

ANAMEDSIMET FORET ENERTHAN

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The Campaign for Take-Off Renewable Energy Partnerships Catalogue

Preface



It is a great pleasure for me as Vice-President of the European Commission responsible for Energy and Transport Policy to present the first edition of this Catalogue to interested readers. It summarises programmes and projects joining the EU Campaign for Take-Off for Renewable Energies and will document the results obtained, including in future regular editions. The catalogue contains information on all programmes carried out by public institutions, industry or associations, and other bodies. We are taking the opportunity to present member bodies of the Renewable Energy Partnerships.

The Renewable Energy Partnership scheme has been developed as a key action under the Campaign for Take-Off with the express purpose to involve key actors in the

Campaign. The Campaign, created in 1999 will run from year 2000 to 2003 and is intended to 'kick-start' the Union's Renewable Energy Sources Strategy and Action Plan to double its share of Renewable energies by 2010. Published at the time of the Kyoto meeting at the end of 1997, the Action Plan was endorsed by the Council of Ministers and European Parliament the following year.

The aim of the Renewable Energy Partnerships is to produce 'Added Value' at Union level, by ensuring optimal awareness of and recourse to existing EU programmes - research and demonstration, regional and agriculture structural policy, environmental policy and other - to ensure optimal effect for Member States' and industry's Renewable Energy programmes and operations.

Local and regional bodies including decision-makers have contributed to safeguarding their environment and security of energy supply by more investment and better planning and foresight in the Renewable Energy area. Renewable Energy Partnerships included in this first Catalogue illustrate this effort.

Work has also continued rapidly at EU level, with the presentation to the European Parliament and Council of Energy Ministers in May 2000 of the draft Directive on "The promotion of electricity from renewable energy sources in the internal electricity market" and continuing support for both technological demonstration projects and priority accompanying measures. Nevertheless, an increasing role for Renewable Energy must be backed up by further improvement in energy efficiency as for instance, in the building sector.

I should like to end with a word on the Renewable Energy Partnership scheme itself. Successful registration of a Partnership with the Commission requires strong commitment and a substantial contribution to the objectives of the Campaign for Take-Off from those involved. I will welcome the First round of Partners and thank all those for joining the Campaign and the EU-wide effort to develop Renewable Energy.

Loyola de Palacio Vice President



In December 1997 the European Commission adopted a White Paper for a Community Strategy and Action Plan, with the title "Energy for the Future":

"Renewable Sources of Energy", setting an indicative target of 12% for the contribution of renewable sources of energy (RES) to the European Union's gross inland energy consumption by 2010. In the spring of 1998 the overall thrust of this White Paper was endorsed by the European Parlmiament and the Council of Ministers.

Accelerating the penetration of RES will play a major role in achieving the Community's international commitment to CO₂ reduction, while at the same time helping to reduce dependence on (fossil) energy imports and offering business opportunities for the European Union's industry.

The comprehensive strategy set out in the White Paper includes a Campaign for Take-Off designed to kick-start investment in RE in key sectors and underpin credibility by achieving substantial new investment by 2003. The necessary trend towards increased private investment in RES will be stimulated in a visible manner through public relations activities, focusing public support programmes on the targets of the Campaign, and raising public awareness of the vital role of RE and of the progress actually being achieved.

The Campaign for Take-Off will run for five years (1999-2003) and will act as a catalyst for the development of key RES sectors, sending clear signals for greater use of RES and encouraging investment. The objectives for the key sectors are:

- 1,000,000 PV systems
- 15 Million m² solar collectors
- 10,000 MW of wind turbine generators
- 10,000 MWth of combined heat and power biomass installations
- 1,000,000 dwellings heated by biomass
- 1,000 MW of bio-gas installations
- 5 Million tonnes of liquid bio-fuels
- 100 communities aiming for 100% RES supply.

Focusing on key sectors, the Campaign for Take-Off sets out a framework for action to highlight investment opportunities, and attract the necessary private funding, which is expected to make up the lion's share of the capital required. The Campaign also seeks to encourage public spending to focus on the key sectors, and, in the process, to complement and trigger private investment. It also comprises two schemes aimed at giving prominence to RE development plans and encouraging co-operation between committed actors including public authorities and investors to push on with their realisation. These are "Renewable Energy Partnerships" and "100 Communities aiming for 100% Renewable Energy Supply".

The Campaign for Take Off



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100% Renewable Energy Communities



100% RE Communities

Sector: RES Country: Sweden Location: Växjö

Fossil Fuel Free

Växjö

Background and objectives

Over the last ten years considerable efforts and investments have been made in Växjö to increase renewable energy sources. Industry, NGOs and citizens have participated in this task force with the result that emissions of fossil carbon dioxide from the heating system are less than half the current national average.

In 1996, the executive committee of Växjö municipality unanimously decided to stop using fossil fuels in the activities of the municipality. Furthermore, the aims set by the Climate Alliance, of which Växjö is a member, have been unanimously accepted:

- Emissions of carbon dioxide from fossil fuels in the whole municipality shall be reduced by 50% per capita by the year 2010 compared with 1993.
- The Municipality of Växjö shall stop using fossil fuels.

The reduction, as agreed upon in "Agenda 21" roundtables with stakeholders, is to be achieved by efforts towards changes in behaviour patterns, energy efficiency and primarily to use bio-fuels to a considerably larger extent than today.

Promoter:

Municipality of Växjö

Parties involved:

University of Växjö, Bioenergy Centre

Bioenergy Group in Växjö Ltd.

Energy Agency for Southeast Sweden



VOLVO converted to Ethanol

Actions

The ambition of the Municipality of Växjö is to achieve a 100% RES supply for its city, by undertaking activities in the fields of biomass and solar energy and transport sector.

Energy from Biomass

Since the beginning of 1980s Växjö Energy Ltd, VEAB, has worked towards replacing oil by bio-fuel and developing a combined heat and power plant in Växjö. Major parts of the city are served by district heating and new areas are continually added. The bio-fuel waste from forestry is taken from within a radius of 100 km.

In small villages, small-scale district heating plants using bio-fuels, so-called local heating plants are used. Municipal subsidies for conversion of heating systems from oil to biomass are provided for households outside the district heating area. The municipality gives free energy advice.

Solar

The municipal housing company, Värendshus, has had encouraging experience with solar panels. During 1998-2001, the municipality will press for the use of solar heating by means of a general subsidy to households for the installation of solar panels.

Transport

Emissions of carbon dioxide in the transport sector continue to increase. Even so, some progress has been made during recent years as far as alternative fuels for vehicles are concerned. There are several ethanol vehicles, both goods vehicles and private cars, including two lorries at BTL Schenker Ltd.

At Växjö Public Transport Company, buses run on 50% RME (rape-methyl-ester).

Växjö and a number of companies are co-operating to start production of DME (di-methylether) and methanol, which can be extracted from bio-mass. In order to encourage cyclist and pedestrians, car crossings have replaced pedestrian crossings and the whole of the city centre is a pedestrian precinct. In 1997, the Municipality of Växjö received the "Swedish Council for Inner City Environments Prize" for its city traffic environment. Major investments are planned for the expansion of the cycle path network.

Fossil Fuel Free Växjö

Financing

Växjö has received a governmental investment grant from the Swedish Ministry of Environment of approximately 9 M Euro that generates total investments of 34 M Euro, in a number of private and public organisations in order to reduce the use of fossil fuels by 32,000 tonnes. This represents approximately 9% reduction of CO2 emissions from fossil fuels in Växjö. Some of the projects are co-funded by the E.U.

Monitoring

Statistics Sweden monitors the use of fossil fuels in the municipality. Total emissions of CO₂ from fossil fuels are diminishing due to the great efforts in the energy sector. However, CO₂ emissions from the transport sector are continuing to increase. A task force is needed in this area.

Results achieved

Energy

- · Co-generation power plant in Växjö, fired by bio-fuel.
- · Pilot project for converting electric heating to bio-fuel district heating.
- · Local bio-fuel heating system in the villages of Ingelstad Lammhult, Braas and Rottne.
- Round table discussion with stakeholders on energy.
- Round table discussion with stakeholders to secure biological diversity and sustainable land use compatible with the energy policy.
- Solar panels on the roof of the technical high school and Växjö swimming hall.
- 35% improvements in energy efficiency at the offices of the Södra company.
- All municipal departments and companies monitor emissions of CO₂ from heating.
- Free energy advice.
- Eco-labelled electricity production at Växjö Energy Ltd.
- Conversion of heating plant at Kronoberg Folk High School to pellets.
- Heating fired by pellets at the municipal airport.
- Energy conversion at Hov School.
- Increased bio-gas production from the sewage plant.

Transport

- · Round table discussion on sustainable transport with interested parties.
- All municipal departments and companies monitor emissions of CO₂ from transport.
- Free parking for environmentally friendly cars.
- Cycle route to Evedal leisure complex.
- Cycle paths cleared of snow before, or at the same time as, roads.
- · Cycle campaign among municipal employees.
- · Bicycle pool for employees at the city hall.
- 50% RME mixture as fuel for city buses.
- Flex card: Bus and car transport using the same smart card.
- Conversion of a Volvo to ethanol.
- Optimisation of goods transport using GPS and satellite at the BTL-Schenker forwarding company.
- Car-sharing pool in Växjö.
- Municipal car pool with environmentally adapted cars.
- Municipal cycle path plan.
- Results in progress

Energy

- The Challenge: A partnership with Swedish Society for Nature Conservation and 4 other cities on fossil fuel free society.
 Municipal subsidies for converting oil central heating to bio-fuel.
 Municipal subsidies for installation of solar panels.
 Mobile bio-fuel boiler as a precursor to district heating.
 Rapid construction of district heating in older areas of the city.
 "Local district bioheating Kronoberg" a regional R&D programme with 15-20 new plants.
 Energy efficient street lightning.

- Joint purchase of solar collectors.
- Energy conversion of Osaby manor house.

Transport

- · Preliminary study for the production of DME bio-vehicle fuel.
- Feasibility study for bio-gas plant. Co-operation with the National Road
- Administration to reduce traffic.
- Intermodal terminal for domestic freight to promote transportation by railway.

Planning

Energy

- Parish council supported local heating system in Gemla.
- Conversion of mineral oil to pine oil in the power plant (postponed due to tax changes).
- Utilisation of surplus heat in Räppe.
- Computer controlled thermostats at refrigerators in co-operative stores.

Transport

- Municipal road plan characterised by safety and environmental issues.
- · Demands placed on minimising CO₂ releases in public purchases.
- · Environmental demands in connection with competitive tendering of transport.
- Flexible public transport with ondemand service co-ordinated using IT.
- DME fleet test.
- · Ethanol fleet test.

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Sector: RES Country: Sweden Location: Malmö

Malmö Bo01

Residential and Office area in the Western Port

Background:

Bo01/ The Western Harbour district is part of a broader Local investment Programme for ecological Adaptation of Malmö. The aim of the investment programme is to start a transformation of Malmö into ecological sustainability according to strategies in the local "Agenda 21" and the Environmental Plan 1998 – 2002 for the city of Malmö.

Promoters:

The City of Malmö, Sydkraft AB, Bo01 – City of tomorrow, The Swedish Energy Administration, The University of Lund

Parties Involved:

The City of Malmö, Sydkraft AB, Bo01 – City of tomorrow, The Swedish Energy Administration, The University of Lund.

European Co-operation:

The area is represented in the SURE/RESECO project.The SURE/RESECO demonstration project will contribute to the solution of two of the key issues: the need for common standards as well as regulation and public acceptance of renewables.

The combination of demonstration a 100% locally renewable energy concept in the new residential and office area in Malmö and the co-operation between five European countries will create a base for developing such common standards and regulations.

European partners in the SURE/RESECO project are:

Danish Technological Institute, Denmark Dublin Corporation, Ireland City of Tallinn, Estonia Regidoria de Ciutat Sostenible, Ajuntament de Barcelona, Spain City of Dublin Energy Management Agency Ltd, Ireland Copenhagen Energy (Koebenhavns Belysningsvaesen), Denmark



Western Harbour in Malmö

Objectives

- Applying for a nomination under the "100 communities" programme for a new residential and office area Bo01 in the Western Port of the city of Malmö –, which will be opened in May 2001.
- The Western Port of Malmö will in the year 2001 harbour the European Housing Exhibition, Bo01. The objective is to show the worlds first ecological sustainable information and welfare society.
- Bo01 consists of both temporary exhibitions and a newly built residential and office area in the Western Port of the City of Malmö. Bo01 will act as an ecological spearhead with environmental features integrated in all aspects of the development of the new urban area.
- An ambitious concept is designed where the annual energy needs will be supplied by 100% locally produced energy from renewable sources. Electricity is generated by wind power and PV. A heat pump makes energy in sea water and aquifers accessible. Solar collectors will convert solar energy into heat. This is then transferred to the district heating network. Bio-gas is produced from waste generated in the area, and this gas is returned to the district through the existing natural gas network of the city.
- Effective energy utilisation will be a key feature. New technology and new forms of energy services will be tried and advanced techniques for measuring and controlling energy consumption will be implemented.

Malmö Bo01 - Residential and Office area in the Western Port

Actions

The housing area, with approximately 500 apartments in phase I, and the energy system, with its production units for generating electricity and heat, and the distribution grids are presently under construction.

Financing sources

The cost of the total investments in production plants for electricity and heat will be approximately 6,000,000 Euro. The share of the partners is 3,000,000 Euro. The Swedish government support with 1,165,000 Euro and the EU support with 1,500,000 Euro.

Management

The project is managed through a steering committee with members from the participating parties.

Monitoring

The project will be evaluated in a national and European research projects.

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Sector: RES Country: Germany Location: Lüchow-Dannenberg

LÜCHOW - DANNENBERG

Planning the changeover to RES within 10 to 15 years

Background

Lüchow-Dannenberg is situated in a very remote area of Lower Saxony (Nothern Germany). Three quarters of the district-border were also border of the former Eastern Germany.

The district has 52,000 inhabitants spread over 1,200 km², which means a very low population density (42 inhabitants per km²). Most of the land is under agricultural or forestry use. With this low population density the district is well suited to cover its energy requirements with renewable energy, especially from biomass and wind.

The Lüchow-Dannenberg district plays a key role in German energy policy, because of the planned final disposal of nuclear waste in Gorleben which is a small village in the eastern part of the district. Therefore the population is very sensitive to topics concerning energy and highly motivated to take part in energy saving actions.

For an underdeveloped region with a high percentage of unemployment such a mobilisation of its own resources symbolises great added value and, at the same time, a stimulation of the employment market as well as a protection of insecure jobs in the agricultural area and forestry.

Promoter

District Luechow – Dannenberg

Parties Involved

Niedersächsische Energieagentur

ReEnergie Wendland

AVACON AG

Gesellschaft für Wirtschafts- und Beschäftigungsförderung

University of Lüneburg

Fachverband Bio-gas e.V.



Rural Energy Consultants visiting a Biogas Unit

Objectives

The aim of the district concept is to change the complete energy supply to climatefriendly renewable energy sources. This aim could be reached within 10 to 15 years. The first rough estimation shows that approx. 55% of the primary energy requirement of the district may be covered by biomass, approx. 15% by wind energy and approx. 20% by savings and efficiency gains.

The aim is to prove that the various energy sources as wind, sun and biomass can be linked in such a way as to guarantee a reliable and tailor-made energy supply.

Therefore, the main objective is to produce 60 MW of wind power, 20 MW with bio-gas block heating systems (BHKW) and 30 MW with wood and biomass BHKW.

The idea to change the energy supply to RES was created by an Agenda 21 Group, who worked for about two years in a round table for "Energy and Climate Protection". This idea was accepted by the district administration and the local politicians. The district assembly passed a resolution to support these plans.

Actions

- Changeover of power supply in Lüchow Dannenberg to renewable energy sources (RES) within 10 years.
- The bio-gas and potatoe amniotic fluid concept.
- Construction of 50 bio-gas power stations.
- A company serves as a central office for the control and monitoring of all decentralised plants for a demand orientated power supply.
- · Complete changeover of the power supply to RES on a long term basis.
- Energy saving campaign and increase of energy efficiency in all sectors.

LÜCHOW-DANNENBERG planning the changeover to RES within 10 to 15 years

Financing

The estimated investment costs are about 240,000,000 Euro					
Private investmer	nts:	70 - 80 %			
Government of L	ower Saxony:	5 -10% from structure and energy funds			
Federal Governm	ent:	15 -20% from the new "Marktanreizprogramm" (market promotion programme for renewable energy)			
Financial support for	r the first steps i	s given by the ALTENER-Programme.			
Within 18 months the following work programme will be finished.					
Phase 1:	Situation audit a	and determination of potential.			
Phase 2: Motivation of the population to active participation by target gr specific information campaigns.					
Phase 3:	Planning of a 10	0% supply by renewable energy sources.			
Phase 4:	Evaluation of the	e results and deduction of medium-range targets.			

Announcement of the model, results and medium-range targets. Phase 5:

Management District Lüchow-Dannenberg

Monitoring

District Lüchow – Dannenberg Niedersächsische Energieagentur

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100% RE Communities

Sector: RES Country: Germany Location: Furth

FURTH

A place in the sun

Background

Furth is a rural community with about 3,000 inhabitants, situated approximately 15 km north-west of Landshut in Lower Bavaria and has already received some awards for accomplishments up to now in the ecological area and the use of renewable energy sources. For 17 years now, people of Furth are working towards the production of energy with RES for its total needs.

The most important renewable energy sources at the moment are individual wood-fired heating systems, solar collectors and photovoltaic systems as well as a wood residue fired heating plant, including a local heating distribution network. Today's percentage of renewable energy sources in relation to the total energy consumed by the community (not including traffic) is estimated to be 31% of the heat and 0.3% of the power demand, most of it is supplied by solar collectors with 0.25 m² solar collector area and photovoltaics with 5 Wp per citizen.

