Intelligent Energy Europe

ELECTRICITY FROM RENEWABLE ENERGY SOURCES

13 innovative projects for an energy-intelligent Europe

Status: December 2006

Editorial Information

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The Intelligent Energy Executive Agency implements the IEE programme. With more than 40 staff, the IEEA is at the service of all IEE partners by managing the different projects and events funded under the IEE programme, and by disseminating the know-how and best practices which they produce.

More details on the IEE programme and on the IEEA can be found on
http://ec.europa.eu/energy/intelligent/index_en.html

Table of contents

Introduction

Background

Vertical Key Action 5 – electricity from renewable energy sources – is focused on the promotion and implementation of the Directive 77/2001 Electricity produced from renewable energy sources, and its projects build on related EC Communications, such as “The share of renewable energy in the EU”, “The support of electricity from renewable energy sources” and the Biomass Action Plan. Typical VKA5 activities include monitoring the development of renewable electricity, looking at potentials and targets, analysing support mechanisms, identifying non-technological market barriers, assessing the regulatory framework for distributed generation, grid connection and grid integration, and promoting the use of green electricity.

Renewable electricity is the most advanced of the RE sectors with already reasonably developed market and business structures in some Member States. This explains why most of the VKA5 activities reach beyond general awareness raising and promotion. In fact, VKA 5 has quite a strong strategic dimension and covers activities and assessments with mainly European and national but also local impact. It addresses both, technology-specific and horizontal questions related to the current and future use of renewable electricity.

Target Areas and Priorities

Vertical Key Action 5 addresses five “Target Areas”:

1. National indicative targets: Actions to increase the future share of RES electricity (e.g. through benchmarking and new approaches to use/interpret data).

2. Support schemes: Actions to add value to existing support schemes to improve their operational efficiency and market impact.

3. Grid system issues (in first instance large-scale integration): Addressing potential impacts on RES markets following from changes in the distribution/transmission networks.

4. Green electricity: Actions to foster marketing of green electricity, including information campaigns, to improve measures or to help new actors to participate in RES markets.

5. Distributed electricity generation: Actions to address policy, legislative or standardisation issues related to distributed generation from RES (including CHP based on biomass), effects of intermittency, potential benefits of intelligent grid control, demand management and storage systems.

Lessons learnt

Until now and for the current range of projects, the following general observations can be made:

- The renewable electricity sector is a quite advanced sector with already well developed market and business structures. Most of the activities reach beyond general awareness raising and promotion. Issues like favourable, reliable and forward-looking policy frameworks, investment security, access to electricity grids and fair regulation, operation and maintenance etc. dominate the picture.
- Although the sector is generally very dynamic and well developed, it still faces considerable regulatory, administrative and grid barriers
- Some of the projects complement or build on ongoing/concluded research activities and sometimes involve modelling tasks.
- The consortia include more and more stakeholders from industry, utilities, network operators and regulators, the financial sector, authorities and NGOs.
- Organisations from the new Member States are still not sufficiently represented and involved
- The project teams increasingly involve stakeholders in the course of their project, e.g. by means of advisory boards or special work shops in order to make the project results more transparent and acceptable
- The dissemination efforts have generally improved considerably but still need to be given even higher priority; in times of a growing flood of information, information needs to be well targeted, concise and well prepared in order to reach the respective target groups
- The projects can gain a remarkable visibility provided that the project teams develop an effective and targeted dissemination strategy and are creative in using a variety of different channels.

Clean Energy Network for Europe (CLEAN-E)

Programme area:	ALTENER, electricity from renewable energy sources
Status:	Ongoing
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Website:	www.eugenestandard.org/clean-e
Objective:	Strengthening and harmonising green power labelling activities across Europe
Benefits:	Green power labels help consumers to verify the ecological performance of green power offerings
Keywords:	Labelling, green electricity, market transparency
Duration:	01/01/2005 – 31/12/2006
Budget:	€ 940,082 (EU contribution: 50%)
Contract number:	EIE/04/136/S07.38593

Short description

The CLEAN-E project strengthens and harmonises green power labelling activities across Europe by supporting the development of green power labels in a sample of EU Member States, notably France, Spain, Italy, Austria and Sweden. The project is part of a broader network: Its results feed into Eugene, an independent network of non-profit organisations working already on green electricity labelling throughout Europe.

