks of local and regional authorities such as Energie-Cités, Fedarene and Islenet, play a particularly important part in disseminating good practice.

Information - Education - Vocational Training

Information is important both for the SAVE Programme and for the programmes of the Member States. The main target is the end-consumer who has a crucial role to play in promoting and adopting energy-saving behaviour. The dissemination of information is therefore a priority. SAVE proposes to increase the dissemination of results and good practice from successful projects, pilot actions and studies in co-operation with the Member States. The setting up and maintenance of a SAVE website is an essential tool in order to ensure better dissemination of these results. Training and certification on the use and maintenance of energy-efficient technology are important areas. The creation of certificates for energy efficiency professionals on a voluntary basis will help develop these concepts.

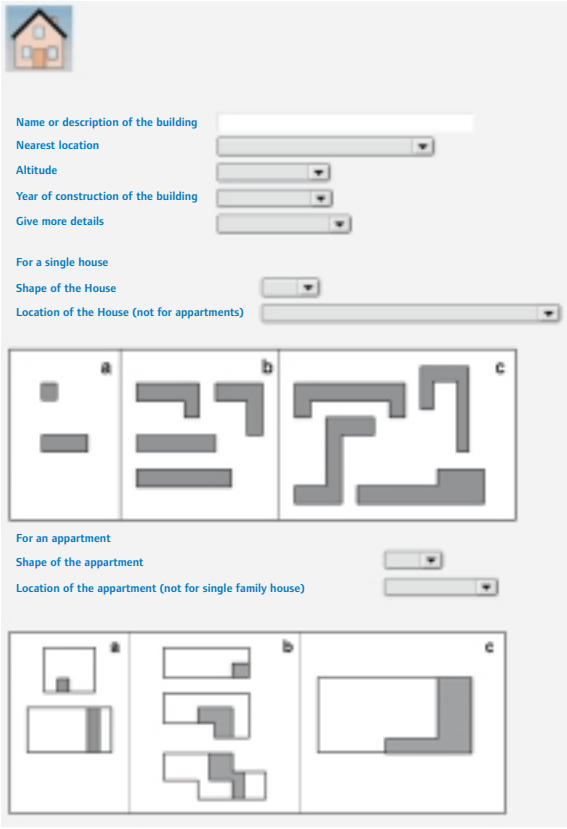
Monitoring and evaluation

The impact of SAVE and the programmes of Member States on energy efficiency and energy intensity in the different sectors of activity needs to be analysed to assess the effectiveness of the programmes and to develop guidelines for the future.
This analysis can only be carried out if comparable data and common methodologies are available, in particular in the field of energy efficiency indicators. This implies increased co-operation between Member States and the EU. Furthermore, the SAVE Programme itself has to be regularly evaluated against the Energy Framework Programme and, in particular, an overall evaluation of the programme results has to be made at the end of the period of operation.

ENERGY AUDITING IN THE HOME VIA THE INTERNET

One more reason for saving energy in dwellings has just appeared. Every end-user will soon be able to know his electricity and heating consumption by carrying out an energy audit on the Internet. The HESTIA software has two objectives: it gives the consumer general information on his energy consumption and also proposes energy-saving measures and equipment.

The 1998 Communication by the Commission [1] enabled new initiatives to be undertaken under the SAVE programme. These include projects such as the development of simple tools to help installers design appropriate energy-saving systems for buildings. The Communication further emphasises the necessity of combining such tools with methods of providing the final customer with clear and reliable information about the performance of the energy systems they may be considering. This recommendation has been applied in the HESTIA project. The HESTIA software, which stands for Home Energy efficiency Software Tool on Internet for Audit, is an energy advice software designed to be used directly by the end-user. This software offers an overall energy audit which calculates the consumption of heating, domestic hot water, lighting and electricity. It then provides advice to the consumer by testing several alternative methods of improving energy efficiency. The objective of the software is to promote new behaviour patterns such as the use of equipment designed to save the stand-by energy used by household appliances. Suitable energy saving equipment for the dwelling is proposed. It is hoped that this software will foster a demand for energy efficient equipment and appliances.



End-users are able to estimate their electricity and heating consumption by carrying out an energy audit on the Internet, using the HESTIA energy software. The software is also testing several alternative methods of improving energy efficiency.
Sources: IED – The HESTIA software

User-friendly software which can make a significant energy saving

The HESTIA project is being led by Innovation Energie Développement - IED, in France and should be operational by February 2000. It is based on a similar software called 'Votre maison, ses performances' managed on Minitel by the French Energy and Environment Agency ADEME since 1993. Considering the increasing availability and functionality of the Internet, HESTIA offers new graphic capacity while at the same time becoming more user-friendly. In addition HESTIA is taking advantage of a previous SAVE project which has already developed an energy advice tool on electricity and energy consumption in dwellings. Set up by Energidata in Norway, the 'Energy Internet Kiosk' project has been operational in Norway, Sweden and Austria since April 1998.

The HESTIA software will benefit from this previous experience and develop it further instead of developing an entirely new model. Since each country has its own building standards and ways of living, adaptations and improvements are necessary for each country where it is used. A key feature of the project is that it is not only targeted at professionals in the building sector but also at the general public.

IED has estimated the energy savings to be expected in Europe at between 10% and 60% for heating consumption, 5% and 30% for domestic hot water and between 20% and 50% for domestic appliances, depending of the country being considered. Effective dissemination of information on the HESTIA software forms part of the project through contacts with national energy agencies, consumers' associations and banks. Using HESTIA to save energy in your home will be one more good reason to surf the net.