Promoters

Community of Furth.

Parties involved

Arbeitsgemeinschaft der Bayerischen Solarinitiativen, Freising Gesellschaft für aktives Umweltbewußtsein e.V., Landshut Windgemeinschaft Furth, Furth Working Group Furth Solar, Furth Biomasseheizwerk Furth GmbH, Furth FH Weihenstephan, Freising



Solar Photovoltaic Installations in the Community of Furth

Objectives/Actions

During the campaign for take-off, the goal is to achieve 100% of RES supply for heat and power consumption. Depending on the outcome of the actions yet to be completed some or all of the following may be implemented:

Installations	Production	Investment
2 Wind turbines ea. 600 kW 2 small-scale hydropower plants ea. 10 kW	1.1 GWhe/y 0.12 GWhe/y	1.3 M Euro 0.3 M Euro
Extension of the existing wood residue heating plant (3 MWth) for power -and heatgeneration	3.0 GWhe/y + 9.0 GWhth/y	4.1 M Euro
Production of pellets		0.3 M Euro
Oil mill with fuel station in co-operation with neighbouring village - Adjustment of vehicles		0.1 M Euro
app. 10 bio-gas installations ea. 10 kWel	1.0 GWhel/y + 2.0 GWhth/y	1.5 M Euro
app. 200 photovoltaic -systems in total 700 kWp	0.63 GWhe/y	4.2 M Euro
app. 150 small solar collector systems	0.3 GWhth/y	0.6 M Euro
app. 100 modern biomass heating systems	11 GWhth/y	1.0 M Euro
Total investment in Renewable Energy Systems (RES)	5.93 GWhe/y + 22.3 GWhth/y	13.4 M Euro

Furthermore there are investments required in order to reach our goal in energy savings. This investments are estimated to be approx. 2.5 M Euro.

FURTH - A place in the sun

Description

To achieve this goal, the energy usage first has to be determined and subsequently the potential for energy saving must be evaluated and put into practice. The local potential for renewable energy sources has to be assessed, evaluated, and the future energy mix must be defined. The requirements for the economical usage of these systems must be evaluated and made applicable; communal and individual participation of the citizens and their overall education and participation have to be ensured. Moreover, suitable partners have to be found to successfully carry out the campaign.

Financial resources

Furth is a rural community with limited financial resources. The Municipality of Furth does not give economical support, but does promote and guide the development of RES within the community. The same will apply for the future. If our programmes are economically viable, the investments are financed by the citizens of Furth. If they are not economical viable the community of Furth will have to seek for support from our partners in the EU partnership or the EU.

Management

Under accompanying external advice, the executive powers without requiring further decision from our local parliament, are placed in the project group "Furth solar", consisting of the first major of Furth, and the Director of the Solar GmbH in Landshut. The guidance and execution of the application, procedures, actions and programmes has been forwarded to Solar GmbH.

Monitoring

The monitoring of the programme will be executed by the Fachhochschule Weihenstephan. They will use the findings of their own study about the local potential of RES in Furth as indicators. The costs involved are estimated at 15,000 Euro for the CTO.

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SAMSOE

The Danish Renewable Energy Island

Background

The island of Samsoe, Denmark, was in 1998 selected by the Danish Government as a demonstration case for a community to be supplied with 100% RE within the next decade. This status was obtained in a competition organised by the Ministry of Energy.

The island, which covers 114 km², has 4,400 inhabitants.Tourist accommodation totals between 375,000 and 400,000 nights per year.

Samsoe has important renewable energy resources available and faces no technical difficulties in covering the energy needs by energy from biomass, solar energy and wind energy. The most important means to achieving the objective of 100% community renewable energy supply are:

- Cuts in consumption and increased efficiency in terms of heat, electricity and transport by the introduction of up to date energy technologies and adjusting people's behaviour patterns.
- Expansion of the district heating supply systems combined with utilisation of local biomass resources.
- Expansion of individual district heating systems using heat pumps, solar heating, biomass-plants and other means.
- Construction of land-based and offshore wind power plants to cover electricity production.
- Gradual conversion of the transport sector from petrol and oil power to electrical power, and later on hydrogen.

Promoter:

Samsoe Energiselskab Smba

Parties involved:

Samsoe Energy and Enviroment Office Samsoe Farmers Association Samsoe Commercial Council Samsoe Municipality



1 MW Wind Turbines erected in 2000

Objectives

The overall objective is to have Samsoe 100% supplied by renewable energy in 2008. It is further the objective to maximise the participation of the individuals on the island in the project on all levels, i.e. politically (local support), technically (local job creation), and financially (local investment, establishment of local co-operatives).

In terms of input to the energy supply, the different technologies are planned to contribute 80% of the heating required (20% for elderly people and summer cottages) with the following:

Technology	% supplied by RE	
Wind energy	22	
Biomass	74	
Solar heating	3	
Others	1	
Total	100	

As far as the transport sector is concerned, it is not possible to achieve 100% renewable coverage initially. It is possible to reduce the consumption by 15% by replacing half of the cars by electrically powered vehicles. The transport sector will then consume about 250 TJ/year. Ferries account for one third of this. Installing 20 MW in an offshore wind farm covers this consumption.

SAMSOE - The Danish Renewable Energy Island

Actions:

Five main tasks shall be implemented:

- 1. The establishment of a solar heating package, which shall be sold to approximately 1,000 households on the island. The package will contain:
 - 1) The technical options including in some cases heat pumps and biomass plants.
 - 2) A loan agreement with local banks.
 - 3) Installation of equipment.
 - 4) Service and maintenance for 10 years period.
 - 5) Insurance.
- 2. The establishment of 4-village district heating systems based on biomass, two of them CHP schemes. Co-operatives, which will own and operate the district heating systems, will be established and similar for the open land establishment of neighbour heating systems. Financial models will be developed and loan agreements with local banks organised. The gradual phasing out of existing individual heating equipment, normally oil burners, will be organised together with an economic compensation for individual consumers.
- 3. The establishment of biomass, wood pellet and wood chip and other biomass production and delivery service to households and farmers in open land. Attractive financial models and loan agreements will be developed for such consumers to phase out oil based heating equipment. Local organisations will establish the biofuel production and transportation to consumers on the same basis as oil delivery services. Support schemes will be developed to initiate the activity, which will gradually operate on a commercial basis.
- 4. The establishment of 11 x 1,000 kW wind turbines on the island in the year of 2000/2001 and 10 x 2,000 kW wind turbines in the shallow water outside to the island in 2002/2003. Establishment of co-operatives to own and manage parts of installations. Financing schemes to be developed and strong involvement by in principal all inhabitants on the island.
- 5. Reduction of conventional energy consumption in the transport sector is not going to have serious effect in the first stages of the project period. But it is now possible to reduce consumption by 15% by replacing half of the cars by electrically powered vehicles. To compensate for the conventional energy use of ferries it is the intention to install 20 MW wind energy capacity offshore.
- 6. The establishment of local workgroups. The work packages have a technical side and also necessary commitment from the local people on organisational issues. Each package needs its own working group.

Financial resources

The change has been estimated to require a total investment of about DKK 590 M over a 10-year period. Almost all investments in hardware are expected to come from private resources including utility investments, even if support for demonstration activities will be looked for through national funding and through EU funding. Funding for detailed planning issues throughout the project period will also be looked for through national and EU funding. Since the Government has selected Samsoe as a window with regard to renewable energy and established clear objectives for the work programme, it has committed itself to support this development on the technical and the financial level.

Management

Samsoe Energiselskab Smba has been set up to implement the 10-year energy plan. The company consists of representatives from Samsoe Energy and Environment Office, Samsoe Farmers 'Association, Samsoe Commercial Council and Samsoe Municipality. The secretariat collaborates with the Danish Energy Agency, the executive body of the Ministry of Energy, ARKE, the local power company and private consultants specialised in the renewable energy sector.

Monitoring

Samsoe Energiselskab will monitor the work programme established to achieve the objective of 100% community renewable energy supply in 2008 for Samsoe. Due to the strong commitment from the Government, a monitoring procedure is to be established in collaboration between Samsoe Energiselskab and the Danish Energy Agency.

The energy plan for Samsoe and other information can be found on www.samso.com.

Contact:

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Sector: RES Country: Sweden Location: Gotland

The Municipality of Gotland:

A Renewable Energy Island in the Baltic Sea

Background

The island of Gotland has more sun hours per year than any other county in Sweden. Its long coastline and location in the middle of the Baltic sea means that Gotland has also some of the best locations for establishing wind power both on land and offshore. The island is 40% covered with forests and 31% of land area is used for grazing and arable land. For these reasons the island has considerable potential for the development of wind, solar and biomass sources in order to cover its energy need from renewables.

On 14th October 1996 the Municipal Council of Gotland published the Eco-Programme, which identifies the municipalities goal that "Gotland is to become an ecologically sustainable society within the course of a generation"

Promoter:

Municipality of Gotland

Parties involved:

Gotland's University College

Gotland's Regional Energy Agency

The Swedish National Energy Administration



Gotland

Objectives

The aim to develop an ecologically sustainable society has been reflected in many other plans and documents of the municipality. These plans have been approved by the elected representatives and were developed in consultation with local actors and the population at large.

Gotland's energy plan develops its activities in the following fields:

Energy from biomass:

The use of district biomass-fuelled heating plant is already well developed on the island with district heating systems in the villages.

Wind power:

The development of windpower on the island began in the late 1980's through the establishment of wind energy co-operatives. Today around 15% of the island's electricity comes from windpower. The municipality has taken an active role in the promotion of windpower. The amount of electricity generated by windpower is expected to at least double within the next 5 years.

Solar energy:

Due to the fact that Gotland has the most sun hours and a large summer population from tourism the potential for using photovoltaics and solar thermal installations in buildings is great. The municipality and university are currently developing a demonstration project for the new public and university library in Visby.

Recycled energy.

Reducing energy consumption through energy efficiency measures is an essential element in developing a sustainable energy system. Re-using excess heat from industrial processes is one way that the overall energy demand on the island can be reduced.

100% RE Communities

The Municipality of Gotland: A Renewable Energy Island in the Baltic Sea

Gotland energy projects:

Achieved:

- Bio-fuelled district heating systems in Visby, Slite, Klintehamn and Hemse.
- 117 Wind turbines installed by 1999 producing 62 GWh/year.
- Energi 2005, an energy plan for Gotland approved by the municipal council October 1999.
- Sweden's first 2.5 MW offshore windfarm completed at Bockstigen.
- · Conversion of oil fired burners to wood chips in Municipal properties.
- RME-fuelled vehicles as a part of municipalities fleet.
- Bio-gas production at the waste tip in Visby
- HVDC light cable installed for 50MW windpower transmission from Näsudden to Visby.
- The use of sea based heat pumps to supply the district heating network in Visby.
- Suderhälsan in Hamra, a health centre and spa supplied from wind, solar and geothermal energy.

In progress:

- The expansion of the district heating network in Visby inner city.
- New public library and university buildings in Visby with 100% renewable energy supply.
- The construction of a bio-gas demonstration plant at Lövsta agricultural college.
- The conversion of excess heat into electricity at Cementa's factory in Slite.
- The installation of solar panels on some municipality buildnings.
- Construction of a 42 MW demonstration offshore windfarm at Klasorden.

Monitoring

The municipality has established an "Agenda 21" Co-ordination group, which is responsible for producing an annual environmental report for the municipality.

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RES
Sweden
Lund

Aiming for a Renewable Energy

Lund

Background

Since the early 1970's Lund has worked towards the fixed purpose of reducing environmental charge. Carbon dioxide emissions have been reduced by slightly more than 30%. This was made possible through purposeful concentration on reducing emissions from both energy production and traffic. A well developed district heating-system with geo-thermics and a purposeful traffic planning, have been important instruments. The Municipality of Lund concentrated on district heating early on, and today 85% of apartments are connected. Since 1984 geo-thermics represents approx. 30% of the district heating production.

In 1971 the city centre was closed for through-traffic with private vehicles, and today traffic to and from the city centre has been reduced to half. In its work with environmentally adjusted transportation, the Municipality of Lund has developed a programme for goals, strategies and suggestions on measures "LundaMaTs".

Promoter

• The municipality of Lund

Parties Involved

- Lund University
- Department of biotechnology, Lund University
- Environmental and Energy Systems Studies, Lund University
- Skane Energy Agency
- Real-estate company Akademiska hus
- LKF, Lund's Municipal Housing Company
- AF Bostäder Foundation
- Trivector Ltd



Solar panels providing energy for hot water and heating in 125 apartments in Balby, Lund

Objectives/Actions

The main goal of the Municipality of Lund is to reduce carbon dioxide emission by 75 % during the period 1995 to 2050. In 1997, Lund's local "Agenda 21", was approved by the municipal council. It contains visions, goals and strategies on measures to master the environmental problems. One of the most important problems that have been emphasised is carbon dioxide emission. The most important causes of carbon dioxide emissions in Lund are energy production and traffic.

- Goals on reducing carbon dioxide emission from power consumption and heating:
 - Power consumption (for other objects than transportation) will be reduced by at least 1/4 by 2005, compared to its level in 1995, and the ongoing nuclear phase-out must not lead to an increase in carbon dioxide emission in Lund.
 - At least 3/4 of the energy used in Lund (for power and heating) will come from renewable energy sources in 2010.

To reach these goals, the municipality of Lund work from three different roles, as authority, owner and source of information/inspiration.

- Goal for decreasing carbon dioxide emissions from traffic/transportation:
 - The road's traffic (transportation of people and goods) share of carbon dioxide emission will be reduced by minimum 1/4, compared to the 1995-level, by 2005.

In "LundaMaTs" five part-strategies have been focused on: Effects on the total traffic activities; co-operation between different kinds of transportation; measures within each kind of traffic; technological measures on means of transport and fuel, and measures concerning the building and running of infrastructure.

Aiming for a Renewable Energy Lund

Results

1. Power consumption and heating

Achieved

- 85 % of the apartment buildings in Lund are connected to the district heatingsystem.
- 30 % of the district heating produced is heated through geothermics.
- 600 $m^{\rm 2}$ sun panels and 150 MWh/year installed in the village Dalby in the municipality of Lund.
- In the Sound School- project, schools are been built with a heavy framework to be more energy efficient.

In progress

- LKF (Lund's Municipal Housing Company) is building an extremely fuel-efficient building with 35 apartments.
- Programme for reducing energy consumption in 430,000 m² floor area of homes and premises.

In Planning

· Bio-fuelled power station.

2. Traffic transportation

Achieved

- A bicycle-plan was result of the bicycle report of 1992, marking the beginning of Lund's great project on bicycle traffic.
- Programme for environmental adjusted transportation systems, "LundaMaTs": Comprehensive strategy for environmentally adjusted transportation in the municipality; community planning, developed public transportation, the bicycle municipality, environmentally adjusted car-traffic and commercial transports.
- Dialogue with the merchants' association, large enterprises, the Society for the Conservation of Nature, and the police, among others, in connection with the introduction of "LundaMaTs".
- There are 100 kilometres of bicycle paths in Lund. In the case of snowfall, bicycle paths are cleared before the streets.
- A supervised bicycle garage with room for 350 bikes has been opened at the railway station; also offering repairs and, services.

• Around the railway station there are bicycle stands with room for 3,500 bikes.

In progress

- Building of the "Lundalink" a traffic route of public transportation, for quick transportation from the railway station to one of Southern Sweden's largest places of work.
- Lund, a bicycle municipality: Plans to improve infrastructure, improve organisation, create safer bicycle traffic, and increase information, marketing and education concerning cyc1ing.
- "Walk or ride a bike to school" measures aiming at safer school ways.
- Environmental strategies concerning all of the municipality's departments, focusing on transportation.
- 75% of the busses in city- traffic run on gas-in the long run bio-gas.

In Planning

- Projects concerning enterprise travelling and handling of goods.
- Projects concerning car- pools and environmentally friendly cars.
- · Projects concerning proximity- of producing goods and of shopping.
- The Staffanstorp link- extension of the Lund link, via Dalby, Staffans- torp and Malmö.

Financing

Lund has received a governmental investment grant from the Swedish Ministry of the Environment of approximately 126.3 M SEK that generates total investment of 450 M SEK, in a number of private and public organisations. These investments will reduce carbon dioxide emissions from traffic with 2,200 tones per year and energyproduction with renewable fuels will decrease the emissions of 4,000 tonnes of fossil carbon dioxide. The estimated saving of energy is 39,000 MWh per year.

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Sector: RES Country: Denmark Location: Aerø

Aerø

A Renewable Energy Island

Background

The project is based on the Danish Governments energy programme "Energy 21" and the work with Renewable Energy Islands.

In 1997/1998 the Danish Island Aerø took part in a competition to become The Danish Renewable Energy Island. Aerø was not chosen but continues to work towards the goal of 80-100% supply of renewable energy plus energy saving during the period from 1998 to 2008.

Aerø covers an area of 90 km² and has a population of 7,600.

About 300,000 tourists visit the island every year. It is estimated that 8,000 of them have a special interest in energy projects and are categorised as energy-tourists.

Holiday houses, mostly situated in towns and served by district heating constitute 17% of the housing.

The work with renewably energy on Aerø has been in progress since the beginning of the '80's, initially through initiatives by the private citizens, the local energy office (NGO), and district heating companies - from 1997 with VE-Organisation Aerø as initiator and co-ordinator. A predesign work, Aerø en vedvarende energi oe, was completed in 1997.