"Green power" means for the CLEAN-E partners that electricity producers reduce environmental pressures from power production to a degree which is below 'business-as-usual', realising thus additional improvements compared to what would happen anyway under current conditions. This principle is called 'additionality'. It can be achieved by either producing greater quantities of green power - which is in particular electricity produced from renewable energy sources - than could be expected under current conditions (which are determined by existing sources and the effects of public support), or by decreasing the environmental impact of existing green power plants beyond mere compliance with existing regulation.

Expected and/or achieved results

- New green power eco-labels in France, Italy and Spain including the establishment of sound labelling structures and the development of label criteria. Existing labels (e.g. in Sweden and Austria) are intended to be improved towards a harmonised European standard.
- Guidelines how to implement ecological minimum standards for hydropower and biomass in the scope of green power labels.
- Procedures and methodologies how to integrate measures in the field of energy efficiency and RES-H.
- Guidelines how to integrate new policies on the EU and Member States' level (e.g. Guarantee of Origin, Electricity Disclosure) and private sector initiatives (such as RECS) in green power labelling schemes.

Lessons learnt

Although the project has not been completed it is possible to draw the following preliminary conclusions:

- Electricity customers (residential customers and also business firms) are interested in green power products and look for independent eco-labels as a guidance to their purchase decision.
- The prospect of success for voluntary green power offers especially depends on the market conditions a green supplier is operating in.
- Widespread acceptance of the concept of 'additionality' as well as a minimum demand for labelled green power (in particular from some large business customers) are key prerequisites for a successful start up of a new quality label.
- Label criteria need to be thoroughly adjusted to national framework conditions (such as public support instruments for renewables) in order to facilitate 'additionality'.

Enhancement of sustainable electricity supply through improvements of the regulatory framework of the distribution network for distributed generation (DG-GRID)

Programme area:	ALTENER, RES Electricity
Status:	Ongoing
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Website:	www.dg-grid.org
Objective:	Improvement of regulatory arrangements between distributed generation and the electricity distribution network
Benefits:	Larger deployment of distributed generation at lower costs and secured reliable electricity supply
Keywords:	Distributed generation, economic regulation, electricity distribution networks
Duration:	01/2005-06/2007
Budget:	€ 957,890 (EU contribution: 50%)
Contract number:	EIE/04/015/S07.38553

Short description

The DG-GRID project is aiming at a better deployment of distributed generation (renewables, CHP and other small generation) by improving the coordination between distributed generation (DG) and the electricity distribution network. Improved coordination can be realised by a more adequate framework that regulates the distribution network operators business and determines regulatory arrangements between DG and electricity distribution networks. New innovative approaches in network planning and operations will provide opportunities for larger DG deployment at relatively low costs. Based on several studies, the DG-GRID project will develop guidelines for improved regulation, network planning and the enhancement of integration of DG in the electricity supply system in both the short and long term.

Expected and/or achieved results

- Review of the current electricity network regulation in 15 EU Member States.
- Analysis of possible innovations and long-term development of electricity grids.
- Assessment of the costs and benefits for the electricity network in the case of large penetration of DG.
- Analysis of new regulatory arrangements for economically viable grid system operations by operators of the electricity distribution grids.
- Guidelines for improvement of electricity network regulation.

Lessons learnt

Although the project has not been completed, it is possible to draw some preliminary conclusions. Based on the review of current regulation the following preliminary recommendations were formulated:

- Incentives for distribution system operators (DSOs): The regulatory framework should include incentives for DSOs to integrate DG. The remuneration schemes for operational and capital expenditures and the benchmarking procedures should take into account the connection and management of DG. Additional incentives should be considered to promote innovation and R&D activities by DSOs
- Connection charges: Deep connection charges that include reinforcement costs should be avoided. Either a shallow charging policy could be adopted or the use of system pricing methodology could be reformulated to allow the financial recognition of DG contribution to the network costs.
- Ancillary services and balancing: Participation of DG in ancillary service and balancing markets can be enhanced if market rules accept aggregation of small individual generators. The timeframe for announcing estimated production in balancing arrangements should become smaller.

European Local Electricity Production (ELEP)

Programme area:	ALTENER, RES Electricity
Status:	Ongoing

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Website:	www.elep.net

ELEP
european local electricity production

Objective:	Removing policy, commercial and regulatory barriers to DG & RES
Benefits:	Lower fossil fuel use, emissions & energy costs. Higher reliability.

