

RENEWABLE ENERGY FOR EUROPE

Campaign for Take-Off



**Catalogue
2003**

European Commission

Directorate-General for Energy and Transport (DG TREN)

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http://europa.eu.int/comm/energy/en/renewable/IDAE_site/index.html

Printed in Spain (January, 2004) white chlorine-free paper

Legal Deposit:

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Preface

I am very pleased to introduce the fourth and very last edition of the Catalogue of the Renewable Energy Campaign for Take-Off. Building on the previous editions, it illustrates the programmes and projects that have joined the Campaign in 2003.

From its beginning, the Campaign for Take-off has provided indicative targets to measure progress for each of the renewables sectors, served as benchmarks for decision-makers and planners, disseminated the results of successful projects and spread best practices across the European regions.



One of the most important aims was to link and create partnerships with promoters of renewable energies at all levels - local, regional, national and European. Since the year 2000, over 700 organisations in the European Union, the Accession Countries and beyond have joined this forum in 130 Partnership agreements. Though bearing a much diversified profile, from municipalities and cities, regions and national governments, energy agencies, business companies and their associations, they pursue a shared objective: to contribute to the achievement of the overall target of 12% renewable energy share in our European energy balance by 2010.

If we pass the last four years in review, they have been marked with significant progress in establishing a Community framework for strengthening and promoting sustainable energy systems: we have set, together with the Member States, clear and objective targets to bring policies into life and to serve as benchmark for our progress. Major pillars of the legislative framework for the renewable energy sources have been set: the 12% renewable energy target is now supported by two Directives both containing sectoral and national objectives, the first for expanding electricity generated from renewable energies and the second for enhancing the part of biofuels use in transport. I am committed to coordinate these initiatives with interventions made within related policy areas such as environment, agriculture, taxation, regional and structural policies, in order to ensure that sustainable energy is at stake across these policy areas. In terms of Community expenditure, we have been providing support to the development of promising key sectors, markets and policies in the frame of several programmes such as the 6th Research Framework Programme and the newly started Intelligent Energy – Europe Programme.

I would like to point out that we are now in the process of reviewing our activities and the impact of our measures. The European Commission is monitoring the progress achieved in enhancing the contribution of renewable energy sources. The Member States are now reporting on the transposition of the Green Electricity Directive. And looking beyond the time frame of 2010, we are also intensively preparing works in order to set new renewable energy targets for 2020.

In paving the way towards an energy sustainable approach, we are equally concerned about our energy consumption. For this reason, present and future targets set for the renewable energy sources will be coupled with the rationalisation and stabilisation of the energy demand.

These are very ambitious objectives and, under the current trends, require a major supplementary promotion action to be put in place at all levels. The situation can give rise to greater challenge if we place ourselves in the context of an enlarged European Union of 25 members, which will become a reality in May 2004.

Hence, I am very pleased to announce that we will launch a successor initiative in 2004, the Campaign for Sustainable Energy, which will be even more substantial in terms of promotion methods and extended in scope. It will merge renewable energies and energy efficiency, including energy aspects of transport under one single tuned Campaign. In the implementation, we will work closely together with stakeholders who share our views and promote similar approaches in order to expand its impact as much as possible throughout the enlarged Europe.

I take this special opportunity to thank and congratulate all the Partners that have joined and supported the Campaign for their commitment and realisations in the renewable energy field. The European Renewable Energy Conference organised in Berlin in January 2004 has provided for a prestigious platform to expose their initiatives and programmes to stakeholders worldwide and to report from their experience on the success of their dedication and their future needs. As I have had the opportunity to stress on earlier occasions, the Partnership between the European Commission and prominent actors in Europe will last long: naturally, all current Partners will be part of our next Campaign and will be hopefully joined by many more actors who are dedicated to sustainable energy.

I express my best wishes for the future success and wish you a good reading!

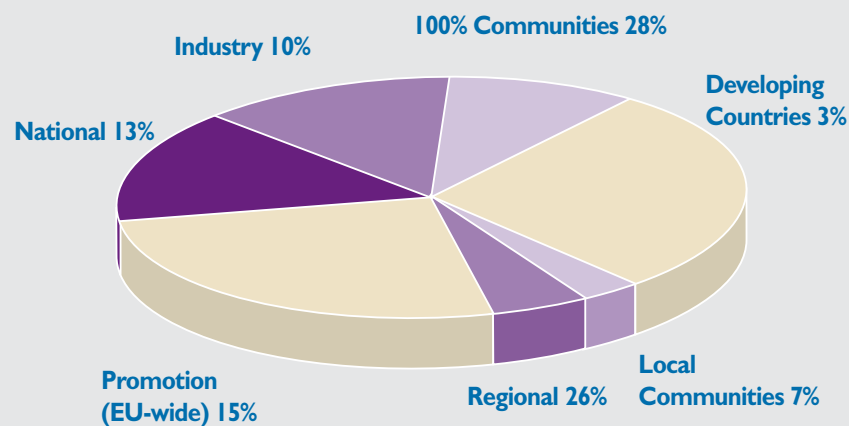
Loyola de Palacio

Vice-President of the European Commission



Renewable Energy Partnerships in Figures (1999 – 2003)

Renewable Energy Partnerships According to Category



127 renewable energy programmes and projects involving more than 700 partner organisations from municipalities, agencies, technological institutes, regional and national authorities, umbrella organisations and enterprises have joined the Campaign for Take - Off as Renewable Energy Partnerships throughout the years 1999 to 2003.

Stakeholders from the whole European Union have thus expressed their willingness to contribute to the campaign and the ambitious White Paper objectives.

Further contributions are coming from Switzerland and the Candidate Countries of Bulgaria, Hungary, Lithuania, Poland and Slovenia. The Year 2003, which is the

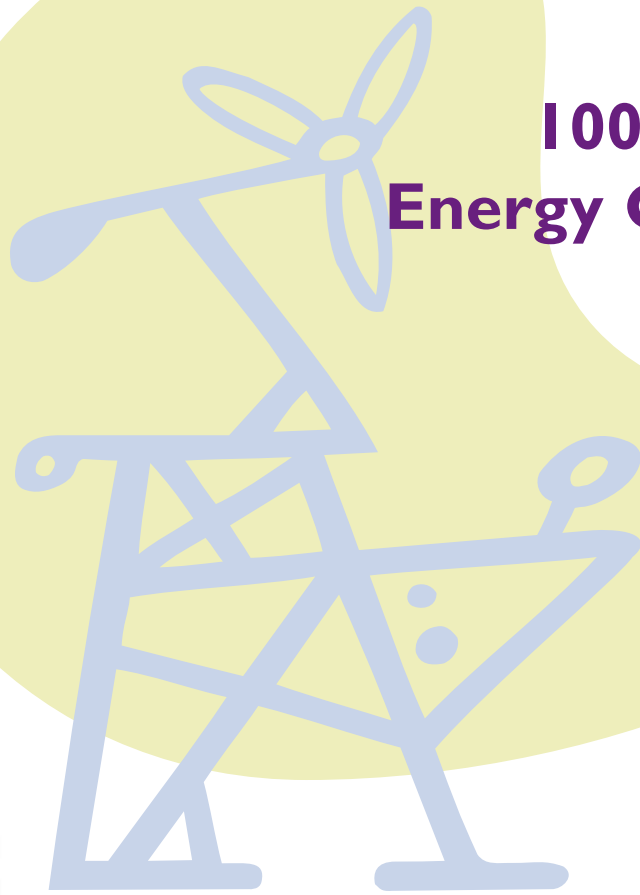
concluding year of the Renewable Energy Campaign, was marked a sharp increase of new Renewable Energy Partnership commitments. Highly encouraging facts, which are already now preparing the ground for the new "Public Awareness Campaign for an Energy Sustainable Europe" (2004 –2007) which is bound to be launched in mid -2004.

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1

100% Renewable Energy Communities





Sector: RES
Country: Portugal
Location: Archipelago
of Madeira

MADEIRA

Greenhotel

Background

The Autonomous Region of Madeira is an archipelago comprising two inhabited islands –Madeira and Porto Santo– and the Desertas and Selvagens islets, on which there is no permanent population.

Madeira has considerable energy potential in the renewable areas of hydro, wind and solar power; but faces one problem typical of remote islands, namely managing the large differences between peak and off-peak hours, which make the use of renewable energy sources difficult.

This is one of the reasons that lays behind the approval of the Environment Policy Plan for the Autonomous Region of Madeira in the year 2000, and of the Energy Policy Plan for the Autonomous Region of Madeira in 2002. They both constitute the framework for the implementation of specific actions that promote sustainable development.

Promoter

AREAM – Agência Regional da Energia e Ambiente da região Autónoma da Madeira

Parties involved

- Quinta do Lorde
- Instituto Superior Técnico
- Planeamento e Arquitectura, Lda.
- Islands European Network on Energy & Environment
- Instituto Tecnológico de Canarias
- Deutsches Zentrum für Luft – und Raumfahrt
- Inter-University Research Centre on Sustainable Development
- E4TECH – S.À.R.L.
- City of Malmö
- Cenergia Energy Consultants
- Regional Energy Agency of Crete



Promotional postcard of the Marina & Resort Hotel, at Madeira

Objectives/Actions

With a view to promoting a new form of tourism and integrating environmental and energy issues in the economic development of the island, in April 2003 the regional agency of Madeira decided to embark on a project called “Green hotel”. This consists of **the creation of a tourist complex that is 100% supplied by renewable energy sources**, through the application of the most advanced energy and environmental solutions.

The complex will be located on the east side of Madeira island, in the area of Caniçal, and will consist of a new hotel and a marina. The hotel will have 165 rooms and the marina will have capacity for 250 vessels. The marina will also incorporate marine reception services, a water sports centre, restaurants and shops. Construction is scheduled to start in early 2004.

The project will integrate most RE technologies and sustainable building design, together with advanced solutions for water desalination and recycling of water and organic waste. The demonstration component of the initiative is key to its success and focuses both on other hotels on the islands and on tourists and the general public.

Wind Turbine

A wind turbine generator will be installed, and connected other electricity generating facilities to provide the expected energy demand of the hotel, which will mainly be for desalination purposes. Its expected energy production will be approximately 2.3 GWh.

Solar Thermal System

A thermal solar system will be used for heat production to achieve temperatures of 200°C with high efficiencies. The heat produced by the system will have two end uses: powering the air conditioning and providing some of the heat for the domestic hot water system. The panels will cover a surface of 432 m².

Solar Photovoltaic System

A photovoltaic system of 260 m² will be installed, with a peak power of around 26 kWp. Its expected output is 26,000 kWh.

MADEIRA Greenhotel

Fuel Cell

A fuel cell will be installed in the marina in a combined heat and power production system. The fuel cell will provide part of the necessary heat for the generator of the absorption system and for the domestic hot water and up to 30% of the electricity requirements of the marina.

Air Conditioning and Domestic Hot Water Systems

In the hotel and marina there will be a connection between the domestic hot water system and the air conditioning, in such a way that the heat given off by the air-conditioning system will be used to pre-heat the water. This will entail important savings of energy, and minimise heat losses.

Integrated Transportation System

An integrated transportation system will be designed to facilitate the transport from/into the airport, the nearby town of Machico and the island's capital (Funchal). A feasibility study is due to be run in order to select the vehicles, but the possibilities that are being considered at present include a minibus powered by fuel cells or electric batteries (recharged using renewable energy sources) and bicycles and electric bikes. These solutions need to include infrastructures for gas storage and recharging electric vehicles.

Other measures

The hotel incorporates a desalination plant powered by wind energy, and a complete system for the separation of solid waste and recycling water and organic wastes. It also has a permanent exhibition on the importance of RES. Special care has been taken over the design of the complex in order to ensure it blends in fully with the local landscape.

Results

The project is now ending its first six months, so it is still too early to assess the overall results. However, based on energy consumption of similar installations in Portugal, the reduction in energy needs appears to be between 35% and 40%. The expected overall balance of all RES components of the system is:

Energy Resource	Production	
	toe	KWh
Photovoltaic	2.24	26,000
Fuel Cell	1.72	20,000
Solar Thermal	19.97	232,200
Wind Turbine	194.97	2,267,128
Total	218.90	2,545,349

Financial resources

The total cost of the project is 4,911,472 € and is being co-funded by the 5th Framework Programme of the European Commission. In the near future, the project will again be submitted to another national programme, to support the investment in the wind turbine. The partners will provide the remaining costs of the project.

Management

The project will be co-ordinated by AREAM, which assumes responsibility for the project management. The work plan is organised into work packages and each work package has a co-ordinator and a leader.

Monitoring

All the partners have to submit a technical progress report on a six-monthly basis and the work package leaders will ensure the co-ordination and prompt delivery of the reports of the partners under their work packages. The reports contain indicators on the impact of the programme on local employment, reduction of CO₂ emissions and perception of the tourists and citizens.

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Sector: **STH and SPV**
 Country: **France**
 Location: **Municipality of Montmelian**

MONTMELIAN

solar x 2 in 2005

Background

For the last 20 years the City Council of Montmelian has been committed to developing solar energy in all its forms, with special emphasis on technological development. To give an example, the local authorities have studied the feasibility of seasonal solar storage systems (which store solar energy collected during the summer for use in the winter) and SOLARWALL technology (solar pre-heating of new air). These two cases indicate the efforts that Montmelian is making to become a genuine test bed for solar technologies.

By 1991 the city had 700 m² of solar panels operating in three communal buildings: the nautical and sports centre, the residential hospital for elderly people and the camp-site, and the cloakrooms of the drive stages. In 2000, a Renewable Energy Service was created, with the aim of monitoring the existing facilities and promoting new ones.

Promoter

Municipality of Montmélian

Parties involved

- ASDER (Savoyard Association for the development of renewable energy sources)
- Energie-Cités
- ADEME
- Region of Rhône - Alpes
- Department of Savoy
- OPAC of Savoy (public office for collective development)
- SIVOM (intermunicipal trade union of the Montmélian canton)



Montmelian local swimmingpool

Objectives/Actions

The general objective of the municipality of Montmelian is to **double the capacity of solar technologies installed in the city by 2005**. The actions intended to achieve this aim include:

Solar thermal panels

The target in the area of solar thermal energy is to double collector area installed on buildings so that it reaches 1,500 m² in 2005. Various projects currently in operation will make this possible; indeed, the city has undertaken solar projects in several municipal buildings (the youth workers' hostel, municipal educational installations, sport centres, etc.) with a total surface of 500 m². The OPAC of Savoy has committed itself to the introduction of 200 m², and the Montmélian SIVOM to another 350 m².

In addition, there is a line of funding enabling private citizens to install individual solar heating systems.

Electro-solar vehicles

Since 2001, the City Council has been working on a project called "electro-solar vehicles", which involves purchasing three electric cars and of a photovoltaic power station with a collector surface of 240 m² to produce the energy used by the vehicles. The monitoring of the solar power station and the analysis of the consumption of the vehicles will enable the renewable energy department to prepare an annual environmental and economic balance sheet for the project.

Monitoring and optimisation of existing solar facilities

Since 1994 a remote system has been in use to monitor the solar installation of the nautical and sports centre. This allows regular checks to be made on its smooth operation. The equipment of the residential hospital for elderly people and the camp-site began to be monitored in 2003 and in the future all new facilities are to include this type of remote control.

MONTMELIAN solar x 2 in 2005

A computer in the Town Hall will be dedicated solely to monitoring and gathering data for “balance sheets” describing solar energy production of the commune. These reports will be produced annually.

Training and technical competence

During the solar projects they run, the authorities seek to build local technical competencies in order to develop know-how in the field, so that this know-how is available on the spot. Thus the design offices, architects, companies and owners are confronted with this new type of installation.

Technical and educational visits

The authorities envisage the design of a cycle of visits to solar facilities in the city, so as to disseminate the possibilities of solar energy more effectively at the regional and national level.

To improve this communication process a new project is being prepared, involving setting up a large information panel aimed at the general public on each solar energy site.

R&D of new solar systems

As mentioned in the background information section, the authorities are promoting new technologies such as seasonal solar storage and solarwall techniques.

Results

At the beginning of 2003 there were 1,100 m² of solar panels in operation. The annual production of solar energy is estimated at 415 MWh which breaks down into 390 MWh of thermal energy and 24 MWh of electricity.

If the surface of panels is doubled by 2005, as the programme intends, the production of energy would be of approximately 675 MWh of heat and 50 MWh of electricity.

Favourable environmental impact

The reduction in emissions of greenhouse gases avoided associated with the figures presented above totals 132 tonnes a year.

Financial resources

The actions of the City Council have always been supported by the National Energy Agency ADEME, the Regional Government, the provincial authorities and, in some cases, European funds. Thus, the share of investment provided for each project by the local authority ranges between 20% and 40%.

The budget reserved for the three electric vehicles is of 27,200 €, net of subsidies from ADEME, and that of the photovoltaic power station 255,000 €.

Management

The solar programmes are managed by the Renewable Energy Service of the City Council.

Monitoring

The municipal authorities are also responsible for the annual evaluation of the installations and programmes.

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Sector: RES
Country: France
Location: Alpine mountain areas

THE SHERPA PROJECT

renewable energy sources for mountain regions

Background

The Mountain Year 2002 was an excellent opportunity to promote world-wide renewable energy sources related to mountain regions and to build a bridge between Western and Eastern European countries.

Single energy supply systems using renewable energy sources have been installed and supported by regions and national Governments, as well as by the European Commission. The SHERPA project, co-funded by the European Commission, will try to unify these often separated efforts. The initiative began on the 1st of June 2003 and will finish on the 30th of November 2005; it represents a wide range of alpine mountain clubs and energy centres in the areas involved.

Promoter

Transénergie S.A.

Parties involved

- ISET (Renewable energies research centre in Germany)
- SASSO (Italian private renewable energies company)
- University of Magdeburg
- CAF (French alpine club)
- CAI (Italian alpine club)
- DAV (German alpine club)
- SEC (Renewable energies research centre in Sofia)



Detail of a mountain hut equipped with RE supply systems

Objectives/Actions

The aims of the action are to summarise successful technological measures promoting social and economic sustainability in these vulnerable areas. The project will seek to **promote a European energy system for mountains**, on the basis of existing good practice. The **transferability of the results to the specific characteristics of the Eastern European countries** is a key issue for the consortium. The outputs of the study will be used in the preparation of the **European Strategy for Sustainable Mountain Energy Systems**.

The specific aims of the initiative include:

- Summarising the European Strategy for Sustainable Energy Use in Mountain Huts.
- Development of specific actions of RES and RUE for autonomous energy supply in the framework of the 100% communities including a concept for environmentally aware Alpine clubs.
- Consultation with Eastern European Countries and replication of best practice.
- Dissemination by means of workshops and a specific website on Sustainable Mountain Energy Communities via the Mountain Society covering the Alps, Rocky Mountains, and the Himalayas.

Phase 1: Social, economic and ecological integrated renewable energy systems

This phase, will summarise the best experience from French, German and Italian mountain areas, highlighting the best financial schemes and national/local strategies. Various partners will be brought together in order to work out a joint European recommendation on how sustainable mountain energy supply systems could look.

Phase 2: Discussions, improvements and consultations

During the second phase, a number of stakeholders (including some from Eastern European countries) will be consulted, in order to improve the recommendations and adapt them to the specific characteristics of Eastern Europe. Other outputs from this stage include the preparation of training tools for mountain hut staff and communication tools.

THE SHERPA PROJECT renewable energy sources for mountain regions

Phase 3: Dissemination and starting of further actions

The partners will organise a series of workshops at which they will present, among other things, the European Strategy for Sustainable Energy Use in Mountain Huts. In addition, two pilot training programmes (each lasting around 2 days) will take place at each workshop.

Phase 4: Bringing the wave to run

This phase will continue the dissemination efforts, thanks to the creation of a web site and a brochure on the European Strategy, which will be distributed to the general public through Alpine Clubs. Another workshop will take place in one Eastern Country.

Direct outputs will be delivered to policy-makers, but also to the implementation level, e.g. training to mountain hut staff, tourists including the mapping of educational and ecological tracks.

Results

No energy results have been recorded so far. Nevertheless, assuming an average consumption of 6 kWh per day per refuge, four months of operation could generate 1,250 GWh per year, enabling substitution of an equivalent amount of energy from fossil fuels. The energy sources that, in principle, will receive the greatest attention are SPV, micro-hydro and, to a lesser extent, STH, wind and biomass.

The beneficiaries of the project are essentially Alpine clubs and tourists but also regional authorities in mountainous regions.

Financial resources

The SHERPA project was co-funded by the DG TREN of the European Commission. The table below summarises the financial allocation per phase, 50% of which comes from the partners and the rest from the EC.

Sources of financing	Allocation (in €)
Phase 1: Social, Economic and Ecological integrated Renewable Energy Systems	93,400
Phase 2: Actions I: Discussions, Improvements and Consultations	104,624
Phase 3: Actions II: Dissemination and starting of further actions	147,334
Phase 4: Bringing the Wave to run	120,584
Phase 5: Over all co-ordination	34,058

Management

The project is managed jointly by all the partners of the consortium under the leadership of Transenergie.

Monitoring

A six-month report has to be prepared to the European Commission, including both a technical and a financial follow-up of the phases.

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Sector: RES
Country: Italy
Location: Municipality of Varese Ligure

VARESE LIGURE

100% sustainable

Background

Varese Ligure is a small rural municipality in the region of Liguria, in Italy. The municipality is characterized by its small population (2,400 inhab.) spread around 27 hamlets in an area of 14,000 ha. 95% of the land has not been built on and is covered by forests.

Around ten years ago, Varese Ligure found itself in difficulties. Its economy was weak, the settlements were decaying and people were moving away. This prompted the mayor to try to do something to reverse the trend and revitalize the municipality by investing in its main resources within the framework of sustainable development.

The village launched its overall development strategy with the renovation of the urban centre; on the economic side, the policy has focused on promoting agriculture and tourism and encouraging farmers to take up organic farming. The administration put a great deal of effort in the protection and promotion of the environmental quality of the village, which eventually allowed it to become the first ISO 14001 certified Italian municipality (Oct. 1999) and the first European EMAS-registered municipality (Nov. 1999). An important aspect of the environmental strategy is the focus on renewable sources of energy and on energy saving. All these actions have resulted in important synergies that support each other to reach the final aim, which is for the municipality to be 100% renewable and 100% organic in the next few years.