Promoters:

VE-Organisation Aerø

Aerøskoebing Kommune



Objectives

The overall goal of this programme is to convert the energy supply on Aerø to 80-100% RE over a period of 10 years from 1998 to 2008 through:

- Reduction of CO₂ and other pollutants generated by production of electricity and heat, and through a sustainable local production of energy.
- · Maintain or increase energy efficiency of the local business community.
- · Create new jobs through a certain degree of self-sufficiency.
- To "green" existing jobs within the energy supply sector.
- To create a monetary abundance as the payment for the energy supply remains in circulation on the island.
- To establish a supply of energy which is at the forefront of the development.
- To contribute to maintain and increase the participation of the population of the island in the development of "the green island".
- To maintain and increase the number of energy related tourism.

Actions

- Increase of 10 to 12 MW windpower
- District heating, in the following municipalities and towns:
 - Marstal:
 - Thermal solar heating, 9,000 m² are installed.
 - Conversion to RE for the remaining production is being investigated.
 - Aerøskoebing:
 - Biomass:Extension from 1.6 MW to 2.5 MW.

Thermal solar heating: 5,000 m² are established.

- Rise:
 - Biomass: 600 kW.

Thermal solar heating: 4,000 m² and seasonal storage.

Aerø - A Renewable Energy Island

- Soby:
 - Biomass: 2 MW.
 - Thermal solar heating: 2,250 m².
- Individual means of heating:
- Solar collectors and biomass boilers for approx. 1,500 detached properties.
- Energy savings, through change of consumer habits and utilisation of best technologies.

Financial Resources

Action	Investment needed	Sources
Wind Energy		
Windmills.	• 90 M DKK	To be obtained through sale of shares, principally to residents on the island
District-heating		
Marstal District Heating	 20-60 M DKK Extension of the system 15 M DKK (1997) 	To be obtained through the general run of the company and grants from DK and EU
Aerøskoebing District Heating	• 1.5 M DKK	To be obtained through the general running of the company
Rise District Heating	• Approx. 20 M DKK	To be obtained through registration fees from consumers, loans, ordinary grants (DK) and extraordinary grants (DK)
Soeby District Heating	• Approx. 31 M DKK	To be obtained through registration fees from consumers, loans, and ordinary grants (DK)
Individual heating		
Biomass boilers, solar collectors	90 M DKK estimated	To be obtained through private investments, Aero Elforsyning, and ordinary grants (DK)
Energy savings		
Replacement of machinery		To be financed by consumers and companies
Information	• 6 M DKK (1997)	To be financed through supply companies and public grants
Conversions of electrically heated properties	• 21 M DKK (1997)	To be financed by consumers and ordinary grants (DK)
Information and proje	ct co-ordination	
Project co-ordination	• 10 M DKK (1997)	To be financed by public grants

Monitoring

VE-Organisation Aerø will supervise the implementation of Aerø - a renewable energy island -and examine the state of all projects at its monthly meetings. At the end of the year a collective account of the year's activities and the status of the Aerø a renewable energy island project is presented.

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Management

VE-Organisation Aerø was established in 1997 as an activating forum, to support the conversion of the energy production on Aerø to RE. The VE-Organisation is to:

- · Act as an inspirator and catalyst with regard to new RE initiatives.
- · Act as a sparring partner and maintainer of RE-projects in progress.
- Co-ordinate RE-activities on the island.

Sector: RES Country: Sweden Location: Säffle

Säffle

A municipality with minimized use of fossil fuels

Background

Säffle municipality is situated in Western Värmland and has 17,000 inhabitants. The business sector is highly varied with processing, e.g. pulp and paper, industry and mechanical industry as well as high-tech companies and small and mediumscale enterprises. The agricultural enterprises are rational and modern with some of the largest pig-raising farms in Western Sweden.

Since 1996 Säffle is one of three municipalities in Värmland participating in a project on efficiency in energy utilisation, "Energy-Efficient Värmland", with the aim to integrate efficient use of energy in day-to-day environmental considerations. The hypothesis is that the diffusion of energy efficient technologies could be considerably enhanced through a holistic approach to the concept of energy utilisation in a particular region

Säffle municipality has the ambition to increase efficiency in energy utilisation and to promote transfer to utilisation of renewable energy sources (RES). A foundation for a successful development in this direction is the dedication and co-operation among all actors: The municipality, the business sector, producers, local organisations, schools, NGOs etc.

Promoters:

Säffle Municipality

Parties involved:

Säffle Municipality (Säffle kommun) Säffle District Heating Company (Säffle Fjärrvärme) The local manufacturer of pellet burners (Vänerbygdens Pellets) Environmental Action in Värmland (Miljöaktion Värmland) Swedish National Road Administration (Vägverket)



District heating installation

Objectives

In 1994 the municipal council of Säffle adopted a vision and a policy for environmental action. It has guided the municipal council into deciding e.g. on introduction of an environmental management system similar to EMAS in all municipal work and decision making. The policy also states that Säffle municipality should:

- Aim at achieving a community adapted to sustainable development and recyc1ing of resources.
- Use renewable resources in its environmental work in a sustainable way, use energy from both renewable and non-renewable sources efficiently.
- Community planning must be guided by sustainability principles.
- Säffle municipality must, within its mandate, shoulder its responsibility to fulfil international, national and regional environmental agreements and objectives.

Säffle municipality has accepted the challenge to reduce carbon dioxide release with at least 50% before year 2025 (1995 as base year). This is one of the policies in the project "Challenger Communities" initiated by the Swedish Society for Nature Conservation.

Säffle - A municipality with minimized use of fossil fuels

Actions

Säffle municipality is developing and planning several actions towards achieving its goals:

- District heating plant: In the town of Säffle is under construction and will have a capacity of 50 GWh per year. Total cost for this project is 7 M Euro. District heating will reduce the need for fossil fuels with more than 10,000 m³ of oil every year.
- Older oil burners/boilers in municipal buildings that are situated out of reach for district heating will be converted to use bio-fuels.
- Sewage works, green houses, secondary schools. The proposal is to install a new heat pump in the sewage to condense heat from the sewage water and to add a new biomass boiler using wooden chips or pellets. Both raw materials are available locally. Total cost for this project is 50,000 Euro.
- Information, education and net-working:
 - Säffle municipality has a well functioning agricultural sector group that includes representatives from district groups of the Federation of Swedish Farmers.
 - Collaboration on environmental issues with the private sector. Thirteen of the largest industrial companies are members of a committee for mutual collaboration. Smalland medium-scale enterprises and enterprises are organised in interest groups.
 Networking on environment issues between schools and pre-school child care.

Dissemination of Results

Every municipal project that includes investment in energy technology will be adequately exposed to the general public. Each responsible municipal project manager will conduct two seminars to present the results of his/her particular project. Local massmedia and the municipal information paper "Kommun-Nytt" are encouraged to report on the projects. Once a year a comprehensive report on all the projects will be published. Säffle municipality will collect all documentation and exhibit results in the public library in Säffle. This library was given the award "Best Library in Sweden" during 1999.

All other collaborators are encouraged to publicise information about their energy investments and environmental efforts. The information from these projects will be included in a conclusive report presented to the steering committee for environmental issues at Säffle municipality.

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Tel.: 46-533-817 80 e-mail: btp@saffle.se Sector: RES Country: Sweden Location: Uppsala

Fossil Fuel Free

Uppsala

Background

Uppsala is one of Sweden's largest municipalities, with a population of 188,000 inhabitants. The city has a long tradition in trying out new ideas and technologies, much due to the fact that two large and modern universities are situated in the city. Also, many companies in Uppsala work in research and development, especially within the fields of medicine, medical technology, biotechnology and pharmaceutics.

Uppsala has worked for a better environment for a long time. We have a district heating plant that runs on almost 60% bio-fuels and a bio-gas plant that provides fuel for the city's buses. Even though the city is situated in a northerly part of Sweden, there are projects in process within the solar energy field at the Ångström Laboratory. Uppsala has also done extensive work regarding road traffic and its emissions. We have a large and well functioning public transport system, with buses and park-and-ride car parks. The municipality is involved in several projects to reduce the emissions and crowding caused by road traffic.

Since Uppsala began working with "Agenda 21" in 1994, many networks have been started within the municipality's organisation as well as outside. Uppsala feels that these networks help in achieving goals regarding the environment.

The municipality's main goal is to base its energy supply on renewable energy sources. Other aims are to reduce energy consumption per capita by 20% and road traffic emissions of carbon dioxide by 25%. An expansion of the infrastructure is aimed to bring about a reduction of the total traffic on the roads. These goals will be reached through an expansion of the bio-gas plant and a more efficient use of the sun as an energy source.

Promoter:

Municipality of Uppsala

Parties involved:

University of Uppsala, The Ångström Laboratory

Skandi System AB



Small Water Power Plant, Uppsala

Objectives

In October 1997 an environmental programme was decided upon by Uppsala's city council executive committee. The environmental programme is an action plan for the environment and health related environmental questions. The programme covers four years, 1998-2001, after which the programme will be updated. During the four year-period, certain parts of the programme are to be revised annually. Some key aspects of the programme are presented below.

The comprehensive goals regarding energy are:

In the year 2010, the energy supply in the municipality of Uppsala shall be based on fuels that do not increase the climate problem. Wood fuel is the most important source for the bio-fuel supply in Uppsala today.

The fossil part of waste fuel will be minimised. Today, extraction of energy from waste amounts to about 700 GWh, which is a little less than 1/3 of the energy production. The part of waste that is considered bio-fuel is 80%, the remaining 20% consists mostly of plastic materials. Due to increased sorting of households' waste the fossil fraction of waste will decrease.

Actions

Action plan for the goals regarding energy, a few examples:

- To lower the return temperature in the district-heating network.
- The possibility of increasing the proportion of wood fuels in HMAB's briquettes is being examined. The possibility to buy wood fuels of the right quality is another option.
- The possibility of using the sun as an energy source,- both for heating and electricity, is to be reviewed and promoted. The municipality will actively support Uppsala University's work in research and development of absorber surfaces for efficient photothermal conversion of solar energy and towards reflector surfaces for efficient photoelectric conversion of solar energy.
- · Local small-size wind power solutions will be promoted.

Fossil Fuel Free Uppsala

Present Status

Heating

- District heating. Today the use of bio-fuels in the district heating plant is more than 50%. The plant provides heating for 95% of Uppsala's population centre. Four new heat-pumps are in use and heat-recycling is estimated to be sufficient for 5,000 small-size homes.
- A new district heating plant in use in Knivsta, just outside Uppsala. Runs on bio-fuels. The plant provides heating for 85% of Knivsta's 7,000 inhabitants.
- A direct solar energy project in Lyckebo, in the northern part of Uppsala. The purpose of the project is to show that direct solar energy may be stored from summer to winter in a rock shelter with acceptable levels of heat loss. Another purpose is to show that flat solar collectors may give high enough temperatures to be meaningful in the energy context.

Traffic

 Uppsala has a bio-gas plant designed for digesting butchery, industry, manure and, where possible, household waste. Today Uppsala has 14 buses that run on bio-gas.

Other:

- Regular monitoring of CO₂ emissions, from traffic and heating.
- · District cooling and steam is being delivered to several companies in Uppsala.
- · An energy advisor has been employed.
- · "Miljötorget" is a stationary exhibit on the environment open for the public.
- "The Challenge" is a project, which aims to spread and implement the idea of a fossil fuel free society.

Planned:

- Several of the smaller villages around town are going to use bio-fuels for their heating.
- A small pellet heating plant is being built in Vänge outside Uppsala. It will supply heat for the local school and a residential area with about 100 flats.
- A policy and action plan regarding small-scale wood heating in Uppsala is being drawn up.

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Övertorneå

Renewable Energy for Europe

Background

Övertornea council district in the Torne Valley is set in beautiful and verdant countryside that in spite of its northerly location near the Arctic Circle has supported a population for thousands of years.

Övertorneå Local Authority in 1983 declared Övertorneå Sweden's first eco-district. It is now clear that the local authority had then already begun its move toward long-term sustainable development for society. One of several significant actions was the construction of Ruskola Ecovillage, and of an evolved bio-fuel-based district heating system.

The Ecovillage was founded on the following four basic pillars: democratic, technological, economic and social goals.

Ever since the project started, the housing in Ruskola Ecovillage has been heated using 75% renewable fuels. No fossil oil is used. All houses have baking ovens with a heat- retention capacity, the houses have extra heat insulation and are built of environmentally friendly materials.

The gardens have vegetable patches with purely ecological cultivation. Tenant administration and community facilities are included.

Övertorneå Local Authority aims to become a model in the field of human, community and economic development under ecological conditions. The interplay between nature and mankind should be based on relations that enable economic development while achieving a society that is sustainable in a long-term perspective.

Promoters:

Municipality of Övertorneå

Parties involved:

Ruskola Ecovillage Länstrafiken i Norrbotten AB BoRö Pannan AB Ekfors Kraft AB Lulea University of Technology, section for energy technology National Road Administration -Northern Region Övertorneå Local Authority Vattenfall AB, Northern Region Övertorneå Värmeverk AB Norrbotten Energy Network SCA Forest and Timber AB



Ethanol Car in the Artic Circle

Objectives

The aim of participation in 100% RES scheme is partly to make a contribution to the battle with the greenhouse effect, and partly to strive toward self-sufficiency in energy and the development of business in the council district.

In 1998 Övertorneå Local Authority unanimously decided to take up the challenge to become a council district free from fossil fuels. This means that:

- The emissions of fossil carbon dioxide in the council district as a whole for the year 1990 are to be halved by the year 2020, or are to be reduced by 20,000 tons/year.
- Ruskola ecological community, consisting of 10 properties, is to be 100% free from fossil fuels by the year 2010.
- Övertorneå Local Authority is completely to cease to use fossil fuels in its own operations.

The Övertorneå Local Council is developing a strategy to encourage citizens and companies to change their attitudes among the use of renewable energies, fostering the change over to these energy sources.

Actions

The reduction that is achieved in accordance with the local authority's "Agenda 21" objective and with the environmental plan will be achieved through increased use of bio-fuels, renewable energy for electricity production, the development of advanced turnkey solar panel systems for heating and through more efficient uses of energy.

Energy from biomass

Of the total area of the council district, 2,374 km² (approximately 161,500 ha.) is forest, which through photosynthesis produces 2,100,000 tons or approximately 40 PJ net of energy per year. In 1998 54 GWh or 195 TJ of energy was supplied in the form of biomass within the council district.

Övertorneå - Renewable Energy for Europe

Council heating plants will be converted to bio-fuels, starting in 2000, which will reduce total emissions of fossil carbon dioxide by a further 5%.

Transport

Övertornea's location and the use of fossil energy entail long transport routes.

Two companies are starting deliveries of E85 ethanol fuel for petrol engines, and RME, rape-oil methylester, for diesel engines, in central Övertorneå in 2000.

The council will acquire vehicles for its car pool and will use rental cars run on biomass-based fuels, beginning in 2000.

The National Road Administration - Northern Region is working for a socio economically efficient and long-term sustainable transportation system. The National Road Administration - Northern Region - is an active participant in the project Challenger Communities.

The development of environmentally aware driving habits will reduce emissions.

The intercity coach company Länstrafiken i Norrbotten AB is changing over to renewable fuels as soon as they become available in the county. Interest in public transport is being stimulated in every way.

All purchasing of transport is adapted to the environment in accordance with the local authority's environmental plan.

Measures in the transport sector will reduce emissions of fossil carbon dioxide by 20% by 2005.

Solar energy

The development of turnkey solar panel systems with accumulators will begin through the company BoRö-pannan AB.

Electricity production

The changeover to the use of electrical power from renewable energy sources will take place through environmentally adapted buying, in line with the council's "Agenda 21- document", and is due for completion by the year 2006.

The environmental management system is being introduced with the objective of certifying according to ISO 14001 all electrical production plants in Sweden (67 units), to be carried out during autumn 2000.

Electricity from wind generators in Norrbotten is to be used in the future.

Financing resources

So far the partners have reserved 1 M Euro for different actions. Projects planned by the partners in the near future demand financial resources up to 110 M Euro.

Management

An executive committee made up of representatives for the partners will be responsible for coordination of the programme's actions. The partners themselves will take care of the administration of their specific actions, together with other investors, or alone.

Monitoring

The governmental organisation Statistics Sweden.

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National Renewable Energy Partnerships


Sector: RES Country: France Location: National

Take-off Campaign

for Renewable Energy Sources in France

Background

The ADEME has taken the opportunity of the negotiation of State-Region plan contracts (CPER) to create a medium term (2000-2006) partnership with the Regions based on the different action plans that have been, or are being, prepared (Regional Air Quality Plans, Urban Mobility Plans, Regional Plans for the Disposal of Industrial Waste, Collective Energy and Transport Schemes, District Waste Disposal Plans, etc.) For the ADEME the State-Region plan contracts are a privileged framework, in which to put sustainable development in practice in a regional context.

This action framework is obviously articulated around the three main priorities of the ADEME's project:

- Engagement to encourage a sustained effort towards optimal energy utilization with significant development of renewable energy.
- Development of a high environmental quality waste economy.
- Improvement of transport performance and a reduction in air pollution.

Promoter: ADFMF



Centrale de la Tour, Small-Hydro installation for electricity production

Objectives

The pluriannual framework agreements between the ADEME and the regions for the period 2000-2006 will be annexed to the State-Region contracts in order to set concrete targets for the actions undertaken. In each of the 26 regions a framework agreement has been signed, or is about to be signed, by the Region, State (Prefect for the Region) and the ADEME. This contract will be reviewed each year under an annual application agreement, which will specify funding provisions for each area and the applicable aid criteria and systems.