[1] *Commission Communication on Energy efficiency in the European Community Towards a strategy for the rational use of energy: COM (1998) 246 final of 29.04.1998.*

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Cost of the project € 246.133
SAVE support € 100.000

8

ASSESSING DRIVERS' AWARENESS OF THEIR IMPACT ON ENERGY USE AND THE ENVIRONMENT

Transport is considered as a priority area for energy efficiency in the 1998 Commission Communication[1] because it absorbs over 30% of total energy consumption. It is essential to act upon mobility habits by promoting energy saving behaviour in drivers. Portugal and Austria are working jointly on a study to evaluate driver awareness of the impact of transport on energy use and the environment. Drawing political lessons from the information collected will help decision-makers to draft more effective transport policies.

Without appropriate action, CO2 emissions from transport are projected to increase by about 40% between 1990 and 2010 [2]. To prevent this scenario from becoming reality, a number of ambitious initiatives are now being carried out by the European Community and Member States with the common objective of achieving sustainable mobility. Most people are aware that transport has a major impact on energy use, air pollution and the environment. Yet 75% of travel in Europe is carried out by private car for distances that are often lower than 5 km, and public transport only attracts a limited number of users.

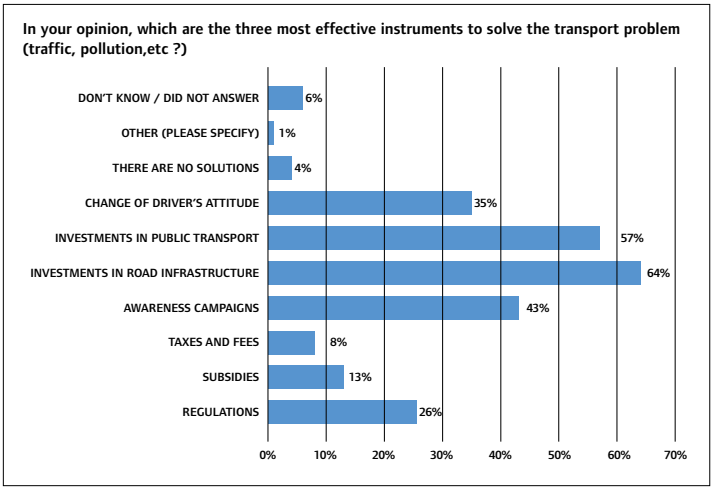
To fill the gap between knowledge and action, the Portuguese Centro para a Conservação de Energia (CCE) has started a study supported by the SAVE programme in collaboration with the Energieverwertungsagentur (EVA) in Austria. Their project is designed to survey the opinion of private car users on traffic congestion, pollution levels and other transport related issues by means of a joint questionnaire. The questionnaire asks about methods of tackling mobility problems such as road-pricing, car-sharing or vehicles using alternative fuels. The survey also refers to attractive public transport and green transport plans.

A useful tool for policy-making

When interviewed about the three most effective instruments to solve the transport problem, the majority of those polled in Portugal were in favour of investments in both road infrastructure and public transport. Awareness campaigns came in third place, changing drivers' attitudes came fourth. If car use were to be reduced by changes to the working day, one third of those persons interviewed would be prepared to work four days a week for ten hours per day with an extra rest day falling variably during the week. Shift work was the second choice solution.

The information collected will be used to quantify driver sensitivity towards energy saving and environmentally-friendly transportation. It will then be analysed to propose politically acceptable and effective measures for enabling a reduction in the use of the private car, and consequently CO2 emissions. Such a goal can only be achieved by persuading the current as well as potential users of the private car to change their habits.

It is therefore planned to disseminate the results through media campaigns in Portugal and Austria, by articles in specialised magazines and through the active participation of automobile clubs. The database and questionnaires thus developed can be of further benefit to other European countries concerned to improve energy efficiency in transport.



When interviewed about the three most effective instruments to solve the transport problem, the majority of those polled in Portugal were in favour of investments in both road infrastructure and public transport. Awareness campaigns came in third place, changing drivers' attitudes came fourth.
Sources: CCE – Questionnaire disseminated in Portugal

[1] Commission Communication on energy efficiency in the European Community Towards a strategy for the rational use of energy, COM (1998) 246 final of 29.04.1998.
[2] COM (1997) 481 final of 01.10.1997.

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Cost of the project € 191.300
SAVE support € 86.085

IMPROVING ENERGY MANAGEMENT IN SMEs

In this project, MOTIVA[1], in close co-operation with IFE from Norway, has developed two energy management tools tailored to SMEs which are based on successful experience in managing energy in Finnish and Norwegian industry. The project has prepared an energy certification scheme and guidebook designed to provide support to SMEs willing to maximise their energy efficiency by effective management.

In 1993, the Council of the European Community adopted a Directive designed to limit carbon dioxide emissions by improving energy efficiency and this makes direct reference to the SAVE programme [2]. Industry is generally willing to make more efficient use of energy in order to meet its own economic objectives thereby also furthering the objectives of the Directive. The programme therefore supports the promotion of energy audits and energy management designed to significantly reduce the use of energy in this sector.

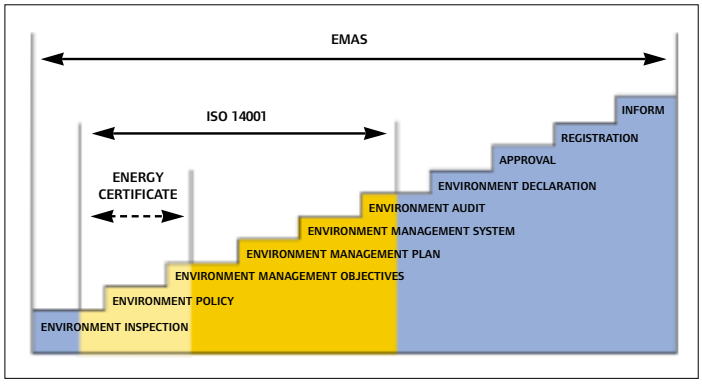
The MOTIVA Energy project falls within the scope of this Council Directive. In many sectors of activity there is a continuously growing interest in energy conservation and there is increasing concern about environmental issues. Furthermore, energy management is an important element in the development of comprehensive management systems conforming to the European Union's «Eco-Management and Audit Scheme» (EMAS)[3] .
SMEs form a special market segment which needs to take action on energy efficiency in its everyday operations. It is very important that SME staff take account of the energy implications of their decisions. This requires that they use equipment rationally, maintain it effectively and select energy-saving technology.
The MOTIVA project is taking up this challenge by developing tools specially adapted to SMEs.