Keywords:	DG, Policy, Legislation

Duration:	01/2005 – 06/2007
Budget:	€ 1,029,000 (EU contribution: 50%)
Contract number:	EIE-04-175- S07.38664

Short description

The ELEP project will help remove a number of main obstacles that are currently restricting the uptake of DG and renewable energy systems (RES) in Europe by addressing 5 major policy or legislative barriers that currently limit the uptake of DG:

- Interconnection
- Certification and authorisation
- Charging mechanisms, planning procedures and metering
- The commercial value of DG and RES
- Energy efficiency and demand side management

The decentralised production of electricity, or distributed generation (DG) is defined as the approach whereby electricity is generated close to the point of consumption. This decreases the need for large electricity systems and opens up opportunities for improvements in energy efficiency, energy usage and the increased use of new and renewable energy sources.

Expected and/or achieved results

- Detailed recommendations for the definition of an EU interconnection standard for DG and RES
- Detailed EU policy guidelines on connection charging, stranded cost charging, ownership and control of DG/RES equipment, and net metering & feed-in tariffs
- Recommendations for new commercial mechanisms reflecting the total value of DG and RES, particularly in relation to overall system reliability and emissions
- Detailed recommendations for a generic EU certification and authorisation procedure applicable to DG and RES of different kinds (i.e. conventional fossil-fuel based systems as well as renewable energy sources)
- A thorough understanding in Europe of DG / RES and their use & benefits in the EU electricity system

Lessons learnt

Although the project has not been completed it is possible to draw the following preliminary conclusions:

- EU Member States apply very different, inconsistent and non-transparent procedures and rules for interconnection and connection charging of new DG and RES market entrants. This creates unnecessary risk and uncertainty to project developers, and it leads to market distortion.
- As a result of the above, there is an urgent need for novel, consistent and pan-European approaches to DG interconnection rules and connection charging across the whole of the EU.
- The documents produced by the ELEP consortium offer some practical policy and legislative proposals for consideration by policy makers and stakeholders in these areas. These will be updated as more outputs of the project are delivered.

A European Tracking System for Electricity (E-TRACK)

Programme area:	ALTENER, Electricity from renewable energy sources; and SAVE, Innovative approaches in industry
Status:	Ongoing

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Website:	www.e-track-project.org

Source: PhotoCase.com

Objective:	To draft a harmonised standard for tracking of electricity generation attributes in Europe
Benefits:	Increased market transparency, reduced transaction cost, reduced multiple counting of attributes, support for electricity disclosure

Keywords:	Tracking, electricity disclosure, market transparency

Duration:	01/2005 – 06/2007
Budget:	€ 1,643,934 (EU contribution: 50%)
Contract number:	EIE/04/141/S07.38594

Short description

E-TRACK analyses the requirements for tracking information on electricity generation in 31 mainly European countries. The project follows a co-ordinated European approach by taking into account the electricity market and policies which require tracking. The current situation is used to develop possible future scenarios and a blueprint for a tracking system by the end of 2006. Governments and market players in the electricity sector can use this standard for implementing the electricity labelling (disclosure) provision contained in the Electricity Market Directive (2003/54/EC) as well as other policies.

Tracked information encompasses energy source used, emissions, support granted for electricity production and further attributes. The proposed standard will support a variety of European and Member State policies such as electricity disclosure, Guarantees of Origin (GO) for electricity from renewable energy sources (RES-E) and high-efficient cogeneration (HE-CHP), support schemes for certain types of electricity generation etc.

E-TRACK addresses the different aspects of the design of a European tracking system and gives specific attention to the cost and benefits of such a scheme. The project features intensive consultations on the European level as well as on the national level.

Expected and/or achieved results

- An analysis of existing schemes for the allocation of electricity generation attributes, and a detailed insight into the policy and market requirements for the design and operation of tracking systems
- A draft blueprint for a co-ordinated standard for tracking electricity in Europe, including technical and non-technical aspects
- A detailed assessment of the cost and benefits of such a system
- Results from intensive consultations with stakeholders on the European and national level
- A revised blueprint for the tracking standard

Lessons learnt

Although the project has not been completed it is possible to draw the following preliminary conclusions:

- Current national systems for tracking electricity are mainly focused on national markets, vary considerably among countries and their design and interaction with related policies lead to significant volumes of multiple counting and loss of information.
- The design of a tracking standard for electricity is a delicate issue for market participants and should be developed carefully in order to produce useful results, e.g. for electricity disclosure, but at the same time not to create negative impacts on the liquidity of electricity markets.
- The preferred tracking system should feature an efficient mechanism for explicit tracking, preferably based on certificates, combined with an option to use a residual mix, which consists of statistical generation data which is corrected by those attributes which have been tracked explicitly.