To achieve these goals the ADEME mobilizes its efforts around seven main modes of intervention:

- 1) Solid research priorities.
- 2) Supporting the definition of standards and regulations.
- 3) Readily accessible procedures to aid decision-making. Procedures which can be articulated on two complementary levels: on the one hand, prediagnosis and guidance, and on the other, diagnosis and preliminary study.
- 4) Demonstration operations and example operations for sustainable development. In practice these operations should promote market access, remedy a failure of diffusion and develop an organizational or territorial practice.
- 5) The financing of investments.
- 6) Strengthened international action.
- 7) Cross-cutting communication to inform the public and maintain a link between all the parties concerned.

Actions

For each of its programmes the ADEME proposes activities to be undertaken up to the 2006 horizon (number of operations, number of partners affected, etc.) and/or impact commitments (tonnes of CO_2 avoided, tonnes of waste utilized, etc.).

In overview, it is possible to distinguish three areas of action:

- The first area covers direct impacts expected from actions carried out by the ADEME

Take-off Campaign for Renewable Energy Sources in France

alone (and in particular using solely its own aid funds). This mainly includes the impact of aid given for equipment.

- The second area includes the indirect impacts of the ADEME's joint activities with its partners (contracting, other "leverage" finance such as guarantee funds, etc.) and anticipated indirect impacts. In particular, this includes the impact of decision support.
- The third area takes in the supplementary impacts obtained through other public intervention instruments not directly under ADEME control, but on which the agency can offer its expertise (for example, the impact of thermal regulations for building construction).

Within the Renewable Energy field, the degree of maturity of the proposed technical solutions and the degree of support necessary in the phase in which they try to become competitive vary greatly. It is however possible to distinguish three areas of action:

- Branches or applications close to being competitive whose rapid development requires their economic position in the market to evolve. The goal is therefore to reduce prices through the economies of scale allowed by broad diffusion, better optimization of components and an effort to structure offered products.
- Branches or applications, which are economically viable or very close to being competitive but meeting non-commercial barriers. This is the case of low-temperature geothermal energy and of small-hydro power in France.
- Branches of renewable energy, which still require considerable Research and Development effort to improve their cost-effectiveness and open up markets. This is the case of photovoltaic energy, solar cooling and deep geothermal power using the potential of fractured rocks.

Financial resources

Under the State-Region contracts, over the period 2000-2006 the part contracted by the ADEME will mobilize 3,500 MF, i.e. 500 MF a year. In other terms, on the basis of the 2000 budget, around 29% of the budget devoted to regional action and 23% of the ADEME's general intervention budget (excluding research).

Around 26% of this package will be devoted to Renewable Energy, totalling over 890 MF over the period as a whole.

Over the period 2000-2006 the Regions are due to mobilize 2,920 MF and ERDF funds will make up a total package of 1,822 MF.

Management

Within the framework of the pluriannual contracting with Regional Councils, three modes of fund management have been used:

- 1) Separate management of funds: each partner manages his credits following his own modes of management.
- 2) The management of a fund entrusted to the Region: The ADEME's financial contribution is given to the Region as a specific budgetary line opened for this purpose in its accounts. A record of payments is used to show that the programmes have in fact been carried out.
- 3) The management of a fund entrusted to the ADEME: The Region's financial contribution is given to the ADEME as a specific budgetary line opened for this purpose in its accounts. A record of payments is used to show that the programmes have in fact been carried out.

The Management committee performs an annual examination of the accounts of each agreement to determine the total expenditure and thus the total credit remaining available. In most cases any outstanding balance will be reassigned under the agreement for the following year.

At the request of some Regions, both parties may also have free funds at their disposition at the closure of the annual agreement.

Monitoring

The ADEME has developed a specialpurpose computer programme to monitor projects integrated within its overall computer management architecture. This focuses on measuring impacts and evaluating the programmes undertaken. Operations initiated in the framework of the State-Region Plan Contracts incorporate this evaluation system. In particular, finance provided by partners and the operations concerned are fully taken into account.

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Sector: RES Country: Spain Location: National

Integrated Energy Management

for SMEs

Background

In 1998 IDAE set up a technical and financial support mechanism for SMEs through its IDAE/ERDF programme aimed at this type of company within the framework of the overall ERDF-IDAE subsidy for 1995-1999.

The programme "IDAE-ERDF for SMEs" is a strategic action of IDAE to promote the realisation of projects for Rational Use of Energy and Renewable Energies in small- and middle-size enterprises, through management and financing of "Turn-Key Projects" situated in Objective I areas.

This programme is interesting for any small- and medium-size enterprise, which has a considerable amount of expenses for energy in their process of manufacturing or activity.

Promoter:

IDAE

Parties involved:

SODEAN, S.A. ITC (Technological Institute of the Canary Islands) IMT (Technological Institute of Murcia) IMPIVA (SME Institute for Valencia) EREN (Energy Agency for Castilla León) SODERCAN (Agency for Regional Development of Cantabria) GESTENGA (Energy Management for Galicia) ASTURENER CESEX (Centre of Socioeconomic Studies of Extremadura)



Renewable Energy Applications for SMEs

Objectives

The programme's main objective is to provide, small and medium sized enterprises in the regions classified as "Objective 1" with a tool for integrated energy management.

The programme's energy target, once the planned installation has been set up, is to generate 192,133 MWh/year, with an annual energy contribution equivalent to 27,423 toe/year. All this implies a saving of primary energy of 46,879 toe/year and a reduction in atmospheric CO_2 emissions of 164,076 t/year.

Actions

The programme's beneficiaries are companies in which the energy component plays a crucial role in their market position with respect to their competitors. They will have the opportunity to improve their competitive position through the rational use of energy or the use of renewable energies, modifying their cost structure regarding to the energy optimisation by each productive unit.

The programme is aimed at firms which:

• Are SMEs:

Any business, which has an important energy outlay during the production process or activity, must meet the following requisites:

- Less than 250 employees.
- An annual turnover not bigger than 40 M Euro (approx. 6,500 M pts).
- An annual general balance not bigger than 27 M Euro (approx. 4,400 M pts).
- No more than 25% of its capital held by a large business.
- Do business in one of the following sectors:
 - Industrial.
 - Agriculture, livestock and fishing.
 - Residential and services.
 - Services for municipal and county councils.

Integrated Energy Management for SMEs

- Meet some minimum conditions:
 - To have an annual income of at least twice the proposed investment.
 - To have own resources of at least 75% of the proposed investment.
 - To have been actively producing for at least three years.
 - To have a positive cash flow.
- Are in an "Objective 1" region:
 - Asturias Cantabria
 - a Castilla-León
 - Extremadura Castilla-La Mancha
- Comunidad Valenciana Murcia
- Ceuta Melilla Islas Canarias

Type of projects covered by the programme

• Energy-saving projects:

- Galicia

- Andalucia

- Change of boiler.
 - Modification of processing equipment (drying equipment, ovens, heating equipment, cooling equipment, residual heat recuperation equipment, lighting, water treatment and recovery, desalination equipment).
 - Indoor installations.
- Energy substitution projects:
 - Transformation of gas equipment.
 - Substitution of equipment to more efficient fuels.
 - Substitution of obsolete equipment.
 - Substitution of conventional energy sources by those that take advantage of process residues.
- · Renewable energy projects:
 - Wind power.
- Installations with permanent consumption (fish-farms, oceanographic installations, filters, desalination, freezing,...).
- Installation with consumption at set times (pumping stations, mini-hydraulic installations, ports, shopping centres, electric power distributors,...).
- Installations isolated from the grid (lighthouses, fire protection installations, petrol stations, isolated tourism installations, rural electrification,...):
 - Biomass.
- Use of biomass (heating installations, slush drying, heating of SHW, heat transfer to process gas or liquid, housing applications, district heating, gasification of organic residues, dehydration,...):

- Solar heating.

- "Turnkey" installations with surface areas greater than 100 m² for heating water.
- Installations to complement conventional equipment, SHW applications, air-conditioning, industrial uses, residential, hotels, schools, health resorts, swimming pools. To this end the Institute has developed a series of innovative generic products aimed at potential users with the following characteristics:
 - Guaranteed technical solution:

"Turnkey" installations, dependable, backed-up by proven technologies in which the IDAE guarantees a sufficiently big energy saving to cover the costs of the operation and the maintenance, the cost of financing it all and a percentage saving for the user right from the start.

- Competitive financial solution:

Financing formulas supported by a return on the money invested in each project by means of the economies generated, with a MIBOR expenditure -3% or equivalent (with a limit less than the forecast CPI) and repayment period of up to 8 years.

- Expert and independent consultations:

Running of the installations before, during and after start-up, supported by the IDAE's extensive experience in these projects and the independence both of the technologies as well as the equipment.

Financial Resources

The SMEs programme has a funding provision of pts 11,313 M, provided jointly by ERDF and IDAE.

Management/ Monitoring

The management and monitoring of the programme will be carried out by IDAE.

To this end, an working group have been created with the following personnel:

- A programme manager.
- Four technicians in the areas of wind energy, combined heat and power, rational use of energy in the building sector, and solar and biomass energy.
- An assistant to the working group.

The development of specific product for SME, the analysis, and the negotiation of agreements of projects will be carried out by this working group, however the operations division will be in charge of the management and monitoring of the projects.

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Sector: SPV Country: Italy Location: Centre-South Italy

Comune Solarizzato

A market for Solar Thermal Installations

Background

The project "Comune Solarizzato -LPU" (Solar City – Workers of Public Utility) is a concrete action for promotion and dissemination of RES in Italy. It was planned to experiment development strategies in real time by involving:

- Major Italian operators in the sector (associated in ASSOLTERM, jointed to ESIF).
- The main Italian research and development institutes and associations (ENEA, ISES, Universities).
- A number of local bodies and authorities, interested to develop the market of RES.
- European companies successfully engaged in similar efforts.

To take up this challenge we need a global intervention strategy that will change Italian industrial policy in the solar thermal sector so as to help public decision-makers attune to technical, economic and environmental choices, institute collaboration between operators, research institutes and local authorities - partly with the aid of a cultural revolution among users and contribute in this way to the economic development and growth of employment in the country, while respecting the environment and reducing CO₂ production.

Promoter:

Ministry of the Environment

Parties involved:

Ministry of the Environment, Ministry of Labour, ENEA, 12 Provincial Governments reunited in the coordination "UPI – Province Solarizzate", 8 Municipal Authority of Provincial Capital and 130 Municipal Authority medium-small reunited in the coordination "ANCI – Comuni Solarizzati", 2 Mountain Communities, 2 Regional Governments, 1 National Naturalistic Park Authority.



Objectives

The aim is to install a surface of 24,000 m²/year of solar thermal collectors in a period of three years 2000-02 on public buildings of Municipal Authorities in the Centre-South of Italy, for a total amount of 72,000 m². The installation will be realised by 400 workers of public utility organized in 47 new micro-companies (reunited in a network) in school structures, sports centres, public swimming pools, and other public buildings. The main actor of this campaign is the municipal authority, the nearest institution to people that can operate the change of citizen life and cultural behaviours.

Other important aims of the "Comune Solarizzato" are:

- The removal of technical barriers.
- Development of demonstration systems for special applications.
- After a transitional period, creation of Official Registers of Installers at national/regional level.
- The removal of the financial barriers.
- Study of incentives by local authorities (regional, provincial, municipal authorities, etc) to be linked directly to a policy of reducing CO₂ production.

The realistic growth of the solar thermal market in Italy (in accordance with Italian government and Italian White Paper) is, up to the year 2005, a potential market of 1.1 M m² of glazed and plastic plates, for 0.4 GWh/year thermal energy production, which is equivalent to 0.03 Mtoe saving of fossil fuels and a reduction of 0.23 Mtons/year in CO_2 emissions.

The "Comune Solarizzato" perspective is, with about 72,000 m² of glazed and plastic plates, the environmental impact will be 0.02 Mtoe saving of fossil fuels and a reduction of 0.2 Mtons/year in CO_2 emissions.

Comune Solarizzato - A market for Solar Thermal Installations

The "Solar City" actions

To become a "Comune Solarizzato" the municipal authority will have to complete the following steps:

- Solar thermal implementations achievement on its structures.
- Dissemination of renewable energy sources use.
- Modify the Municipal laws and regulations (town-planning scheme, building regulations, accomplishment technical laws, reclamation buildings planning) in favour of solar solutions.
- Settle the territorial energy plans and the territorial energy agencies.
- Set up an information campaign and incentives for citizens.

Regional and national networks

Regional networks, possibly linked to a national network, would certainly encompass private or public units, companies or organisations operating in the field of R&D, laboratories and certification institutes, training centres.

A national plan of mass information

This will be delegated in part to the local networks but should nevertheless be part of a national initiative to raise awareness and inform about the problems of rational use of fossil fuels and renewable energy sources and the control of pollution.

Financial resources

The financial resources to realise the whole project are allocated on different institutions:

- 39 MLD Ministry of Environment.
- 36 MLD Locale Authorities.
- 5 MLD Ministry of Labour.
- 2 MLD ENEA.
- 82 MLD Total amount of financial investments.

Management

The management team will be indicated by Ministry of Environment, while ENEA will achieve the operative management with specific project for the next three years.

Monitoring

By selecting the national unit responsible for certification, approval, quality guarantee, regulations, etc. (ENEA) and the identification of R&D lines of action designed to support national industry (integration in buildings, etc) ENEA will insure the monitoring of all the actions.

Commitments of each party

According to the internal Agreement, signed by Ministry of Labour, Ministry of Environment, ENEA and all involved local institutions, it is foreseen a Programmatic Agreement with the same institutions.

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Regional Renewable Energy Partnerships



Sector: STH Country: Spain Location: Andalucía

PROSOL

Programme for promotion of Renewable Energy Installations

Background

The Andalusian Programme for the Promotion of Renewable Energy Installations (Programa Andaluz de Promoción de Instalaciones de Energías Renovables, PROSOL) is an integrated instrument for the promotion of the development and implementation of systems utilizing renewable sources of energy. The programme began in 1993 and seeks to respond to the clear needs of both society today and the energy policy of the future. The programme is jointly managed by SODEAN, a public company under the Andalusian administration (Junta de Andalucía), and part-owned by the Andalucía Development Institute (Instituto de Fomento de Andalucía).

Promoters:

Dirección General de Industria, Energía y Minas

Consejería de Empleo y Desarrollo Tecnológico

Junta de Andalucia (Directorate General for Industry, Energy and Mines, Board for Employment and Technological Development, Government of Andalusia)

Parties involved:

Sodean, S.A. (Sociedad para el Desarrollo de Andalucia)

Installer Companies: Consult the web page www.sodean.es, PROSOL section.

Eurosolar

Helios

Dhartford

Alcoucer, S.A.

Collaboration Agreements with Financial Entities: BBV, La Caixa, El Monte, Cajas Rurales, Solbank, Unicaja, Cajasur y BSCH – Red BCH

Sanchis y Asociados

Instituto Andaluz de Energías Renovables, Center, Inta



Solar Photovoltaic installation for green house water irrigation

Objectives

The general objectives of the PROSOL Programme are the following:

- Promoting the use of renewable energy.
- · Increasing diversification and energy saving.
- Improving environmental quality.
- · Consolidating the economic sector linked to renewable energy.
- · Contributing to job creation.

The basic approach taken by the programme centres on the key idea of enabling the purchase of renewable energy installations through financing solutions backed by the Public Administration. This involves direct grants and subsidized interest rates for new installations using renewable thermal, photovoltaic and wind power. This offers an economic solution to the hurdle that the large initial outlay required by these systems represents.

This idea is intended to aid the purchase of small systems in family units and speed up the rate of repayment of large systems.

Thus, it not only contemplates resources destined to financing installations, but also considers a series of accompanying measures for the programme, such as:

- A public dissemination and awareness raising campaign.
- The setting up of new installer companies.
- Decentralization of services.
- Computerization of services.
- Support for the development of new systems.
- Assistance in the quality.
- Creation of an advisory service for developers and planners.

The Administration needs a new philosophy regarding the development of renewable

PROSOL Programme for promotion of Renewable Energy Installations

energy whereby its current participation in terms of finance is complemented with commercial actions.

In other words, the programme for the development of renewable energy must cover direct funds for installations and for accompanying actions to promote adequate COMMERCIAL MANAGEMENT.

Actions

The initial PROSOL experiment provided a realistic view of the problems and opportunities for the expansion of the use of renewable energy in Andalusia. This laid the foundations for the design of the new phase of PROSOL, based on a realistic and tailored approach, in the awareness of the considerable potential of the sector and its brilliant future, but also of the rigidities and market failures (in terms of both supply and demand).

Above all, the initial PROSOL experiment confirmed the need to advance along an ever more integrated approach, particularly in terms of the role of institutional promotion (the involvement of the government of the autonomous region as a project promoter and a useful product for Andalusian citizens for the economy and environment of the region) and to reinforce all aspects related to commercial management of the products and services being developed.

In this way, PROSOL should offer finance solutions and technical guarantees for the most favourable installations and, in turn, improve their commercial management.

It has therefore been designed to be an integrated programme covering aspects relating to:

Financing and the subsidy regime.

The setting up of new installation companies.

Technology transfer.

Commercial diffusion (citizen awareness campaigns and advertising). Advice on quality and the integration of installations.

Financing Sources

Sources of financing	Allocation (in Euro)
- Investment	42,000,000
- Financial resources	
Partners share	
 Public aids (ERDF) 	19,000,000
 External financing 	23,000,000
- Single payback period	6 - 10 YEARS

Management

The coordinating organisation of the procedure will be the Dirección General de Industria, Energía y Minas (General Direction of Industry, Energy and Mines) without prejudice to the tasks assigned to SODEAN.