An energy certificate for a comprehensive environmental management system

The project has prepared a practical handbook entitled «Energy Management and EMAS» that is adapted to small industrial facilities. It also suggested setting up an energy certification scheme for SMEs. This energy certificate, which also takes account of some environmental issues, is neither a substitute for EMAS nor a competitor to official certifications, but rather a first step towards an environmental management system. It offers a cost-effective way for SMEs to prove their level of energy efficiency to their customers. Both tools were given initial trials in a number of facilities and subsequently improved.

About 470 companies in the Helsinki area were interviewed during September 1998. A multiple choice questionnaire was distributed to company managers with a view to finding out their company's interest and need for such energy management tools.
The final stage of the project brings together and disseminates the results which are also available on MOTIVA's web site.

Reports dealing with the presentation of an energy certification scheme and the integration of energy management in the ISO 14000/EMAS environmental management system were circulated to all the relevant organisations in Europe in March 1999. The broader environmental context of EMAS should provide the opportunity to widen the use of the energy certificate among European SMEs. However the existing EMAS procedures place a heavy financial and administrative burden on applicants and it may therefore be possible to develop a so called «light EMAS» tailored to small facilities. A new project proposal has been made to the SAVE programme designed to deal with exactly these issues.



The figure illustrates the relationship between the MOTIVA Energy Certificate, ISO 14001 and EMAS. **Sources:** MOTIVA – The energy certification scheme

[1] *The Finnish information centre for energy efficiency and renewable energy sources.*
[2] *Council Directive 93/76/EEC of 13 September 1993 to limit carbon dioxide emissions by improving energy efficiency (SAVE).*
[3] *EMAS is an EU initiative based on the voluntary introduction of environmental management and auditing into industrial companies.*

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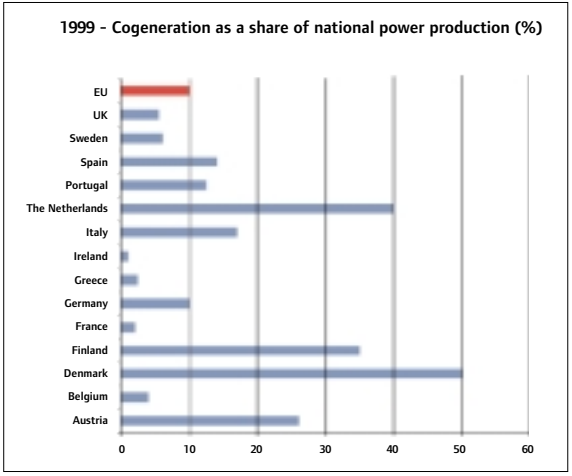
Cost of the project € 197.343
SAVE support € 78.937

EUROPEAN COGENERATION REVIEW 1999

Supplying heat and power by cogeneration offers high energy conversion rates and low emissions of CO2. Therefore it has a major role to play in improving energy efficiency and competitiveness in Europe. The European Cogeneration Review 1999 being carried out by COGEN Europe analyses up-to-date and comparative information on the state of cogeneration in Europe. These data provide essential guidelines to policy-makers in this field.

Combined heat and power (CHP) increases the competitiveness of enterprises, generates employment and helps conserve energy supplies. Rough estimates suggest that replacing all existing electricity and heat production plants with cogeneration could reduce the planned CO2 emissions of the EU-15 in 2010 by 9 %.[1] Despite this potential, the proportion of heat and power within the EU that is produced by CHP decreased during the period 1974-1990. Therefore the European Commission issued a White Paper in 1997 [2] which outlined the Community's strategy for promoting CHP and increasing its penetration in the European energy market. The objective is to double the proportion of heat and power in the EU that is produced by CHP by the year 2010. The COGEN project is supported by SAVE and is an essential step in the right direction. The European cogeneration review provides clear information to Member States about the challenges in developing CHP technology as well as about the solutions required to overcome the remaining barriers.



The development of cogeneration appears to be marginal in Ireland, whereas Denmark is the highest CHP performer.

Sources: COGEN Europe – European cogeneration review 1999

A complete overview on cogeneration provides useful guidelines for policy-making

The 1999 review analyses the market conditions for cogeneration in 27 European countries. Each country-by-country review presents information and statistics on the cogeneration situation with regard to general electricity production, market growth forecasts and the current legal framework. CHP technology is also analysed in connection with the liberalisation of the electricity and gas markets, promotional policies and the remaining barriers. The country review ends with a rating giving indicative benchmarks to each market investigated.

If one compares the share of cogeneration in the national power production in 1999 (see figure), the development of cogeneration appears to be marginal in Ireland, whereas Denmark is the highest CHP performer. This is partly due to the lack of a legal framework or general policy approach fostering cogeneration in Ireland. The Danish government on the contrary actively promotes CHP through specific legislation, voluntary agreements and energy planning. Not all measures are appropriate to other countries. Nevertheless there are certain measures that most governments could take even with the current liberalisation of the energy market. For instance environmental costs could be included in energy prices by exempting small scale cogeneration from paying electricity and gas taxes, as has happened in the German ecological tax reform. Inter-country comparisons clearly appear as an important aid to the definition of national or European policies on cogeneration. The COGEN Europe network is disseminating the review throughout the European Union using its world-wide database. It is the first time that such a complete review on cogeneration has been undertaken and COGEN Europe plans to repeat the exercise every two years.