Promoter

Comune di Varese Ligure

Parties involved

- Public utilities company (ACAM)
- Regional, provincial and Mountain Community authorities
- Breeding and farming co-operatives
- ARE Liguria Spa (regional energy agency)



Energy challenge in Varese Ligure

Objectives/Actions

The final aim of the municipality of Varese Ligure is to become **100% renewable and 100% organic in the next few years** through a comprehensive programme of sustainable development.

Within Varese Ligure's strategy, all areas are linked to each other and give rise to important synergies: thus, the promotion of RES is a means to reach self-sufficiency, less emissions, energy and cost savings, while the ISO 14001 and EMAS certifications have been key to raise the village's environmental awareness and to promoting it outside its boundaries.

Energy actions

Within the energy framework, Varese Ligure is focusing on wind, solar and biomass technologies.

- The municipality already has two **wind** generators (4 M Kw) and will be installing a further two in the near future (2 M Kw).
- The **PV system** consists of one facility on the municipal building comprising 102 panels (with a power of 120 Wp each) covering an area of 94.76 m² and with a power output of 12.24 kWp. The plant produces 13,701 kWh/year and meets 98% of the needs of the building. A second PV installation is located at the school, consisting 39 panels (120 Wp each) covering a surface of 36,23 m² and with a power of 4.68 kWp. This installation produces 4,600 kWh/year and meets 62% of the needs of the building. A third solar photovoltaic installation on the public wastewater treatment station is scheduled.
- In the field of **biomass**, the authorities are promoting the use of pellet boilers by encouraging local production of pellets as a means of generating income and contributing to forestry maintenance.
- Finally, Varese Ligure is working hard to raise people's **awareness**. One of the main actions is the participation in the EU project for schools called FEE (Force Énergétique par les Enfants), to raise the awareness of pupils, families and local stakeholders on energy issues (energy saving and renewable sources) and to the environment in general.

VARESE LIGURE 100% sustainable

Results

The strategy will result in an improvement of the environment and health protection, more security, comfortable lives and higher standards of living.

Favourable environmental impact

The two PV installations that are already in operation enable emissions avoidance of 9,600 Kg/year of CO₂ and the future one will account for another 9,700 kg/year. The wind farm allows saving 8,000 tonnes of CO₂. In total, they amount to 0.05% of total CO₂ regional annual emissions.

Financial resources

Sources of financing	Allocation (in €)
Urban renovation of main centre – EU, national and regional funds	4,600,000
Urban renovation 2 nd main centre – national, regional, local funds	600,000
ISO 14001/EMAS registration – local funds	51,000
Wind farm – EU and regional funds (30%)+ private investments (60%)	1,800,000
PV installation – regional and local funds	155,000
Organic farming promotion – EU and Mountain Community funds	n.a.
Waste management (municipal landfill site and separate collection) – local, Mountain Community and provincial funds	320,000
Hydro system – regional and local funds	1,000,000

Management

The strategy is managed by the City Council under the direct supervision of its mayor.

Monitoring

Overall responsibility for the achievement of the objectives lies with the mayor, who is supported, as far as the environmental certification aspects are concerned (periodical audits), by an ad hoc committee.

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Sector: RES
 Country: United Kingdom
 Location: Islands of Westray and Unst

WESTRAY – UNST

Communities Renewable Energy Partnership

Background

Unst is the most northerly island in Shetland with a population of less than 900, and Westray, which belongs to the islands Orkney, has a population of less than 600.

Both islands are geographically isolated with similar base industries and therefore similar profiles of energy use, which, in general terms, relies heavily in the use of electricity and oil and on private transport. However, their geographic situation give them access to a huge resource of renewable energy, especially in the areas of wind, tides and waves. The communities have a shared vision of these possibilities and thus have decided to create an energy partnership.

Promoter

Westray Development Trust

Parties involved

- HIE Community Energy Unit
- Unst Community Council
- Westray Community Council
- Orkney Enterprise
- Shetland Enterprise
- Orkney Islands Council
- Shetland Islands Council
- European Regional Development Plan of the European Commission



Wind turbine generator in an isolated area

Objectives/Actions

The aim of this on-going partnership is to “develop the renewable energy potential of the two islands for the benefit of both communities in order to maximise the contribution of renewables to supporting the wider community development aims”.

Specifically, the two communities have committed themselves to:

- Produce locally the equivalent to 100% of the total energy consumption of the community.
- Achieve community ownership of renewable energy projects.
- Ensure an identifiable and quantifiable contribution of the community energy plan to the main aims of the overall community development plan – particularly in the areas of enterprise development, tourism, transport, skills development, public services and the general promotion of the island and its products and services.

Actions

The programme of action will be co-ordinated and facilitated in Unst by the Unst Partnership and in Westray by the Westray Development Trust, although it is hoped that the partnership programme will embrace a third community in Iceland.

The partnership includes several **visits**, each of which will be documented by the respective community development agency. A group of up to 10 people from each community will visit the other community each year. Those visiting and hosting the visits will represent crafts, tourism, local heritage, industry, local politics, transport, and public services and will change from year to year.

In addition, a joint delegation from Unst & Westray will on at least 2 occasions during the first 3 years of the project, visit a third community in northern Europe, which has committed itself to achieving 100% renewable energy status. Findings from these visits will be the subject of revisions and modifications to the respective community energy strategies.

The following table summarises the main activities that have been planned or are underway. Some of them have a clear timing, while others will develop during the next few years:

WESTRAY – UNST Communities Renewable Energy Partnership

Actions	Timing	Degree of achievement
Feasibility and partnership	2003	Underway
Westray: 500,000 kWh prod.	2003	Begun
Unst: 1,000,000 kWh prod.	2004	Planned
Projects foreseen in Westray: Biodiesel production plant Large scale 660 kW + turbine Island energy audit		
Projects foreseen in Unst: More small scale projects <100 kW Small hydro power unit Large scale (1 MW wind turbine)		

Results

- Production of the amount of kWh of energy from community owned renewables equivalent to that which is currently consumed by activities on the islands.
- Promote widespread awareness of opportunities by commissioning a Renewable Energy Resource Assessment & Demand Audit.
- Maximise the involvement of all sections of the community (including the youth) in the execution of the programme.
- Reduce the dependence of the community on fossil fuels for local transport, by having at least one green transport project operational by the end of 2003.
- Encourage and support local research and development in renewable energy production, supply and applications – with at least two projects undertaken by the partnership by the end of 2003.
- Develop the skills and experience locally to service the development of renewable energy within Unst and Westray and further afield – creating at least 2 new jobs in each community and at least one new business.

Favourable environmental impact

The Partnership Programme in Unst and Westray aims ultimately to deliver at least 100% of the total energy consumption for both communities as well as making dramatic reductions in carbon emissions.

Financial resources

In addition to the proposed budget of 67,860 € for the programme, both communities are pursuing a range of renewable energy projects within the private, public and community sectors. The combined investment in these projects is likely to run into over 1,45 M €.

The sources of funding come from the European Union, through the ERDF; the Scottish Executive, the National Lottery, the Energy Saving Trust, the Carbon Trust, the UK Department of Trade and Industry and from local and external businesses.

Management

The RE Partnership Programme will be managed jointly by the Unst Partnership and the Westray Development Trust, with the latter being the lead agency in all contacts with third parties. The employed development workers for the respective community development agencies in Unst and Westray, will act as executive officers in the conduct, operation and administration of RE Partnership activities. In turn these development workers and their voluntary colleagues, will report to their respective management committees (Directors of the Unst Partnership and Westray Development Trust). The overall co-ordination of the RE Partnership Scheme will be undertaken by the Westray Development Trust.

Monitoring

The routine monitoring of the RE Partnership will be undertaken in the first instance by the respective management committees in Unst and Westray. The monitoring of the RE Partnership will also be the focus of joint project evaluation as part of the Unst-Westray initiative. These monitoring activities will be recorded for dissemination to the wider community groups (and to funding agencies).

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2

National Renewable Energy Partnerships





BULGARIA

National Programme on RES

Sector: RES
Country: Bulgaria
Location: Nationwide Action

Background

Bulgaria is heavily dependent on external sources of energy as it imports more than 70% of its primary energy –mainly natural gas– from Russia. Despite its limited domestic supply of energy, the country's economy is characterised by what the public authorities have called "energy extravagance", in reference to its high energy intensity per unit of output.

These factors have motivated the preparation of a National Energy Strategy, which will foster the liberalisation, privatisation and opening up of the Bulgarian energy market and the publication of a series of legislative measures. This process started with the adoption of an Energy and Energy Efficiency Act in 1999, and which will culminate with the approval of an Energy and Energy Efficiency Law this year. As part of the National Energy Strategy, a National Programme for the Usage of RES (NPRES) has been drawn up and is currently ready to be submitted to the Council of Ministers.

Promoter

Ministry of Energy and Energy Resources (MEER)

Parties involved

- The Bulgarian Energy Efficiency Agency (EEA)
- All Bulgarian Ministries (through their RES sectorial programmes in NPRES)
- All Bulgarian Regional Governments (through their regional RES programmes in NPRES)



Renewable energy applications used in Bulgaria

Objectives/Actions

The main objectives of the National Programme on Renewable Energy Sources in Bulgaria, which will run from 2004 till 2010, are the following:

- **Increasing the share of RES in the energy mix to 8% by 2010:** this is equivalent to a production of 303 MW of electricity and 1,489 MW of heat from "clean" sources.
- **Promoting technical development** through the introduction of modern EU technologies for clean & green energy generation.
- **Fostering the uptake of prospective investment** to an amount of around 1,647 M €.
- **Creating 2000 new jobs** by the year 2010.
- **Improving environmental protection** by avoiding 4,373 thousand tonnes of CO₂ emissions annually.

Actions

The NPRES is an ambitious programme, which envisages nearly 1,000 investment projects in the main RE areas. The table below shows the expected pattern of development of the different sectors, in which wind energy, solar energy and biomass predominate. Mini-hydro, which does not appear in the text, is, however, the only RES technology well exploited at the moment, so no additional plans for expansion have been made.

RES development according to the NPRES by technological area:

Type of RES	Theoretical potential (toe/ year)	Objectives for 2010 (toe/ year)	Application areas
Biomass	3,670,962	380,000	Heating, cooking, industry
Geothermal	481,966	95,143	Greenhouses, heating, hospitals, households
Solar	13 x 10 ⁹	246,000 (52,500 in SPV and 160,250 in STH)	Household, hot sanitary water
Wind pumps	75 x 10 ⁹	31,476	Electricity, pumps for irrigation

BULGARIA National Programme on RES

An effort by the private sector is expected, together with some funds coming from European, national and regional sources.

Apart from the investment plans, and recognising that the deployment of RES faces other bottlenecks, additional measures have been approved or will be so in the near future. The most important include:

- Mandatory purchase of electricity from RES up to 10 MW, based on long term contracts at preferential prices. These have not been decided yet, except in the case of wind energy.
- Simplification of the administrative procedures: no production license is required for RES with a capacity of less than 5 MW (electricity) or 1 MW (thermal).
- Raising public awareness through dissemination campaigns (seminars, conferences, presentations, articles in specialist journals, brochures, etc.).
- Attraction of foreign investment. With this purpose, the Bulgarian Energy Agency has prepared a manual for investors in RES so as to ensure foreign investors are able to operate on a fully transparent basis.
- In the future, a system of green certificates will be launched.

Results

The main energy results of the NPRES, according to the first draft being circulated, will be:

- An electricity capacity from RES of 302.55 MW.
- A thermal capacity from RES of 1,487.87 MW.
- Electricity savings of 1,602,128 MWh/year.
- Heat savings of 6,973,467 MWh/year.
- More than 2,000 jobs created.
- 43,731 thousand tonnes CO₂ a year saved.

The main beneficiaries of the programme are municipal installations, such as schools, kindergartens, hospitals, social buildings, etc.; and the industrial and tertiary sectors.

Financial resources

The NPRES mainly relies on private investors for the implementation of the projects (around 1,647 M € will be needed for its implementation). Additional sources will come from the European Union and from the National Ecofund, which has been created for this purpose.

At present, for instance, the European Union is already financing some interesting projects in the area of geothermal energy in Separeva Bania and Velingrad and of solar energy for the production of hot water in hospitals and other public places.

Management

The Bulgarian Ministry of Energy and Energy Resources (MEER) is managing every stage of implementation of the NPRES, including the financial part. The Bulgarian Energy Agency, to which it reports, acts as the executive body for the implementation of its different measures. Finally, the Ministry of Environment is also collaborating on specific tasks.

Monitoring

The Ministry of Energy and Energy Resources is also charged with the monitoring, with the support of the Bulgarian Energy Agency and the EU Delegation in Sofia.

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Sector: Biomass
Country: Slovenia
Location: Nationwide Action

SLOVENIAN

National Biomass Energy Programme Tools to remove barriers

Background

In line with the Resolution on Slovenia's Strategy for Energy Use and Supply, the Slovenian National Energy Plan (approved in February 1996) envisages increasing the share of wood biomass within the primary energy balance by 50% (its current share is 4.4%).

The analysis conducted by the Slovenian Forestry Institute, which was supported by the United Nations Development Programme, estimated that a potential of 600,000 metric tonnes of wood biomass was available for district heating use, either in heat-only or in co-generation plants.

In this context an ambitious programme, co-funded by the UNDP, is being developed with the aim of removing barriers to the increased use of biomass as an energy source. It will complement the financial and technical support measures currently being applied by the Slovenian Government.

Promoters

Ministry of Environment, Spatial Planning and Energy

AURE – Agency for the Efficient Use of Energy

Parties involved

- United Nations Development Programme (UNDP)
- Municipalities
- Timber industry



Construction of the district heating system in Predvor

Objectives/Actions

The general objective of the UNDP-sponsored programme is to **raise the awareness of Slovenian communities of the advantages of wood-biomass technologies** by identifying and implementing a number of demonstration projects in this field. The pilot projects will be complemented by a wider set of feasibility studies and by the development of a National Biomass Energy Programme.

The pilot projects are intended act as a revolving feature to encourage further investment in Slovenia. The establishment of appropriate technical, economic and financial criteria that can be applied in the future is thus especially important and justifies the preparation of a transparent and comprehensive public call for tender.

The focus will be on district-heating technologies, which seem to be particularly appropriate to the national conditions, but other biomass uses and applications, such as individual biomass boilers will also be explored.

By the end of the project, Slovenian communities should have available a set of tested pilot systems that can be easily replicated in their municipalities, and with appropriate training material and legislative measures that make the uptake of such projects easier.

Actions planned

Implementation of the programme began in October 2002 and is now in the middle of its first phase. The following paragraphs outline the sequence of activities planned, and the outputs that are or should result from each of them.

Phase I:

The main objective of phase I is the preparation and approval of the terms of reference of the Biomass Energy Fund. At present, these have already been written and are matter of approval by the UNDP RBEC Regional Support Centre Bratislava. Prior to that, the programme appointed the National Project Director and the Steering Committee.

SLOVENIAN National Biomass Energy Programme Tools to remove barriers

To complement this phase, a number of actions, such as the preparation of a guidebook and other training material, are taking place to support the work of the local experts due to conduct and supervise the activities.

Phase 2:

This phase will involve feasibility studies, with special emphasis on the technical and financial solutions, on at least 20 biomass district heating and other biomass related energy projects. The results will be publicised and discussed with the local communities and industry representatives.

Phase 3:

Three main outputs will result from this phase. In the first place, some of the projects identified (3 to 5) will be fully deployed and will constitute a pilot system which may be replicated by other communities. The focus will be put in biomass district heating, but other energy efficient technologies will also be explored.

Secondly, a **National Biomass Energy Programme**, will be launched, including legal, financial and technological aspects. It falls under the responsibility of the national Government, although the Project Steering Committee is to participate in the supervision of the drafts.

Finally, and given the lack of experience of key actors in the preparation and enforcement of legal contracts for the supply/demand of energy from biomass sources, the programme will help define these legal aspects, through the publication of a model of fuel supply and heat purchase agreement.

Phase 4:

The final phase of this programme consists of the monitoring and follow up of the previous activities. This will include financial audits, monitoring and evaluation exercises.

Results

The project is expected to remove the key barriers to the improved and increased use of biomass as an energy source in Slovenia, thereby fostering its growing share in country's energy balance. During the lifetime of the project, at least 3-5 new biomass district heating projects will be developed.

Favourable environmental impact

CO₂ emissions will be reduced by 10,000 tonnes per year up to year 2005, thanks to the increased use of biomass for heating purposes.

Financial resources

Sources of financing	Amount (in US \$)
The UNDP GEF sponsorship	4,300,000
Parallel Financing	Gov. of Slovenia 2,500,000 400,000 (in kind)
	Ecofund of SLO 2,500,000
	Municipalities 1,500,000
	Others 1,000,000
Total	11,800,000

The amount in € is approximately the same.

Management

The Agency for the Efficient Use of Energy of Slovenia (AURE) is the executing and implementing agency of the project. The national project director is Mag. Jani Turk, the project manager, Mag. Damir Staničič and the technical adviser, Mr. Lojze Šubic. Ecofund of Slovenia will implement the financial component of the programme.

Monitoring

Monitoring and evaluation will be undertaken by the Project Steering Committee and representatives of UNDP Regional Support Centre in Bratislava.

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Sector: **STH**
 Country: **Germany**
 Location: **Nationwide Action**

The SOLAR HEAT PLUS

Initiative

Background

The Solar Heat Plus Initiative is the name that has been given to a new campaign to promote the installation of solar thermal panels on buildings, involving a wide range of participants from government, business and associations.

The goal of the Solar Heat Plus Initiative is to stimulate steady market growth in the renewable heat market in Germany as an essential element for the achievement of the Federal Government's climate protection goals. After years of spectacular rates of increase, there was a market slump in 2002, which was partly due to the fact that the "Solar – na klar" campaign ended that year.

The initiative was designed in 2002 and presented to the public in March 2003. The idea was to learn from the weaknesses of the previous campaign, and to build a sales-oriented campaign based on modern marketing principles.

Promoter

German Energy Agency (DENA)

Parties involved

- Bundesumweltministerium – BMU (Federal Ministry for the Environment, Conservation and Nuclear Safety)
- Zentralverband Sanitär Heizung Klima – ZVSHK (Central Association for Sanitary Facilities, Heating and Air Conditioning)
- Ruhrgas AG (gas company)
- Verbund Netz Gas AG (gas company)
- Bundesverband Solarindustrie –BSi (National Solar Industry Association)



Promotional brochures of the "Solar Heat Plus" Initiative

Objectives/Actions

The Initiative Solar Heat Plus is a campaign to promote the acceptance and sale of solar water heaters.

The concrete goals are:

- **To convince home-owners and builders of the advantages of solar water heaters** (potential of 2 M systems with a panel area of 10 M m²).
- **To support tradespeople in the areas of sanitary facilities, heating and climate control** in their advisory and sales efforts.

The campaign is based on the most extensive market research and opinion survey to date in the area of solar thermal energy, which was carried out in 2002. This ascertained the level of knowledge and the attitudes existing in the population regarding solar thermal. Building on the results, the campaign strategy was designed so as to reinforce existing preferences and overcome reservations. For this purpose, an extensive and highly tailored consumer information package was developed. The individual components provide direct information for interested consumers, and trade workshops with materials for facilitating and promoting sales.

The first part of the strategy involves raising the level of acceptance and sales competence of the tradespeople concerned as a basic step towards significant market expansion. A package of materials has already been produced, and is designed to facilitate the advertising and consulting of customers by tradespeople. Moreover, they are to be brought into contact with interested homeowners by means of the solar hotline and the Internet presence of the campaign. Furthermore, as of 2004, training measures as well as an advertising bonus and a sales event are to increase sales competence and volume.

Building on that, the second part of the strategy is designed as a communications "offensive" to establish a new positioning of the product "solar heat as a natural component of every new heating system in Germany". Even now, extensive promotion measures are already being implemented to this end, and are to continue in 2004.

The SOLAR HEAT PLUS Initiative

The following table outlines the actions that have been planned:

Activity	Time Frame	Result
Market & consumer investigation	May. 2002 -Oct. 2002	First comprehensive insight in users/non-users motivations regarding solar-heat appliances
Public relation measures	Feb. 2002 – Dec. 2005	73 M clippings (Aug. 2002 – Sept. 2003)
Solar hotline	Feb. 2002 – Dec. 2005	1,500 calls/month
Brochures for crafts-people and end-users	Since Mar. 2003	20,000 each
Leaflets for end-users	Since Mar. 2003	100,000
Internet www.solarwaerme-plus.info	Since Jul. 2002	> 5,000 hits/month
Flip-chart/display for crafts-people	Since Jun. 2003	3,000 units
CD-Rom (sales letters, press-release texts)	Since Jun. 2003	3,000 units

Results

- Excellent progress in sales for solar thermal manufacturers and tradespeople in 2003: According to application figures available through the end of September for state subsidies of 125 €/m², as many facilities have already been planned as in the record year 2001, when almost 1 M m² of solar panels were installed.
- The goal of the Solar Heat Plus Initiative was market growth: from 550,000 m² to 850,000 m² in 2003. According to current information, this target will be considerably exceeded.

Favorable environmental impact

The installation of 100,000 m²/year would save the environment emissions of 10,000 tons of CO₂/year. The goal of the campaign is to support the achievement of that target. The original hope that a market growth of 100,000-200,000 m² could be achieved, has probably been confirmed, and may be exceeded.

Financial resources

Sources of funding	Allocation (in €)
Federal Ministry of the Environment	450,000
Ruhrgas AG	100,000
Verbund Netz Gas AG	50,000
ZVSHK	50,000
Bsi	100,000
Total	750,000 net

Management

The Initiative is being managed by the Renewable Energies Department of the German Energy Agency, DENA, where one full-time and one part-time employee are working on it. Furthermore, the campaign contracts with a number of service providers in the areas of promotion, marketing and advertising.

There is a web site devoted to the initiative, and a “telephone-hotline” where any person, company or institution involved can request additional information – around the clock.