EUROBSERV'ER

Programme area:	ALTENER, electricity from renewable energy sources
Status:	ongoing

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Website:	www.energies-renouvelables.org/observ-er/html/Barosom.asp

Objective:	Measure the progress made by renewable energies in each of the 25 member states
Benefits:	A measurement, analysis and forecasting tool enabling to grasp trends in renewable energy sectors
Keywords:	Monitoring, indicators, renewable energy sectors
Duration:	01/2005 – 12/2007
Budget:	€ 908,990 (EU contribution: 50%)
Contract number:	EIE/04/014/S07.38552

Short description

Since 1999, the EurObserv'ER barometer measures progress in the development of renewable energies in each EU member state. Based on a series of up-to-date energy indicators, EurObserv'ER analyses main trends in the different renewable energy sectors both at member state and EU-level. A new barometer is displayed on all project partner websites every two months, from where all barometers can be downloaded for free.
The EurObserv'ER barometer helps energy stakeholders to grasp in a very synthetic way the latest developments in the renewable energy sectors and to forecast the short and middle term evolutions that will affect them.

Expected and/or achieved results

- Publication of 18 thematic barometers (6 per year) that review the industrial and economic dynamics and growth of each member state for the eight renewable energy sectors. In 2006, the wind power and PV barometers have been published. To come: biogas and biofuels (end of May) small hydro (July), solar thermal (October), wood energy (December).
- Publication of 3 annual overview barometers that sum up the progress in the different RES sectors at EU level and compare it with the EU objectives. The overview barometer also provides a short focus on the situation of concentrating solar power technologies and wave and tidal energy technologies. The 2005 edition is available.
- Setting up of a cartographic visualisation and information query Internet module (GIS). To come in autumn 2006.
- Creation of new biomass indicators: some will be already available in the 2006 biogas barometer.

Lessons learnt

- Wind power, PV and geothermal sectors will achieve the European targets set in the White Paper.
- Other sectors need more incentive from the individual member states.

RES & micro CHP in rural lodges (GREENLODGES)

Programme area:	ALTENER, electricity from renewable energy sources
Status:	ongoing
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Partners:	ASTER, Italy ENERNALÓN, Spain Energies Environnement 74, France EDV Energia, Portugal Austrian Energy Agency (AEA), Austria AGENER, Spain CRES, Greece
Website:	www.greenlodges.net
Objective:	To promote and facilitate renewable & micro-CHP heat and electricity applications in rural lodges
Benefits:	Fossil fuel savings, environmental benefits, procedure guides in order to help the lodges's owners.
Keywords:	Rural lodges, renewable energy sources, micro-CHP
Duration:	01/01/2005 – 31/01/2007
Budget:	€ 849,652 (EU contribution: 50%)
Contract number:	EIE/04/252/S07.38608

Short description

The project aims to develop a guide that can be used by the owners/managers of rural lodges for the implementation of renewable energy and micro cogeneration systems.
Along the project most frequent energy demand patterns will be defined, in order to cover the energy demand with the best available mix of local energy resources. These patterns will be defined on the basis of energy audits developed in some lodges selected from every region.
Administrative and legal barriers as well as financial support schemes are also addressed to help the owners/managers in decision making.
All these information will be disseminated by means of regional and national workshops, regional (addressed to each regions involved in the project) and multi-regional guide (addressed to other European regions written in English language). These information can be found in English, Spanish, Greek, Portuguese and French languages in the project's web site.

Expected and/or achieved results

- Improvement in the energy management in rural lodges and facilities.
- Renewable energy implementation projects in rural lodges in order to maximise the covering of the energy demand with renewable energies in such establishments.
- Improvement of the renewable energies and micro CHP systems knowledge by owners, and guests of such lodges.
- Exchange of knowledge among the 8 participant regions regarding the different possibilities available for renewable energy sources applications in rural business
- Dissemination of information and assessment of potential of micro-CHP technologies and applications in rural business.