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Cost of the project € 117.700
SAVE support € 29.250

[1] *Commission Communication to the Council and the European Parliament : a Community strategy to promote combined heat and power (CHP) and to dismantle barriers to its development, COM (1997) 514 final of 15.10.1997.*

[2] *ibidem*

REAL-TIME PRICING SYSTEM FOR ELECTRICITY CONSUMPTION

It is technically feasible to develop a real-time pricing system for electricity consumption. This has been tested on selected households which form part of a project carried out by the German «Forschungsgesellschaft für umweltschonende Energieumwandlung und –nutzung mbH». Furthermore this project demonstrated that customers actually reacted to the variations in price and developed dynamic electricity demand strategies in reaction to it. This therefore provides a successful tool for promoting the optimal use of resources.

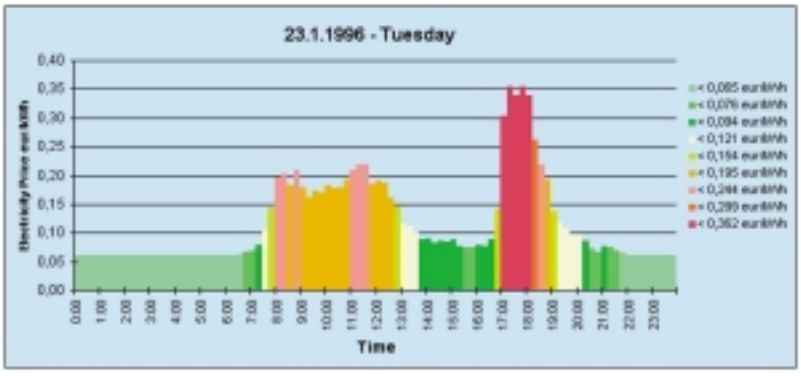
Integrated Resource Planning (IRP) in the electricity and gas distribution sector is leading to higher energy efficiency, lower costs and significant CO_2 reductions. The objective of IRP is to promote development plans which give equal consideration to all economic options, on both the supply side as well as on the demand side. Meeting consumer demand and needs certainly contributes to a more rational use of energy. Considering the fact that the production cost of electricity varies with demand, it is essential to raise customers awareness of real time costs to optimise the use of electricity resources.

A pricing system reflecting the actual price of electricity on a continuous basis has been developed and tested in the city of Eckernförde in North Germany. About 1.000 randomly selected households were equipped with additional materials to evaluate the impact of a dynamic electricity tariff over a two-year period from 1994 to 1996. Innovative electronic components for the determination, transmission and billing of dynamic electricity prices were developed to set up the system. A signal device showed the real time electricity price by activating green, yellow or red light diodes. In addition, the households could turn their appliances on and off automatically with the help of a price controlled switch. An electronic meter was also part of the system. This showed various pieces of information on a display and recorded the data necessary for billing. After the merger with the «Forschungsgesellschaft», the «Energiestiftung Schleswig-Holstein» is carrying on this work in another SAVE project promoting energy saving and consumer satisfaction by providing more informative electricity bills for household consumers.

Real-time prices lead to correspondingly dynamic electricity demand

The two-year test of the innovative pricing system has shown a clear acceptance of the dynamic cost- oriented tariff among the selected households. Customers reacted strongly to varying prices with a corresponding dynamic electricity demand. Many participants switched off electrical appliances and lights when the prices were high. Approximately 80 % of the participants spent less with the real-time tariff than with the standard one.

The results of these trials have been considered very positive and it should be possible to develop more sophisticated standard meters in the near future. Wider use of this dynamic rate meter will decrease the additional equipment costs associated with this tariff.
This pricing system generates a clear reduction in peak electricity demand and is proving to be an economically efficient pricing system in the liberalised electricity market of tomorrow.



As illustrated in the graph, the production cost of electricity varies with demand. It is therefore essential to raise customers awareness of real time costs to optimise the use of electricity resources. **Sources:** Forschungsgesellschaft für umweltschonende Energieumwandlung und –nutzung mbH – Variation of the electricity price during a typical day.

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Cost of the project € 1.230.000
SAVE support € 153.200

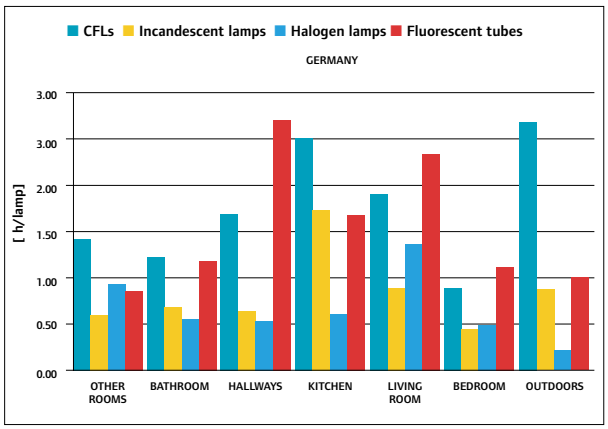
ENERGY SAVING LAMPS IN THE DOMESTIC SECTOR

The use of compact fluorescent lamps (CFLs) leads to a sizeable reduction in energy consumption and to significant financial savings for both the end-user and society. This being the case, how can one realise this large energy saving potential through an extended use of CFLs? How can one convince consumers of the benefits of using CFLs instead of incandescent lamps? The 'Research Institute for Danish Electric Utilities' (DEFU) is dealing with these issues with support from the SAVE programme.

According to the 1996 Directive on energy efficiency requirements for household appliances [1], electricity generation and consumption account for 30% of man-made carbon dioxide (CO_2) emissions and some 35% of primary energy consumption in the Community. A significant part (about 20%) of total Community electricity demand is related to domestic lighting, as mentioned in the 1998 Directive on energy labelling of household lamps [2]. However, the scope for reduced electricity consumption is substantial.

The DEFU project is building on this potential. Denmark, Germany and the Netherlands already have great experience in the development of promotional campaigns and strategies designed to promote the use of energy-saving lamps. Close to 50 % of consumers already use CFLs in these countries. The objective of this project was to analyse the results and suggest how to reach the remainder.