Monitoring

An external evaluation is due to be carried out by independent market researchers, but given the fact that the campaign began only recently, no results have been gathered so far.

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Sector: RES

Country: Spain

Location: Nationwide Action

THIRD PARTY FINANCING

and the take-off of renewable energy sources in Spain

Background

There is a wide variety of potential renewable energy generation projects which, although financially viable, are not implemented as a result of market failures. First of all, these investments require an initial capital outlay that many promoters are unable to meet. Although the logical thing to do in this situation might be to resort to external finance, promoters come up against additional problems arising from the relative lack of understanding financial intermediaries have of energy issues. Finally, many business people are not familiar with the technologies, thus making the task of finding a reliable company to which to entrust the installation difficult.

The above are some of the main reasons for which slow progress is being made by renewable energy projects. The Third-Party Financing (TPF) mechanism, which was conceived of in the United States in the early eighties, was rapidly considered, assessed and adapted by the IDAE to the specific circumstances of the Spanish market. Thus, 20 years later, TPF has become an indispensable tool for the development of renewable energy and a benchmark for Europe and the rest of the world.

Promoter

IDAE (Instituto para la Diversificación y Ahorro de la Energía)

Parties involved

- Spanish industrialists
- Other key agents in the building and commercial sectors
- Financial institutions



Solar photovoltaic pergola at “La Moncloa” (the Prime Minister’s residence)

Objectives/Actions

The mechanism for TPF investments in energy projects consists of the identification, analysis and installation of a facility owned by the promoter but in which the IDAE is responsible for joint implementation of all the stages through from the original idea until the investment is recouped. This investment is usually paid over the medium to long term from the power generated, either by the income produced by the project or the savings the promoter makes from not having to buy in power from elsewhere.

The phases of the TPF mechanism are as follows:

Identification of project: the process starts by an analysis, carried out jointly with the IDAE, of the potential for saving energy or for generating energy from renewable energy sources by applying new technologies.

Analysis of the feasibility of the project: once the IDAE has received the basic project data it can analyse its technical and economic feasibility and confirm its strengths and weaknesses. After this initial analysis it proposes a more detailed feasibility study in order to allow the promoter to make the relevant decisions on the implementation of the project.

Negotiation of a collaboration agreement: once it has confirmed the technical and economic feasibility of the project, the IDAE and the promoter sign a TPF contract, in which the scope of the project and investment taken on by the IDAE are defined. In this contract the promoter also assigns to IDAE a percentage of the income generated by the facility over a specified period of time. From this point, the Institute is responsible for implementation of the following phases of the project and handles them as if the project were its own (selection and purchase of the equipment, management of administrative formalities, detailed engineering, etc.). To do so, it provides the financial resources needed from its own funds.

THIRD PARTY FINANCING and the take-off of renewable energy sources in Spain

Implementation: during this phase of the project the IDAE draws up the necessary technical specifications for the invitation to tender sent out to suppliers, compares the offers made, and selects the equipment and systems suppliers. The facility is installed and tests are run, and the relevant operational guarantees put in place.

Operation and monitoring of results: once installation work is complete, use of the facility is handed over to the promoter. Through its monitoring of the results obtained from the facility, the IDAE receives from the promoter a percentage of the cash flow the facility generates. The amount received will vary depending on the income and operating costs, and will be paid over the period defined in the contract between the IDAE and the promoter.

Exit of the IDAE from the project: once the period envisaged in the TPF contract has expired, the IDAE hands over full ownership of the equipment to the promoter at the agreed residual value. All income generated from this point on accrues to the promoter.

Results

The TPF mechanism has been used to fund projects from all RE technologies, with special emphasis in mini-hydro, solar thermal and photovoltaic and biomass. In global terms, they have saved an estimated amount of 407,000 tonnes of CO₂ equivalent. They have also contributed to the renovation of the equipment and the spread of innovative solutions.

Financial resources

To date IDAE's total investment in renewable energy projects under the third party financing mechanism has totalled (data from June 2003) 94,539,058.25 €, and it has mobilised total investments of 103,847,340.95 €.

The IDAE normally finances projects out of its own capital and bears all the risks of the investment. However, in some cases the scale of the project is such that it is necessary to seek additional finance: the most frequently used modes are joint ventures, part ownership of companies, economic interest groups and participation accounts.

Management

Each project is managed by a specialist unit at the IDAE, with support from general services (hiring and procurement, legal department, finance department) as required. The technical staff selected are given responsibility for project monitoring and quality control over both the materials used in the installation work and the operation of the facility once completed.

Monitoring

All the projects implemented by the IDAE are first evaluated by a risk committee made up of members of the Institute. On the basis of its experience, and the relevant financial return indicators, the risk committee evaluates the suitability or otherwise of the initiative. Technical control of installations is carried out by the IDAE's engineers during the period in which the investment is being recouped and by the experts appointed by the promoter after this period.

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3

Regional Renewable Energy Partnerships





Sector: RES
 Country: France
 Location: Connurbation of Île-de-France

‘ÎLE DE FRANCE’:

promotion of RES

Background

The Île de France connurbation accounts for 16% of all the energy consumed in France: a total of around 29.5 Mtoe. This is mainly provided by oil and natural gas, which results in the emission of 50 M tonnes of CO₂ annually. A recent study carried out by ARENE, the energy agency for the Ile-de-France showed that 95% of that amount is imported, despite the fact there is considerable potential for the development of indigenous sources such as biomass, biogas and geothermal, solar, and wind power.

For over eight years, the agency has been working to raise the awareness of economic and public actors as to the importance of renewable energies. To do so it runs dissemination actions, and also organises visits, feasibility studies and pilot projects. In addition, the agency, which is associated with the Regional Council, is responsible for energy efficiency programmes and for assisting local authorities in the preparation of a Local Agenda 21.

Promoter

ARENE Ile de France (energy agency)

Parties involved

- Regional Council
- Local authorities
- ADEME
- Gaz de France
- Regional Agency in charge of water policy
- Geothermal promoters association
- Forest National Office (ONF),
- Association of cereal producers (AGPB)
- Regional office for agriculture and forest (DRIAF)
- Local energy agencies (St-Quentin and Montreuil)
- OBSERVER



Detail of solar panels, installed on a roof

Objectives/Actions

The main objectives pursued by ARENE are:

- **Promotion of local and renewable energy sources.**
- **Reduction in greenhouse gas emissions** and other air pollutant emissions associated with burning fossil fuels.
- Implementation of energy channels and **creation of local employment.**
- **Reduction of heating costs for local communities** and social housing companies.

With a view to achieving the objectives enumerated above, ARENE has worked on a number of actions in the field of energy efficiency and renewable energy sources. The pattern normally followed starts with the identification of good practices that can be applied to the special characteristics of Île-de-France; as a second step, the agency evaluates the feasibility of the different options in collaboration with key regional agents; finally, ARENE implements a dissemination strategy and supports a number of pilot projects which are potentially able demonstrate the technology well.

In general, the studies conducted to date have highlighted the potential of biomass from wood, straw and energy crops. The recovery of energy from municipal solid waste or solid residues from water treatment plants is also worth mentioning.

The table below summarises some of the recent actions organised by ARENE, their timing and their current progress.

Actions	Timing	Degree of achievement
Assistance for regional energy discussions	2001	Completed
Study on regional energy policy and renewable energy potential		
- Wood energy	2000	Completed
- Solar thermal	2000	Completed
- Biogas from landfill and waste	1996 - 2003	Completed

“ÎLE DE FRANCE”: promotion of RES

- Wind energy atlas	2001	Completed
- Biomass from straw	2001	Completed
- Heat from urban waste incineration	1999	Completed
- Geothermal energy : development of districts heating using geothermal energy, development of geothermal heat pumps	1999 – 2006	In progress
Implementation of energy channels		
- Wood energy plan	2000 – 2006	In progress
- Wind: promotion of the regional wind energy committee	2003 – 2004	In progress
Promotion actions		
- Solar thermal for hot water in homes	2002	In progress
- Solar thermal for hot water in municipal swimming pools	Created in 2002	In progress
- Wood energy advice	Created in 2001	In progress
- Geothermal newsletter	1999 - 2002	In progress
- Solar photovoltaic	2001	In progress

Results

The situation of renewable energy sources improved considerably in 2001 and 2002:

- 20,000 homes were connected to a geothermal district heating network.
- 20 RES plants were implemented in the framework of the regional programme: wood energy heating , solar thermal in homes, biogas for electricity, heat, etc.
- A regional structure for wood energy supply was created in September 2001 (CODEL).
- 50 RE-related articles were published in national and regional newspapers.
- More than 10 wind farm projects are being studied by private promoters.

Favourable environmental impact

The strategy will entail the reduction of 60,000 tonnes of CO₂ emissions between 2000 and 2003. The target for 2006 is a supplementary decrease of 100,000 tonnes.

Financial resources

ARENE is funded by both public and private sponsors. The following tables reflects the amounts that were devoted to promotion actions during the period 1997 – 2003:

Funder	Allocation in M €
Regional Council	1.5
ADEME (National Energy Agency)	0.5
Agence de l'Eau (local water agency)	0.05
Other public promoters	0.5
Gaz de France (gas utility)	0.05
Bureau de Recherche Géologique et Minière (Research bureau in mining and geology)	0.05
Others	0.05
TOTAL	2.70

Management

ARENE employs a staff of 18, some of whom work full-time in the energy field. Additionally, the staff of the communication department offers assistance arranging seminars and other activities to promote RES and raise public awareness.

Monitoring

ARENE publishes an annual report offering a detailed analysis of the activities performed during the previous year. The report is available on the agency's web site.

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Sector: **RES**
 Country: **Spain**
 Location: **Region of Navarra**

NAVARRA

energy planning

Background

Navarre is a leading region in the development of renewable energy technologies, in particular wind power, from which around 40% of the region's electricity was generated in 2000 (550 MW). Other areas have also benefited from investment efforts, specially mini-hydro (107 power stations in operation), biomass (the largest Spanish plant for the production of electricity from biomass is located in Sangüesa) and, to a lesser extent, solar power.

The factors that have contributed to this success can be grouped under three headings:

- The broad social acceptance of renewable energy (RE) facilities, especially wind farms.
- The existence of private promoters who have given strong support and made considerable investments in RE.
- The Energy Plan 1995/2000 aimed at promoting energy saving and efficiency and expanding the role of RES.

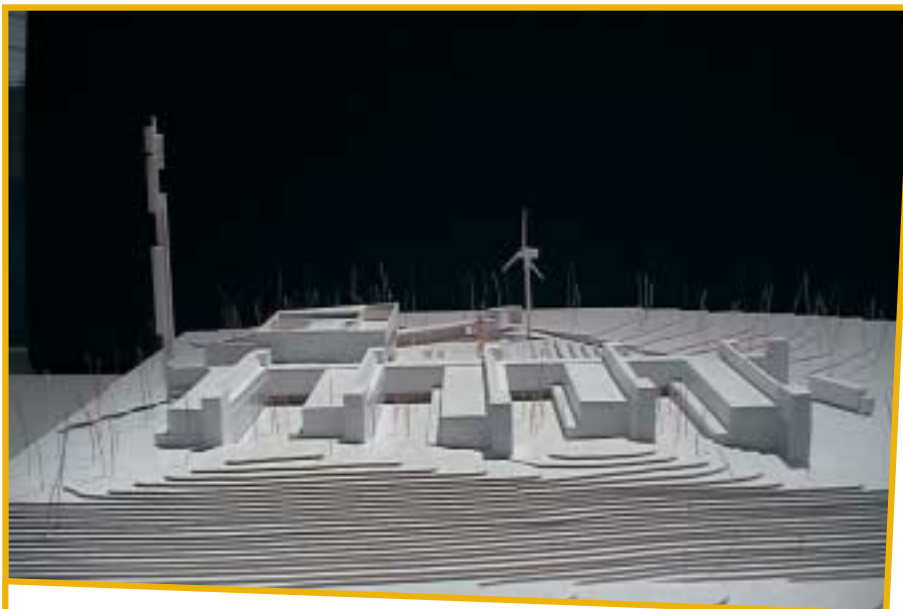
In 2002, a new strategic document, called "Energy planning" was approved, involving, among other things, the creation of an energy agency, a training centre and support lines of funding.

Promoter

Department of Industry, Technology, Commerce and Labour of the Navarre Regional Government

Parties involved

- Private investors
- Other departments of the Regional Government
- Non-profit organisations
- Local companies



Renewable Energy National Center CENER

Objectives/Actions

After the end of the 1995/2000 Energy Plan, the Regional Government of Navarre proceeded to frame a new strategy for the development of RES over the period up to the year 2010. The strategy states, among other objectives, that by **2005** the region is to have 1,334 MW of installed RES generating capacity, which implies output of 4,179 Gwh. This is enough to satisfy **97% of Navarre's electricity consumption**.

Specific actions on RES

Among the projects related to the setting up of new RE installations, the most outstanding are:

In the area of **biomass**, the creation of a power plant in Sangüesa with a generating capacity of 25 MW consuming 150,000 tonnes of straw a year. The plant is the largest of its kind in Spain and will entail an investment of 51.09 M €.

Solar technologies will receive a boost with the construction of a solar photovoltaic plant in Tudela. The plant will have a generating capacity of 1.2 MW and require an investment of 12.02 M €. For its research and development the plant will draw on the resources and equipment of different solar modules and technologies. Another 30 MW of solar thermal panels are due to be installed by 2005.

As for **wind power**, the policy is to continue building the new wind farms that have been approved up to 2005. From that year on, any increase in generating capacity will be achieved through a gradual substitution of the original wind turbine generators by others with a larger unit power output, thus using only existing approved sites and reducing the overall environmental impact.

Lines of financial support

The Regional Government envisages providing some **financial support** for power generation. The "minimis" economic funds, as they are called, are to promote small-scale RE through a partial subsidy on the investment costs. In addition, there is a line that focuses on solar and biomass technologies, which is due to run up until 2006; finally, a Decree to promote energy saving, efficiency and diversification is being prepared.

NAVARRA energy planning

Centres for the promotion of RES

Other important initiatives currently underway in the Comunidad Foral de Navarra are the creation, in 2001, of the Renewable Energy National Centre **CENER**, with an investment of 16.83 M €, and the first **Professional and Job Training National Centre in Renewable Energies**, with an investment of 5.41 M €.

CENER will be devoted to the investigation and technological transfer of energy technologies. The agency will be divided into specialised departments covering wind energy, photovoltaic solar and thermal solar energy, biomass and bio-climatic architecture.

Results

The table below summarises the expected contribution of RES to electricity production up to year 2010:

These elements will allow component manufacturers to set up in sector, thus contributing to the diversification of the industrial structure of Navarra. For instance, 1,800 direct jobs have already been created, along with a further 200 indirect jobs, by wind power:

Concept	2000		2005		2010	
	Power (MW)	Production (GWh)	Power (MW)	Production (GWh)	Power (MW)	Production (GWh)
Wind power energy	550	1.003	936	2.291	1.536	3.911
Mini-hydraulic	145	499	160	552	175	605
Hydraulic			30	145	106	280
Biomass			25	200	75	600
Co-generation	77	401	147	915	162	1.120
Solar thermal-electric			30	60	90	180
Solar photovoltaic			4	8	7	14
MSW	0.7		2	8	4	11
TOTAL	772,7	1.905	1.334	4.179	2.155	6.721

Favourable environmental impact

During the year 2000, 1,798,000 tonnes of atmospheric CO₂ emissions were avoided, and the forecasts for 2005 total 5,260,000 tonnes.

Financial resources

The Government of Navarra plans to provide financial support of 12 M € per year up to 2007 for the different RES and RUE aid lines. This quantity should be added to the investment made by promoters, the activities of CENER and those of private companies.

Management

The energy plans are prepared and managed by the Regional Minister of Industry, Technology, Commerce and Labour of Navarra, with the support of the Environment and Economy Departments.

Monitoring

The plans will be monitored at two-year intervals. At present, an inventory of final energy consumption and power produced by the different energy sources is being compiled. The inventory could lead to a change in the objectives of the planning.

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Sector: RES
 Country: Germany
 Location: State of Nordrhein Westfalen

NORDRHEIN-WESTFALEN

renewable energy strategy

Background

Nordrhein-Westfalen (NRW), with 18 Million inhabitants is the most densely populated State in the Federal Republic of Germany, and an outstanding economic region in Europe. The role of energy in the State has a long tradition and NRW offers excellent conditions for the development, production and marketing of energy efficient and renewable energy technologies. This potential builds on scientific, technical and organisational know-how, combined with a comprehensive problem solving capability.

The activities of the Nordrhein-Westfalen Energy Agency, created in 1990 in the city of Wuppertal, are intended to further develop these skills and capabilities, accepting the challenges resulting from the rapid globalisation of markets and accelerated structural change in the economy.

Promoter

Energy Agency of Nordrhein-Westfalen

Parties involved

- Regional Ministry of Traffic, Energy and Spatial Planning NRW
- Regional Ministry of Urban Development and Housing, Culture and Sport NRW



“On the road consulting” bus

Objectives/Actions

The main objectives of the RNW sustainable energy policy are **economy, ecology and social development**. As energy related laws fall within the scope of the Central Government, the regions (*Länder*) have three possibilities of having an impact on its outcome: influencing Federal policy, supporting scientific, technological, commercial and industrial processes and enhancing the development of energy technologies by different means.

The REN- Programme

One of the main activities carried out by the energy agency in the recent past has been the financial support (grants and low interest loans) provided to energy projects under the REN-Programme (Programme for energy efficiency and the use of renewable energy sources). Since 1988, when the programme was launched, more than 46,000 projects have been approved, with total financial support of 560 M €, entailing an investment of more than 2.5 B €.

A number of technologically outstanding projects were selected as “lead projects”; these included the following:

- Energy Park Mont-Cenis: 1-Megawatt photovoltaic plant on a former mining site.
- Development of advanced technology in conventional power plants.
- 50 Solar Energy Housing Estates throughout NRW: integration of solar energy in communities, new development areas, etc.
- The Centre of Fuel cell Technology Duisburg and the Institute at the Research Centre in Jülich.
- A 2.5 MW wind energy facility at a testing site.
- The biogas plant in Herten, which demonstrates the large-scale, integrated processing of 18,000 tonnes of organic waste per year into methane, hydrogen and high-quality compost.

NORDRHEIN-WESTFALEN renewable energy strategy

Other actions

The agency carries out a number of other relevant actions in range of fields. These have been summarised in the table below where they are explained in further detail:

Actions	Brief description	Degree of achievement
On the road consulting (bus)	Mobile information centre for companies, end-users, retailers, schools and the Public Administration	50,000 people
Building Check and Solar Check	Private households checked by qualified craftsmen	16,000 dwellings checked
Energy Action week	Action-week for energy saving to improve knowledge on how to save energy in companies and the Public Administration	45,000 employees motivated
Energy Network NRW	Initiative to provide with detailed energy information for communities on a permanent basis	5 communities
Energy School NRW	Action aimed at raising school children's awareness	1,000 schools involved
Indicators NRW	20 cities and small communities worked on preparing of a set of indicators in the fields of energy, social cities/towns, city/town development and resources and flow materials, in the period 1999-2000. A pilot phase is currently being tested (2001-2003)	20 communities, 29 indicators
REN qualifying programme	Financial support for energy projects (as explained above)	93,000 individuals trained
Project consulting	Consulting services for public and private agents	5,000 enterprises and communities
European Energy Award	Training and labelling programme for cities and municipalities	3 communities awarded

Results

The most outstanding results of the programmes carried out by the NWR energy agency are shown in the table above. It is worth adding that the Energy School programme succeeded in reducing consumption of electricity by 11.5%, water by 19% and heating by 8% during the first year of implementation.

Financial resources

Most of the resources came from the NRW Federal State Government, although specific activities such as project consulting, "on the road" consulting or the energy network are co-financed by the European Union. The funds dedicated to energy efficiency and renewable energy sources development in the region are substantial. Only the REN-NRW subsidy programme awarded 560 M € from 1988 to 2002.

Management

The energy agency has a staff of 50 members, who are in charge of the management of the various programmes enumerated above.

Monitoring

The monitoring of both quality and statistics for all Energy Agency NRW programmes is done in-house. Statistics are published in the annual report. Should visitors, consultants, participants, etc. feel disappointed with the results obtained, a reorientation takes place, thus ensuring the process is continuously under quality control.

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Sector: RES
 Country: Portugal
 Location: Region of Alentejo

RE-ALQUEVA

project

Background

Alentejo is a rural region of Portugal in the south of the country. The Multipurpose Alqueva Project, which has a direct influence on 19 municipalities located around the Alqueva basin, consists of a set of actions that link environmental, energy and economic objectives. The main infrastructures planned are the Alqueva Dam and hydropower plant; the Pedrógao Dam and hydropower plant; the Alqueva-Alamos water supply system and the primary and secondary irrigation system.

After a period focusing on the construction of the Alqueva Dam and the initial filling of the Alqueva basin, in 2003 the strategy was extended to enhancing the potential of other sources of energy such as wind, solar and biofuel technologies. In all cases, a strong partnership has been created.

Promoter

EDIA – Empresa de Desenvolvimento e Infra-estruturas de Alqueva S.A.

Parties involved

- Research Centre for Energy, Transport and Environment Economics (CEEETA)
- Sistemas de Gestão e Informação, Lda (UNIREDE)
- Austrian Biofuels Institute (ABI)
- GESTALQUEVA (a consortium between EDIA and some municipalities)
- Agência Regional de Energia do Centro e Baixo Alentejo (AREC-BA, regional energy agency)
- EDP Group Companies
- Instituto de Engenharia Mecânica e Gestão Industrial (INEGI, research institution)



Overview of the Alqueva Dam

Objectives/Actions

The general objective of the RE-Alqueva Partnership is the promotion of endogenous renewable energy use, strengthening its contribution to the sustainable development of the Alentejo. Specific targets for 2006 include:

- The **improvement of hydropower capacity along the Guadiana River**.
- The **assessment of wind energy potential** in the area and, if technically and economically feasible, the promotion and installation of a wind farm.
- The **assessment, design and installation of a small demonstration photovoltaic plant**.
- The **development of a biodiesel chain** production in Alentejo.
- The **improvement of energy performance** and integration of renewable energy sources in EDIA's buildings and in rural villages around Alqueva and Pedrógao basins.