Besides the management of the programme, collaborating with the Dirección General de Industria, Energía y Minas, the necessary actions that SODEAN will perform:

- Control, activating the service to users and installers through computerization to allow rapid implementation of the necessary actions for reaching the objectives.
- Dissemination, through the adequate use of publicity and social communication measures.
- Advising installer companies, architects and promoters.
- Technological transfer, gathering experience obtained from the programme and

transferring it to the Andalusian enterprises, creating jobs and promoting the introduction of new renewable energy products, applied both within and outside of our Autonomous Community.

Monitoring

The periodical monitoring of the programme is done by the Junta de Andalucia, Dirección General de Industria, Energía y Minas (Andalusian Regional Government, Directorate General of Industry, Energy and Mines).

SODEAN is in permanent contact with all the organisations involved for the control and monitoring of the different areas of the programme.

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Sectors: RES Country: Germany Location: North Rhine-Westphalia

Renewable Energy

and Energy Efficiency in Buildings

Background

Initiatives for a reinforced use of solar energy, energy efficiency and renewable energies in buildings may contribute significantly to a sustainable, environmentally friendly and secure energy supply in Europe. Being decentralised energy systems, they also have a positive impact on employment. North Rhine-Westphalia, the German Federal State places much importance on the support of renewable energies and energy efficiency.

Promoters:

Ministerium für Städtebau und Wohnen, Kultur und Sport

Ministerium für Wirschaft und Mittelstand

Parties involved:

Energieagentur NRW (Energy Agency of North Rhine-Westphalia)

Landesinitiative Zukunftsenergien NRW (Federal State Initiative, Energy for the Future)



Solar Energy houses in Steinfurt-Borghorst

Objectives

The Federal State of North-Rhine-Westhphalia provides support and market incentives to reinforce the market introduction and dissemination of renewable energies, through key programmes:

- The RES Programme with the two components "RES large-scale diffusion support" and "RES demonstration support".
- The RES Impulse Programme "Energy and Buildings" (REN) and "Efficient Use of Electrical Power" (RAVEL). These are qualifications and advanced training programmes to improve and promote the transfer of know-how regarding the issues related with energy saving in buildings and the use of electrical energy. The aim is to give new incentives for the environment, economy and employment in the region. The main target groups of these programmes are not only energy market agents, but also private consumers.
- The Federal State Initiative "Energy for the Future", which is a programme designed to support the development, production and utilisation of innovative energy technologies in the region. It is focused on innovative technologies for the efficient production and use of energy, as well as renewable energies.
- The project "50 Solar Settlements in North Rhine Westphalia". The aim of this project is, on the one hand, to achieve an important reduction of the energy requirements, through appropriate solar construction methods and, on the other hand, to cover the remaining energy needs.

The tasks, aims, structure and implementation regulations of these programmes, provide together an annual amount of around 28 M Euro for support.

Renewable Energy and Energy Efficiency in Buildings

Actions

These four North-Rhine Westphalia State Programmes, include several activities such as:

- Establishment of Working Groups to offer enterprises, specialists, and interested parties, the opportunity to make contacts and to form co-operation links to implement energy saving projects or renewable energy projects. Some examples of these activities could be the bio-gas plant in Herte, the Mont-Cenis energy park in Herne-Sodingen, the solar cell factory in Gelsenkirchen, and the wind testing site in Grevenbroich.
- Construction of 50 solar settlements.
- Provision of advice from external experts.
- Didactic Assistance.
- Methodically/didactically trained specialists.
- Production of high level and quality documentation for technicians.
- · Active participation of trainees in specific activities.

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Renewable Energy Partnerships in Cities



Sector: RES Country: Spain Location: Barcelona

Barcelona

Renewable 2004

Background

In 1999 Barcelona council (Ayuntamiento de Barcelona) passed a bylaw on the use of solar energy. According to this bylaw, which is known as the "Ordenanza Solar" (Solar Bylaw), all new buildings and buildings undergoing major refurbishment, are obliged to use solar energy to supply 60% of their running hot water requirements. This bylaw will come into effect in July 2000. An urban development and infrastructure plan is being developed on the coast at Besos (Barcelona and Sant Adrià del Besòs) in the district of Poble Nou, Barcelona, which will bring out a significant reorganization of the area. These changes will entail considerable building activity over the next few years. The "Forum Universal de las Culturas - Barcelona 2004" is due to take place on the Besòs coast between 23 April and 24 September 2004. The Forum will be an unprecedented event, which will try to promote a spirit of coexistence and cooperation between all sectors of society and promote a model of a sustainable city, which administers its natural resources optimally.

The Forum is an initiative of the Barcelona council, with the support of the Catalonian Government – the Generalitat – and the Government of Spain. The three institutions have created a Consortium that will be responsible for preparing and managing this ambitious project. The Forum was unanimously approved by UNESCO at its 29th General Assembly, and UNESCO subsequently became its main collaborator.

Promoter

City Council of Barcelona

Parties Involved

Municipality of Barcelona Municipality of Sant Adria de Besòs Universal Forum of Cultures Barcelona 2004 Catalan Institute of Energy Barcelona Regional Consortium of Besòs Metropolitan Entity for Hydraulic Services and Waste Treatment Patronat Municipal d'Habitatge APERCA AFERSA BP Solar ISOFOTON



Future view of the "Universal Forum of Cultures" site

Objective

The "Barcelona Renovable 2004" partnership has been created with the aim of having an impact on the area which falls between the municipalities of Barcelona and San Adrià del Besòs, which includes the context chosen for Forum 2004 and will be the setting for the main events of the forum.

The partnership also takes into consideration adjoining areas (Diagonal-Mar, Llull-Taulat and la Catalana), all of which are undergoing, or are about to undergo, far-reaching redevelopment. The aim is the rehabilitation and recovery of an area, which has to date been highly degraded so as to make it a pleasant and environmentally friendly urban area in which to live.

The urban renovation and reconstruction of this territory offer an excellent opportunity for application of the principles of sustainable development. The Renewable Energy Partnership "BARCELONA RENOVABLE 2004" is being founded with this idea, and with a special emphasis on the issue of energy cycle. Its general objectives are the following:

- · Promote the application of Renewable Energies.
- Promote the measures for the efficient use of energy.
- · Reduce the impact on the environment caused by the use of energy.

The Renewable Energy Partnership "BARCELONA RENOVABLE 2004" puts forward several specific propositions that should be attained by the beginning of the year 2004. They are:

- 4.5 MWp of photovoltaic systems.
- 10,000 m² of solar thermal collectors.
- 3 MWf of the geothermal energy at low temperature.
- 50 apartments with the biomass heating.
- Application of the principles of the bioclimatic architecture in the urban planning and in the building design.
- A community which tends towards 100% renewable energy supply.
- Forum 2004.

Barcelona Renewable 2004

Actions

In order to guarantee the fulfilment of the above stated objectives, the following actions are being proposed:

- Extension of the Solar Bylaw of the City Council of Barcelona to the City Council of Sant Adria de Besòs.
- · Control of development of the application and realization of the Solar Bylaw
- Installation of solar thermal energy in the public sports' centres already existing within the area defined by RE Partnership.
- Projection of a photovoltaic urban power plant with the power of 3.5 MWp.
- Introduction of the renewable energies as a source for the future district heating and cooling networks.
- Application of criteria of the bioclimatic architecture in the urban planning and in the building design.
- Analyse feasibility of the application of the solar photocatalytic systems for the destruction of toxins emitted by the solid urban waste incineration plant situated in the area of RE Partnership.
- Promote use of low temperature geothermal energy.
- Apply energy certification of the newly constructed residential buildings.
- Promote use of the condensing boilers.
- Promote use of the residual heat from the technical plants situated in the area of RE Partnership.
- Spread information on renewable energies through the Sustainability Office.
- Spread information on low energy air-conditioning systems.
- Create a web-page with the information on this agreement, reports concerning the actual state of actions and the degree of fulfilment of the objectives. The web page will also be a site with both information and opinion oriented articles dealing with the relevant topics, such as "best practice projects", realized in other parts of Europe.
- Promote the organization of events dealing with renewable energies: EuroSun, European Congress of ISES.

Financing Sources

The Municipality of Barcelona Regional and the Altener Programme for some specific promotional projects. The participation of other public entities as well as the private companies will also be included.

Management

Barcelona Regional is in charge of the management of the RE Partnership.

Monitoring

Each action will be evaluated separately by its own indicator. Barcelona Regional is in charge to deal with the monitoring.

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RES Country: Italy Location: Bologna

Renewable Energies

for Bologna

Background

Bologna is a Northern Italian city with almost 400,000 inhabitants. The city is a strategic node in the Italian mobility system as concerns railway and motorway.

The city has a significant history in environmental policies and has already played a leading role in the Italian landscape. A major work was undertaken in the last years towards the establishment of precise environmental criteria and procedures for the development of the city towards sustainability.

The challenge for the municipality of Bologna is to develop urban sustainability, by solving a range of problems experienced within the city itself.

The initiatives and actions have covered different levels and different sectors working together in the management of the city.

The most important part of the overall environmental project carried out by the local authority is the "Urban CO₂ reduction Project", approved in April 1999.

The municipality of Bologna developed a collection of procedures named "ValSIA". The Assessment of the Environmental Impact Studies or "ValSIA" in Italian (VALutazione degli Studi di Impatto Ambientale) is a voluntary procedure in the city of Bologna to apply EIA at urban level. "ValSIA" is required not only for large public and private development projects, but also for public and private strategic and development planning.

Promoter

Muncipality of Bologna

Parties involved

Bologna Society for Energy and Environment (SEABO)



CHP with gas for district heating installations in Monterenzio

Objectives

The main objective of the proposed "Renewable Energies for Bologna" programme, is thus to direct the city policies and plans towards a process of increasing sustainability by means of sound energy policies and actions such as:

- 1. Improvement of energy production from renewable sources at an urban scale (wind turbine generators and bio-gas recovery from landfills).
- 2. Diffusion of building scale solar collectors and PV system installations for new buildings and for refurbishment interventions by means of agreements with builders, information and dissemination activities and modifications of building rules and the city master plan.
- 3. Organisation of an European Local Communities Forum in June 2002.
- 4. Reduction of Greenhouse gas emissions:
 - Planned reduction of CO₂ emissions for 2005 (calculated according to IPCC standards and using, the ICLEI campaign Cities for Climate protection methods and tools): 465 ktoe/year (on 1990 basis)
- 5. Increase of energy production from renewable sources at an urban scale:
 - · Electric energy produced by wind turbines:
 - 2.34 TJ/year · Electric energy produced by bio-gas recovery from landfills: 0.11 TJ/year
- 6. Promotion of diffuse installation of solar PV and thermal systems:
 - · Heat produced by diffuse solar thermal installations: approx. 5.00 TJ/year
 - Electricity produced by photovoltaic installations: approx. 2.20 TJ/year

Actions

Monte Galletto wind Power plant:

The wind turbine generators of Monte Galletto are situated in San Benedetto in Bologna province. The plant will exploit the wind speed (6.8 m/s) on the ridge of mount Galletto (950 m above sea level). The plant is constituted by ten 350 kW wind turbines,-which will produce 2.34 TJ/year.

Renewable Energies for Bologna

Bio-gas recovery:

The first succesfull project for bio-gas recovery from landfills involved utilisation at an exhausted landfill (via Stradelli Guelfi) and was implemented by Seabo. Three landfills in the Bologna area will be involved in bio-gas recovery projects in the next years: Baricella, Galliera and Castello di Serravalle.

Diffuse PV and solar thermal installations boosted by new building code and city master plan:

Over the next 2 years the city will update its main government tools for urban development, the city master plan and the building code.

The new master plan will thus adopt an ecological approach in its analysis of urban development (including energy parameters).

The definition of an environmental aware city, in the widest sense of this term, needs the promotion and development of a new building culture, attentive to environment protection and energy cycles through the design principles of bioclimatic and bio-eco-compatible architecture. This approach is shared by the Expert Group on urban environment in the document European Sustainable cities.

The new master plan and the new building code will thus promote the wide use of renewable energy sources and the energy savings for heating and for electric uses (included summer cooling).

Diffuse PV and solar thermal installations in municipal buildings and facilities:

This task will be carried out within a renewed management of Municipality energy consumption and uses. The analysis work will be done using the WinCem tool in a supporting role.

PV and solar thermal installations will be used for the retrofitting of existing service buildings, municipal schools and sport facilities following a programme of interventions to be developed by February 2000.

PV installations will be partly financed by the national programme 10,000 tetti fotovoltaici **(10,000 photovoltaic roofs)**. Two pilot installations within this programme will be realised in Aldini Valeriani Municipal School and in an University facility.

Events organisation: 2002 Eurosun conference and city forum about "Renewable Energies in European Local Communities":

In year 2002 Bologna will host the fourth European Solar Congress organised by ISES Europe. The theme of the congress will be: Renewable Energies for European Local Committees. ISES and Bologna Municipality are now working out the official programme, which will include a "Scientific Congress" and a "Local Communities Forum".

Financial Resources

• Monte Galletto Wind Power Plant:

The project is being financed Seabo and Riva Calezoni that studied and produced the wind turbines. Project has been co-financed through the Thermie programme.

- Bio-gas Recovery from Baricella, Galliera and Castello di Serravalle waste landfill: The project will be financed by Seabo.
- New building code and new city master plan:

Financial resources for the development of the new city master plan and building code will come mainly from the municipality itself, which has the institutional duty to produce these tools.

- PV and solar thermal installations in municipal buildings and facilities:
 - The municipality, within the maintenance budget for buildings, will finance these installations. Financing may come also from national projects for PV diffusion (10,000 tetti fotovoltaici for example).

2002 European local communities forum:

Bologna Municipality will support the forum organisation, by ISES (which organises the Eurosun 2002 congress) and by Bologna Fiere (technical organisation).

The work could become a substantial part of the take-off campaign and be partly financed through the Altener II project.

Management

The general management will compete to the Municipality of Bologna, Environmental Bureau that will be responsible for project coordination, regular reporting and general relations with DG-TREN.

Monitoring

The Municipality itself (Environmental Bureau) will carry out the monitoring of the programme.

Scientific collaboration on energy balances of the city and development of actions will be possibly given by Ambiente Italia Research Institute (Milan) and Softech (Turin).

Monitoring will concern the achievement of planned results according to task's description.

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Renewable Energy Partnerships on Islands



Sector: RES Country: Spain Location: Canary Islands

Renewable Energy

Canary Islands Renewable Energy Programme

Background

The level of concentration of carbon dioxide (CO₂) in the atmosphere is expected to be twice as high by the middle of the 21st century as the value registered during the pre-industrial epoch if the current trend of emitting pollutants to the atmosphere continues. The reduction of these agents is of paramount importance and it is an essential objective in the agenda of the international political and scientific community.

Among the most significant efforts, the production and more efficient use of the energy resources and an increment of the use of Renewable Energy for the production of electric energy are fundamental. These aims have a greater priority in the context of islands such as the Canary Islands, where the shortage of conventional energy resources increases outside energy dependence in the maintenance of regional economic development. The tourist situation in the Canary Islands, with an annual income of around 9 M of tourists, also makes it necessary to generate energy from clean sources on the archipelago, taking into account the excellent conditions existing on the islands for the development of Renewable Energy.

Promoter:

Cabildo Insular de Tenerife

Party involved:

ITER



Future location for Bioclimatic Urbanization and visitors centre, ITER installations

Objectives/Actions

Recognising that the RE represents a strategic sector for the development of the islands, awarding of the necessity of overcoming the insular barriers for the implementation to large scale of the RE, especially in the regulation environment, the Exmo Cabildo Insular de Tenerife and ITER (Instituto Técnoclógico de Energías Renovables) signed an agreement to undertake the following set of actions:

- The installation of a wind energy park of 30MW by the middle 2001. This action subject to the award of the competition being publishes of the Autonomous Government of Canary Islands. The autonomous Government of Canary Islands, trough its "Consejería de Industria", awards a certain wind power periodically by means of public competition. The ITER has requested for the present campaign a total power of 30 MW. Cabildo de Tenerife (the island Council) supported this petition politically that, in the event of being granted, ITER commits to execute to end up having 43 MW of wind power in installed parks.
- The construction of the winning housings of the Competition 25 Bioclimatics Dwellings in the year 2002. Of existing the appropriate financing, the 25 dwellings would be built, that which would suppose also, the installation of 50 kW of PV energy, as well as of several other systems of RE, what would endow to the group of the 25 Bioclimatics Dwellings of energy autonomy.
- The construction of a centre of visitors, that will be finished by the end of the year 2000, annex to the facilities of the main Headquarters of the ITER.
- The diffusion of the RE through the Technological Walkway, with about 2000 visitors a month, and of the Visitors Centre, as well as with the realisation of courses, chats and seminars in diverse acts.
- To develop energy efficient systems application based in Renewable Energies in the tourist sector, by means of the technical support and the backing to concrete projects, as well as the diffusion of its gaining and worked out. In the same way, it will be gone ahead with supporting the parliamentary initiative started by "Cabildo de Tenerife" for the creation of a level ground rules of the Canary Islands, about "Solar Thermal Pre-Installations destined to the production of Sanitary Hot Water in new constructions or renewals of buildings in the Canarian Community.