The sale and use of CFLs is influenced by professionals such as architects, designers, retailers, manufacturers, utilities and public institutions. Therefore the project carried out detailed market surveys among these professionals in the three participating countries. The objective was to identify the existing barriers to a more extensive use of CFLs as well as suggesting solutions for overcoming them on the basis of the experience of those contacted.



The figure illustrates the average burning hours per type of lamp and room in Denmark and Germany, demonstrating that CFLs are correctly used as energy-saving lamps. **Sources:** DEFU - Compact fluorescent lamps (CFLs)

The results proved very valuable and confirmed the energy-saving potential

New and detailed information about the use of lighting in the home confirmed the energy saving potential. The surveys identified where it is most effective to use CFLs in the home by considering the burning hours per lamp in different rooms. The economic potential is on average around 11 lamps per home, while the realistic potential is estimated to be at least 6 CFLs per home. The latter gives a potential saving of 12,000 GWh in the three above - mentioned countries of which only close to 25% had been achieved by 1996. Besides the saving in energy, the use of CFLs provides a high standard of illumination and long lamp-life.

The work of the DEFU project has also identified principles for successfully removing the barriers to the procurement of CFLs. Giving a rebate to manufacturers for example is an effective way to tackle the higher price of energy saving lamps.

The European Commission and national bodies have been using the results of the DEFU project to tackle existing barriers and to organise awareness campaigns on CFLs. A dissemination project, funded by SAVE, is currently following up these results with seminars in several EU Member States and candidates for membership.

[1] Directive 96/57/EC of the European Parliament and of the Council of 3 September 1996 on energy efficiency requirements for household electric refrigerators, freezers and combinations.

[2] Commission Directive 98/11/EC of 27 January 1998 implementing Council Directive 92/75/EEC with regard to energy labelling of household lamps.

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Cost of the project € 210.000
SAVE support € 84.000

ASSESSMENT OF THE EU ENERGY LABEL FOR REFRIGERATION APPLIANCES

The 1992 Framework Directive on Energy Labelling[1] set up a compulsory labelling scheme within the Community. It required the Commission to make an assessment of the implementation and results of the Directive after it had been in operation for three years. The Cool Labels study carried out by the Environmental Change Unit at the University of Oxford with support from SAVE formed part of this monitoring exercise. The project, carried out during 1997 and 1998, provides a comprehensive overview of the state of the EU energy labelling scheme for refrigeration appliances across all relevant players and all Member States. It furthermore provides recommendations to the Commission and Member States on how to improve the operation of the scheme.

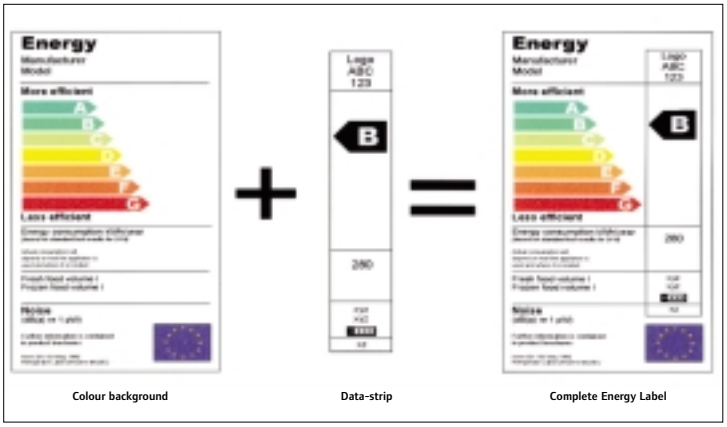
The 1992 Directive recommended a scheme which ensures that energy consumption is indicated by means of labelling and product information sheets. Article 7 of the Directive states that Member States should take the measures necessary to support the successful introduction of the energy labelling scheme by means of educational and promotional information campaigns aimed at encouraging more responsible use of energy by private consumers. Therefore the Cool Labels study reviewed the success of the labelling scheme in two ways. Firstly, it examines the implementation and the promotion of the scheme for refrigeration appliances. Have member states applied the Directive properly in their national laws? Are the energy labels accurate and have shop-owners actually applied them to domestic refrigerators and freezers on sale in their shops? Has the labelling scheme been properly supported by advertising and promotion efforts? Secondly, the responses of those targeted and the interactions between them were rigorously analysed. How do governments, regulatory agencies, retailers, manufacturers and consumers respond to the labelling scheme? Has it changed their behaviour? All this quantitative and qualitative information was analysed and recommendations were drawn up on how to improve the operation of the labelling scheme.

A comprehensive overview of the state of the energy labelling scheme for domestic refrigerators and freezers

The results of this study, published in 1998, showed that just over half of refrigeration appliances surveyed in the Member States were labelled correctly. Correct labelling was most common in the Netherlands, Denmark and the UK, whereas Greece, Italy and Spain had the lowest levels of compliance. A close match was found between the compliance levels in retail outlets and the ability of consumers to recall the label. The proportion of consumers who thought that the label had had a strong influence on their purchase varied from 3% in Greece to 61% in Denmark.

Interviews with retailers suggested that, in general, they currently show significantly less interest in the labelling scheme than consumers. This reflects the perceptions of many retailers that consumers themselves do not place a very high priority on the energy use of appliances. It emphasises the fact that retailers' interest in labelling follows, rather than leads, the interest of consumers. This research shows a need for better information aimed at the retail sector, and better training for individual sales staff. Several of the recommendations mentioned in the report have been taken up by the Commission including the setting up of a network of enforcement agencies and of a forum for test laboratories.

The Commission is now expected to submit a report on the assessment of the Directive to the European Parliament and to the Council.