The planned and implemented RE-Alqueva Partnership actions are:

Construction of the Alqueva Dam and a large hydropower plant

Plans to build an Alqueva Dam were first put forward in 1957. However, only in 1995 did work begin in earnest. At present, the plant has an installed capacity of 240 MW, comprising two generator sets.

Construction of the Pedrógao Dam and a small hydropower plant

The construction of the Pedrógao Dam and the small hydropower plant was launched in 2002. The infrastructure is also located in the Guadiana River, 23 km downstream from the Alqueva Dam. The reservoir will have a maximum capacity of 54 hm³ and it will run on a counter-change basis with the Alqueva Dam. Construction work is due to be completed in 2005.

Wind energy assessment

The wind energy assessment began on May 2003 after a collaboration agreement was reached with INEGI. It is expected that the wind energy assessment will be completed in June 2004 and it will be possible to evaluate the wind energy potential.

RE-ALQUEVA project

Feasibility studies related to the development of a biodiesel chain in Alentejo

In July 2003 EDIA launched a complete series of technical, economic and environmental studies related to the development of a biodiesel chain in Alqueva. The studies will be completed by the end of February 2004, including the business plan for an industrial biodiesel unit in the area.

Assessment, design and installation of a small photovoltaic plant

In July 2003, EDIA and CEEETA began to analyse the viability of installing a 100 kW photovoltaic plant close to the Alqueva Dam. After an initial pre-feasibility study, EDIA decided to begin the first administrative procedures. In addition, some efforts have been made to enable possible financial support within the scope of the Community Support Framework 2000-2006.

Improvement of energy performance and integration of renewable energies in EDIA's buildings and in rural villages

EDIA's interest in this action is directly related to the renovation of buildings that can be used for cultural, tourist and leisure activities and the refurbishment of sixteen rural villages around the Alqueva and Pedrógao lagoons. This is being achieved by the improvement of the thermal properties of the buildings, in particular by the adoption of passive solar technologies and natural cooling techniques, and by the use of solar water heating systems.

Results

- The estimated annual average production of the Alqueva hydropower plant is of 480 GWh, the equivalent to the electricity consumption of a Portuguese city of 250,000 inhabitants.
- The Pedrógão small hydropower plant will have an electricity capacity of 5 MW each. The annual average electricity production estimated is 40 GWh.
- EDIA expects that at least one wind turbine of 1-1.5 MW will be installed.
- The photovoltaic plant capacity considered on the pre-feasibility study was 100 kWp.

Financial resources

Actions	Sources of financing	Allocation (in €)
Alqueva dam and hydropower plant	Structural Funds - ERDF, INTERREG II, Cohesion Fund BEI, Governmental Budget and other bank loans	498,000,000
Pedrógão dam	Structural Funds - ERDFBEI, Governmental Budget and other bank loans	72,000,000
Wind energy assessment	EDIA Budget	9,870
Biodiesel chain	Structural Funds - ERDF and EDIA Budget	470,000
Photovoltaic plant	Structural Funds or Innovative Actions (in preparation), EDIA Budget and potentially ERDF and INTERREG	600,000
RE in EDIA's buildings and rural villages	Structural Funds (in preparation), EDIA and local authorities budget	1,600,000

Management

EDIA is responsible for overall management lies, although other partners cooperate on specific actions.

Monitoring

The progress of the RE-Alqueva Partnership actions is frequently monitored by EDIA's technical services (Department of Production and Projects) and by one representative of EDIA's Management Board. The results of this monitoring are discussed with EDIA's partners in each specific action and, if necessary, are presented to the Management Board, which has the competence to decide, change or re-formulate the actions undertaken.

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Sector: RES
 Country: Italy
 Location: Region of Sardinia

SARDINIA'S

challenge for promoting RES

Background

The energy consumption of the region of Sardinia is very imbalanced, with a preponderance of the use of fossil fuels, partly due to its situation as an island.

The Regional Energy Plan, which was first drafted in the late 1990s, tried to reverse this situation by placing special emphasis on reducing energy consumption and the consequent greenhouse gas emissions. Renewable energy sources can make an extremely valuable contribution to meeting the objectives of the Plan, and thus, the Regional Department for Environment and the Environmental Board have decided to promote the creation of a local partnership that shares the objectives of the Campaign for Take-Off, albeit adapted to the specific characteristics of Sardinia.

A specific working group will be in charge of defining the scope of RES actions. The working group "Renewables/Energie Rinnovabili" is made up of representatives of the Sustainable Environmental Service and the Energy Service, supported by an external consultancy company.

Promoter

General Directorate for Environment of the Sardinian Region (Environmental Board)

Parties involved

- General Directorate for Industry (Industry Board) - Energy service



Renewable energy sources in Sardinia

Objectives/Actions

The main aim of the approach adopted is to **change the boundary conditions that influence end-users' decisions relating to energy consumption patterns and energy use.**

The selection of RE technologies has been influenced by the particular conditions faced by the region. Finally, four areas have emerged: wind energy, solar energy, biomass and sustainable communities. The Plan seeks to create ad hoc working groups in each of the areas and disseminate the information and conclusions emerging from them.

Wind energy

It is anticipated that wind power will constitute a major source of energy in the short term, thanks to favourable climatic conditions and to the relatively low cost of the technology. An international co-operation project undertaken jointly with the regional Government of Navarra (Spain), which ended in November 2002, helped to select suitable areas for wind farms in the province of Cagliari, once environmental, technical and economic variables had been analysed. Once this project has shown the "path" that needs to be followed for the identification of suitable sites, the Sardinian authorities anticipate extending the use of the planning tool across the whole region.

In January 2003, many projects had already been submitted to the regional Government for approval. When all of them reach the implementation stage, their combined output will be around 1,556.40 MW.

Solar energy

The strategy on solar thermal energy focuses on promoting this technology in public buildings and homes. The stress is being put on dissemination campaigns to raise public awareness, while training and educational initiatives are also being implemented.

In relation to solar photovoltaic energy, its situation is somewhat different, due to the fact that the investment costs of this technology remain high compared with other options. In this case, the Government is promoting the implementation of demonstra-

SARDINIA'S challenge for promoting RES

tion plants, and, by the end of 2002, two plants were running and four more were being planned or implemented.

Biomass

According to the Regional Energy Plan, the potential for bioenergy is estimated at 380 – 500 ktoe/ year, which is sufficient to produce between 100 and 250 MW of electricity. The largest source is forestry waste (around 90 MW), followed by straw and cereals and the conversion of former agricultural areas for energy crop production.

The Biomass Regional Strategy consists of the optimisation of the biomass chain, through providing advice to the logistics industry and the construction of small-scale (polygeneration) demonstration plants. Nine potential areas for bioenergy development have been identified.

Sustainable communities

Sardinia has some isolated rural communities (on small islands) which are particularly suitable for setting up sustainable community schemes. The activities that are being carried out in this field are supported by the European Commission or by national and local plans, and are based on the promotion of a local structure that can handle the operation, maintenance and service of RES installations. A project in the municipality of La Maddalena has already been completed, with the participation of several international partners in the framework of the Altener Programme. Others are underway.

Results

The Regional Plan has established quantitative targets in the field of RES to be reached by 2010. These are the following:

Technology	Present contribution (MW)	Target in 2010 (MW)	
Wind	100	1,900 – 2,900	
Biomass		170 – 204	
Solar photovoltaic	0.7	Under evaluation	
Solar thermal	Low temperature	< 1% housing	Under evaluation
	Electric production	0	Under evaluation
Sustainable communities	1.56 (planned)	Under evaluation	

Financial resources

The funding of the Regional Plan comes from a variety of sources, including the following: green certificates, national and regional support to SPV installations, Structural Funds of the EC, European energy programmes, local funding; funds from the Regional Environmental Board and private investment.

A rough estimate of the resources that will be provided for the Energy Regional Plan implementation is of around 5 M €. At the moment, it is not possible to give more accurate data.

Management

The Programme will be managed by the Environmental Board of the Sardinian Region, in close collaboration with the Industry Board and with the support of Koba s.r.l.

Monitoring

A detailed monitoring plan has been agreed. In relation to the creation of the local partnership (March – July 2003), meetings were held at the regional level, involving other regional boards with competencies in the areas that are to be affected by the Plan. When the implementation of the action plan took place (August – December 2003), the various members checked the coherence of the actions proposed with the EU Directives and with other national and European initiatives. Finally, the Environmental Board ensured a good co-ordination of the activities with the European Commission.

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Sector: RES
Country: United Kingdom
Location: North East of England

THE CENTRE

of excellence for developing new and renewable energy

Background

At the Kyoto Conference in December 1997 the UK Government committed to meeting a target of 10% of its electricity being generated from renewable sources by 2010. To achieve this target the UK will need to spend up to 14 B €. As a result, markets for new and renewable energy are growing rapidly of creating demand for new technologies, equipment and services to enable the generation and distribution of this energy.

The North East of England is very well placed to address opportunities arising from this growth, due to its existing industries, research and development facilities and universities. The New and Renewable Energy Centre of Excellence (NaREC) will build on and exploit the Region's new and renewable energy assets and knowledge base by leading and facilitating the development of new technologies originating from the Region's existing research base, and new inward investment.

As the UK renewable obligation can only be achieved via the co-operation of the whole energy industry and academia, NaREC will also work together with stakeholders from other regions of the United Kingdom.

Promoter

New and Renewable Energy Centre (NaREC)

Parties involved

- NorthSTAR
- The Region's Universities
- RE industries in North East of England



Eddie Ferguson House (NaREC)

Objectives/Actions

The aim of the Strategy for Success programme, and NaREC in particular, is **to effect a dramatic improvement in the exploitation of the knowledge base linked, in this case, to the new and renewable industry**. The duration of the programmes has been estimated in five years and will be centred around the following lines of action:

Technology Transfer Services

The technology transfer services NaREC will provide are:

- **Targeted Research and Development:** NaREC will undertake, with partners, extensive analysis of the likely requirements for new technologies. Research and development projects in the Region's Universities, and potentially also in business, typically on a collaborative basis, would then be supported to bring these technologies to the market, in conjunction with other activities undertaken by NaREC.
- **Testing facilities:** Testing facilities will initially focus on plugging the gap for the offshore wind and wave developments. The most outstanding investments to be carried out are a marine power laboratory able to test wave, tidal and offshore wind powered technologies and a renewable technology laboratory including an electric power lab and a blade testing centre. The electric power lab will analyse large scale power systems in terms of generation, distribution, transmission and utilisation; the blade testing centre will assess the feasibility of new generation large scale blades for offshore wind power generation.
- **Technical & commercial development:** NaREC will provide services to start ups and existing SME's to enable them to design and manufacture prototypes, evaluate and market them, develop full scale production, and support their market use. These services will encompass a range of technical activities, such as design, and commercial services, including marketing. These services will primarily take the form of consultancy delivered by NaREC personnel, and related organisations, such as the Universities.
- **Attraction of new investment and cluster support:** NaREC will identify potential gaps in the Region's capability which cannot economically be met through the development of existing companies or start-ups. Where appropriate, targeted inward

THE CENTRE of excellence for developing new and renewable energy

investment opportunities will be pursued, either as stand-alones or as potential joint venture opportunities.

- **Development of Network Capability:** A key objective of NaREC is to develop a national network of research and development capabilities in energy technologies, to overcome the existing fragmentation in UK capabilities. This fragmentation currently prevents the maximum benefit being obtained from the UK's expenditure, facilities and expertise related to energy research and development.

Development and Licensing of Intellectual Property

Research and development projects which create intellectual property are likely to be of greater priority and potential, and receive more attention than those supported by the earlier measures. Such projects may arise from universities research programmes, SMEs and larger company R&D programmes.

Provision of early Venture Capital and Investments in SMEs

Strategic investments will be made in companies rather than projects, typically through the early stage venture capital. Such investments are likely to occur in the case of new spin off companies or SMEs developing new business streams from new and renewable energy markets, and could take the form of equity participation or joint ventures.

Policy and Commercial Model Development

In addition to the core activities, NaREC will also seek to work with energy suppliers and policy makers to enhance the market for these technologies. Activities will include techno-economic modelling, the development of novel supply models such as local energy network management, and scenario modelling and forecasting. It is envisaged that fees would be received for elements of this work.

Results

The work that will be undertaken in the five years of duration of the programme will create a momentum by way of increased confidence, quality and level of investment and knowledge base in new and renewable energy that will lay the foundation for this major economic improvement. As a result of the first five years of activity it is expected that the effect of the work of NaREC in the Region will safeguard, create and attract 4,800 high calibre jobs in new and existing high growth companies by the end of year 10. A further 4,500 similarly high calibre jobs will be created in years 11-15. Investment in the areas of new and renewable energy from the private sector is expected to increase by more than 997 M € (700 M £) during the first 10 years.

Financial resources

NaREC's business model requires funding for its operational core costs and in respect of capital for its investment programmes. The forecast total funding for the five years of operation of the Strategy (up to 2008) are of 51,384 thousand € for projects. The net core costs will be of 10,636 thousand €.

Income will be achieved by NaREC largely through fees for services provided. In addition, for specific technology projects NaREC will take a share in the ownership and/or development of intellectual property arising from research and development projects.

After five years the Company will be financially self-sustaining in terms of its operating costs. In order to achieve the Company's objectives, further public and private sector investment will be required over the same period for research and equipment, primarily for developing its test facilities and for supporting and making investments in SMEs. Each major project or investment will be the subject of a detailed proposal, adding to the applications already approved.

Management

An experienced and commercially orientated team has been recruited, led by Doug Everard, a respected energy industry senior businessman. The team is supported by a highly qualified board of non-executive directors drawn from industry and academia.

Monitoring

The monitoring of progress is carried out by the Board of Directors, the Management team and the owners after each financial year. The results of this monitoring will be presented publicly and disappointing results would probably trigger actions by the Board of Directors, the Management team and the Owners.

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4

Renewable Energy Partnerships in Cities





Sector: RES
 Country: Germany
 Location: Municipality of Berlin

BERLIN

action for climate protection

Background

The “Berlin Energy Concept” is an environmental programme approved by the Berlin Senate in May 2000 with the aim of reducing the environmental damage caused by the use of energy in old and new houses, public institutions as well as in industry and commerce. The fields of action are the promotion of energy saving and the use of renewable energy sources. As its target for 2010, the Berlin Energy Concept aims for a reduction in CO₂ emissions by the State of Berlin of at least 25% (compared with 1990 levels).

In the RUE field, it is worth noting that the plan seeks to reinforce the role of CHP, to replace old heating systems and improve insulation in buildings (especially in industrial and pre-fabricated structures), to enhance the use of “energy contracting” and to promote the more widespread use of a heating class index to define the energy quality of centrally heated houses.

In the RES field, the plan promotes the increased use of solar energy as well as that of biomass.

Promoter

Berlin Ministry for Urban Development

Parties involved

- Energy Agency in Berlin (Berliner Energieagentur GmbH)
- Berliner Impulse c.o.
- Climate Protection Partners Berlin
- Chamber for Industry and Trade
- GASAG (gas utility)
- BEWAG (local power supply company)



RES in Berlin

Objectives/Actions

The Berlin Energy Concept plans **to reduce CO₂-emissions by approximately 25% between now and the year 2010 (taking 1990 emission levels as its benchmark)**. The Berlin Energy Report specifies the means and methods to be used in order to achieve this target, and a combination of RUE and RES actions are envisaged.

Specific efforts along these two lines can be summarised as follows:

Voluntary and co-operation agreements

- Prior to 1997 the public authorities had worked on a solar-thermal ordinance, but it was never published owing to opposition from the business sector. In its place, the Berlin Senate prepared a number of voluntary agreements with industrial associations, grouped under the umbrella of “climate partners”. The first set of agreements came into effect between 1998 and 2002, and a second set of agreements is currently under discussion. Overall, 24,035 m² of STH panels and 38,000 of SPV panels have been installed (14,736 tonnes of CO₂ avoided).
- In addition to public funding, the Senate has signed a number of other co-operation agreements with utilities in order to fund particularly innovative and environmentally-friendly energy technologies. As a result of these agreements 63 schools now have SPV installations.
- A co-operation contract between the Senate of Berlin and the local gas utility GASAG has been signed and will be in effect for a period of four years (2002 – 2005). The contract facilitates the installation of solar thermal panels in combination with boiler technology.
- The Senate also aims to promote the installation of SPV systems by signing a co-operation agreement with the local power supply company BEWAG. The contract stipulates a support of 1,000 € per kWh of installed equipment (up to a maximum of 5,000 € per plant).
- Finally, it is worth noting that the recent privatisation of the Berlin energy utilities BEWAG and GASAG provided an estimated 25 M €, which could be used in innovative projects.

BERLIN action for climate protection

Programme “Berliner Impulse”

This programme funds publications and public debates on climate protection and on the Regional Energy Programme. The Berlin Energy-Days present new ideas, projects and future developments for energy policy. A newsletter and a quarterly magazine are also published.

The Energieforum

An “Energieforum” was set up in 2003 with the support of public subsidies and a consortium of organisations providing private funding. The Energieforum building is equipped with solar panels and thus serves as a best practice sample of RUE and RES solutions. The centre provides a forum for conferences and seminars on the topic of energy use. Furthermore, it houses the offices of several associations that promote solar energy use.

Fifty-fifty programme

This programme aims at reducing energy consumption in schools by changing user behaviour. Half of the savings achieved are credited to the participating schools, thus providing them with additional resources. At present, over 300 schools have shown an interest in this initiative and more than 200 agreements have already been signed.

Biomass CHP

The company HARPEN IKT TmbH (a subsidiary of RWE) has established a combined CHP/ biomass station in Rudow. The CHP is expected to supply the large housing estate Gropiusstadt with 20,000 dwellings as well as other customers (hospital) with long-distance heating. The CHP plant was inaugurated in May 2003 and the biomass facilities will be built in 2004.

Solar photovoltaic panels in public buildings

The Federal State of Berlin offers the roofs of its public buildings (144,000 m²) for the installation of SPV panels funded by private investors.

Results

- Primary energy use has decreased from 337,929 TJ in 1990 to 316,382 TJ by the year 2000 (a 6.4% reduction). This is the result of the reduction in the number of coal-heated flats and the renovation of 600,000 apartments in accordance with energy efficient criteria.
- At the end of the year 2002 Berlin had 910 photovoltaic-plants with a power-generation of 4,700 kWp. The power produced by photovoltaic was, thus, ten times higher than in 1995. In the same year Berlin had 2,800 solar thermal units, most of them installed in single-family houses.

Favourable environmental impact

Berlin's CO₂-emissions (including emissions from the import of electricity) were almost 32.8 M tonnes (climate adjusted) in 1990. CO₂ emissions caused by energy production showed a reduction of 13.7% in 2000 (excluding power-imports and kerosene). These are mainly due to the upgrading of combined thermal power plants, energy savings in buildings, an improved energy efficiency in industry and the setting-up of solar energy installations.

Financial resources

The privatisation of the Berlin energy utilities raised funds of almost 25 M €, which is available as additional to public funding for innovative energy projects. Today, 10 M € of the total sum are still available.

Management

The Berlin Energy Report was prepared by the Unit for Climate Protection of the Ministry of Urban Development, in Berlin.

Monitoring

The programme is being closely watched by several organisations, such as the Ministry for Urban Development, the Regional Senate and an Energy Advisory Council.

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Sector: RES

Country: Switzerland

Location: Municipality of Geneva

GENEVA'S

energy policy

Background

The energy policy of the city of Geneva is drawn up in co-ordination with the legislation and objectives stated at the canton level by its energy law. Moreover, it is connected with the SuisseEnergie Programme of the Swiss Confederation.

In this respect, the SuisseEnergie Programme, approved in 2001, sets the quantitative and qualitative aims for Swiss energy policy. Each stage of the Programme is subject to a strict legislative framework.

At the canton level, the approach also includes defined targets, and the relevant documents are updated every four years.

Finally, the Geneva City Council has a wide range of actions underway, notably the production of electricity from RES (91% of consumption), the promotion of solar thermal and solar photovoltaic systems in buildings and the introduction of optimisation measures in the residential sector. Geneva is a signatory of Agenda 21, which emanated from the Rio Conference in 1992.

Promoter

The City of Geneva

Parties involved

- Services Industriels de Genève - SIG (Energy producer and provider, water provider)
- Service Cantonal de l'énergie (cantonal energy service)
- Service Cantonal de la protection de l'air (cantonal service for air protection)
- Centre intercollectivités pour la maîtrise de l'énergie (CIME)
- Energie Cités



Solar thermal installation in the city of Geneva

Objectives/Actions

The general objectives of Geneva City Council's renewable energy programme rely on the **environmental targets of the Kyoto Protocol** and on the **"Air Protection Plan"** prepared by the Canton of Geneva. The programme is an integral part of the general goal of energy policy aiming at reducing the consumption of energy.

The RE Programme relies on a number of areas, which are listed below:

Solar Photovoltaic

The city of Geneva seeks to install a capacity of at least 10 W of power per inhabitant by the year 2010. In order to achieve this, several parallel programmes have been designed and implemented:

- Systematic study for the integration of renewable energy production in the projects of construction or restoration of buildings.
- Place the public buildings' roofs at disposal of the companies which wish to make an SPV installation on them.
- Information and sensitising of the users.
- Introduction of automatic systems on buildings and other measures that reduce energy consumption.
- Development of alternative productions.

Green electricity

The new and recently rehabilitated buildings, according to the Swiss Standard Minergie (high energetic performance), are provided with 100% renewable energy.

Solar Thermal

During the past few years, the City of Geneva's engineering departments have systematically analysed the potential for the integration of solar thermal facilities in new and renovated buildings. The City Council also aims to develop its own programme for the inclusion of such installations in existing buildings.

GENEVA'S energy policy

Research & Development

A share of the energy policy budget is dedicated to research and to testing technical innovations.

Programmes carried out in partnership with other key agents

- Research into geothermal applications in the canton of Geneva.
- Supporting the green electricity programme "Vital Green".
- Development of a cantonal register of heat needs and an own register of polluting emissions.
- Participation in the "Intercollectivity centre for energy management" (CIME), which groups together the relevant services in the field of energy management. The Centre will play an advisory role in the decision-making process regarding the subsidising of public energy projects.