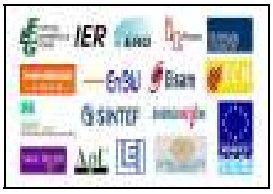
Lessons learnt

Although the project has not been completed it is possible to draw the following preliminary conclusions:

- There are great differences among the typology (size, building type, etc) and use, which leads to a very wide range of energy demand patterns, especially in what regards demand profile along the day, the week, the month and the year.
- Given the very different conventional energy cost from one region to the other, micro-CHP's profitability varies a lot, even is technically feasible in the most cases.
- There are not standardised financial mechanisms at private level, existing public support schemes (Grants, tax reduction and soft loans) for renewable and rational use-related investments.

Guiding a Least Cost Grid Integration of RES-Electricity in an extended Europe (GreenNet-EU27)

Programme area:	ALTENER, Electricity from renewable energy sources
Status:	Finished
Coordinator:	Hans Auer Energy Economics Group, Vienna University of Technology, Austria E-mail: auer@eeg.tuwien.ac.at Tel: +43-1-58801-37357
Partners:	IER, University of Stuttgart, Germany eERG, Politecnico di Milano, Italy Heat&Power, Lund University, Sweden RISOE National Laboratory, Denmark ECN, The Netherlands FhG-ISI, Germany IT Power, UK Wienstrom, Austria LEI, Lithuanian Energy Institute, Lithuania Ape, Energy Restructuring Agency, Slovenia BSREC, Black Sea Regional Energy Centre, Bulgaria EnBW, Energie-Baden-Württemberg, Germany UNIMAN, The University of Manchester, UK SINTEF Energiforskning, Norway Energinet.dk, Denmark Elsam, Denmark
Website:	www.greennet-europe.org
Objective:	Derive least cost strategies to integrate renewable electricity into European electricity grids.
Benefits:	Tailor-made guidelines and action plans on least cost grid integration of renewable electricity for key stakeholders.
Keywords:	Renewable electricity, grid-Integration, policy
Duration:	01/2005 – 12/2006
Budget:	€ 1,288,958 (EU contribution: 50%)
Contract number:	EIE/04/049/S07.38561



Short description

The core objective of the project GreenNet-EU27 is to derive least cost strategies for integration of electricity from renewables into the European power grids. Based on comparative empirical case studies, application of existing software models and comprehensive involvement of key stakeholders in the consortium still existing barriers for large-scale grid integration of renewable electricity are identified – taking into account a variety of different constraints (e.g. different system configurations of the UCTE-, Nordel-, UK-region) – and best-practice concepts to overcome these barriers are derived.

An equally important objective of this project is to disseminate several project outcomes and practical guidelines to a broad audience, especially to key stakeholders as there are decision makers, regulators, grid operators and renewable electricity generators.

Achieved results

The major products of the project GreenNet-EU27 are:

- Tailor-made practical guidelines and action plans for decision makers and stakeholders in order to establish a common understanding on strategies for least cost grid integration of renewable electricity in an extended Europe under different constraints.
- The simulation software GreenNet-EU27 modelling strategies for least cost grid integration of renewable electricity under a variety of different constraints and energy policy settings up to the year 2020 for the EU27-region.
- Comprehensive and consistent empirical data on cost-resource curves for renewable electricity generation as well as additional system operation costs and additional grid reinforcement/extension costs caused by large-scale (intermittent) grid integration of renewable electricity in different European system configurations.
- A set of comprehensive dissemination activities – incl. the project website www.greennet-europe.org – guaranteeing know-how transfer of several project outcomes (and its applications) in several European countries and regions.

Lessons learnt

Based on the results achieved in the project GreenNet-EU27 the following major conclusions are drawn:

- In different EU Member States there still exist a variety of different, non-transparent cost allocation and cost reimbursement principles for grid integration of renewable electricity and system operation. Practical guidelines to harmonise existing legislation in this context are presented in the recommendation report (action plan for decision makers) of the project GreenNet-EU27.
- From the grid-operators' points-of-view, at present there exist no incentives for large-scale grid integration of renewable electricity, since the corresponding grid-related costs are hardly eligible in the grid regulation / grid tariff determination procedures. Practical guidelines to overcome these disincentives are also outlined in the recommendation report (action plan for decision makers) of the project GreenNet-EU27.
- Comprehensive quantitative analyses (renewable electricity modelling, empirical renewable electricity case studies) provide evidence that the "overall costs" of large-scale intermittent grid integration of renewable electricity (incl. system operation costs and grid reinforcement/extension costs) are still below 10% of the long-run marginal costs of the renewable electricity generation technology itself.