Canary Islands Renewable Energy Programme

Financial Resources

Total budget is 5,129,409,776 pts (30,828,374 Euro). The financial details by action are shown in the following tables. The Cabildo Insular de Tenerife will contribute to the capital required by increasing the "ITER's own capital and reserves"

Installation of a wind farm (30 MW)		
Budget	4,000,000,000 pts	
Own Capital and Resources	1,000,000,000 pts	
Bank Debts (Long Term)	3,000,000,000 pts	

25 Bioclimatic Dwellings			
Budget	713,000,000 pts		
Own Capital and Resources	663,000,000 pts		
European Union (E.C. project)	50,000,000 pts		

Visitors Centre		
Budget	287,509,776 pts	
Own Capital and Resources	287,509,776 pts	

Technological Walkway		
Budget	83,000,000 pts	
Subsidies	25,000,000 pts	
Own Capital and Resources	58,000,000 pts	
Annual Maintenance	35,000,000 pts	

Actions to develop efficient energy systems			
Hotel	Budget	Area	ITER, S.A
Hotel Tenerife Sur	7,650,000 pts	153 m ²	141,075 pts
Hotel Gala	21,250,000 pts	425 m ²	391,875 pts*
Hotel Las Palmeras	8,500,000 pts	170 m ²	156,750 pts*
Hotel Jardín Caleta	8,500,000 pts	170 m ²	-
TOTAL	45,900,000 pts	918 m ²	689,700 pts

• ITER funds at least 40% of the project cost. Other 6 projects are scheduled for the year 2000.

Management

The management of the agreement will be assumed in a main way by the ITER that will be who presents, administer, develop and finalise practically the entirety of the projects, for those that ITER can obtain help of other partners unaware to the agreement. On the other hand the "Cabildo de Tenerife" lends political and financial support to all actions derived of this agreement.

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Sector: STH Country: Italy Location: Palermo

Diffusion campaign

for Solar Thermal Systems with National Gas back-up

Background

AMG, the local gas utility of Palermo, has recently launched the Diffusion Campaign of Solar Thermal Systems for Hot Water Production, with Gas Back-up.

The initiative, aimed at AMG's users, has been designed on the basis of a number of pilot installations, monitored from technical and economical points of view.

The diffusion campaign is scheduled over three years (1999-2001) and it is based on three main actions, in which target-users are both single families and collective users.

Most innovative Campaign's features are: Selling hot water produced by combined gas-solar systems, guarantee of solar results applied on small and medium size schemes and direct involvement of various stake-holders in the diffusion process.

The whole Campaign is monitored by technical (systems' performance), economic (cost/benefit analysis, also considering externalities) and social points of view (users' behaviour and job created).

Main objective of the Campaign is the implementation of a new role of local energy utilities.

Such a promotional and demonstrative Campaign can be suitably considered as a positive contribution to the key sector "15 M m² solar collectors" envisaged in the Campaign for Take-Off (CTO).

Promoters

Ázienda Speciale AMG

Parties Involved

Ázienda Speciale AMG ENEA (the Italian Energy and Environment Agency) CODIF (National Consortium of Energy Utilities) Banca Sant Angelo (locally originated bank) Legambiente (leading national environmentalist association) ISES Italia EUROSOLAR Kyoto Club (Association of Industries Promoting Environmentally-Sound Products and Processes) MEDEA (Mediterranean Agency for

MEDEA (Mediterranean Agency fo Renewable Energies and Water)



Objectives

Main objectives of the Diffusion Campaign are:

- To enrich and innovate the energy services offered by AMG, considering the local solar radiation as economical resource.
- To favour the elimination of primary energy waste.
- To contribute to improving the skills of local installers (involved through specific meetings and voluntary agreements) and the environmental sensitivity of Palermo citizens, especially on solar energy applications.
- To create a partnership around this initiative, by involving complementary key-players.
- To give a contribution to the achievement of goals considered in the European and Italian White Papers on Renewable Energy Sources.

Actions

Action A

It is directed at families living on the upper floors of buildings or in detached houses who still use electric heaters to produce hot water.

A family wanting to shift to a combined system, receives from AMG (through a specific "front office", or toll-free phone number or web site):

- A roster of qualified installers (Solar Roster) who have signed with AMG after a wide "partnership" with local stake- holders - a "voluntary agreement" with technical and economic terms of reference regarding combined systems' installation.
- Assistance for obtaining tax reduction (36%) on investment (about 1,500 Euro for an installed combined system).
- All necessary documents to obtain a special 5 year loan negotiated between AMG and Banca S'Angelo, with favourable interest rate and instalments to be paid back in the gas bill.
- Information on possible solar energy applications in homes.

Moreover AMG gives a 50 Euro grant to the first 100 citizens participating to the Campaign.

Diffusion campaign for Solar Thermal Systems with National Gas back-up

AMG expects the installation on 2,500 combined systems in three years (about 10% of estimated urban potential), with the following progression: 500 systems in the 1st year, 800 in the 2nd and 1,200 by the 3rd.

It is to be considered both that in Palermo the average daily value of total solar radiation is of 5.5 kWh/m² on a 30° inclined south oriented surface, and that in the present Italian tariff the cost of kWh grows with the consumption.

Considering the special price of combined system agreed with installers and the tax reduction offered by Italian Government for private investment in house's refurbishment and renewable technologies applications, the pay-back time for conversion from electric heaters to a combined system, is less than four years.

Action **B**

Among the number of citizens contacting AMG to receive operative information on the Campaign, a group of 15 families is being selected for the "solar hot water sale".

For these users, AMG will install the solar system at its own expense and will meter and bill the user only for the hot water consumed.

Heat price (about 0.05 Euro/kWh) offers a saving opportunity for private users and allows AMG to consider the installation a medium-term investment.

The system's performance will be further guaranteed by a GSRth contract (Guarantee of Solar Results), which ensures at least a 60% solar fraction.

Action C

Target of action C are collective structures showing high hot water consumption (hotels, gymnasiums, hospitals, etc.), therefore good margins of saving by means of conversion to large solar schemes with natural gas back-up.

Also in this case, AMG offers "solar hot water sale".

Obviously the scale effect makes the large installation more interesting from the economic point of view, with a pay-back time range of 4-6 years.

With the expected outcomes, the whole Campaign should activate a new local economic sector and leverage private investment to produce solar technologies locally.

Financial Resources

Since the Diffusion Campaign shows a positive ratio costs/benefits from AMG's point of view, it is mainly financed by AMG. There is also a substantial contribution - in terms of human and financial resources - by ENEA and CODIF, in the framework of an agreement subscripted with AMG.

More specifically: AMG envisages the investment of about 300,000 Euro for installations regarding Action C (about 350 m² of large combined systems for "solar heat sale" to collective users). Action B should cost 25,000 Euro, while "software" expenses should be less than 150,000 Euro.

Management

Campaign's development is followed by a Steering Committee, of three experts (representing AMG, ENEA and CODIF).

In fact, between AMG and ENEA-CODIF an agreement - containing a work plan and terms of co-operation and support - has been preliminarily subscribed.

In Steering Committee's Meetings, technical, economical and sociological outcomes of the Campaign are evaluated, in order to optimise the actions' efficiency.

Monitoring

The whole Campaign is monitored from the technical (systems' performance), economical (cost/benefit analysis, also considering externalities) and social points of view (users' behaviour and jobs created).

More particularly: Systems' energy performance is controled in cooperation with ENEA, by means of permanent monitoring equipment and through the same "Solar Heat Sell Service", economical features are analysed from the Steering Committee; while users' behaviour is monitored through appropriate interviews and questionnaires.

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Sectors: RES Country: Greece Location: Crete

Action Plan

for the large scale deployment of RES in Crete

Background

Crete is the fourth largest island in the Mediterranean Sea with an area of 8,335 km² (6.3% of the national area) and a population of 540,000 (1991) resident inhabitants (5.3% of the national population). Its population is increased during summer due to the tourist development (in 1999 the arrivals reached 2.6 M). It is a mountainous island with 60% of the total territory 400 m above sea level.

The island's energy demand is met mainly through the use of conventional fuels, biomass (12% of energy demand is covered by biomass) and a percentage of wind and solar energy (8% of electricity). The rate of increase in energy demand and particularly electricity is the highest nationwide (twice as much as the national average) and causes power problems, which require expensive solutions in coping with peak power loads (due to seasonal variations mainly from tourism).

Three main policies have been proposed for the solution of Crete's electricity problem:

- The connection of the island's grid with the mainland's electrical grid by means of a submarine cable, which is very dificult to realize.
- The construction of new thermal units on Crete in order to fully cover future demand increases significant objections in the public opinion due to the environmental impacts.
- An alternative energy policy based on the large-scale deployment of RES.

Promoter:

Hellenic Republic - Region of Crete / Regional Energy Agency.

Parties involved:

Private Investors Greek Community Support Framework Regional Community Support Framework ALTENER SAVE Energy Programmes



Hotel using Solar Thermosiphonic Systems, Nikolaus (Lassithi Prefecture)

Objectives

The objective of this action plan is to implement an integrated approach to the current energy requirements of Crete, by combining the conventional power production plants, the renewable energy sources and energy saving interventions.

By the wide penetration of RES technologies into the energy system of Crete, the continuously increasing rates in electricity demand could be met, without establishment of new conventional electricity generating stations.

RES may enrich energy planning in two different ways:

- Energy production from RES can lower the cost of electricity production, as gas turbines may then operate only during maximum load hours. In addition introduction of RES will decentralise the electricity production system, decrease the transportation losses and increase local development in a sustainable way.
- The large increase in electricity demand indicates the need for electricity savings. Corresponding actions may handle the problem of in a short-term basis and avoid the installation of new units in the long run. Exploitation of solar energy in addition to other actions can help in this direction.

The objectives are:

- a. To cover the additional electricity demand in a sustainable way.
- b. To cover maximize the hourly production.
- c. To provide the electrical system with an adequate safety margin.
- d. To require the minimum interventions to the existing grid.
- e. To use the most mature and cost-effective RES technologies.

A scenario for the maximum possible penetration of RES into the electrical system of Crete, should be formulated under the consideration of several technical, financial, operational and management constraints, which still exist.

Action Plan for the large scale deployment of RES in Crete

Actions

ACTION AND IMPLEMENTATION PLAN FOR THE ISLAND OF CRETE

Demand –side management (1998-2010)

- 1. Energy-saving measures
- Replacement of incandescent bulbs in the residential sector and in street-lighting
- Passive and hybrid systems for cooling of dwellings, hotels and bungalows
- 2. Solar Hot Water systems
- Intensive use of solar hot water systems at the domestic sector and tourist sector 86.000 m² in 2000, 365.000 m² in 2005 and 500.000 m² in 2010
- 3. Actions for the smoothing of the daily average hourly load curve
- Time-zone pricing systems

		Sho	r t Term	Medium Term
		2000	2005	2010
Electricity Production	Maximum load	409	527	647
	Energy demand (GWh)	1,815	2,484	2,700
	1. Conventional	1,470	1,508	1,474
	2. RES	345	976	1,226
	2.1. Wind Parks	223	499	624
	2.2. Biomass Units	120	238	356
	2.3. Small Hydro-Electric Units	2	25	27
	2.4. Photovoltaic Installations	0.2	2	5
	2.5. Pumped Storage Units	0.0	211	213
	Safety margin	21%	36%	20%
	Total non-intermittent sources (MW)	491	717	776
	Mean Net Power of Conventional Units (MW)	469	546	585
	Mean Net Power of RES (MW)	110.2	373	445
	1. Wind parks (MW)	89.3	200	250
	2. Biomass units with agricultural by products (M	N) 20	40	60
	3. Small Hydro-Electric units (MW)	0.6	6	6
	4. Photovoltaic installations (MVV)	0.2	2	4
	5. Pumped-Storage units (MVV)		125	125

Financial Resources

The total expenditure of the Implementation Plan till 2005 is approx. 591 M Euro. Initial expenditures include not only the investments required for the Installation of the plants at each site, as well as any required interventions to the electrical grid to connect the plants.

As mentioned before, the majority of the investments are expected to be realised by private investors. Subsidies will be provided by the Greek Operational Programme of Energy - (European Regional Development Fund and Greek State), by the Greek Development Law 2601/98 (Greek State) and by European programmes like Energy (5th Framework Programme). "Soft" actions could be co-financed by other European programmes like ALTENER, SAVE, programmes for environment, exchange experiences programmes, educational and public campaign programmes, etc.

Management

The authorised body for the management of the plan will be the Region of Crete and its Regional Energy Agency. The region of Crete has developed an energy policy, which has been unanimously approved by the Regional Council and has its full support, as well as the support of relevant national authorities: Ministries for Development and National Economy, Public Power Corporation (PPC), etc.

Monitoring

The "structure", which will carry out the necessary actions for the implementation of the defined action plan, is referred as "Implementation Group".

The main activities of the Implementation Group will be:

- To define the Implementation Plan.
- To co-ordinate and monitor the realisation of the Implementation Plan.
- To take responsibility for specific necessary actions during the realisation of the Implementation Plan.
- To plan informative and promotion activities about the Implementation Plan (leaflets, press conferences, speeches, etc.).

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Sector: RES Country: Greece Location: Corfu

Renewable Energy Park

for the Island of Corfu

Background

Corfu is an island located at the north-west borders of Greece, between Greece, Albania and Italy.The Municipality of Thinalli was formed in 1990 by the merging of the 12 preexisting communities of the region. It covers an area of 8,000 hectares, with a permanent population of 5,500 people, which is tripled in the summer months (March-October), due to tourism.

In 1995 the Municipality of Thinalli started an initiative aiming the establishment of environmental protection projects and policies. In spring 1999 the Technical Services of the Municipality started a programme for the next 5 years. The programme is concentrated on actions that have to be taken by the Municipality and private bodies, in order to increase the Renewable Energy penetration to the local consumption of energy. The reason for this action was the fact that the electricity produced in Greece is generated by the coal-fired stations of PPC and heating is supplied by petrol-fired boilers as the natural gas introduced lately to the Greek market will not be supplied to island regions such as Corfu.

Promoter:

Municipality of Thinalli

Parties involved:

Development Company of Thinalli Municipality of Feakes Municipality of Kassiopi Municipality of Esperion Municipality of Agios Georgios Municipality of Palaiokastritsa.



Part of the 144 solar panel installations, Imperial Hotel, Corfu

Objectives

The objectives of the "Renewable Energy Park" programme are:

- 1. Introduce the contribution of renewable energies in the power consumption of the local population and industry. The Municipality is committed towards demonstrating the availability of renewable energy technologies, in order to stimulate further private initiatives and projects in the island of Corfu.
- 2. Exploit the energy potential of biomass, wind and solar energy.
- 3. Provide with 100% renewable energy the communities of Acharavi, Perithia, Palea Peritheia, Lafki and Klimatia, by the year 2004-5.
- 4. Use of facilities for research purposes (applicable only in the case of biomass reactor for bio-oil production).
- 5. Introduce renewable energy technology to the local professional human resources (training of engineers and technicians).
- 6. Increase awareness of local population and tourists upon renewable energy sources and their benefits through information (advertising) campaign.
- 7. Stimulate the market of liquid bio-fuels in the island of Corfu.

Actions

Recording of loads:

The first action to be taken is the recording of all municipal, citizens and industrial loads in the area. This will help in calculating the yearly energy consumption of the area, and therefore the requirements for installed RE power will be quantified and determined. This will help the Municipality to set yearly targets for installation of RE systems, for the next 5 years, in order to achieve the 100% RE supply. This process has already started, and will be ended by December 2000.

Energy efficiency:

The engineers of the Technical Services Department of the Municipality have already started considering the implementation of various solutions, in order to reduce the energy consumption and achieve rational use of energy in installations and buildings owned by the

Renewable Energy Park for the Island of Corfu

Municipality (Municipality building, schools, athletic centre, water pumping stations, etc). Such actions include the replacement of all the incandescent lamps with electronic, highefficiency ones, the implementation of double glazing, the installation of capacitors at the large pumping stations, etc. These measures have already started being applied and will be ended by late 2000; they are aiming in reducing the energy consumption of the municipality by 40%, in yearly basis.

Biomass

The main objective of the project is to build a biomass plant, for municipal and agricultural waste combustion, using advanced combustion technique for the production of bio-oil. The Municipalities covering the north part of the island have merged together, in order to implement an action plan, targeting the construction of the plant, using municipal and agricultural waste as combustion fuel. The local authorities participating on the action are the Municipalities of Esperion, Thinalli, Kassiopi, Agios, Georgios, Feakes and Palaiokastritsa, all located in the north of Corfu. The action is included in the target for "5 M tonnes of liquid bio-fuels" in the campaign for take-off. The plan is to start construction of the plant by 2001.

Anaerobic digester

The Municipality of Thinalli has recently started a project consisting of the installation of a waste-water network and a biological waste-water treatment plant, together with a anaerobic digester unit for methane production. The project started in 1999 and it will be concluded by late 2002. The Municipality achieved public financing for this project of 6,060,606 Euro.

Wind power

After measurements of the region's wind power have been completed (by early 2002), a decision will be made upon the potential of the wind turbines to be installed, in order to cover the energy needs of the communities belonging to the municipality. It is estimated that a plant generating an approximated of 5 M kWh/annum will be required. Installation is expected to commence by early 2003 and will be directed by the Development Company of Thinalli.

PV Systems

A demonstration installation of a PV system to supply electricity for the Municipality building will be achieved, within the year 2000. This is to promote and introduce the use, effectiveness and reliability of PV technology, in order to be adopted by citizens and industries as well.

Solar Thermal collectors

A number of solar collectors will replace the existing electric boilers of the sports centre of the municipality, in order to provide the centre with hot water. The installation will take place in Autumn 2000 and will be directed by the Municipality of Thinalli.

Financing resources

The municipality of Thinalli has already reserved funds from the year 2000 budget for the financing of the small systems (PV street lighting, solar thermal collectors and energy efficiency measures).

An application for finance for the wind measurements and the preliminary study for the biomass plant will be made under the Altener programme. All the participating Municipalities have declared their financial and political contribution to the installation of the plant after 2001.

Financing of the biomass plant will be achieved from the Municipality's budget, public funding and bank loans.