The figure shows the energy label and its components. It communicates the relative energy efficiency of models through colours, arrows and the alphabet. The A-G scale of the colour background ranks appliances from 'more efficent' (A) to 'less efficient' (G). The data-strip contains model-specific information and is applied to all identical models irrespective of the language of the destination market.
Sources: University of Oxford, environmental change Unit - Energy label

[1] *Council Directive 92/75/EEC of 22 September 1992 on the indication by labelling and standard product information of the consumption of energy and other resources by household appliances.*

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SAVE support € 313.860

PROMOTING ENERGY MANAGEMENT AT LOCAL AND REGIONAL LEVELS

If one wishes to implement energy efficiency measures at the level of the consumer, it is essential to decentralise energy management and increase the awareness and involvement of the general public . The Commission's Directorate-General for Energy has promoted energy management at local and regional levels since 1989, and from 1992 has supported the creation of local, regional and island energy management agencies.

More than 200 SAVE agencies will be established in the EU by the year 2000 out of an estimated overall potential of 1 800 agencies in the EU. The Commission is counting on elected representatives at local, regional, national and European levels to further increase the number of energy management agencies. For this reason, the SAVE Agency Charter was announced in Cork in December 1998. SAVE Agencies provide an effective means for promoting sustainable development at local level.

The role of energy management agencies is to promote energy management and renewable energy among local authorities, SMEs and the public. In addition, agencies stimulate integrated partnerships involving a variety of players to participate in Community Programmes. They also encourage local authorities to take action, in particular with the aid of the Structural Funds which are themselves integrating energy efficiency and renewable energy in many policy sectors. Three success stories are described below : at local and regional levels and on an island.

Wind turbines at Blyth Harbur – Wansbeck District
Sources: Wansbeck Energy Company (United Kingdom)

Energy management and job creation at local level : the Wansbeck Energy Company

The Wansbeck Energy Company (UK) was formed in 1996 with a wide range of objectives. These include the exploitation of local resources, the promotion of the rational use of energy, the creation of new employment opportunities and the improvement of social conditions. The Agency finally targeted its work on a restricted number of activities including renewable energy. In particular, it has developed wind turbines providing energy for local consumption (Wansbeck Hospital and Blyth Harbour Wind Farm) and is building the first offshore wind farm in UK which will be erected off the Wansbeck coastline in the summer 2000.
The agency has worked on CHP and is providing advice to those carrying out energy surveys in industry in order to establish whether it is appropriate to invest in such technology. The Region has established a Strategy «Energy For A New Century». In line with this, a grant has been obtained from the ERDF [1] which will support a flagship project for coal-fired power generation in North East Northumberland. The Agency is actively involved in the implementation of this «Wansbeck Generation Project», which it is hoped will become a world leader on completion. Indeed, this technology is expected to be exported to Far-Eastern countries.

The Wansbeck Agency is also promoting the recovery of energy from waste both from the technological standpoint and by raising awareness of its advantages.
Finally, education is considered as a crucial means of promoting energy efficiency and the agency is currently working with schools on a project involving 13 000 children between the ages of 8 and 11. It is dedicated to increase awareness of the benefits of energy saving by encouraging children to pass on their knowledge to their parents.

Wansbeck Company has been successful in creating co-operation with a wide range of urban stakeholders and in launching partnerships with both public and private sectors.

[1] *European Regional Development Funds*

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SAVE support € 150.000
Member of the Energie-Cités Network

Energy management at a regional level: EREN in Spain

EREN - Ente Regional de la Energia de Castilla Y Leon - was set up in 1996 by the Regional government of Castilla Y Leon with support from SAVE. The agency promotes an energy policy modeled on the three principles of the EU Energy White Paper: security of supply, competitiveness and environmental protection.
EREN concentrates its attention on SMEs and promoting energy efficiency among all socio-economic sectors. The promotion of renewable energy has been one of its main fields of activity and can give a competitive edge to local companies. This gives a high profile image to the agency while at the same time providing environmental benefits and improving the quality of life of their citizens.

One of their most successful practical projects in the renewable energy field has been a district heating system fuelled by forest residues which has been built in Cuellar (Segovia Province). This project, started in 1997, has already shown its worth at a socio-economic and environmental level, by offering higher comfort at a lower price, by promoting employment in a region suffering from rural depopulation and by making use of the numerous biomass residues that are found in this heavily forested area.

EREN is also working on more traditional aspects of energy policy. They are implementing the Castilla y Leon Regional Energy plan called PERCYL (1995-2000). They manage the regional energy plan PASCER (Castilla y Leon Programme for Energy Saving, Substitution, Cogeneration and Renewable Energy) and ERDF grants to support energy efficiency. They also promote national programmes such as PAEE (Energy Saving and Efficiency Plan) and work on Community projects with partner agencies from all over the EU, in particular under ALTENER and FPV RTD. The agency directly provides studies, services and advice targeted to the industrial, residential, transport and service sectors in order to promote better use of energy, in particular biofuels and cogeneration[2]. It is also working on the implementation of these projects. EREN also develops training and education programmes and advises local and regional authorities on energy issues and legislation. The agency would like to maximise the use of renewable energy in all its forms (hydro electric power, biomass, wind energy, solar thermal, photovoltaics and geothermal energy). By increasing the supply of «clean» energy, EREN also promotes the participation of local and regional bodies in the local economy, so increasing employment and improving the quality of life. Finally, EREN is a forum for exchange of experience between institutional, economic and social partners involved in energy issues at local and regional levels.

A centralised water and heating system with the use of forest residues as a raw material in Cuellar, (Province of Segovia, Castilla y León Region, Spain). Biomass is used as fuel for a steam power plant in which water is heated for its later distribution to end-users through a preinsulated double pipe-line system.
Sources: EREN (Spain)

[2] *Cogeneration or CHP (Combined Heat and Power)*

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SAVE support € 150.000
Member of the FEDARENE Network

Energy management on an island: the Regional Energy Agency of Crete (REAC)

The Regional Energy Agency of Crete, created in 1993 and still operating successfully, introduced the concept of a regional energy policy and programming for the first time in Greece. The agency has a wide range of objectives, both political and practical, including defining and implementing an integrated regional energy policy, with particular emphasis on renewables and energy saving. The agency ensures that their energy policy is consistent with the other sectoral policies and programmes of the Region.