Results

- The City of Geneva counts in 2003, 34 thermal solar installations, for a total of 2,188 m² of solar panels, which correspond to an avoided consumption of fossil energy of approximately 137,000 litres oil equivalent.
- All municipal buildings are supplied with green electricity provided by the local energy provider, which has a special tariff for 100% hydraulic power and energy resulting from the valorisation of waste.
- Three feasibility studies concerning the installation of around 350 kW of solar photovoltaic panels have been completed. The first phase of these installations has already started in 2003 and will affect a local day nursery.
- The first tests to introduce vehicles with alternate fuels into the fleet of the City of Geneva are carried out. If the results are positives, the City will be able to use these fuels on a large scale.

Financial resources

The local council spends a total of 1 Million € annually for the development of energy policies (both RUE and RES and other technical installations). In addition, there is a cantonal fund of 675,000 € for energy policies supporting the deployment of innovative projects which rationalise the use of energy in the municipality of Geneva.

Management

The management of the energy policy and, within it, of the RES Programme, is carried out by Geneva City Council's energy department, which has a staff of 29.

Monitoring

The City Council's energy department is responsible for an annual evaluation of the programme, involving the publication of an annual report with supporting financial statements.

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Sector: **SPV**
 Country: **Portugal**
 Location: **Municipality of Moura**

PROJECTO GIRASSOL

the biggest PV Plant in the world

Background

The municipality of Moura is located in a region of the interior of Portugal, where the resident population has been decreasing in recent years due to the lack of employment opportunities. In spite of this problem, the location has some important advantages, one of them being the fact that it has a very high overall level of solar radiation (over 170 Kca/cm²). This natural advantage, together with an interest in diversifying the economic base of rural areas explains the fact that this municipality has been chosen for the construction of the largest solar photovoltaic plant in the world, named GIRASSOL, with a capacity of 64 MW.

The project will be undertaken by AMPER – Multiple Activities for the Production of Renewable Energies of Moura - a municipal enterprise with a majority of public funds (90% Council of Moura; 10% Renatura Network.com), which is currently being launched as a stock-exchange listed company – AMPER CENTRAL SOLAR, S.A.

Promoter

Amper Central Solar, S.A.

Parties involved

- Agência Portuguesa para o Investimento (Government partnership)
- BP SOLAR (technology partner)
- Banco Comercial Português (project finance partner)
- Empresa de Desenvolvimento e Infra-estruturas de Alqueva, S.A. (regional energy development partner)
- DELOITTE & TOUCHE (project consultant partner)



Detail of solar photovoltaic panels

Objectives/Actions

The project thus consists of the **construction and operation of the largest PV plant in the world**, more than 12 times bigger than the largest project currently in operation. GIRASSOL will also contribute to increasing the market for SPV panels in Spain and Portugal and the reinforcement of local economic activity (more than 50% of the inputs will be acquired locally).

All the energy produced will be **fed into the National Electrical Network for a period of 30 years**. The feasibility of doing so is confirmed by the National Energy Policy, which envisages a special system for producers generating electricity from renewable sources.

Given its scale, the plant constitutes the anchor project of the “Integrated Programme of Sustainable Development of the Moura Municipality” and the Region. It is anticipated that building the plant will make the region an industrial magnet in the energy field. The project will entail the creation, amongst other things, of an industrial park, the Solar Panels Unit; the aSi (amorphous silicone) Modules Manufacturing Unit and the Inverter Unit.

Also, in terms of building expertise and stimulating research and development, the plant will catalyse the efforts in this area in Portugal. Establishment of an Investigation Centre for Solar Energy, New Materials and Hydrogen is also planned for the Moura Municipality.

In addition to the construction of the plant, the project is expected to have further structural effects. Moura City Council wants to take advantage of them and has designed a series of associated support projects, namely:

- An ecological industrial zone, in the vicinity of the plant, made up of companies in sectors relating to technology, agriculture and food, retail and other services, environmental services, etc. The architectural construction project of the zone will take into account energy efficient and RES criteria.
- Some industrial projects will be carried out: these mainly refer to the establishment of

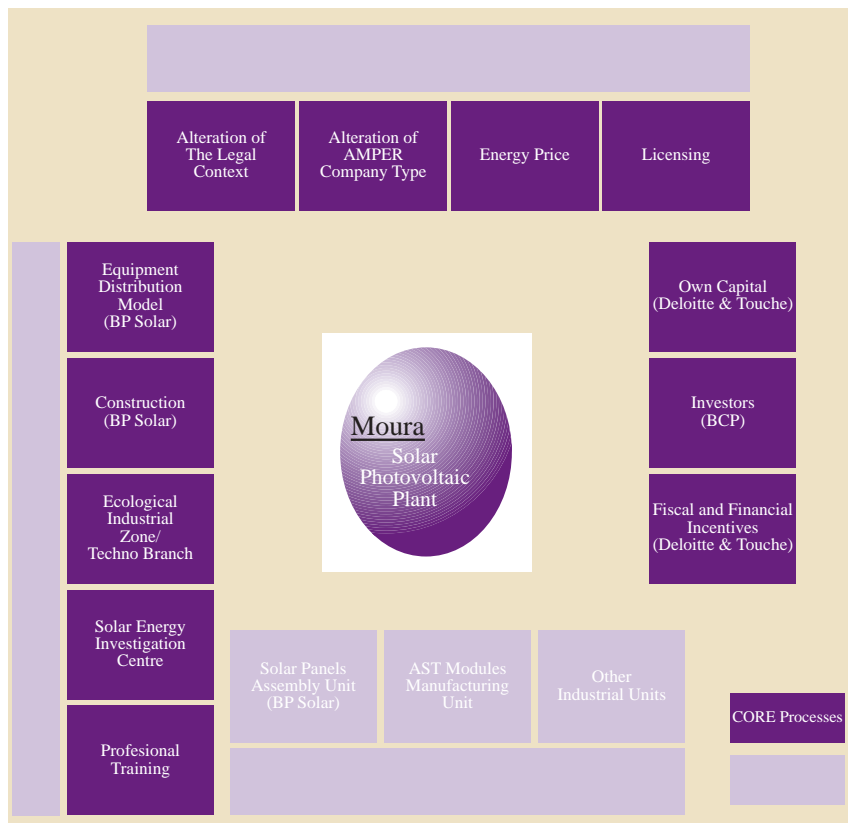
PROJECTO GIRASSOL the biggest PV Plant in the world

branches related to the production of SPV panels and raw material. The companies will supply other parts of Portugal with technical material.

- Development of R&D projects through the creation of a centre for a research into new materials, hydrogen and solar energies.
- Construction of a residential area with strict environmental criteria (for instance, installation of STH and SPV panels) in which deprived families and workers attracted by the industrial complex could live. Around 130 dwellings will be built under these premises.
- Installation of SPV panels in some municipal buildings: Moura Professional School, Amareleja Basic Integrated School, Moura High School. Other actions comprise the creation of a Solar Interpretation Centre and a Solar Museum.

Results

- Creation of 120 new qualified jobs, prepared by professional training in this specific area.
- Creation of another 30 jobs for the maintenance and operation of the plant.
- Indirect employment will also be important, and could total 1,280 to 2,400 new jobs.
- Production of green electricity and contribution to the strengthening of the electricity market in Spain and Portugal.



Financial resources

Project GIRASSOL is being financed using the “project finance” formula, which consists of a loan in which the guarantee of the investment is the installation itself. The expected costs (approximately) for each of the phases of the project are as follows:

Phase of the project	Cost (in €)
Phase 1	13,748,000
Phase 2	65,460,400
Phase 3	201,468,800

The total investment will be sustained by a financial structure in which 20% is equity.

Management

BP Solar is responsible for construction and technical management of the plant. Amper will subsequently be in charge of its maintenance and operation.

Monitoring

The “Integrated Sustainable Development Programme” has been monitored by an independent local commission, in which the main social, economic and cultural groups are represented.

This Commission meets every three months to verify the PV plant progress. Additionally, an executive team from AMPER manages all the aspects of the project and integrate the participation of the partners involved.

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Sector: RES

Country: France

Location: Urban Community of
Strasbourg

STRASBOURG

urban community promotes RES

Background

The Urban Community of Strasbourg, created in 1966, is a public inter-municipal co-operation authority that groups together 27 municipalities, including the city of Strasbourg, and which carries out actions in a number of areas of competence, one of which is the improvement of the environment and the quality of life.

A work plan has been launched within the framework of the policy goals of the mandate relating to sustainable development. More specifically, this means gearing actions towards:

- The stock of buildings owned by the local authority, through a programme of awareness and reduction of energy consumption.
- Consideration of environmental quality and energy performance from the programming phase onwards when planning new facilities.
- Supporting external activities.
- Analysis, of the possibilities and potential for developing the use of wood as fuel for district heating.

The slogan chosen for this purpose is “With you, energies for life, with you, energies for the city”, which symbolise the Community’s efforts and commitments.

Promoter

Urban Community of Strasbourg

Parties involved

- Region of Alsace
- ADEME
- CTS (Strasbourg Transport Company)
- AMORCE (Association of Local Government Bodies and Professionals for District Heating Networks and Waste Utilisation)
- Energie-Cités



Slogan used by the urban community of Strasbourg to promote RES

Objectives/Actions

Fully aware of the role that local government bodies can play in environmentally sound sustainable development, **the Urban Community of Strasbourg aims to become a leader at national level in the promotion of renewable energies.** The Community seeks to do so by “teaching by example” and by ensuring the coherence, transversality and subsidiarity of the actions. The involvement of the Community staff is the last pillar of the strategy.

The envisaged actions can be grouped together in a number of areas. The following sections give an overview of the most important:

Promotion of active solar systems

Feasibility studies have been carried out on energy optimisation at three swimming pools with the option of solar heating of the water for the pools and the hot water supply, with plans to extensively restructure the roofs of two of them.

Furthermore, the objective is for all public buildings belonging to the City or the Urban Community of Strasbourg, which are due for renovation or rebuilding to automatically become the subject of a feasibility study into the possibility of installing solar systems.

The Community public housing office, after completing an initial installation of 400 m² of solar collectors now intends to introduce, between 2004 and 2006, 7,640 m² more in some 5,246 apartments at an engineering and investment cost of close to 5.2 M € before tax, with financial aid from ADEME and the Alsace Region.

Finally, for private individuals, a financial package worth 300 € per application has been operating since 1st January 2003 in addition to the subsidies granted by ADEME and the Alsace Region for the installation of solar systems in individual dwellings.

STRASBOURG urban community promotes RES

The promotion of the use of wood as a fuel, in particular for district heating networks

The Urban Community of Strasbourg has commissioned a feasibility study into the construction of a 5,000 kW wood-fuelled boiler which would provide heating for a substation of a district heating network in Strasbourg HautePierre with an estimated annual wood consumption of 4,500 tonnes.

Transport and energy efficiency

A study is underway into reducing emissions of greenhouse gases and other pollutants, in relation to the extension of the tram network.

A second line of action relates to the purchase of clean vehicles. At present, the fleet consists of 5 dual-mode (electric and diesel) refuse collection trucks and 16 collection trucks that run on natural gas. These vehicles are supplied with gas by CTS (Strasbourg Transport Company) depot, which has its own compression station. The fleet also includes 37 vehicles running on LPG and 57 electric service vehicles.

Partnerships and awareness-raising

Awareness-raising initiatives and partnerships are (and will continue to be) an important part of the strategy. For example, since 2001, public employees have received training on "sustainable development in our everyday working lives". Similarly, other actions focus on the general public (brochures, for instance) and on institutional partners (reciprocal commitments based on shared objectives).

Results

According to the data and estimates available at the present, some of the quantitative results can be summarised as follows:

- The swimming pools could save around 300,000 kWh/annually, which would mean a financial saving of approximately 10,520 € from a total investment of 341,000 €.
- The wood-fuelled boiler plant could produce 9,930,901 kWh.
- A target of 50 installations a year has been set for grants to private individuals to enable them to install solar systems in individual dwellings.

Favourable environmental impact

The swimming pools will avoid the emission of 101 tonnes of CO₂ per year. The gain for all the buildings equipped with solar installations can only be quantified once the projects have been defined. The substitution of the production of 9,931 MWh energy using oil and gas by wood-fuelled production, would lead to an increase in NO₂ emissions of 4.8 tonnes and dust by one tonne, but on the other hand it would reduce SO₂ emissions, currently totalling 6.8 tonnes.

Financial resources

The Urban Community of Strasbourg's programme of actions will be financed from its own budget. Financial aid will be provided by ADEME and the Alsace Region in some cases (feasibility studies and investments).

Management

The staff of the Community of Strasbourg, in close collaboration with the municipalities it groups together, will manage the actions. Other actors involved include the Region of Alsace and the ADEME, amongst others.

Monitoring

All the initiatives undertaken will be monitored internally by the project management departments and centralised and analysed by the sustainable development mission both for communication purposes and to allow for adjustments according to the analyses made.

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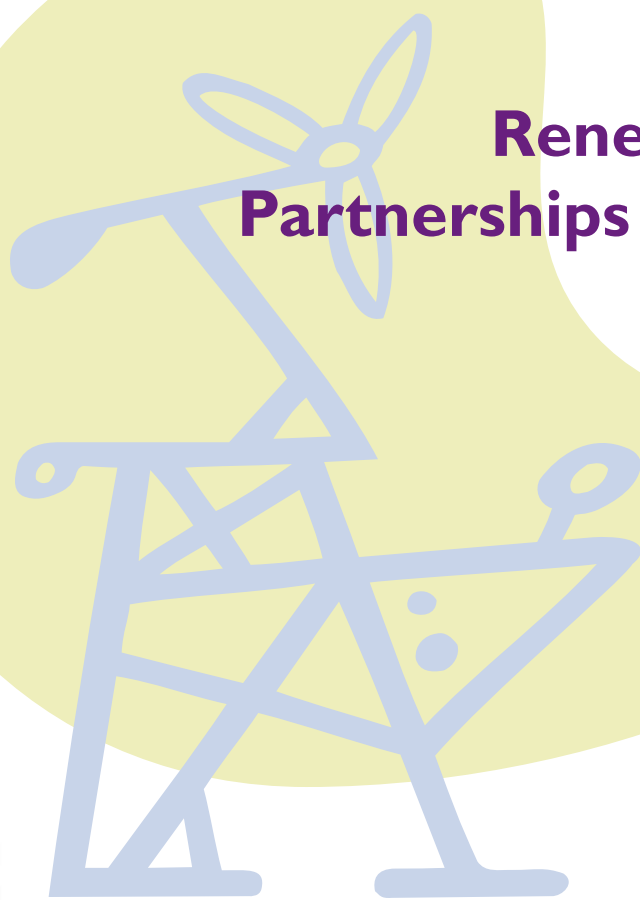
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5

Renewable Energy Partnerships with Industry





Sector: RES
 Country: France
 Location: France, Germany, Italy, Switzerland

15% TARGET

for renewable energy in 2010

Background

STMicroelectronics is a global, independent and Europe-based semiconductor company, which has made a strong commitment to protecting and improving the environment.

With the aim of taking a proactive approach to the environment, as well as meeting the expectations of its customers, shareholders, employees and society in general, STMicroelectronics has designed and implemented a set of initiatives based on what is called the "Environmental Decalogue".

Among its targets, the commitment to the reduction of greenhouse emissions has been established in the following terms:

- Reduce total CO₂ emissions due to the company's energy consumption by a factor of at least 10 by 2010.
- Increase the utilisation of RES, so that they represent at least 5% of total consumption by 2010.
- Adopt, whenever possible, alternative energy sources.
- Compensate for the remaining CO₂ emissions due to the company's energy consumption by means of reforestation.
- Reduce greenhouse emissions by at least a factor 10 in 2008 versus 1995.

Promoter

STMicroelectronics

Parties involved

- École de Mines de Paris
- Compagnie de Chauffage de l'Agglomération de Grenoble
- EOLE-RES
- ADEME
- Region of Rhône-Alpes
- European Commission
- Arizona Public Service
- Office Cantonale de l'Énergie (Energy agency in Switzerland)



Grenoble building South-East façade

Objectives/Actions

The greenhouse gas emissions target has been translated into a road map, which is reviewed on a regular basis. After an initial period of analysis, it has been decided to set a **new target of RES of 15%, instead of 5%**.

In order to achieve this new target, STMicroelectronics is actively financing RES installations, purchasing green energy, developing fuel cells and installing solar thermal and solar photovoltaic systems in its own buildings. The table below summarises the main actions that have been undertaken or are underway:

Actions	Timing	Degree of achievement / results
Construction/funding of wind farms (target of 150 MW installed in 2010).	2003/2010	Implementation of 10.5 MW by the end of March 2003 in Opoul (South of France). Identification of different sites in Europe (Germany, France and Italy).
Introduction of renewable energy in new buildings.	2000/2010	Grenoble 10,000 projects implemented in 2001. Geneva headquarter building implemented in 2002. Phoenix warehouse building implemented in 2000. Catania office building implementation forecasted in 2004.
Development of fuel cell use Knowledge acquisition relating to fuel cells.		Partnership with the Ecole des Mines for a prototype of combined fuel cell /photovoltaic power supply. The objective is to acquire experience in fuel cells which could be fuelled directly by hydrogen used in some of

15% TARGET for renewable energy in 2010

	2003/2005	our facilities. Photovoltaic power is used to electrolyse water.
Implementation of 4 MW of fuel cells in 2010.	2010	Information not yet available.
Purchasing green energy where and when is possible.		Agrate (Milano) site has signed a contract with a hydropower generator, representing 9% of its needs. The company's Grenoble site signed a contract with CCAG (Compagnie de Chauffage de l'Agglomération de Grenoble) to purchase hot water (1.25 MW 3.3 GWh/y) produced by a renewable energy power supply (household waste + wood + animal flour).
	2003/2010	
Solar thermal development office building heating.	100% in 2010	Some projects under study.
Clean room air preheating.	100% in 2010	Some projects under study.

Results

The actions have led to outstanding physical outputs, which have been summarised in the previous table.

Financial resources

Sources of financing	Allocation (in €)
Opoul Project has been entirely paid by ST without any other sources of financing.	>€10 M (clause of confidentiality signed).
Grenoble building:	€ 500,000 paid by ADEME (15%), Rhône Alpes Region (30%), EC (35%) and STMicroelectronics (20%).
Agrate (Milan) Photovoltaic fuel cell:	€ 250,000 paid by EC (50%) and STMicroelectronics (50%).
Geneva headquarters building:	\$ 498,000 (16% of which was financed by the Office Cantonal de l'énergie).
Phoenix warehouse building:	Joint project between STMicroelectronics and Arizona Public Service, the latter supports investment while the former pays an additional fee of \$ 526 per month.

Management

The programmes are managed by specialised staff of the company.

Monitoring

As mentioned, the company has a set of quantified targets which are monitored on a regular basis, and updated when necessary (as has happened in the field of RES).

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Sector: **Wind**
 Country: **Spain**
 Location: **Region of Castilla y Leon**

CASTILLAY LEÓN

development for RES

Background

The European Union's commitment to reducing the global level of green house gas (GHG) emissions by 8% compared with 1990 levels entails, in the case of Spain, a maximum growth of 15% in emissions above those recorded in 1990. In order to achieve this, Spain needs to generate a larger share of its electricity from renewable energy sources.

Several factors, such as the existence of a mature technology, adequate conditions of access to the power grid and the introduction of certain forms of financial support have made wind energy the most profitable area of RES in Europe. In Spain alone, installed capacity has grown by around 70% in the last five years and currently exceeds 4,500 MW, which makes the country the third most important producer worldwide. In this framework, the region of Castilla y Leon has become one of the main recipients of wind energy investments and today wind farms have become as common a feature of the Castilian landscape as windmills once were in the past.

The creation, in May 2002, of the company Biovent SA, whose objective is to promote, build and manage installations that produce electricity from RES in the region of Castilla y Leon, is an indication of the effort that is being made.

Promoter

Biovent Energía S.A.

Parties involved

- Iberdrola Energías Renovables, S.A.
- Gasindur, S.A.
- Caja Duero



Windfarm of Valdeporres, Burgos

Objectives/Actions

The objective of Biovent is **to install, by the year 2006, a capacity of 1,500 MW for the production of electricity from renewable energy sources.** The main RE source used will be wind, but biomass, solar and hydro-electric generating technologies will also be employed. According to the estimates made by the company, achieving this goal will require a total investment of 1,364 M €.

Biovent will be responsible for the development of all the RES projects undertaken by Iberdrola, one of the largest electricity companies in Spain. Despite the fact that the company was only recently set up, there are already several projects that are operative or in the construction phase.

For instance, in the area of wind energy, which accounts for the lion's share of the investment efforts, two wind farms have already been built, with a generating capacity of 55 MW. The table below shows the expected growth of wind capacity up to 2006. Most of the wind farms due to be constructed will be located in Soria and Burgos.

Year	Capacity installed (in MW)
2003	55
2004	350
2005	550
2006	600
TOTAL	1,555

Retortillo wind farm

The Retortillo wind farm (Soria) is located 60 km south east of Soria at an altitude of 1,300 – 1,460 metres above sea level. The project, which is in the implementation phase, will have 23 wind turbines of 850 kW each. The total capacity of the wind farm will be approximately 19.55 MW.

CASTILLA Y LEÓN development for RES

Valdeporres wind farm

The Valdeporres wind farm, in turn, is located north of Burgos, on a mountain called “Rio Nela”, close to an ornamental-stone quarry. The site has an installed generating capacity of 31.45 MW, divided into 37 wind turbines of 850 kW each. The turbines have a tower height of 44 metres and rotor diameter of 52 metres.

Other RE projects

In addition to the construction of wind farms, Biovent is also developing a number of projects in other areas, such as small biomass power stations, a small mini hydro-power station and some solar power plants.

In relation to mini-hydro, one of Biovent’s concerns is the modification of the existing legislation so that many small hydro power stations located in the region can be included under the special system, which would entitle them to receive a premium per kWh produced.