The financing of the anaerobic digester for the waste is already achieved.

Since the Municipality of Thinalli is limited in financial resources, it has introduced the Development Company in the action, in order to attract financing from public and private sources.

Management

The installation will be directed by the Technical Services Department of the Municipality of Thinalli. The engineers of this department will also contribute to the workload to be undertaken by the Development Company of Thinalli.

The decision making for all the actions will be undertaken by the Mayor of the Municipality of Thinalli, excluding the biomass plant, where all 6 Mayors will contribute; it is expected that after finishing the preliminary design study of the plant, a company will be formed to undertake the project.

Special attention should be given to the participation of the Development Company of the Municipality of Thinalli (AN.THI), which will undertake a large stake of the projects, in order to achieve a flexible platform, where a mixture of private and public investments could be exploited, for developing the renewable energy projects in the region.

Monitoring

The Energy Agency of Ionian islands (based in Kefalonia).

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Renewable Energy Partnerships with Industry



Sector: SPV Countries: United Kingdom Location: Spain, Germany, Netherlands, United Kingdom, Portugal, Austria, Switzerland

Plug in the Sun:

Solar Energy across the World

Background

The Plug in The Sun Programme, aims to install photovoltaic panels on the canopies of 200 service stations in 10 countries over two years. It is a collaboration between BP Solar and BP Oil, whose network of retail service stations provide the framework for the development of the programme. With an average 500,000 visitors per year at each BP station, the project will be visible to 100 M visitors per year.

BP Solar, one of the world's largest Solar companies, which manufactures and markets the photovoltaic panels, is a wholly owned subsidiary of the multi-national energy company BP. The Plug in the Sun programme is the most visible demonstration of the company's approach to the issue of climate change. The BP group has declared its commitment to addressing the problems of climate change in six key ways:

- Development and promotion of new clean energy technologies.
- Reduction of its own greenhouse gas emission by 10% from a 1990 baseline by 2010.
- Introduction and development of a viable emissions trading system.
- Conservation of energy in its own operations.
- Active participation in research with scientific and industrial organisations world-wide.
- Participation in establishment of new national and international institutions and their policy processes.

BP Solar is one of the world's largest solar companies, both in manufacturing and marketing, with customers in 160 countries.

Promoters:

BP Solar	BP plc
BP Oil UK	BP Oil Netherlands
BP Oil España	BP Oil Portugal
Deutsche BP Oil	BP Oil Austria
BP Oil Switzerland	Bovis Europe Ltd.



Typical Plug in the Sun installation, Düsseldorf, Germany

Objectives

In its initial phase the Plug in the Sun programme will have installed solar panels on 200 BP service stations in 10 countries across the world, including Spain, Portugal, Germany, Austria, Switzerland, UK and Netherlands by the end of year 2000. The programme, launched in April 1999, facilitates the development of a large market for solar energy by:

- Driving down costs of solar power through economies of scale.
- Increasing know how and experience of solar systems in the construction industry.
- Educating and informing visitors to the service stations on the use of solar power.

Indirectly, the project will also facilitate a higher uptake in the solar market as BP Solar will:

- Increase awareness about issues facing PV customers by becoming one of the world's largest private PV customer.
- · Improve the already highly developed large-scale project delivery capability.

In total, the programme aims to install approximately 3.5 MW of solar generated electricity.

The Plug in the Sun programme also demonstrates to corporate audiences the value of using solar energy on urban structures as part of a corporate environmental programme.

Actions

Initially a number of prototype designs were tested in five countries. The designs were assessed on the following criteria: Cost, power generation, visibility, ease of installation and connection. The final designs and installation proceedures are described in detail in the "Project Sunflower Design Guide", which is used as the basic manual for installations world-wide.

Manufacturing and procurement

The design selected was agreed in co-operation between the manufacturing unit and the implementation teams in the nine lead countries.

Plug in the Sun: Solar Energy across the World

The panels are manufactured at BP Solar's facility in Spain. The demand for solar panels created by the Plug in the Sun programme allows overheads to be spread across a significant volume of product, reducing costs for other customers.

To take further advantage of economies of scale and guarantee quality, auxilliary components such as inverters and monitoring systems are developed and procured centrally. Offering these as standard products for other projects again significantly reduces costs for other customers.

Framework and installation services are procured locally. This ensures that, wherever a solar service station is installed, the local PV know-how and capability is increased. Through this a European wide network of qualified installers is being grown.

To minimise the environmental impact of transport of goods logistics shipments are sent via a road transport consolidator when this is possible.

Installation

As far as possible, BP Oil's regular contractors are used to carry out the installation. The support frames for the solar installation are manufactured and installed by the canopy contractors. The electrical contractors install panels, inverters, AC/DC wiring and the control and monitoring systems. Overall responsibility for the solar installation and sign off lies with the Solar Project Manager.

Connection and permits

Local regulations vary considerably between areas and between countries; the electrical contractors and the Solar Project Managers are responsible for obtaining necessary permits to make connections to the electricity grid.

Performance and fault monitoring

The kWh output for each installation is checked annually as a minimum requirement, although many are checked more frequently as Solar Project Managers visit at least two installations every month. Each site also has a fault monitoring system installed. The cumulative output of each installation is also shown on the customer display sign at each site. This display shows at all times the production of electricity and makes it very easy for the public to understand how the system works.

Communication

Teams of communication experts work in each country to devise and implement a communication plan. The plan specifies target audiences, key messages, and focuses on the use of marketing PR to gain publicity for the programme, with the aim to increasing understanding of, and interest in photovoltaic energy. A website (www.bp.com/pluginthesun) has been developed to explain details of the programme to a broad audience.

New signage has been designed for each solar retail service stations to inform customers about the purpose and scale of the solar installation and provide data on solar power generated to date.

Financial resources

The Plug in the Sun programme, which will cost approx. \$50 M, is funded by BP group. Where subsidies in individual countries are available for this type of installations, an application for funding will be made.

Management

The programme is managed from BP Solar's office in Sunbury, UK. A Solar Project Manager from BP Solar has been appointed in each country to oversee the technical aspects of the implementation. Local teams from BP Oil business units have overall responsibility for implementation.

Monitoring

Monitoring is carried out internally by the central project management team which reports to a project board on a guarterly basis.

The following indicators are being monitored on a monthly basis:

- Number of sites completed and connected to the grid.
- kW installed.
- · Cost of each installation.
- Press coverage.

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e-mail: ScoufR@bp.com www.bp.com/pluginthesun Sector: Liquid Bio-fuels Country: Spain Location: Cartagena and Curtis

Bioethanol

176,000 t/y of Bioethanol Production for ETBE in Spain

Background

The commitment made by the EU -and therefore also Spain as part of itat the Kyoto Conference, obliges the national authorities, as well as the companies that produce and distribute fuels to pay special attention to the fact that it is necessary to reduce as soon as possible the net CO_2 emissions in the atmosphere.

In a period of economic growth in which people like to enjoy great freedom of movement, it seams obvious that the tendency will not be the reduction; but a slight increase in fuel consumption.

Although the efficiency of the engines is increasing constantly and the fuel consumption per unit has already decreased remarkably, it is also obvious that the number of cars is growing in absolute terms.

In these circumstances; how is it possible to reduce the CO₂ emissions? We have already mentioned the possibility of improving the efficiency of the engines, the other one is to apply components in fuels, which have no or practically no net-emissions, i.e. using fuels proceeding from renewable sources.

Within this project, the two biggest Spanish Petroleum Companies, REPSOL-YPF and CEPSA, will use ethanol from the fermentation of cereal produced by the engineering company ABENGOA, in the manufacturing of an oxigenated additive for gasolines called ETBE (Ethyl Ter Butyl Ether)

Promoters

REPSOL-YPF, S.A. CEPSA ABENGOA

Parties Involved

Ecocarburantes Españoles, S.A. Bioetanol Galicia, S.A.



Plant for the production of 100 Mlitres of bioethanol, Ecocarburantes Españoles, S.A., Cartagena

Objectives

The main aim of this project will be to commercialised in the petrol stations of REPSOL-YPF and CEPSA, who represents 78% of the Spanish market, 176,000 t/y of bioethanol through the manufacturing of ETBE fuel.

The project has several environmental, economic, social and technical benefits:

Environmental

- This project has the effect to reduce the net CO₂ emissions to the atmosphere.
- The use of oxygenates in the gasolines reduces by a 5% the HC emissions and by up to 10% the CO tailpipe emissions, hence reducing the ozone precursors.
- The ethanol and its derivative ETBE reduce the emissions of sulphur, aromatics and olefins by means of a substitution effect.

Economic

- Because ethanol is produced from barley and wheat. For these crops and for the purpose of producing bio-fuels, the set aside land can be used, therefore this activity increases the farmers incomes. This project allows to crop more than 85,000 set aside Ha.
- This project contributes to preserve the employment in the rural areas. It is calculated, according to the Levy's report, that more than 3,000 new jobs will be created in the rural areas, as a consequence of this project.
- This project helps to balance the import/export balance within the European Union because the external dependence in oil and animal feed is reduced.
- From the tax point of view, this project returns more than 90% of the total tax exemption, because of the increase of the local economic activity.

176,000 t/y of Bioethanol Production for ETBE in Spain

Social

- This project will generate more than 150 direct jobs in depressed areas.
- It is evaluated as well, that the project will generate more than 500 indirect jobs (transportation, external maintenance, supplies, etc), in addition to those generated during the construction phase.
- The number of new jobs estimated in the agriculture field is 2,500.

Technical

- The project allows to develop a new technology in the EU.
- The project demonstrates the possibility to use biomass for commercial projects.

Actions

The project consists basically of three main activities:

- 1. Production of 226,000 m³/year bioethanol, in two factories in Spain. The first one located in Cartagena, and operated by Ecocarburantes Españoles, S.A., is designed to produce 100,000 m³/year and is already operative. The second will be erected in Curtis (Galicia) and it is designed to produce 126,000 m³/year. This second plant will be operated by Bioetanol Galicia, S.A.
- 2. Manufacturing of 500,000 m³/year ETBE.
- 3. Marketing of green gasoline in approximately 78% of the retail stations around Spain.

This project is probably one of the most important in the area of bio-fuels because of its magnitude, the huge scope and the spread out.

The project is today a reality because it is commercially running. The plant in Cartagena is producing ethanol, and the refineries of Puertollano, La Coruña and Algeciras are manufacturing ETBE.

By 2002, when the plant at Curtis will be operative, the dependence of Spain on imported oil will be reduced by 200,000 toe., simultaneously net GHG emissions will be reduced by 168,000 Tm/year.

Financing Sources

Sources of financing	Allocation (in Euro)	
Investment	156,260,000	
Financial resources		
Partners share	39,000,000	
Public aids	46,878,000	
External financing	70,382,000	
Single payback period	Five years	

Monitoring

The project will be monitored by the governmental tributary agency who makes severe controles of the movements of the Ethanol and therefore elaborates a record of all the productions and destinations.

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STH &
France
EU

SPV

Solar Installations

for hotel establishments in Europe

Background

For a number of years ACCOR has been pursuing a policy for sustainable development in France and abroad. This policy is inscribed within an international framework through partnerships and collaboration with institutions such as the UNEP (United Nations Programme for the Environment), the ADEME (Agence de l'Environnement et de la Maîtrise de l'Energie), the ICAEN (Catalonian Energy Institute), the IDAE, etc.

In January 1999 ACCOR signed a cooperation agreement with the ADEME to promote optimal energy use and conservation of the environment. This agreement is due to last for three years and covers the following areas:

- The rational use of energy.
- The development and use of renewable energy.
- The management and disposal of wastes.
- The environmental design and management of buildings.
- Training and awareness raising of collaborators.

ACCOR is a founding member of the International Hotels Environment Initiative (IHEI) and the World Travel Tourism Council (WTTC) environment programme. ACCOR is also an active partner in "The Tour Operators Initiative for Sustainable Tourism Development" working group set up by UNEP, UNESCO and the World Tourism Organization (WTO).

Promoter: ACCOR



Solar Installations in Accor Hotels

Objectives

We plan to install around 3,000 m² of solar thermal collectors for the production of running hot water in various European countries during the period 2000/2002.

We plan to install 30 KWc of solar photovoltaic modules during the period 2000/2002.

To fulfil these objectives it is essential that we accompany these operations with powerful awareness raising campaigns in order to convince all of our collaborators.

Actions

Solar Thermal Energy

France

Implementation of around 20 solar thermal installations for the production of running hot water in 20 hotels of all categories in France ACCOR will draw on its partnership with the ADEME and establish relations with the regions affected by the projects.

Spain

Implementation of around 5 solar thermal installations for the production of running hot water in 5 hotels in Spain. The hotels selected are all new buildings. ACCOR will draw upon the various regional structures, such as the ICAEN, IDAE, SODEAN, to carry out these projects.

Other countries

In other European countries (Greece, Italy, Portugal), Australia and certain third countries (Morocco, Tunisia), we also plan to develop solar thermal installations for the production of running hot water. The projects have not yet been clearly defined, but we plan around five.

Solar Photovoltaic Energy

Implementation of a grid-connected solar photovoltaic system on a hotel in the Paris region in 2001.

We plan to implement two other systems of this type on two other establishments in Europe, and actually work on a clear definition.

Solar Installations for hotel establishments in Europe

Financial resources

The funds allotted by ACCOR for these operations to be carried out total around 760 000 euros over the period 2000/2002. The financial contributions will be delivered by different partners in each country:

- France: By the ADEME and the Regions, following the national and regional aid procedures. Other aid may also be given.
- Spain: By different regional structures with responsibility for energy (ICAEN, IDAE, SODEAN, etc.).
- In the case of other countries we will ask for the assistance of existing national structures responsible for renewable energy when necessary (CCE, ENEA, etc.).

Management

This contract will be managed by "Direction Environmement" (Environment Management) within the ACCOR group.

Monitoring

This project will be monitored by "Direction Environnement" (Environment Management) within the ACCOR group. The indicators gathered will include the number of solar installations implemented and the number of square metres of solar collectors installed. Cost control will be followed very closely by ACCOR.

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Renewable Energy Partnerships for Promotion



REP for Promotion

Sector: Geothermal Country: Italy Location: EU

Green Energy

from the heart of the Earth

Background

Following the United Nations conferences on the environment in Rio (1991) and Kyoto (1997), the European Union has committed itself to reducing the overall emission of greenhouse gases by at least 8% below 1990 levels in the commitment period 2008-2012. Prior to the year 2012 only geothermal energy, hydro, and to a lesser extent wind energy, appear technically ready to make a significant contribution to an overall reduction in the CO₂ emissions in Europe. In spite of this, as yet, the role of geothermal energy is very limited in the energy strategy plans for Europe. Many governments have recognised the need for action to stabilise the amount of carbon dioxide in the atmosphere by reducing the burning of fossil fuels and by reversal of deforestation. Geothermal energy has the potential to contribute substantially to reduction of greenhouse gas emissions. The International Geothermal Association (IGA) promotes research, development and utilisation of geothermal resources world-wide, through the compilation, publication, and dissemination of scientific and technical data and information. The IGA is a non-political, non-profit, non-governmental organisation in special consultative status with the Economic and Social Council of the United Nations, and Partner of the European Union for the renewable energy sources.

Promoter:

The International Geothermal Association and its European Branch.

Parties involved:

All members of the International Geothermal Association. The IGA ALTENER Action will take the form of an international co-operation of many different participants. It was approved at the 25th IGA Board of Director's Meeting, held in Reno, Nevada (USA) 21-22 October 1999.



Panoramic view of a modern power plant in the Philippines

Objectives

Geothermal energy has proved to be an economically viable and relatively clean form of energy, together with wind, solar and other renewable energy sources. So far, however, geothermal has not been given the same attention by the media as the other RES, and consequently is not as well known by policy-makers, decision-makers, students and the general public as a whole.

The actions covered by our "Green Energy from the Hearth of the Earth" are targeted at all these levels, and in all these directions, vertically and horizontally.

The IGA expects to have extended the public knowledge of the geothermal, and to have convinced policy-makers and energy decision-makers to consider geothermal as a possible alternative renewable energy in the campaign to reduce the emission of greenhouses gases world-wide.

The main aim of the "Green Energy from the Heart of the Earth" project will be to fill in the lack of information on geothermal energy, through the realisation of diverse dissemination activities, such as production of informative documentation, and organisation of seminars, workshops, training courses, etc.

"Green Energy from the Heart of the Earth", will be launched by the IGA (International Geothermal Association) starting from the first half of the year 2000, and the first milestone will be the World Geothermal Congress (WGC2000), which will be held in Japan, May 28 – June 10, 2000. This congress, which is scheduled every five years, will be a very important event for the geothermal community.

Green Energy from the heart of the Earth

Actions

The first phase of the action will consist of preparation for the WGC2000, with the following sub-tasks:

- 1.1 Preparation and printing of a new colour brochure.
- 1.2 Printing and delivery the new IGA poster and leaflet.
- 1.3 Co-ordination of IGA educational events: the four Short Courses during the Congress itself.
- 1.4 A special issue of IGA News, the IGA Newsletter.
- 1.5 Updating and maintenance of the IGA Website.
- 1.6 Co-ordination of IGA presence at WGC.

The second phase (second half of the year 2000) will consist of the dissemination of the main result of the WGC 2000 world-wide, reaching all countries where the IGA is present with members and affiliated organisations. It will be structured via the following two sub-tasks:

- 2.1 The IGA Website will be a fundamental tool for this dissemination activity, and the main result of the Congress will be presented on it.
- 2.2 Organisation of seminar, workshop and other information events in different countries.