Assessment and optimisation of renewable energy support schemes in the European electricity market (OPTRES)

Programme area:	ALTENER, electricity from renewable energy sources
Status:	ongoing
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Website:	www.optres.fraunhofer.de
Objective:	Derivation of effective and efficient policies supporting renewable energies in a liberalised European electricity market
Benefits:	More effective promotion of electricity from renewables at lower costs
Keywords:	Renewable energy sources, Policy, Legislation
Duration:	01/2005 – 12/2006
Budget:	€ 705,422 (EU contribution: 50%)
Contract number:	EIE/04/073/S07.38567

Short description

The effectiveness and the efficiency of current and future support schemes for electricity from renewable energy sources (RES-E) is analysed with specific focus on a single European market for renewable electricity products. Current best practices are identified, and (future) costs of RES-E and the corresponding support necessary to initiate stable growth have been assessed. Main barriers to a higher RES-E deployment as perceived by market actors and stakeholders have been assessed. The central questions of this project are the following:

- Which of the currently implemented support schemes (feed-in law, quota obligation, tender procedure, investment incentive) is most effective and which is most efficient?
- Are these support schemes compatible with the principles of the internal electricity market?
- Which innovative policies and regulatory frameworks might be alternatives to the currently existing ones?
- Is a coordination of RES-E support in Europe preferable with respect to effectiveness and to efficiency in the future and which instruments are optimal in such a scenario?

Expected and/or achieved results

- Clear empirical insights into the present success and failures to support RES-E in Europe on Member State level.
- Quantitative results on the costs and benefits of future policy options such optimised national and coordinated policy options based on the techno-economic model Green-X.
- Detailed definition of best practice criteria for renewable electricity support schemes and barrier mitigation.
- Stakeholder involvement through in-depth interviews and an internet based questionnaire.
- Recommendations and action plan on optimisation of RES-E policy measures to support policy makers on European and national level.

Lessons learnt

Although the project has not been completed it is possible to draw the following preliminary conclusions:

- The effectiveness as well as the economic efficiency of support measures for RES-E in Europe is very heterogeneous across Member States. The most effective instruments often tend to be very successful with respect to their economic efficiency as well.
- Among the key barriers hampering a faster development of RES-E in Europe administrative and regulative obstacles as well as grid connection barriers are most relevant.
- In the short to mid term the highest efficiency gains with respect to RES-E support can be achieved through an optimisation and a regional coordination of national policy measures.

PV Policy Group (PV Policy Group)

Programme area:	ALTENER, electricity from renewable energy sources
Status:	ongoing
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Partners:	ADEME, France ADENE, Portugal Austrian Energy Agency, Asutria ApE, Slovenia CRES, Greece EPIA, Belgium IDAE, Spain Senter Novem, The Netherlands WIP, Germany
Website:	www.pvpolicy.org
Objective:	Improvement of European and national political support systems for photovoltaics
Benefits:	Overcome political-legal barriers for the deployment of PV by cross-national exchange of know-how.
Keywords:	Photovoltaics, policy improvement
Duration:	01/2005 – 04/2007
Budget:	€ 1,083,045 (EU contribution: 50 %)
Contract number:	EIE/04/058/S07.38564

Short description

Eight national energy agencies and additional informal partners work together in this project to recommend how national and European policy frameworks for PV could be improved. The group addresses 3 main issues: national support schemes, PV regulatory frameworks, and monitoring systems.
A European Best Practice Report is one of the first main outcomes of the project. It examines PV policy benchmarks and draws conclusions on the most effective policy measures. It also helps national and cross-national expert groups prepare position papers and action plans for each participating country and at the European level. These documents, which will be published during the second half of 2006, are mainly written for political decision-makers.
PV Policy Group is the first purely politically oriented European PV project and will establish a cooperative basis for a better coordination of policy measures throughout Europe.

Expected and/or achieved results

- Joint European Position Paper and Action Plan (publication: end 2006)
- The Position Paper provides recommendations to European political decision-makers for a better coordination of PV policy measures for PV throughout Europe on the basis of experience made in a number of countries. The Action Plan builds upon the Position Paper and proposes concrete actions for policy improvement. The project partners commit themselves to the implementation of the proposed actions in order to continually enhance the political framework for PV.
- National Position Papers and Action Plans (publication: in the course of the 2nd half of 2006)
- Each of the eight participating countries elaborates Position Papers and Action Plans. The national papers have the same targets as the European ones but are adapted to the particular needs of the countries. They are written in the respective country's language.
- European Best Practice Report (publication: May 2006)
- With its assessment of 12 national policy frameworks for PV It delivers a comprehensive and coherent knowledge basis for the development of positions and the definition of actions. It contains detailed country analyses, benchmark analyses and delivers important conclusions for the judgement of PV policies.