The main effort currently being made in the biomass field is focused on the construction of a biofuel plant in Briviesca, which will produce bioethanol from cereals. In addition, a new R&D project is due to begin soon, its aim being to identify areas where there are sufficient raw materials for a biomass plant to be viable and analysing which technology would be most appropriate.

Results

The installed generating capacity of the region of Castilla y León is approximately 4,300 MW. Thus, the addition of 1,500 MW would imply an increase of 35% in just three years.

Favourable environmental impact

The installation of 1,500 MW from RES will reduce the amount of CO₂ emitted to the atmosphere (assuming an equivalent amount of power from fossil fuels is replaced) by around 2.6 M tonnes. The projects will also reduce the incidence of acid rain by approximately 15,000 tonnes of SO₂ and NO_x per year.

Financial resources

The initial funds devoted to the investments are reproduced in the table below. Additional funds will come from the sale of the electricity from RES.

Sources of financing	Allocation (in €)
Bank Financing	255 M €
Own Funds	85 M €

Management

The projects will be managed by the staff of Biovent SA.

Monitoring

The projects are monitored internally and the results evaluated by the board of directors of the company.

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Sector: **SPV**
 Country: **France**
 Location: **Region of Rhône-Alpes**

HESPUL

from PV pioneer to renewable energy champion

Background

With 76% of the country's electricity needs met by nuclear power, the French energy context is somewhat different to that in the rest of Europe. Despite the significant level of nuclear output, the European Directive on Renewable Energy Sources requires France to increase the share of renewable electricity in national consumption from an original 15% to 21% by increasing the contribution of various technologies such as wind, biomass and solar photovoltaic.

The main objective of Hespul, an association dedicated to the development of RES and RUE in the Region of Rhône-Alpes, is to promote SPV installations. One year after its creation, in 1991, Hespul installed the first solar roof with a capacity of 11 kW (10 m²). This solar roof continues to generate 1,000 kWh every year.

Whilst Hespul initially played a technical role in coordinating Thermie programmes, its field of expertise has widened to include more social and promotional activities, in line with changes in the renewable energy context in France and Europe as a whole.

Promoter

Hespul

Parties involved

- European Commission (DG TREN)
- ADEME
- Rhône Alpes Regional Authority
- Other partners from European Programmes



Solar system used in a rural dwelling

Objectives/Actions

The combined objectives of Hespul's European Programmes and promotional actions have been:

- To **encourage private individuals and public bodies to install grid connected photovoltaic systems** to generate clean, renewable electricity.
- To **encourage and educate PV users** to reduce their energy consumption.
- To **create a viable market for grid connected photovoltaic systems** in France.
- To **develop standardised kits and building integration products** so as to facilitate the growth of the market.
- To **define and draft technical conditions for grid connection**.
- To **simplify grid connection requirements** and procedures.
- To **develop renewable energy sources** and energy efficiency in the Rhône Departmental government area through actions targeting local councils, SMEs and individuals.
- To **advocate a fair financial and technical framework for RES** amongst policy-makers at all levels.

Since its establishment, Hespul has sponsored a good number of actions. The following can be outlined (this is not a comprehensive list):

- Installation of many SPV systems in successive phases grouped under the name of Phébus.
- Preparation and distribution of guides for users and training of SPV installers.
- Installation of SPV panels in educational centres (Universal project).
- Provision of special modules on renewable energies to primary and secondary school students.
- Technical assistance for eco-buildings.

HESPUL from PV pioneer to renewable energy champion

Results

The various different programmes have enabled Hespul to provide European financing and install a modest 376 kWp, (however, this is over 50% of the current installed capacity in France) with an estimated annual production of 376,000 kWh. A further capacity of 740 kWp will be installed by the end of 2004 with PV STAR-LET and UNIVERSOL.

In the technical field, the programmes have achieved a number of valuable results:

- Adapting photovoltaic inverters to the French grid.
- Creating standardised grid connected photovoltaic kits.
- Monitoring over 190 grid connected photovoltaic systems.
- Establishing the technical conditions for grid connection with the national grid manager.
- Training tradesmen, consultants and users on grid connected photovoltaics.
- Technical assistance in the development of a standardised clay tile compatible PV tile.

Favourable environmental impact

Hespul directly undertook the installation of 376 kWp, avoiding the emission of 867,000 kg of CO₂ equivalent.

Financial resources

The cost in € of each action varies widely; some of them are totally funded by Hespul, while others receive European or national funding.

Management

Hespul has coordinated a number of the programmes described above. In addition, it has managed other actions in France. The association has a staff of 19.

Monitoring

A variety of actions have been monitored in different ways: the European Programmes through periodic reports to the European Commission; when local financing has been available, periodic reporting is also given to the financial backers. Reporting is generally on a six-monthly or yearly basis, depending on the type of programme.

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Sector: **Biomass**
 Country: **Finland**
 Location: **Nationwide Action**

POHJOLAN VOIMA'S

bioenergy programme

Background

Finland needs increased capacity to meet its growing electricity demands. However, any new investments must meet the economic and environmental standards specified by the Kyoto Protocol.

Given the fact that Finland has one of the most intensive forest industries in the world, biomass-based energy production offers an excellent solution. Efficient use of forest industry by-products, forest energy and energy crops are growing rapidly in Finland. The country is aiming at increasing RES use by 30%. 86% of that amount will come from bioenergy.

With a staff of 800, Pohjolan Voima is the second largest energy company in Finland, supplying 21 TWh of electricity per year. Its 19 owners include representatives from the Finnish forest industry, energy companies and Finnish municipalities. The company's current capacity of 4,000 MW includes a variety of RES plants, recent projects having been channelled towards biomass and wind. In the 1999-2004 period, the company will invest 620 M € in RES.

Promoter

Pohjolan Voima Oy

Parties involved

- UPM-Kymmene (forest company)
- Timberjack (forest machinery producer)



Alholmens Kraft power plant

Objectives/Actions

Pohjolan Voima, which is formed by 19 owners representing the energy industry as well as Finnish municipalities, is planning to **invest in nine new biomass-fired power plants**. Seven facilities have been approved up until now.

Investment projects

The seven plants for which there is data available will generate 3.2 TWh, equivalent to around 4% of Finland's electricity consumption. The raw material chosen is bioenergy, in several forms:

- Forest chips: initially 500,000 m³ of forest chips are going to be used, but it is expected that this amount will increase as their procurement cost falls.
- Agro crops: reed canary grass, which is a very productive domestic plant.
- Industrial residues, such as bark and sawdust.
- Peat.

Typical consumption in these new plants is 50% – 70% industrial residues (bark, sawdust), 20% - 40% peat and 10% forest chips. In the future, the proportion of peat is expected to decrease, with the use of wood increasing. A special effort is being put into forest chip procurement to increase volume. A new target level will be set after 2005. Pohjolan Voima's ownership varies from 50% to 100% of these subsidiary companies.

The table below lists the power plant investments, their expected production in terms of electricity and heat, and the year of completion of the construction works. These investments are breaking new records - Alholmens Kraft, for instance, is the biggest biofuel boiler in the world, the Wisapower recovery boiler is the biggest of its kind in the world, while the Kymin Voima boiler is the biggest BFB-boiler built so far.

POHJOLAN VOIMA'S bioenergy programme

Pohjolan Voima's bioenergy investments

	Electricity MW	Heat MW	Completed year
Alholmens Kraft	240	160	2001
Kokkolan Voima	20	50	2001
Kymin Voima	76	180	2002
Jämsänkosken Voima	46	130	2002
Järvi-Suomen Voima, Ristiina	10	65	2002
Järvi-Suomen Voima, Savonlinna	17	53	2003
Wisapower	140	400	2003
2 new units at planning stage	100	250	n.a.
Total	649	1,288	

- 620 M € investments, 85% of the new Finnish biomass electricity capacity.

New Product Research & Development

The company has a large R&D programme aimed at increasing the use of forest and agro biomass. At present, it has financed more than 20 different research projects in this area. The most successful technology has been the logging residue bundler, which was developed parallel to the Alholmens Kraft investment.

In addition, the power plants have started to use stumps, which is a very promising fuel. Another source of wood energy comes from young forests, thanks to multifunction harvester technology. Pohjolan Voima has also started an energy crop project this year, targeting 4,000 ha of reed canary grass by 2005.

Results

- The use of forest chips increased to 440,000 MWh in 2002, the main input being residue bundles from regeneration cuttings. This year the amount has grown to 700,000 - 800,000 MWh, both in stumps and in residue bundles.
- The reed canary grass area is about 400 ha after the first year of the project.
- The investments have created 750 new jobs, of which 600 relate to fuel procurement. The construction of the seven new plants is providing 4,000 man-years of employment.

Favourable environmental impact

The 444,000 MWh use of forest chips instead of peat entails a reduction of 170,000 tonnes of CO₂. In addition the use of stumps has a very positive environmental impact as it prevents the spreading of rot.

Financial resources

Total investment into new biomass capacity is 620 M €. The Finnish government's investment aid totalled 10 M € (1.6%) and European co-funding covered another 3 M € (0.4%).

Management

Pohjolan Voima has a department of eight people, who are responsible for new capacity. These services include plant specification, management of investments and preparation of the legal documentation (environmental permits, fuel procurement documents, etc.).

Monitoring

Pohjolan Voima is an active investor and has a visible role in the Finnish energy sector and society in general. The results of its investments are presented in several forums and channels including annual reports, the company web site, presentations, etc.

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Sector: Biomass
Country: Ireland
Location: Nationwide Action

WOOD PELLET

promotion in Ireland: delivering pellet power

Background

Although Ireland's biomass energy resources are vast and varied, at present they account for just over 1% of the country's primary energy supply (160 ktoe)— mostly in the form of wood used for domestic and industrial heating. It has been estimated that this figure could rise to 40% if proper use of the opportunities was made.

The national statutory body for promotion of sustainable energy in Ireland, called "Sustainable Energy Ireland" (SEI), has indicated in its Briefing Document on Biomass that in the medium-term (by the year 2010), we consider it practical to achieve an installed capacity of 145 MWth capacity from biomass heating. With this aim, the Irish Government has created some lines of support for both large and small biomass installations. In addition, a number of private companies are making efforts to diversify energy sources and to reduce the environmental impact of fossil fuels.

Promoter

Galtee Fuels Ltd.



Wood pellets used for heating

Objectives/Actions

Galtee Fuels Ltd. is a company dedicated to the import and distribution of energy from fossil fuels and recently, also from biomass. In connection with the latter, the company aims at **creating a pellet market in Ireland** and, more specifically, at establishing its own brand of wood pellets. The company therefore aims to make imported pellets available for heating purposes.

In order to achieve its objectives, Galtee has taken a number of steps, the first of which consists of an analysis on what is happening in other countries where the use of pellets is more common. This was done through visits to Austria, Finland and Germany in 2002.

After this research, the company sourced some initial products for marketing in Estonia, Latvia and Germany.

As a result, the importing of pellets began and is currently ongoing. The products come from Germany, and the trade began in 2002 with a volume of around 200 metric tonnes. Currently, there is no national production of pellets.

Having wood pellet heating demonstration units up and running in Ireland will help to overcome any negative perceptions encountered by heating customers; as they will have an opportunity to see that wood pellets are a clean fuel and that the heating systems are fully automated in terms of fuel feed and maintenance. For these reasons, Galtee Fuels has funded a demonstrative heating site at the University of Limerick.

WOOD PELLET promotion in Ireland: delivering pellet power

The table below outlines the main actions of the programme:

Actions	Timing	Additional details
Identify the market, monitoring what is happening in more advanced countries with renewable projects.	Completed	
Sourced initial products for marketing.	Completed	
Importation of wood pellets.	Ongoing	
Promotion of these wood pellet fuels.	Ongoing	Galtee took part in Sustainable Energy Ireland (SEI)'s Energy Awareness Week promotional activities.
Identify wood heating customers that could act as demonstration sites.	Ongoing	Supplier to 1 st wood pellet boiler in commercial building in Ireland. Installation due in November 2003.

Results

- A continuous wood pellet fuel supply has been put in place.
- The 1st wood pellet boiler was installed in November 2003 in a commercial building, acting as demonstration site for further units.
- Promotion of wood pellet heating by participating in Sustainable Energy Ireland's promotional activities-speaker at Renewable Energy Information Evening and Energy Awareness Week, 2003.

Favourable environmental impact

Wood pellets are carbon dioxide neutral. Their balance is shown in the table below:

Fuel Source	Energy value (GJ/tonne)	Ash content %	Carbon dioxide Emissions (kg/tonne)
Firewood	13.5	1 - 3	0*
Pellets	17.3	0.4 - 1	0*
Peat	18.5	2 - 15	104
Coal	28.3	5 - 50	86

Financial resources

Galtee Fuels has spent approximately 50,000 € on the project from its own resources.

Management

Mr. Pat O'Sullivan (managing director of the company) is the manager of this programme.

Monitoring

The project is being continuously monitored in-house, and in the future will be reviewed internally by the project promoters and engineering consultants.

Future changes in the project do not seem likely, as a niche in the market has been identified, with very good prospects.

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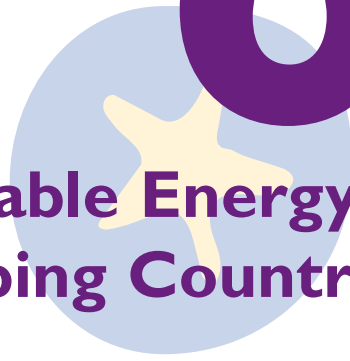
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6

Renewable Energy in Developing Countries





Sector: **SPV**
 Country: **United Kingdom**
 Location: **South Africa**

DEMONSTRATION

of housing energisation to reduce climate change

Background

From the total South African population of more than 44 M, about 18 M people live in rural areas and have limited access to basic services. Households that are not connected to the electricity grid traditionally use biomass for their cooking and heating needs. At present, approximately 8 M cubic metres of wood fuel are chopped in the country every year, contributing to an accelerated rate of deforestation and to the reduction of carbon sinks. However, grid electricity in South Africa is generated almost exclusively from coal. Thus, electrification of rural areas in South Africa simply converts one source of greenhouse gas for another.

The project described here proposes an alternative energy solution for remote areas, which consists of the combination of solar photovoltaic systems for basic electrical needs and liquefied petroleum gas as a complement, together with an appropriate financial solution that minimises initial investment and makes the system affordable to rural households.

Promoter

Parallax – Sustainable Development Solutions (Pty) Ltd

Parties involved

- Energy Research Institute, University of Cape Town
- Nokusa Consulting
- Ubuhlebezwe Municipality, Ixopo, KwaZulu Natal



Local “switch on” team in Nkweletsheni

Objectives/Actions

The overall goal of the project is to **show the extent, to which energisation for rural communities using PV offers a means for sustainable development whilst limiting the contribution to climate change.** In addition, it aims to demonstrate that a user-owner model can be implemented with minimum external investment.

As the first, self-contained phase of this longer-term initiative, this project initially had the following objectives:

- Provision of energy supply to a small community, allowing about **100 non-grid-connected households to meet basic electrical and thermal needs** with reduced impact on climate change.
- **Improvement of the global and local environment** from reduced greenhouse gas emissions.
- **Demonstration of an effective model that may be replicated** in other communities with a minimum external grant to meet the initial capital costs of equipment.

The lines below summarise the achievements of the project to date:

Project preparation and work plan production. This is focused on the identification of an appropriate location, a local energy agent and a local banking institution. After extensive negotiation, the location selected was Nkweletsheni near Ixopo in KwaZulu Natal.

Community Liaison. Engagement of key members of local community, preparation of show homes and arrangement of an “Energy Day” for residents, at which the project was formally launched.

Selection of suppliers. Contact was made with various potential solar, LPG and other peripheral suppliers. Final agreements were reached with suppliers who expressed a wider interest in developing their market into rural areas, and who offered competitive rates and terms.

DEMONSTRATION of housing energisation to reduce climate change

Financial arrangements. Appropriate account facilities for the project business were arranged with First National Bank, which is adopting a favourable policy towards rural customers. Loans were made from the project business to residents who wanted to buy the energy package; repayments were set at ZAR150/month for three years, – which is considered an affordable level.

Team recruitment. Selection, capacity building and training of a local team made up of men and women from the local village. Their role was to market the system, install this at customers' homes, educate the customers, and provide ongoing maintenance and service to customers.

Installation of New Energisation Systems. Development of "Switch On" as the energisation package brand. Management of the Switch On team to install and service 90 households (90 systems being the maximum achievable within the donor grant budget). Installation of the systems completed in September 2003. All new systems are checked in weekly visits by the technical manager.

Monitoring and Evaluation. Collection and measurement of all baseline data regarding climate change emissions took place before the installation of energy systems. Reduction in green house gas emissions was calculated. Positive impacts on health and safety were assessed.

Project information gathering and dissemination. The project was initially exhibited at the World Summit on Sustainable Development in Johannesburg in 2002. A website has been established to show the project activity. A final case study will be produced and disseminated to all relevant stakeholders.

Phase Out. Transfer of all responsibilities of the project management team to a local stakeholder. Arrangements with community leaders and the bank will be agreed for the transfer of monthly payments from energisation customers to the "Switch On" business.

Results

- 90 households in a remote rural community, with no previous access to grid electricity, now supplied with cost-efficient energy sources to meet their essential needs.
- Climate change impact assessment that shows a 2.2 ton/annum emissions reduction from the introduction of PV.
- Positive impact on health and safety within the community, with indicative avoided health costs estimated at over 40,000 €.
- Customer reaction indicating "...the impact of having a better quality of life due to the energisation system has lifted the users' self esteem, making them feel proud and more 'civilised'...".
- Direct and indirect employment opportunities, through job creation from the project and from future income-generating activity using improved access to energy.
- Market creation for South African manufacturers/suppliers of PV and LPG systems.
- Consideration of project results in the Government review of non-grid electrification, indicating potential for significant replication of the model developed.

Financial resources

Sources of financing	Allocation (in €)
USAID/Dept Env Affairs & Tourism	200,000
Parallax & Partners	19,000 in kind
Local Municipality	5,000
Local Community	40,000

Management

The Parallax directors continue to assist with management of the local business and particularly the community fund. Parallax is a limited liability company, registered in the United Kingdom and South Africa, whose aim is to achieve sustainable development through environmentally sound energy solutions. As Parallax's geographical target is Southern Africa, with a particular emphasis on rural areas, its directors are currently based in Cape Town, South Africa.

Monitoring

There is an ongoing monitoring process conducted by the project managers in terms of delivering the project milestones. This includes a follow up of the user-owner model, a record of the emissions reduced, an analysis of the jobs created and a review of future income generation through the creation of future micro-enterprises.

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Sector: **Biomass**
 Country: **Belgium**
 Location: **EU and developing countries**

WORLD NETWORK

on bioenergy – a global RE partnership

Background

Historically, biomass is mankind's oldest energy source. The main problem to be addressed today is how to retain biomass as a fundamental source of energy supply in industrialised countries, and particularly in developing and emerging countries, while ensuring its efficient and modern use and promoting social-economic development in a way that is in harmony with local lifestyles, cooking habits and traditions.

The Brussels-based European Biomass Industry Association (EUBIA) was founded in 1996 and is making a special effort to strengthen the links between European and developing countries in order to achieve this transformation in biomass use. Additionally, it focuses on bioenergy systems and technologies that are particularly appropriate for rural development, as well as for smaller bioenergy businesses.

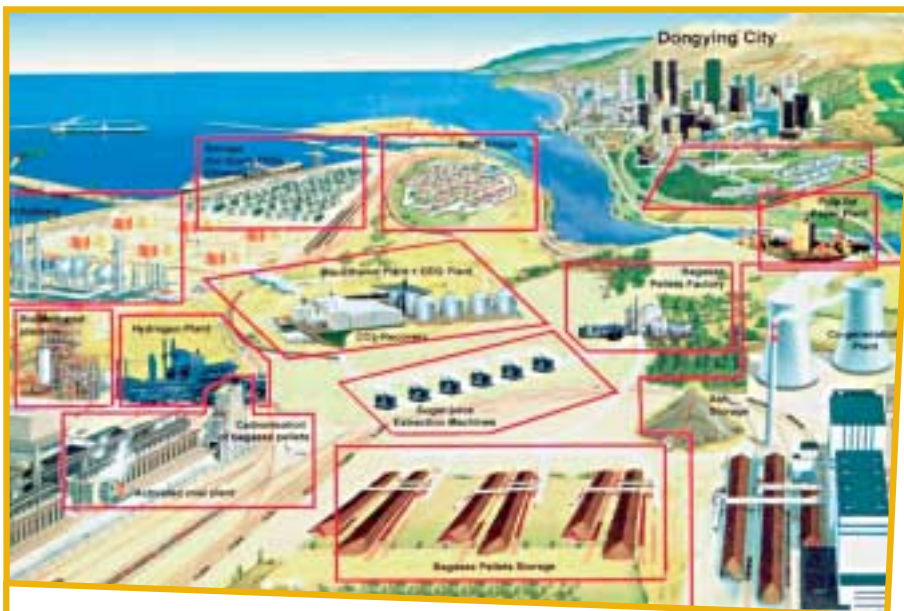
While in the past the emphasis tended to be placed on large-scale centralised energy production (a well-known example being Brazil's ProAlcool programme for ethanol fuel production), the interest is now in decentralised applications lower-capacity technology options.

Promoter

The European Biomass Industry Association – EUBIA

Parties involved

- Bioenergy technology developers worldwide
- European Institutes
- Partners from Africa, Asia and Latin America



Biocomplex worldnetwork on bioenergy

Objectives/Actions

The project 'Global Network on Bioenergy', has the general aim of **addressing issues concerning the adequate utilisation of biomass residues and energy crops worldwide** and to make use of selected reliable and proven practical technologies and systems.

Relevant technologies and systems are selected on the basis of the maturity of the technologies, their cost-effectiveness, simplicity of maintenance, social acceptability and the impact on development. In addition, the Bioenergy network identifies and promotes opportunities for international cooperation, technology transfer and joint-ventures in the field of bioenergy technologies.

The project focuses in particular on the promotion of small-scale, decentralised bioenergy technologies as it is expected that it will be much easier for them to penetrate the market given the fragmented nature of the supply of biomass resources and the smaller investments they require. The network prepares documents describing bioenergy projects and technologies, which include a detailed technological and economic analysis. It also supports the preparation of recommendations for the development and implementation of policy options for the promotion of biomass and bioenergy as well as the identification of commercially available and reliable biomass technologies worldwide.