The year 2001 will be covered by the third phase of "Green Energy from the Heart of the Earth", called the "National Languages Programme", with another important IGA Educational Event: an International Summer Course in Germany/Austria. The main issues and data emerging from the WGC 2000 will be translated and disseminated. The following are the sub-tasks of this programme:

- 3.1 International Summer Course in Germany/Austria.
- 3.2 Preparation and printing of new informative material, in different languages, organised in two sections: the first will be of general interest, while the second will be tailored to the different countries (in co-operation with the IGA affiliated organisations); a special edition will be prepared for the European countries only.
- 3.3 Improvement and updating of the IGA Website.
- 3.4 Organisation and definition of a questionnaire on Geothermal Energy in EU countries.
- 3.5 Preparation of a CD of geothermal learning material.

Financing

The total cost of the project will be 420,000 Euro, and has the support of the ALTENER programme.

Management

The affairs of the Association is governed by a body, chosen from its membership, which is called the Board of Directors. The Board of Directors selects from its members the Officers (President, Vice-President, Secretary, Treasurer) and the Chairmen of the Permanent Committees.

The European Branch is governed by a Forum appointed by the IGA Board of Directors. The Chairman of the Forum is elected by the Board of Directors, at the same time as the Officers of IGA. The Forum has a Vice-Chairman, Secretary and Treasurer, elected by the governing Forum from among the Forum members.

Monitoring

Dissemination of the results represents an essential part of the action itself. Our tasks will be implemented through the printed media (newsletters, course textbooks, leaflets, brochures and posters), through the electronic media (Website and CDs) and verbally (by course lectures). An e-mail based "IGA Discussion Group" on Internet will give access to international geothermal experts through a free answering services.

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Sector: Bio-gas Country: Denmark Location: EU

Bio-gas

Promotion programme for Bio-gas from waste and agriculture

Background

As mentioned, in the White Paper on RES and in the Campaign for Take-off, the exploitation of bio-gas has an important environmental benefit, as it mitigates the emission of methane, one of the most powerful greenhouse gases. The contribution of bio-gas from livestock production, agro-industrial effluents, sewage treatment and landfill is estimated to 1,5 Mtoe by 2010. During the last ten years, both largescale bio-gas plants but also small farmscale plants have been established throughout Europe and it is expected that a market will develop for both options. Landfill gas recovery has been established at many existing landfill sites.

In order to achieve the goals of the Campaign for Take-Off, it is of crucial importance that the existing knowledge, know-how and technologies in the area of bio-gas are disseminated and promoted and as many implementation steps as possible are taken.

Another important role of the dissemination activities is to bring the public and the private sector closer together, to he1p and support the private sector to involve all interested parties in promoting renewables and to involve a range of main actors in the Campaign for Take-off.

Promoter:

Bioenergy Department, University of Southern Denmark.

Parties involved:

Swedish National Energy Administration (STEM) Netherlands Agency for Energy and Environment (NOVEM) German Biogas Association (GBA) Technical University of Vienna (TU Wien) Finish Biogas Association (FBC) Centre for Renewable Energy Sources (CRES) Centro da Biomassa para a Energia (CBE) Italian Biomass Association (ITABIA) Energy-Development-Environment Association (EDEN) Tipperary Rural and Business

Development Institute (TRBDI)



Bio-gas Plant in Denmark

Objectives/Actions

Dissemination activities can help remove the technical and non-technical barriers, raise public awareness, awareness of the main bio-gas actors and target groups, promote the export and open new markets for EU renewable technologies, facilitate the access to financing and the investment in RES installations, etc.

The Bioenergy Department of the University of Southern Denmark proposes to undertake a bio-gas dissemination programme for the period 2000-03 with the following main actions:

- 1. Continuing and reinforcing the action oriented towards EU-countries and third, in particular candidates countries, where the demand and the potential is appropriate, by the means of organising and carrying out bio-gas seminars/conferences, business forums/contractor meetings, workshops and study tours. These main activities will be organised in close relationship with the aims of the Community Strategy and Action Plan, in the field of Renewable Energy Sources, the Campaign for Take-off.
- 2. Planning, organising and conducting "Bio-gas Mini Training Actions", using demonstration and educational material, mainly aimed at countries where bio-gas technologies are not yet well developed. These actions always include well-organised and structured study tours to the developed bio-gas areas in the EU-15, such as Denmark, Germany, Sweden, etc. The mini training actions include also third candidate countries, for participation and mutual transfer of knowledge.
- 3. Detecting and promoting business opportunities, with the aim of developing industrial and commercial co-operation in the field of bio-gas and landfill gas. Activities like business forums combined with mini demonstrations, exhibitions of material and poster sessions, as well as independent activities, but also as integrated in a larger frame of exhibitions, conferences, etc., are strongly promoted.
- 4. The output and the results of the activities of Campaign for Take-Off events, and mini training actions will be further disseminated by the means of publications, proceeding reports, workshops, publishing articles in professional journals, and by means of the Internet homepages as well as other media, such as videos and television programmes.

Promotion programme for Bio-gas from waste and agriculture

5. The Bioenergy Department wishes to continue and to develop the activities of exchange of information, mutual assistance, collaboration, sharing of knowledge and experience between the EU-countries and with other potential partners inside, and outside Europe, and by this, to continue and to develop the expert assistance, dissemination and promotion of bio-gas as renewable energy source in close relationship to the aims and goals in the White Paper of Renewable Energy in EU-15.

Time Planning

	Activities in 2000	Activities in 2001	Activities in 2002	Activities in 2003
Mini training actions with national partners	3 - 4	3 - 4	3 - 4	3 - 4
Bio-gas event Conference/Seminar	1	1	1	1
Workshops Targeted actions	1 - 2	1 - 2	1 - 2	1 - 2
Business Forums Participation in fairs, trade, actions, etc.	3 - 5	3 - 5	3 - 5	3 - 5
Participation in major DG Energy & Transport Events (Awards, etc)	1	1	1	1
Europe - Asia - America joint activities	1	1	1	1

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Financing:

The financing of the dissemination activities will come from different sources. Waste for Energy network activities will partly be covered by DG TREN, and partly by the partners involved. The Danish Energy Agency will partly cover internationally activities like study tour planning and partly by the clients themselves. Sponsors will be searched at oficial events there will be participation fees at training actions and seminars.

Management:

The Bioenergy Department, University of Southern Denmark will take care of the management in full co-operation with different partners. The partners will be chosen according to the skills needed for the different jobs. Many countries and regions will be targeted during the period of Campaign for Take-Off. The Waste for Energy network partners and other renewable energy centres and universities will be the partners for the management.

Monitoring:

Programmes, participants interest, documents and evaluations from the different activities will be available by contacting the promoter.

Sector: RES Country: Netherlands Location: EU

SUSTAIN 2001-2003

International Trade Fair on Sustainable Energy

Background

SUSTAIN began as the world's first trade fair for Renewable Energy (RE), held in May 1997. This event was initiated by EMML (European Media Marketing Ltd), to open the market for renewables on a global level. Supported by RAI and Novem (Netherlands Agency for Energy and the Environment), there were 5,059 visitors to this initial event. The second event became known as SUSTAIN '99 and attracted 6,232 visitors and 200 exhibitors.

The parties involved wish to create an international platform for promoting renewable energy, by organising a trade fair, exhibition and a related conference.

This is a very practical, visible and effective way to promote renewable energy, and to bring all market parties together in a positive environment. The event will be held annually and will be named SUSTAIN 2001, SUSTAIN 2002, and SUSTAIN 2003.

Promoters:

Amsterdam RAI

Netherlands Agency for Energy and Environment (NOVEM)

European Media Marketing Ltd. (EMML)



Objectives / Actions

The philosophy behind the SUSTAIN trade fair is to:

- Bring renewable energy into the mainstream energy market, and take it away from the alternative or research circuits.
- Show that sustainable energy is a commercially viable investment that will become an integrated part of the energy market.

The objective is to:

- Stimulate trade between electricity utilities, energy traders, manufacturers, project developers and all other market parties.
- Create an international platform and forum to discuss developments and market trends.
- Function as an annual exhibition to launch new projects, products and partnerships.

SUSTAIN will assist the European Campaign for Take Off ("CTO") by making the possibilities for renewable energy visible, giving European parties an easy-to-access market for renewables and create a unique place in the overall energy market.

The main objectives (source: lbt visitors survey) of the participants attending SUSTAIN 99 were to learn about new market trends and product development, and to make new business contacts.

The parties involved hope to have 7,000 visitors and 250 exhibitors from all over Europe at the next event.

The main action will be therefore to organise an annual trade fair and exhibition, combined with a comprehensive conference and workshop programme. SUSTAIN activities will also include press briefings and educational excursions.

SUSTAIN 2001-2003. International Trade Fair on Sustainable Energy

Management

Amsterdam RAI is the main organiser/owner and is responsible for the operational management of SUSTAIN.

Novem will co-ordinate the contents of the conferences and workshops, and will give general input regarding the international RE situation.

EMML will have a consulting role.

Monitoring

The three parties will monitor these events via interviews, delegate and visitor statistics, and in-depth analysis of exhibitors commercial results.

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Biomass Heating

"Entrepreneur of the year 2000", a National Competition

Background

Several municipalities in Finland have started to invest in biomass heating systems for public buildings such as schools, old age homes, etc. (output < 1 MW/th) in the beginning of 1990's. At the same time farmers formed new kind of rural enterprises - heating entrepreneurs - i.e. supplying customers with heat produced from wood fuels.

A heating entrepreneur/enterprise can be an individual entrepreneur, a co-operative, a limited company or a group of individual companies, who sells heat. Heating enterprise typically operates locally and the main fuel is wood. The fuel comes from the entrepreneur's own forest or from the forest owners in the area. The heating entrepreneur operates the heating plant and earns income per produced heat. At the end of 1999 about 80 heating entrepreneurs were supplying heat mainly for the municipal buildings like schools, old age homes or industrial buildings.

Promoters

Finnish Ministry of Trade and Industry

VTT Energy

Motiva, Information Centre for Energy Efficiency and Renewable Energy Sources

Parties Involved

Satakunta Polythechnics

TTS Institute

Northern Carelia Polytechnics

BENET

Wood Energy Association

Association of Finnish Local Authorities



Industrial plant heated with wood chips, Kuru, Finland

Objectives

VTT Energy in co-operation with Motiva (Energy Information Centre in Finland) are organising a National Competition for Biomass Heating Entrepreneur of the Year 2000. This Competition supports local entrepreneurship, use of local wood fuel resources and job creation, especially in rural areas. Through the Competition VTT Energy will select the three best projects, and will produce information about them for its dissemination through European networks, eg. AFB-net.

The main target is to promote heating entrepreneurship as an established form of business. Heating entrepreneuship brings several advantages:

- Ensuring the employment of local farmers, forest owners and harvester entrepreneurs locally and permanently.
- Ensuring forest cultivation.
- Reducing emissions by replacing oil and electricity with wood fuels.
- Boosting the local economy.

The project aims at increasing the size of the plants from present 320 kW in average to 500 kW.At present there are about 100 heating plants in Finland. However, there is a great potential for such plants. The national competition Heating Entrepreneur of the Year aims at finding them. The goal is to convert another 1,500 plants to use wood fuels instead of oil and electricity in ten years' time.

Actions

To find out the best projects in Finland VTT Energy has suggested that Motiva (Energy Information Centre of Finland) organise a national Competition "Biomass Heating Entrepreneur of the Year". Motiva, in co-operation, with several organisations have launched a first competition on 11th April 2000 in the connection with the Heating Entrepreneurship - Seminar. Motiva is intending to organise the Competition for three years. The first competition was open until end of August 2000 and the winner will be announced in the National Energy Day organised by Motiva on 12th October 2000.

Sector: Biomass Country: Finland Location: National

"Biomass Heating Entrepreneur of the year 2000", a National Competition

Based on previous studies done by VTT Energy, Satakunta Polytechnics and TTS Institute, and on their results, the Heating Entrepreneur National Competition, will be implemented by Nothern Carelia Polythecnics through the following actions:

- 1. Heating Entrepreneur of the Year National Competition organised by Motiva and VTT Energy (AFB-net).
- 2. Development of a Database of Heating Plants Using Wood Energy.
- 3. Promotion of co-operation and networking:
 - Heating Entrepreneur Theme Days.
 - Establishment of Finland's Heating Entrepreneurs' Association.
 - Promotion of co-operation of regional wood fuel advisers' and information dissemination within the network.

Financing Sources

Investment	Allocation (in Euro)
Budget breakdown among parties Total	29,529
- Motiva	16,807
- Northern Carelia Polytechnic	6,722
- VTT Energy (AFB-net)	6,000
Budget breakdown among activities Total	29,529
- Heating Entrepreneur of the Year National Competition	5,042
- Database	11,765
- Promotion of Co-operation & Networking	6,722
- Seminars, information dissemination	6,000

Management

Project management:	Ms. Kirsti Kärkkäinen, Motiva Ms. Eija Alakangas,VTT Energy
Sub-contractor:	Mr. Asko Puhakka, Northern Carelia Polytechnics
Working group:	Representatives from: The Ministry of Trade and Industry, Energy Department, VTT Energy, Satakunta Polytechnics, BENET Bioenergy Network, Northern Carelia Polytechnics, Wood Energy Association, TTS-Institute, Wood Energy Association, The Association of Finnish Local Authorities and Motiva

Monitoring

The enrolment in the national competition requires that all the entries have to include a filled out questionnaire. On the basis of the questionnaires "a pre-selective jury" go through all the entries and select the ones meeting the requirements. The appointed jury makes the final selection and announces the winners.

TTS-Institute does constant research on execution of the projects (budget, technology, user experiences, need for development) as well as their impact on the municipalities and life in rural areas.

Criteria for the selection of the winners will be developed in the working group. The working group consist of representatives of the following organisations: The Ministry of Trade and Industry, Energy Department, VTT Energy, Satakunta Polytechnics, BENET, bioenergy network, Northern Carelia Polytechnics, Wood Energy Association, TTS-Institute, Wood Energy Association, The Association of Finnish Local Authorities and Motiva

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Sector: RES Country: Sweden Location: Lund, Säffle, Växjö, Uppsala, Övertorneå

The Challenger

Communities

Background

We, five municipalities in Sweden, in co-operation with the Swedish Society for Nature Conservation and its corresponding local branches, forming the project "the Challenging Communities", are worried that man continues to change the earth's climate and we believe that far too little is being done to halt these changes, whether on a local, national or international scale.

We are impatient and we wish to make a constructive contribution to raising the tempo of political action on the issue of climate change.

We realise that the rich countries must take the lead and show the way towards sustainable development. We release the most greenhouse gases per capita, therefore, we in the West must take our share of the responsibility and change our society as an example for other countries to follow.

We have therefore decided to initiate this development. As far as possible, we desire to use the absolute minimum of fossil fuel, initially in municipal activities but in the long term in the entire area of each municipality.

Promoters:

Municipality of Lund Municipality of Säffle Municipality of Växjö

Municipality of Uppsala

Muncipality of Övertorneå



Objectives/Actions

By "fossil fuel free municipality" we mean the following:

- The long-term aim for each of the signatories to this declaration is to achieve a fossil fuel free municipality, through the activities of the municipality and the municipality as a geographical unit.
- In the activities of the municipality and in each municipally owned company shall, on the long term basis, cease to use fossil fuels such as coal, oil, natural gas, lignite and peat.

This vision shall be realised through:

- 1. That each of the municipalities signing to this declaration in co-operation with other interest groups in society and together with our citizens, work to reduce the use of fossil fuels in the whole municipality.
- 2. That the municipalities signing to this declaration have adopted the following targets for the reduction of carbon emissions in each municipality:

Location	Base year	Target year	CO ₂ reduction in percent
	1995	2050	75%
Lund	1995	2005	Reduction of road traffic emissions by 25%
Säffle	1995	2025	50%
Växjö	1993	2010	50%/capita
Uppsala	1990	2010	Reduction of road traffic emissions by 25%, energy consumption shall be based on fuels that do not increase the greenhouse effect
Övertorneå	1990	2020	50%
Sweden	1990	2000	Stabilisation at 1990 levels, thereafter reduce

The Challenger Communities

- 3. The signatories agree that more effective energy consumption and renewable sources of energy should primarily replace fossil fuels. This includes energy for the generation of electricity as well as for heating and transport.
- 4. The signatories agree that the use of renewable energy sources for the production of fuels or the generation of electricity and heating shall not decrease biological diversity, deteriorate the long-term production capacity of the land, further deplete the ozone layer as or threaten the long term development potential of the citizens.

Financial Resources

The total budget for three years is approx. 2.2 M SEK of, which the communities themselves are estimated to contribute with approx 1.2 M SEK. Swedish Society for Nature Conservation has been given a grant from The Swedish National Environment Protection Board. The National Road Administration also finance "The Challenging Communities" with a total of 750,000 SEK over a period of three years.

Management

Seminars and workshops: "The Challenging Communities" meet 4-5 times a year in seminars and workshops to educate, exchange experiences and to discuss certain issues. These meetings have different themes, as: Heating, carbon dioxide measurements/calculations, environmental political leadership, how to motivate people, methods and strategies, how to increase the energy efficiency, how to reduce the demand for transportation, public transport solutions etc. The themes can also be to continue the common work on our challenges to other actors.

Between the meetings the communities work in their own pace with the aid of the local SSNC groups. At the seminars continual reports are delivered by the communities and the local groups.

The headquarter of SSNC is the co-ordinator of the hole project, the municipalities are "doers" and the local branches of SSNC inspire and support the municipalities.

Monitoring

The five municipalities have monitored there emissions of CO_2 and will continue to do so yearly.

The results of the project will be evaluated in spring 2001. This evaluation will be process related, more then it will show the actual results in the environment.

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