The Mediterranean Island Region puts specific constraints on energy supply. The major motivation behind the establishment of the agency was the better exploitation of the renewable energy sources available on the island. Indeed, renewable energy sources have been widely used on Crete, through:

- 10 wind farms with a total installed power of 100MW (4 of them already in operation and 6 more under construction) and a biomass-fuelled CHP plant of 20 MW,
- the installation and operation of several PV systems in hotels and isolated buildings,
- the operation of 2 small hydroelectric plants of 0.6 MW,
- the wide use of olive kernel biomass for thermal purposes.

Crete present themselves as a priority area for the extensive application of renewable energy sources in Europe and the Mediterranean.

In addition to their role in policy-making, REAC has carried out public information campaigns on energy saving and environmental awareness by means of leaflets and a special emphasis has been put on education in schools and on training courses.

Finally, European co-operation is considered as an essential element of REAC's activities: the agency works at European level through various EC programmes and they are actively involved in several European networks.

Leaflets on energy saving in central heating systems have been distributed in schools. **Sources:** REAC (Crete)

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SAVE support € 100.000
Member of the FEDARENE and Islenet Networks

MANAGING ENERGY IN SCHOOLS

Energy consumption habits take root in childhood. Therefore MOTIVA has produced an energy guidebook targeted at schools. This information material is helping teachers to develop an energy management plan for their school. Every year issues such as adopting energy saving attitudes and observing lighting conditions and levels of indoor comfort are raised as topics of discussion. This provides better opportunities to the various occupants of a school to enhance energy efficiency.

Non-professional end-users have a great influence on energy consumption. It is therefore essential to provide them with practical knowledge and best practice information. This is especially the case in multi-occupancy buildings like schools, since they have different user groups, activity levels and operating times. According to energy audits carried out in Finland in 1998, the potential for savings in schools is, on average, about 16% in heating, 9 % in electricity and 10 % in water consumption. The audits further showed that one third of the savings can be achieved without investment costs.

Therefore, the European Commission's Energy Framework Programme [1] emphasises the importance of raising awareness of the effect of behaviour on energy consumption. Educating young people is one essential way to foster energy-saving behaviour. MOTIVA is in charge of an information pilot scheme supported by SAVE. Their project has launched an innovative approach to energy management in schools. An organisational scheme and a guidebook targeted at schools have been developed in collaboration with about 20 pilot schools in Finland, Norway, Austria and Estonia. The guidebook is divided into three parts: how to learn more about energy, how to manage energy in schools and how to act to improve energy efficiency. This «learn-manage-act» approach is intended to integrate energy management as an essential part of the school environmental system.

Significant savings were achieved in the pilot schools

Teachers participating in the project are invited to attend workshops and training seminars dealing with energy consumption, energy-saving potential and energy costs. They are encouraged to include energy and environment issues in the curriculum. The guidebook also presents technical systems to help end-users to improve the lighting conditions and indoor comfort in the school.

In Finland, eight pilot schools at different levels ranging from elementary education to vocational colleges participated in the project. The Helsinki Business College, for instance, saved about € 3.000 within a year simply by turning off the lights. Students have been asked to systematically observe lighting conditions and indoor comfort in the school. They metered the energy consumption of different appliances as well as the air temperature in rooms. Posters and videos were part of the education programme design to disseminate information on the efficient use of energy in their school.

The results of the MOTIVA project will be disseminated more widely in the participating countries through new pilot schools. In addition, MOTIVA is exploring the possibility of developing further collaboration between teachers, local authorities and local energy agencies, as a way of promoting the idea of sustainable development in school practices.

[1] *Proposal for a Council Decision adopting a Multiannual Framework Programme for actions in the energy sector (1998-2002), COM (1997) 550 final of 18.11.1997.*

Observing the lighting conditions and indoor comfort in the school is part of the education in the 'Eestinkallio school' in Espoo in Finland.
Sources: MOTIVA – Energy management in schools

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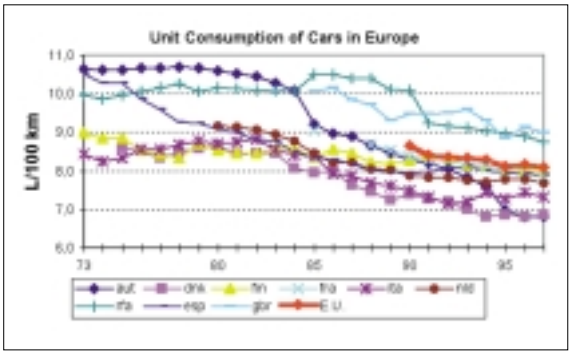
Partners Norsk Enok og Energi AS
Subcontractors: Project Consultants Ltd, Ramse Consulting Ltd, Helsinki Business College.
Cost of the project € 174.000
SAVE support € 70.000

USING INDICATORS TO MONITOR TRENDS IN ENERGY EFFICIENCY

Policy-makers are always being called on to assess how efficiently energy is used in the different sectors of activity in order to define a strategy for the rational use of energy. The European Network of Energy Efficiency Agencies (EnR) is currently looking at a methodology of making this assessment. Energy efficiency trends at both national and European levels are being monitored by means of macro-indicators.

Monitoring is part and parcel of the Energy Framework Programme of the European Union [1]. ADEME (the French National Agency for Environment and Energy Management) is in charge of a project on energy efficiency indicators which is one of the important analytical tools that have been developed under the SAVE programme.