The Network has succeeded in **setting-up a trans-national forum in Latin America, Europe, China and Africa**, bringing together **48 institutions** (knowledge centres and SMEs) from 24 countries worldwide, thereby involving a large number of members with a high level of expertise in the field of biomass.

Instruments of the Global Network

The Global Network disseminates information and creates contacts through several instruments: a web site, a database, newsletters and a series of thematic seminars

- **The web site** was established early in 2002 at www.bioenergy-lamnet.org. It provides detailed information on the objectives, activities and scientific publications of this trans-national forum as well as the contact details of all network members.

WORLD NETWORK on bioenergy – a global RE partnership

- **A database** is embedded in the web site, with the goal of providing information on energy demand and energy resources in Latin America and other emerging economies, covering both the current status and the future potential of bioenergy.
- **Three newsletters** have been issued so far; the first was published on the occasion of the 12th European Conference on Biomass for Energy, Industry and Climate Protection in Amsterdam in 2002, the second was launched in December 2002, during a conference in Brasilia; the third was issued in June 2003 during a seminar in Mexico.
- **Many workshops in Asia, Africa and Latin America** have been held, bringing together a wide range of representatives of the European biomass industry and research centres and a selected group of companies and policy makers from the host countries. To give just a few examples, a conference was held in Johannesburg prior to the World Summit in August 2002 to prepare the network's contribution to this important forum; another workshop on bioenergy policies and innovative bioenergy technologies was held in Brasilia; an international seminar on bioenergy and sustainable rural development was held in Mexico in June 2003; finally, an international conference on bioenergy utilisation and environmental protection took place in September 2003 in Dalian, China. Further workshops are scheduled for 2004 in Cuba, Chile, Europe and China.

Results

Dissemination activities and efforts to identify experts from different countries have borne fruit in the form of concrete projects, of which the following deserve highlighting:

- Introduction of biomass pelleting technologies in South Africa for the production of sustainable "green" energy by means of a co-operation agreement between Illovo Sugar and a European manufacturer.
- Introduction of innovative bioenergy technologies (e.g. gasification, cogeneration) in Cuba to improve the rural electricity supply and reduce dependence on energy imports.
- Promotion of intensified research into ethanol-based fuel cell technologies for implementation in bio-ethanol producing developing countries.
- Increased utilisation of bioenergy technologies in China for rural development, environment protection and improved energy supply in rural areas.
- Stimulation of international co-operation between developing countries and the EU in the field of bio-fuel production.

Financial resources

The total investment in the initial phase of the project comes to approximately 15 M €, of which the partners from emerging and European countries have provided 50%, and 1 M € has been provided from public funds.

Action	Cost (in €)
All network activities, seminars, introducing of experience from SMEs, negotiations with governmental and local partners, with financing entities, monitoring, etc.	1,000,000
Implementation of first projects (biomass pelleting, co-generation, gasification)	
• Local financing/bank loans.	7,500,000
• Financing by European banks/Industry.	7,500,000
TOTAL	16,000,000

Management

The project is managed under the umbrella of EUBIA by coordination partners (members of EUBIA) and coordination support points in emerging countries. Management support is provided by local institutes, organisations, governmental entities, industry and SME partners. The network Steering Committee acts as the clearing house for all important decisions regarding project strategies and international relations.

Monitoring

Monitoring the programme of activities and evaluating success is performed by the Global Network's high-level Steering Committee. This committee consists of members from the European Union, Latin America, Africa and China meets three times a year to review the progress of the Bioenergy network and to decide on future activities. At these meetings advice and recommendations are given on the selection of dates and venues for workshops, the structure and content of the project web site, database and the newsletters as well as the key issues of co-operation between government, local authorities, SMEs and industry in all countries participating in the network.

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7

Renewable Energy Partnerships for Promotion





Sector: **Biomass**
 Country: **Belgium**
 Location: **EU and accession countries**

CEPI's

declaration of intent on renewable energy sources

Background

The European pulp and paper industry is an energy intensive but also an energy efficient sector. It reduced its specific primary energy consumption by 16% between 1990 and 2001 and consequently it cut carbon dioxide emissions by 25%. This was achieved by the use of biofuels, combined heat and power (CHP) systems and improved process technologies.

The Confederation of European Paper Industries (CEPI), representing 19 member countries (13 European Union Member States plus Norway, Switzerland, Hungary, Czech and Slovak Republics and Poland) and through its members (which are the national associations), some 1,000 pulp, paper and board-producing companies across Europe, has recently published a declaration of its intention to produce and use more renewable sources of energy, in the form of biomass, for electricity and heat generation.

According to the Confederation, this new challenge involves an increase in the average amount of biomass used of some 130,000 TJ by the year 2010 (compared to the year 2001). This is expected to contribute to the reduction of the emission of greenhouse gases (GHGs). The Declaration will become a part of the CEPI's sustainability strategy.

Promoter

The Confederation of European Paper Industries (CEPI)

Parties involved

- More than 1,000 pulp, paper- and board-producing companies across Europe through their National Confederations



Wood forest residues used for energy production

Objectives/Actions

The general objective of CEPI's Declaration is to increase the use of biomass within the paper and pulp sector and thus reduce the overall level of emissions of greenhouse gases. According to the estimates made, the Initiative will entail an average of a **25% increase in the use of biomass** (compared with an 18% increase in the business as usual scenario), representing some 130,000 TJ in its on-site biomass-based primary energy consumption (does not include fuels for purchased electricity and heat) for on-site heat and power production **by the year 2010** (compared to 2001).

The targets set out in the declaration are to be achieved through industry-based initiatives and complementary measures.

Industry-based initiatives

In the first place, CEPI expects to mobilise considerable resources in renewable energy production through the following projects:

- Construction of a new fluidised bed incineration plant, planned for January 2004.
- Construction of new power plants.
- Construction of new high performance biomass boilers.
- Construction of new combined heat and power (CHP) installations.

The substitution of coal, natural gas and fuel oil by biomass is also envisaged, so as to enable the share of biomass to be increased from 49% (for 2001) to an average of 56% (by 2010).

Another set of initiatives focuses on the increased use of solid recovered fuels and on the increased use of forestry wastes. This will entail a better partnership with forest-based industries; some of which have been very active in this area.

A forth line of actions relies on the signing of voluntary agreements by the industry with a view to the reduction of GHG emissions. A number of pulp and paper companies have already signed such agreements.

CEPI's declaration of intent on renewable energy sources

Finally, the Association will support product development and pilot projects in order to improve the technological development of the sector.

Complementary measures

In addition to the efforts of the industry, the Association and its members will make use of the economic and legislative tools that are being designed by the European Commission and other national and international bodies. The most important are:

1. Green certificate transactions.
2. Application of the directive on Emissions Trading, which is an incentive to substitute fossil fuels by biomass.
3. Call for tenders for the production of bioelectricity based on biomass; (for example in France: to subscribe for the production of bioelectricity based on biomass for installations of more than 12 MW).
4. Shares to be fulfilled by the pulp and paper industry in the national action plans for the promotion of RES.
5. Communication plan on renewable energy sources.

The official launch of the declaration took place during the Annual Paper Week in November 2003, after some preliminary activities, like the appointment of an independent committee to monitor progress.

Results

The outcome of the Declaration will be an additional 130,000 TJ of energy from biomass for heat and electricity production. The initiative will also have a positive impact on the forestry and agricultural industries and on the management of waste.

Favourable environmental impact

The estimated reduction in CO₂ emissions over the period 2001 – 2010 will be increased by nearly 3 M tonnes (in the business as usual scenario it would only be 1.5 M tonnes and the amount envisaged in the Declaration 4.4 M tonnes). The assumptions made are the yearly average increase of the total primary energy consumption (calculated by means of a linear extrapolation) as well as the unchanged shares of the different energy sources (except for biomass).

Financial resources

In many cases, the projects will benefit from regional systems of green certificates. At the national level there has been an investment of 125 M €, out of which 95 M € was dedicated to renewable energy production (the construction of a new high performance biomass boiler required an outlay of 50 M €, which is approximately 10% of the total devoted to new plants). The new fluidised bed incineration plant costs some 34 M € and a medium-sized CHP installation costs around 25 M €. The average investment in a new power plant lies somewhere in the order of 50 M €.

The declaration itself has entailed a number of costs, of which the most relevant are a subcontracting to verify the basis for the declaration: 6,000 € and an annual budget for the monitoring and reporting exercise: 10,000 €.

Management

The Declaration is managed by the CEPI secretariat. Every year, an internal CEPI RES survey will be sent out to the national associations for them to complete. The results will be used as the basis for the further monitoring and reporting on progress made.

Monitoring

The VTT Technical Research Centre of Finland, which is an independent body, has been given responsibility for the annual monitoring and reporting of the progress made by the Declaration up to 2010. The final document will be publicly available and will be forwarded to the European Commission as part of the regular reporting that is necessary in the context of this RE Partnership Declaration. In case the results would be disappointing, immediate appropriate action(s) will be taken by CEPI.

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Sector: RES
 Country: France
 Location: Municipalities in the EU

Background

Current energy policies have shown their limitations throughout Europe and the increase in energy consumption, in the levels of background noise and air pollution in cities, in greenhouse gas emissions and in waste production are evidence of this. Three-quarters of our energy consumption occurs in cities. However, there are already technical solutions available, which are economically viable. More than ever, municipalities have a crucial role to play in a situation where the world of energy is undergoing profound changes due to the effect of liberalisation.

These are the reasons that lie behind the creation, in 1990, of Energie-Cités: an association of European local authorities aimed at providing its members with information on the promotion of sustainable local energy policies by taking an integrated and holistic approach. The network reaches over 20 European countries and includes about 100 municipalities.

Energie-Cités has co-ordinated and participated in numerous European projects. In 1999, it participated in the CityRES initiative, which consisted of setting up a network on RES in cities. Two years later, another project called CityRES 2010 began, this time focusing on the promotion and dissemination of measures in the field of RES.

Promoter

Energie-Cités

Parties involved

- More than 100 municipalities from 21 countries
- In addition, collective members include more than 250 members



The organic waste treatment plant of Linköping (Sweden)

Objectives/Actions

Energie-Cités started the CityRES campaign in 1999, and it received funding in 1999 and 2001/2002 from the European Commission through the ALTENER programme.

In 2003, the CityRES 2010 project was launched, its general objectives being:

- **Stimulating the exchange of experience and good practice between municipalities** from different countries, including the candidate countries.
- **Encouraging local authorities to look at their energy performance** and take action.
- **Providing an advisory service to local authorities** to help them understand market liberalisation and transparency measures, new energy technologies, and European Directives, thus empowering players and enhancing their decision-making.
- **Increasing the actors' knowledge** of the opportunities that exist for the use of renewable energy, including supply of green electricity and Community Plan shares.
- Increasing the awareness of **the possibility of "zero carbon dioxide emission"** or low carbon dioxide emission communities.

The sections below reflect the most important actions that were applied within the framework of CityRES and, more recently, within CityRES 2010.

Monitoring centre

More than 100 good practice case studies have been produced. These offer a balanced presentation of RES technologies and have been published in English and French. Although the emphasis was placed on solar, wind and biomass, there are also interesting examples of geothermal and hydro-power applications. All of them can be viewed and downloaded freely at the website of Energie-Cités, in the "good practice" section. Promotion activities have been carried out and will continue through traditional media. To support the promotion, a CD ROM has been created.

CityRES 2010

European cities RES - partnership and networking

1. **Creation and co-ordination by Energie-Cités of an experience exchange network.** A "Renewable Energies" network was set up in spring 1999. The network includes more than 20 members and is led by Rome City Council.

2. **Organisation of a seminar** in Spring 2000. The 5th annual conference of Energie-Cités took place in Verona (Italy) the 6th and 7th of April 2000, its focal theme being renewables. Entitled "Into a Renewable Millennium", Energie-Cités sought to demonstrate that the new century will be a booming age for this type of energy. More than 150 participants from 21 countries attended the meeting.

3. **Dissemination and Information Service.** This service gives information about the Altener Programme; the CTO and the RES Partnership have been widely disseminated among the members of Energie-Cités and representatives of the cities included in the 105 case cards gathered under CityRES, in particular; and to local authorities in general. Dissemination was aided by the use of a special RES dossier; the RES Partnership dossier and personal contacts. The dossiers were developed as a supplement of Energie-Cités INFO.

4. **Promotion of the RES Partnership.** Energie-Cités contributes in particular to the RES Partnership at the municipal level. The association committed itself to setting up 40 Partnerships. By the end of October 2003 twenty local authorities had signed the RES Partnerships.

New actions of CityRES 2010

CityRES 2010 will continue and enlarge the action already started under CityRES by the following means:

- A monitoring centre for initiatives carried out by municipalities in the field of RES.
- A dissemination service on "Intelligent Energy for Europe programmes".
- A working group to promote Energie-Cités.
- The joint organisation of events bringing together municipalities to discuss renewable energy in the urban environment.
- Organising study tours to pioneer cities visiting RES installations.
- The promotion of the RES-Partnerships and the CTO follow-up programme.

Results

- Reaching all European municipalities with more than 100,000 inhabitants, as well as a significant number of municipalities with more than 50,000 inhabitants, with a special focus on new accession countries.
- Gathering the most active municipalities in the field of renewable energy within the network co-ordinated by Energie-Cités.
- Providing reliable information on projects on renewables in urban areas.
- Facilitating the emergence of new quality projects, essentially through Partnerships.

Financial resources

Sources of funding	Allocation (in €)
Membership fee	210,000
In-kind financing from member cities	500,000
Community funding and funding from national energy agencies	500,000
Sponsoring	100,000

Management

The programme is managed by the staff of Energie-Cités in collaboration with the cities.

Monitoring

An annual evaluation and progress report will be prepared by Energie-Cités in co-operation with the member cities. This report will be presented at the annual General Meeting of Energie-Cités, which is part of Energie-Cités annual conferences (2004 in April in Martigny, CH, 2005, Clermont-Ferrand, FR) and, if necessary, modifications will be made.

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Sector: **SPV**
 Country: **Italy**
 Location: **Nationwide Action**

LOW COST photovoltaic energy

Background

The results of recent attempts in Italy to create a reasonable market for solar photovoltaic technology have been disappointing, with only a slightly increase in the rate at which solar photovoltaic panels and components have been installed.

The aid granted both by the Central Administration and the European Commission has been distributed, in some cases, in a non-discriminatory way, and there has been no explicit focus on reducing the cost of manufacturing panels, although this is probably the most urgently needed measure. This is precisely the field of action of AISEF, a non-profit Italian association for the development of photovoltaic energy created in March 2003 with the aim of starting up a “virtuous cycle” of production and sale of SPV panels and plants at attractive prices through the creation of a leasing company. The most important part of the loan will be provided by voluntary funds with the stimulus of an effective advertising campaign.

Promoter

AISEF (Italian Association for Development of Photovoltaic Energy)

Parties involved

- Public Administration bodies and the energy authority
- Banks and financial agencies
- Installers, manufacturers and electricity operators
- Local Mountain association
- Consumer associations
- Research centres
- Advertising agencies



Solar photovoltaic cell

Objectives/ Actions

In view of the fact that the development of photovoltaic energy production in the past 20 years has been confined to a very small quota of renewable energy sources due to the high costs of SPV panels and plants, AISEF is determined to achieve the following objectives:

- **Raise the public’s awareness of the importance of RES and SPV energy** in particular.
- Choose a suitable set for research centres and start-up a process to **decrease the cost of production of SPV panels.**
- Initiate an experimental low-cost “ready-to-fit” production SPV module.
- Stimulate and make deals with small local companies for the installation and maintenance of home and domestic low-power plants.
- Promote the installation and maintenance of **large photovoltaic production plants in mountainous areas.**
- Involve leasing and financing institutions for long-term financial loans.
- Set up a relevant number of maintenance companies able to perform **remote supervision, remote control and technical assistance for low-power domestic SPV plants.**

The association has set itself the target of installing about 3,000 SPV domestic low-power plants of 3 Kw/p each in a period of 22 to 26 months at a cost, for the final user, of 6,000 € per plant. Each plant will produce 8,000 MWh/ year of electricity, which is equivalent to a saving of 1,600 tonnes of oil.

The revenues from these first plants can then be used to install another 3,000 SPV domestic modules in the next year or year and a half, and so on. As can be seen, this formula creates a revolving fund available for SPV projects and will hopefully contribute towards achieving economies of scale.

LOW COST photovoltaic energy

Actions

The Association's plan of action can be outlined as follows:

In the initial stage, the Association will concentrate on the activation of Internet and telephone systems, the presentation of the initiative to several public bodies, public corporations and banks. The initial funds will be raised with a limited amount of advertising.

Subsequently, suitable research centres will be selected so they can begin working on reducing the cost of SPV cells. Some time later, an experimental production process should be ready for commercialisation. The idea is to install a number of experimental plants for energy production both in the mountains, for high power generation, and on individual houses for family usage.

The programme also includes a pilot phase for the production of hydrogen coming from SPV cells.

Action	Timing
Presentation to the public	4-6 months
Initial fund raising	8-10 months
Selecting a head office	2 months
Large scale advertising	18 months
Starting research centre	4 months
Starting production	4 months
Large scale advertising for customers	8 months
Installation	6 months

Results

As the Association has just been set up, the results are not yet visible. If the objectives mentioned in earlier sections were to be achieved, the natural consequences of the programme would be the following:

- Increase in SPV energy available for the country.
- Decrease in oil usage and therefore a reduction in the dependence on foreign countries for energy.
- Possibility of increasing the presence of Italian SPV companies in other EU countries.
- Favourable environmental impact.

Every 1,000 Kwh produced with solar photovoltaic energy can entail a reduction in consumption of 0.2 tonnes of oil and an avoidance of around 750 kg of CO₂ emissions. In environmental terms, it is also worth noting that this brings with it a reduced risk of environmental disaster resulting from the transporting of oil by ship.

Financial resources

As stated in previous sections, the funds will be mainly provided by public voluntary contributions drawn from a variety of sectors. To get started the programme requires a minimum allocation of 500,000 €. The revenues raised in any one period with the installation of SPV plants will be used to fund later stages of the programme.

Other potential sources of financing may include central or regional administrations and European programmes.

Management

The staff of AISEF will manage the programme. When a sufficient contribution level has been accumulated, AISEF will outline an activity plan related to it, which takes public participation into account.

Monitoring

The monitoring of the programme will be carried out on the basis of the activity plan described above. The promoter's view is that if there are no relevant economic results in a period of 18 to 24 months the association will probably be wound up.

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Sector: RES
Country: Portugal
Location: Nationwide Action

PORTAL DAS ENERGIAS RENOVÁVEIS

www.energiasrenovaveis.com

Background

Portugal, like the rest of the EU Member States, is highly dependent upon fossil fuels for its energy supply. This is why the national authorities have set the overall target of obtaining 39% of electricity from renewable sources of energy. In order to achieve this, in 2001 the Portuguese Government published the E4 Programme, which promotes some forms of renewable energy and energy efficient technologies, such as solar thermal energy and energy efficiency in buildings.

Dissemination tools in general and information technologies in particular are meant to play a key role in the attainment of such targets. This is the spirit that lies behind the creation, in 2002, of a professional internet portal, called "energiasrenovaveis", intended to provide the Portuguese market with internet and engineering solutions affordable to SMEs so they are able to utilise the world wide web in a way that allows them to expand their own business. The RE portal is owned by Enerlink divulgação e tecnologias informáticas, Lda. and is currently financed by companies advertising on the portal. However, the promoters are looking for additional sources of funding.

Promoter

Enerlink divulgação e tecnologias informáticas, Lda.

Parties involved

- SPES (Sociedade Portuguesa de Energia Solar): images and information
- NREL: images
- ARENA (Agência Regional da Energia da Região Autónoma dos Açores): images
- ENERGAIA: information



Home site of www.energiasrenovaveis.com

Objectives/Actions

Energiarenovaveis.com was conceived of as an **advanced tool for the promotion and dissemination of renewable energy technologies in the Portuguese speaking world** and became the Portuguese RE Portal, given that there were no specific Internet sites focused on this issue.

The project began with a compilation of information on RE technologies and companies, which was used to compile a database. This was done during the final months of 2002, together with the general design of the site, which had to combine a user-friendly format and comprehensive information.

The site is subdivided into several technological areas: biomass, wind, geothermal, hydro, solar and ocean/wave-power. Recently, hydrogen has been added. Each of these areas contains some background information for educational purposes, complemented with technological sections and a "news" section which includes recent developments, applicable legislation, grants that have been awarded and seminars that are being organised. Finally, each area has links to other relevant bodies and companies.

The site has a mosaic of other small sections, such as a new section, which brings together RES-related news items that have appeared in the media, a job-opportunities section, a glossary, a virtual library and even a chat feature.

An important part of the site is a database of RE companies, arranged by technological area. In July of this year, the site will begin launching an electronic newsletter with outstanding news and figures. In the future, it will also allow visitors to offer their opinions and suggestions.

The initial target of the site was to attract 50 visitors per day. Now, the figure has risen to 100 per day and, in 2004, it is expected to reach 200. Actual visitors number will be monitored through an internal statistics system, which will provide extensive information about the number and type of people who visit the site, the most visited pages, length and time of the visits, etc.

There are two types of periodical updates:

- Weekly: News and information (some times can be daily, depends on the availability of material).
- Monthly: Dossiers and Interviews.

Obviously, the site is fed with information provided by other public and private organisations that operate in the area.

Results

The main merit of the portal is that, for the first time, Portuguese-speakers can have access to RE comprehensive information nation-wide using a single, continuously updated, Internet tool. In the medium term, it is expected that such a tool will contribute to raising the awareness of the public and private sectors. Some noteworthy outcomes achieved include:

- Around 100 visitors a day.
- Database of more than 50 RE companies operating in Portugal.
- Thirty-one publications already on-line.

Financial resources

Most of the funding has come from Enerlink (around 900 € a year). Another 300 € comes from private sources, which advertise on the site.

Management

Four people work on the updating and maintenance of the web site: collecting news, creating dossiers and interviews, developing news areas and functions, etc. The office is located at Enerlink's headquarters in Lisbon.

Monitoring

As explained in earlier sections, the site will be assessed after it has been in operation for two years in order to detect new areas in which it might be extended, to restructure certain sections and possibly replace those that prove not to be of interest.

Obviously, the creation of a "public opinion" section in the site will contribute to improving its quality and usefulness.

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Sector: RES
 Country: France
 Location: Region of Rhône-Alpes

RES

today in the Rhône-Alpes region

Background

After the petrol shocks of the 1970s, the Regional Council of Rhône Alpes committed itself to control energy demand and exploit local resources. The continued pursuit of this policy has made it possible to identify and develop the niches best suited to the potential of the Rhône-Alpes (wood energy, solar heating and drying, standalone renewable energy sources, grid connected photovoltaic systems, water-supply micro-hydropower), help control works under study and implement demonstration facilities, and develop networks of institutional, professional and associational partners and bolster their competencies.

In 1995, the Regional Council decided to set up the DEE, a body to manage energy and environmental issues and RhônAlpénergie became RhônAlpénergie-Environnement. In 2001 the DEE merged with the agriculture and forestry department to create the current DAFEE (*Direction de l'Agriculture de la Forêt de l'Environnement et de l'Energie*), which is closely bound up with the regions' economic development.

Promoter

Rhône-Alpes Regional Council

Parties involved

- Territorial groups
- Professionals
- ADEME
- Associations
- Other governmental bodies



District Heating plant Saint Marcelliu

Objectives/Actions

The aims of the strategy pursued by the Council are to **demonstrate the interest of renewable energy sources for the diversification of energy resources, the maturity of the technologies and the professionalization of the actors.** In terms of the social benefits, the project is creating employment in the area and reducing the cost of energy for use in social housing. In environmental terms, the exploitation of local resources has an impact on the landscape, particularly in the case of wind farms. However, it has many advantages in terms of improved resource management (forests) and a reduction in pollution associated with the use of non-renewable resources, in particular greenhouse gases.

In this context, in 2000 the Regional Council decided a series of measures which could be summarised as follows :

Bolstering the aid to develop solar-thermal energy particularly in social housing and water-supply micro-hydropower.

Diffusion of mature technologies at the level of individual homes, domestic hot water, combined systems, grid-connected photovoltaic systems and automatic wood-fired heating systems.

Stepping up measures to promote the diffusion of wood energy and demonstration of other branches of renewable energy, particularly wind power, biogas and biofuels.

In parallel, **actions accompanying** this policy have been put in place, ensuring an overall role for the resource and assistance centre in certain flagship projects and for specific programmes, and for local associations in providing information and advice and promoting renewable energy through local partners and the public at large.

The "energy of today" call for proposals in Rhône-Alpes has been relaunched by the Region and ADEME in conjunction with RhônAlpénergie-Environnement.

At the initiative of SEPELCOM and in conjunction with the Regional Council, ADEME

RES today in the Rhône-Alpes region

and numerous partners, a renewable energy trade-fair was organized in parallel with EXPOTHERM, EXPOBOIS and SANIPOLIS in February-March 2001 and 2003 at EUREXPO (programme included herewith).

ADEME, the General Council of Savoy and the Regional Council launched a study leading to the setting up of a national solar energy institute INES (*Institut National de l'Energie Solaire*) at TECHNOLAC near Chambéry.

Results

- Considerable growth in the number of solar water heaters: from 120 in 2000 to a forecast 900 in 2003. Diffusion in social housing has been slower to take off, but in 2003 there was a significant increase.
- The publication of buy-back rates by the electricity grid for renewable electricity should provide a sufficient incentive for the launch of new wind farms. In fact, only one project is under construction (20 MW) and a 10 MW project is due in 2004 (without investment subsidies from the Regional Council).
- The reduction in greenhouse-gas emissions brought about by the programme as a whole came to almost 90,000 tonnes of CO₂ a year at the end of 2003.

Financial resources

The table below shows the growth in the subsidy budgets allocated to renewable energy sources, which, in the context of its desire to maintain tax stability, is a clear indication of the Regional Council's interest in the subject.

Renewable Energie	2000	2001	2002	2003	2004 Forecasts
Subsidies for studies and investments (M €)	3.126	3.289	3.688	5.8	7.8
Number of applications handled a year	363	564	1,087	1,500	2,300

Management

The programmes are managed by the Regional Council and ADEME under an agreement signed in September 2001, which envisages each organisation's managing aid according to its own procedures once agreement has been reached on project technology.

Monitoring

An evaluation of the energy policy may be proposed after the regional elections due in 2004.

The regional energy observatory (*Observatoire Régional de l'Energie*) will be responsible for monitoring of the regional energy balance in terms of greenhouse-gas emissions.

Contact

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Sector: RES
Country: Spain, France, Italy and Germany
Location: Municipalities and districts

SIBART

seeing is believing as replication tool

Background

As in many aspects of life, the saying "seeing is believing" is the best way of breaking the barriers of the incredulous. The Kronsberg district in Hanover has created an exemplary urban development with solutions that have proved to be energy efficient and economically feasible for a wide urban sector. In total, over 6,000 homes (15,000 inhabitants) which have been built to high environmental standards: these include water saving concepts, efficient traffic and transport systems, large-scale integration of renewable energy sources, district heating, passive and active solar and challenging social plans.

In order to generalise this and other exemplary practices to other European cities, the European programme Altener has supported a project responsible for introducing this experience, SIBART, which stands for "Seeing Is Believing As a Replication Tool". The project ran from 1st January 2002 to 30th September 2003.

Promoter

Geohabitat

Parties involved

- ADEME
- Hanover City Council
- Energie-Cités
- SOFTECH (Italian Energy Technology Environment Group)
- BRE (the UK institution dealing with all the energy developments)
- IDAE



Solarcity at Kronsberg district

Objectives/Actions

The aims of the SIBART Project are to:

- **Disseminate good building practices**, by financing schemes and energy codes.
- **Integrate the use of renewable sources of energy** and rational use of energy in buildings.
- **Inform on pioneering programmes** to develop social awareness and acceptance of sustainable urban development concepts.

The starting point of the project is the example provided by the district of Kronsberg. During the first phase, the partners **collected relevant information** on economic, technical, environmental and energy fields that were used for the construction of the Kronsberg district concept. All these documents were translated into several languages (English, French, Spanish and Italian) and constituted the basis for the **preparation of a Handbook** that acts as a guide to help key agents in municipalities to understand what the district of Kronsberg is and how it was created. The experience of other cities with good records (Malmö, Helsinki, Utrecht, Linz, Maersfoort, Oslo, London, Lyon, Turin, Copenhagen and Freiburg) was also used.

Each participant organised a number of **workshops in their respective countries** with the aim of presenting the details of their experience effectively. Thus, the workshops focused on the interests of different actors (architects, builders and municipal officers) and were conducted in native language by experts that explained the general facts and the concrete aspects interesting any of these groups. All attendees received a copy of the Kronsberg Handbook and complementary material as an additional support to the workshop. In total, more than 50 workshops with 2,000 participants were held.

As a close to the SIBART project, an **international symposium** was organised **at the Hanover-Kronsberg district** from 14th to 16th of May 2003. The event comprised the celebration of several meetings with city planners, city officers and communication channels and a special session with architects and builders on the construction process. In addition, two technical visits in the district took place, in parallel with the presentation of other European sustainable development experiences. The event was attended by nearly

SIBART seeing is believing as replication tool

150 experts from the building sector, predominantly from France, Italy and Spain.

SIBART produced several information tools, in particular a web site dedicated to this project, a virtual library and five newsletters.

Results

- Over 2,000 building-sector professionals from four different countries got first hand information of a successful case study with high replication potential.
- More than 50 workshops held in the main English French, Italian and Spanish cities.
- A web site dedicated to the project.
- Five electronic newsletters with “hot news” on the building sector and EU programmes.
- A professional handbook.

Financial resources

As stated previously, the project was funded by the European Commission through the Altener Programme. The table below shows how the funding was divided between the different partners and the EC:

Sources of financing	Allocation (in €)
EC contribution	369,880
Partner's financing	369,880

Management

The project was co-ordinated by Geohabitat SA, in Spain, but all the tasks required a considerable input from the other members, in special the preparation of the handbook, the design of the dissemination tools and the organisation of the final seminar.

Monitoring

At the end of each workshop a questionnaire was distributed to the participants in order to obtain feedback on the usefulness of the seminars and to be able to make the appropriate changes, if necessary. Periodic reports were prepared and submitted to the European Commission.

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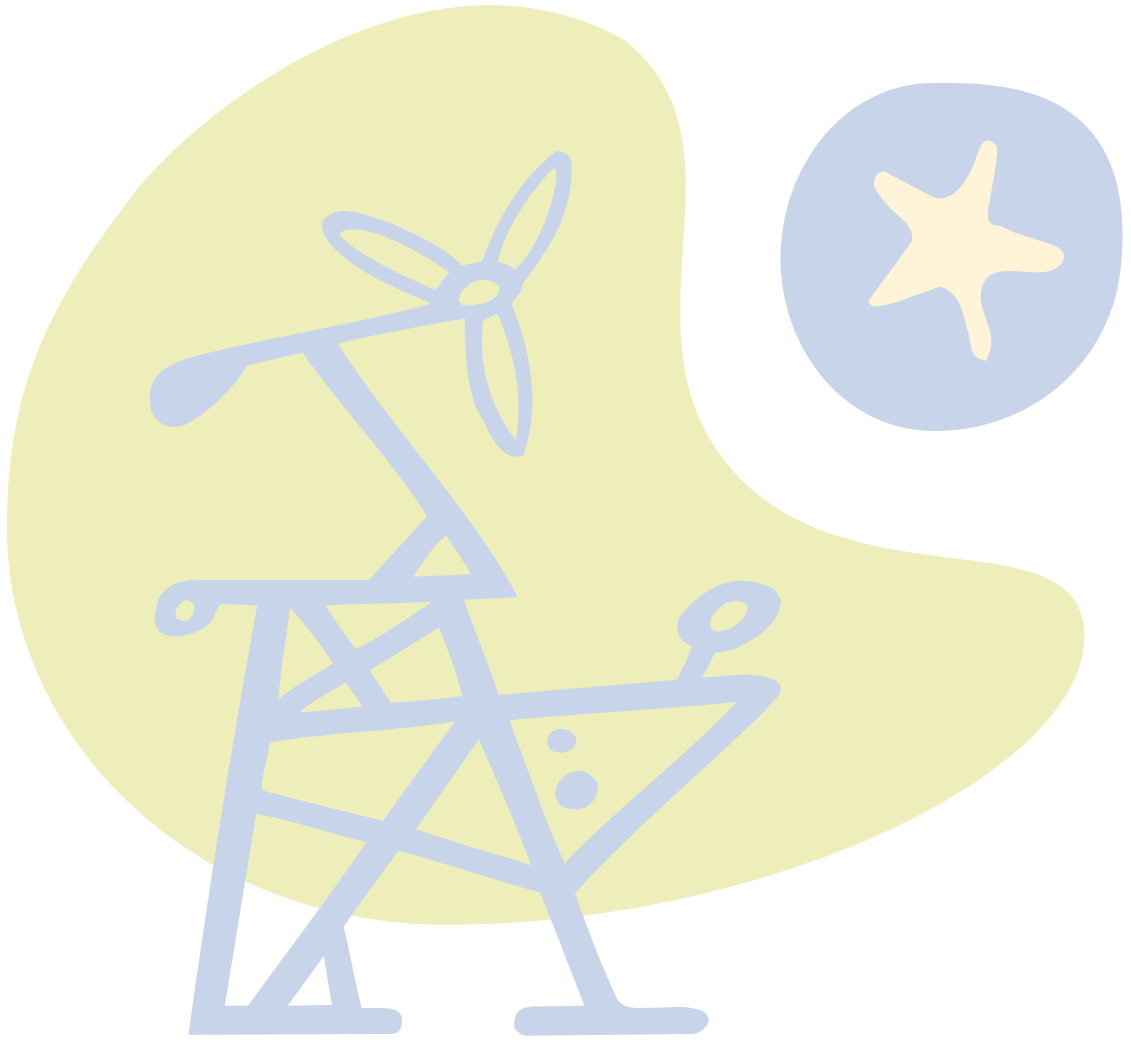
www.geohabitat.es

www.sibart.org

8

The REGBIE project





Regional Biomass Initiatives around Europe

REGBIE

Background

Biomass, including wastes, is the most important renewable energy source in the European Union. In 2000 it contributed 53,690 thousand toe to primary energy production thus representing 61.3% of all energy from renewable sources. But even though biomass could be termed the “renewables giant”, its current rate of development and growth is not sufficient to reach the objectives set out in the White Paper.

Since the main use for biomass has traditionally been for heating, increasing the proportion of electricity generation from biomass still requires a considerable effort to be made. Forecasting an average annual growth of 10% for the least developed markets in the EU and 1% for the leading countries, the energy production of solid biofuels could reach 62 M toe in 2010 – far below the 100 M toe needed to meet the White Paper’s target.

In order to achieve significant market growth and investment in biomass facilities, overall promotion of the diverse modern technologies involved is essential. These promotional activities have to accommodate the specific regional needs and structures, include a targeted building up of networking and also advisory services and an information infrastructure.

At the beginning of 2003 the network Regional Biomass Initiatives around Europe (REGBIE) set out to create an European platform for promotional biomass activities at regional level throughout Member States and Candidate Countries. REGBIE aims to develop practical promotional tools for all relevant areas of this technology such as political, legal and economic conditions, technical developments, pilot- and demonstration projects, information and marketing measures. These actions are clearly targeted to achieve rapid, visible and sustainable growth of the bioenergy market in the partner regions involved.

REGBIE will be implemented by partners from Austria, Denmark, Germany, Hungary, Italy, Lithuania, Poland and Sweden and is coordinated by the Hanover-based agency target GmbH from Germany.

Promoter:

Target GmbH, Germany

Parties involved:

- Ambiente Italia srl, Italy
- BAPE Baltic Energy Conservation Agency, Poland
- Energikontor Sydost, Sweden
- Energy Centre Hungary, Hungary
- Folkecenter for Renewable Energy, Denmark
- GDE-net, Sweden
- Lithuanian Energy Institute LEI, Lithuania
- O. Ö. Energiesparverband, Austria
- Ökoinstitut Südtirol/Alto Adige, Italy



Objectives/Actions

The overall objectives of REGBIE are:

- **Achieving the bioenergy target defined in the European White Paper** at regional level by consultations with relevant decision makers (manual workers, farmers, urban development planners, local authorities, etc.)
- **Analysing potentials**, describing obstacles and market barriers to implementation.
- **Overcoming market barriers.**
- **Defining regional strategies** for implementation in relation to regional policies and activities (regional objectives, target groups, schedules, milestones).
- **Exchange of implementation instruments** and tools between transnational project partners.
- **Supporting project partners** from the EU candidate countries Poland, Hungary and Lithuania.
- **Information on best practice** examples and exchange of experience.
- Compilation of **technical and legal guidelines** in the partner regions.
- **Europe-wide dissemination** of project results.

Regional Biomass Initiatives around Europe – REGBIE

List of parties involved

Summary of activities and individual REP contact details.

Institution	Main actions	Contact details
Ambiente Italia srl, Italy	Planning, implementing and monitoring promotional activities for biomass in the Apennine region (1,000,000 inhabitants).	Mr. Rodolfo Pasinetti Ambiente Italia srl Via Carlos Poerio 39 I-20129 Milano, Italy Tel.: 00 39 2 27 74 41 Fax: 00 39 2 27 74 42 22 rodolfo.pasinetti@ambienteitalia.it www.ambienteitalia.it
BAPE Baltic Energy Conservation Agency, Poland	Planning, implementing and monitoring promotional activities for biomass in Pomerania and Mazurka (2,190,000 inhabitants), setting up a regional information and advisory office.	Ms. Katarzyna Grecka Bałtycka Agencja Poznańowa Energii S.A. Ul. Stranganiarska 24-27 PL-80-37 Gdansk, Poland Tel.: 00 48 58 3 06 24 61 Fax: 00 48 58 3 05 84 36 opet@bape.com.pl www.bape.com.pl
Energikontor Sydost, Sweden	Planning, implementing and monitoring promotional activities for biomass in Southeast Sweden (420,000 inhabitants).	Mr. Hans Gulliksson Energikontor Sydost PG Vedjesväg 15 S-35196 Växjö, Sweden Tel.: 00 46 470 71 33 21 Fax: 00 46 470 77 89 40 hans-gulliksson@energikontor-so.com www.energikontor-so.com
Energy Centre Hungary, Hungary	Setting up a regional information and advisory office.	Ms. Agnes Csolti Energy Centre Hungary Raday u. 42-44 H-1092 Budapest, Hungary Tel.: 00 361 45 6 43 12 Fax: 00 361 45 6 43 01 agnes.csolti@energycentre.hu www.energycentre.hu
Folkecenter for Renewable Energy, Denmark	Planning, implementing and monitoring promotional activities for biomass in Denmark (5,280,000 inhabitants).	Mr. Niels Ansø Folkecenter for Renewable Energy Kammersgaardsvej 16, Sdr.Ydby DK-7760 Hurup Thy, Denmark Tel.: 00 45 97 95 66 00 Fax: 00 45 97 95 66 65 na@folkecenter.dk www.folkecenter.dk
GDE-net, Sweden	Planning, implementing and monitoring promotional activities for biomass in Middle Sweden (556,000 inhabitants), setting up a regional information and advisory office.	Mr. Anders Backman GDE net Björkhagsgatan 10 S-81332 Hofors, Sweden Tel.: 00 46 290 2 41 60 Fax: 00 46 290 2 24 70 anders.backman@x.komforb.se www.x.komborb.se

Regional Biomass Initiatives around Europe – REGBIE

Institution	Main actions	Contact details
Lithuanian Energy Institute LEI, Lithuania	Planning, implementing and monitoring promotional activities for biomass in Lithuania (3,680,000 inhabitants), setting up a regional information and advisory office.	Mr.Vladislovas Katinas Head of Renewable Energy Laboratory Lithuanian Energy Institute (LEI) Breslaujos 3 3035 Kaunas, Lithuania Tel.: 00 370 37 40 18 41 Fax: 00 370 37 35 12 71 dange@isag.lei.lt www.lei.lt
O. Ö. Energiesparverband, Austria	Planning, implementing and monitoring promotional activities for biomass in Upper Austria (1,380,000 inhabitants).	Ms. Christine Öhlinger O. Ö. Energiesparverband Landstraße 45 A-4020 Linz, Austria Tel: 00 43 732 7 72 01 48 61 Fax: 00 43 732 7 72 01 43 83 chrsitne.oehlinger@esv.or.at www.esv.or.at
Ökoinstitut Südtirol/Alto Adige, Italy	Planning, implementing and monitoring promotional activities for biomass in provinces of Bolzano and Trento (937,000 inhabitants), setting up a regional information and advisory office.	Dr. Hans Glauber Managing Director and President Ökoinstitut Südtirol / Alto Adige Talfergasse 2 I-39100 Bozen, Italy Tel.: 00 39 04 71 98 00 48 Fax: 00 39 04 71 97 19 06 oekoist@tin.it www:
Target GmbH, Germany	Key REGBIE coordinator, planning and implementing a model biomass campaign in Lower Saxony with key focus on the Region of Hannover (1,750,000), setting up a regional information and advisory office.	Mr. Andreas Steege Managing Director target GmbH An der Markuskirche 1 D-30163 Hannover, Germany Tel: 00 49 511 90 96 88 42 Fax: 00 49 511 90 96 88 40 steege@targetgmbh.de www.targetgmbh.de



Regional Biomass Initiatives around Europe – REGBIE

There are five key fields of the REGBIE activity, which are due to be implemented by the partners:

Regional networking

Each partner will build up a regional network to support the promotion of biomass technologies. Stakeholders from administrative bodies, trade associations, environmental organisations and regional business are going to be involved. A key target is to build up specific biomass information and advisory services for policy-makers.

Regional campaigning and promotion

A regional biomass model campaign is due to be carried out in the Lower Saxony with the focus on the region of Hanover. The concept and approaches will be made available to the other partners. Each partner will plan and implement similar promotional activities in order to kick-start biomass demand and supply. In some cases a preparatory assessment of the regional market situation and biomass potential will be carried out. Some partners will set up regional information and advisory offices with the task of installing a key contact point for interested investors, potential users and suppliers.

Monitoring and market assessment

All the activities implemented will be subject to monitoring and continuous assessment.

European exchange of best practices

One central milestone of REGBIE will be the compilation of a campaign manual with tools, instruments, experiences and other useful information from all the activities implemented within the scope of REGBIE. The campaign manual will be made available to all interested parties anywhere in Europe.

European networking

General networking and dissemination is a vital aim of the project, especially in the case of knowledge transfer from advanced regions to those involved in Lithuania, Hungary and Poland.

Results

Since the regional REGBIE activities have just started, it is still too early to give objective results. Generally, the expected outcome is a strong marketing and image improvement for bioenergy technologies and visible steps towards a market breakthrough for bioenergy-related technologies. Bioenergy is an indigenous energy source and the increasing use of bioenergy, whether in the form of solid or liquid biofuels or biogas, will help regional trade and the economy.

Financial resources

In order to implement the tasks defined in the REGBIE concept a budget of 1,200,000 has been allocated. Since REGBIE is an ALTENER project, 50% of these costs will be provided by this European support programme. The remaining costs will be covered by project partners or third-party financing. Project partners will build up regional networks to encourage additional financial contributions.

Management

Each REGBIE partner will manage the regional activities, which are subject to the overall transnational exchange and dissemination. The overall REGBIE coordinator and key contractor of the European Commission is Target GmbH from Hanover, Germany.

Monitoring

The assessment of the promotional activities and the campaign are an integral part of the project and will be oriented at measuring regional indicators such as sales numbers, market development, public awareness and the image of bioenergy in general and the campaign, information needs and buying motives. Constant monitoring of the campaign will be carried out by the regional coordination offices and will also include polling the key target group as well as the organisations involved. Monitoring is due to start in July 2004, after the first round of activities has been implemented.

Contact

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