Energy efficiency programmes in Member States and in the EU can be evaluated by means of comparable energy efficiency indicators. These indicators also provide guidance for future action and programmes. Detailed indicators have been developed to monitor change in technology and in behavioural or energy efficiency practices. In addition, energy efficiency indicators can also be used to define and monitor the sectoral targets established by the European Union for the reduction of CO2. They also provide a useful tool for making inter-country comparisons and for improving forecasts of energy demand.



The "Litres/100 kilometres" indicator estimates improvements in the average fuel consumption of cars in Europe between 1973 and 1997. One can see on the graph a definite improvement in the average consumption of the European fleet, with a saving of about 10 % in fuel consumption between 1990 and 1997.
Sources: ADEME – Improvement of the fuel consumption of cars in Europe

Energy indicators contribute to a more rational use of energy

These indicators have been placed in the ODYSSEE database [2], and the information is updated and improved on a regular basis in line with the latest trends in the energy field. The database now offers up to 250 indicators which are selected to answer both specific and more general questions raised by economic or technical policy issues.

For example, the «L/100 km» [3] indicator estimates improvements in the average fuel consumption of cars in Europe between 1973 and 1997. When the data are presented graphically, one can see a definite improvement in the average consumption of the European fleet, with a saving of about 10 % in fuel consumption between 1990 and 1997. The trend shows EU countries converging towards a common lower average consumption and this can be related to the fact that most of the Member States are using similar technology.

The monitoring of changes in energy efficiency forms part of any energy policy, and so SAVE wishes to give its results official political standing. The project is therefore actively disseminated by means of a book, a CD rom, a web site and national workshops.

With their sector-by-sector approach, these energy efficiency indicators provide appropriate material to help policy-makers in charge of energy and environment issues.

[1] Proposal for a Council Decision adopting a Multiannual Framework Programme for actions in the energy sector (1998-2002), COM (1997) 550 final of 18.11.1997.
[2] available on a CD rom and on the web site www.enerdata.grenet.fr/odyssee
[3] Litres/100 kilometres.

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Cost of the project € 800.000
SAVE support € 350.000

ENERGY EFFICIENCY SCENARIOS WITH MURE

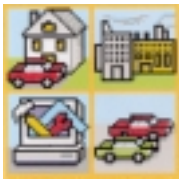
MURE stands for «Mesures d'Utilisation Rationelle de l'Energie». This unique tool carries out a priori evaluations of measures and policies on the rational use of energy. A database provides a useful information resource and an interactive software simulates scenarios on the potential for energy saving at both national and European levels. MURE is designed as a policy support system founded on the promotion of energy efficiency in individual end-use sectors.

National energy efficiency policies need to be analysed and compared in the light of the economic, social, political and even climatic constraints in each country. There is also lack of sufficient quantitative evidence to assess the potential benefits generated by energy efficiency measures. Simulating such benefits is one way to provide valuable information for policy-makers in order that they can identify priorities. It also helps energy planners to select the most energy-effective instruments.

The Energy Framework Programme of the European Union [1] therefore recommends the development of monitoring tools and explicitly mentions the MURE model. Indeed the database developed within MURE covers the legislative, fiscal, financial and other energy conservation measures carried out in all Member States in four end-use sectors: household, tertiary, industry and transport. MURE is primarily targeted at energy planners working at a macro-economic level.

In addition to the valuable database, the project has developed an interactive and user-friendly software designed to create different scenarios and evaluate their impact on energy efficiency at national and European levels. These simulations are carried out in a bottom-up manner starting at the level of the end-user. The software also simulates the impact of a combination of energy efficiency measures. The whole point is to determine which is the most appropriate way to spend a given budget taking into account energy efficiency considerations.

MURE has already proved its worth



Over the past two years, both the European Community and national bodies have used MURE to carry out specific appraisals of building codes, voluntary agreements and best available technology. For instance MURE has been used to calculate the potential impact on insulation in the household sector were a grant scheme similar to the UK's Home Energy Efficiency Scheme to be applied across the EU.

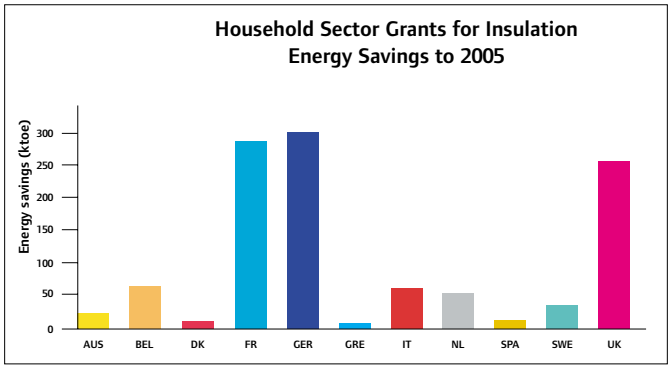
This grant programme for individual houses started in 1995 and will run for 10 years. Roof insulation has been put into existing housing or upgraded to the standard achieved by new housing. The resulting energy-saving potential to 2005 is 1078 ktoe [2], which is equivalent to 3291 ktonnes [3] of CO2 (see graph).

MURE has been widely presented at international workshops and national seminars. Updated information is also being disseminated via a MURE Newsletter, specialised publications and a web site. A new version named MURE-T (for Territory) has recently been developed to support energy planning at the local and regional levels. MURE-T is currently only available to the Italian building sector and the project team plans to disseminate it through the Network of Energy Agencies set up with support from the SAVE programme.

[1] Proposal for a Council Decision adopting a Multiannual Framework Programme for actions in the energy sector (1998-2002) , COM (1997) 550 final of 18.11.1997.

[2] Kilotonnes oil equivalent.

[3] Kilotonnes.



MURE has been used to calculate the potential impact on insulation in the household sector were a grant scheme similar to the UK's Home Energy Efficiency Scheme to be applied across the EU. The figure shows the breakdown by country of the energy-saving potential in the period to 2005.
Sources: MURE – Household sector grants for insulation

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