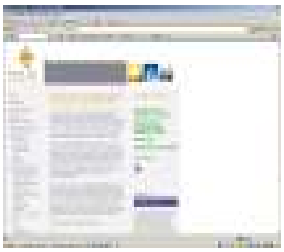
Lessons learnt

Although the project has not been completed it is possible to draw the following preliminary conclusions:

- PV policy measures and starting positions vary strongly from country to country. Therefore close cooperation, deepened cross-national discussions and actions are absolutely necessary, also after finishing the project.
- Especially the National Position Papers and Action Plans will help the respective countries for an improved political discussion of PV.
- Although the core group of the PV Policy Group already gathered eight nations it is desirable that the results are disseminated and used in non-participating EU countries.

Renewable energy and liberalisation in selected electricity markets – Forum (REALISE FORUM)

Programme area:	ALTENER, Electricity from renewable energy sources
Status:	Ongoing
Coordinator:	PD Dr. Lutz MEZ Environmental Policy Research Centre, Freie Universität Berlin E-mail: umwelt1@zedat.fu-berlin.de Tel: +49 30 838 555 85
Partners:	Center for Clean Technology and Environmental Policy, University of Twente, The Netherlands BI - Norwegian School of Management, Norway CESI RICERCA S.p.A., Italy Berliner Energieagentur GmbH, Germany Slovenski E-Forum, Društvo za energetsko ekonomiko in ekologijo, Slovenia
Website:	www.realise-forum.net
Objective:	Stakeholder dialogue on experiences with support schemes for electricity from renewables; show possible paths for a co-ordinated approach
Benefits:	Policy recommendations for future support schemes and other incentives for electricity from renewable energy sources
Keywords:	Green Electricity, support schemes, stakeholder dialogue energy policy
Duration:	01/2005 – 02/2007
Budget:	€ 946,695 (EU contribution: 50%)
Contract number:	EIE/04/085/S07.38569



Short description

Building on and complementing running national and international activities, REALISE FORUM encompasses the strategic analysis of specific support policy issues for electricity from renewable energy sources.
REALISE FORUM attempts to:

- evaluate the experience gained with feed in schemes (FIT), tradable green certificates (TGC) and other incentives in countries that are in an advanced phase of liberalisation of their electricity markets;
- create a platform for various stakeholders to discuss in a balanced way specific support policy issues and promote the exchange of information and experience;
- assess whether a co-ordinated support of electricity from renewable energy sources in Europe would represent a better solution with respect to effectiveness and to efficiency of the system;
- draw recommendations for future policymaking.

The project is managed by a joint contact point and by five national desks. These are responsible to initiate the dialogue with the key actors and target groups, examine the potential for support schemes and to estimate the costs and benefits of the various support measures.

Expected and/or achieved results

- Reports on national support systems for electricity from renewable energy sources. An independent and coherent actors-centred analysis and an assessment of the interplay between support measures and liberalisation in selected new/old Member States and Associated Countries of the EU, where the liberalisation of the electricity market has already been completed or almost accomplished.
- Identification of the barriers for a possibly co-ordinated EU support system and analysis of perceived needs/expectations of various stakeholders.
- Assessment of the degree of cohesion at a national level and within actor groups about the support instruments in use and the possibility for a co-ordination at European level.
- Lessons for policy/recommendations from on going experiences with FIT systems and green certificate trading.
- Establishment of a regular dialogue and of a platform (REALISE FORUM) to promote exchange between policy makers, regulators, energy practitioners, NGOs, consumers associations and major stakeholders and encourage a broad debate about future design of support system for electricity from renewables.

Lessons learnt

Although the project has not been completed it is possible to draw the following preliminary conclusions:

- There is a scope for establishing a platform for stakeholders and decision makers to discuss in a balanced way specific support policy issues and promote the exchange of viewpoints and perceptions on possible co-ordination paths.
- The consensus on national support schemes and/or willingness to change them is dependent on the degree of competitiveness, of risk and of specification of the respective systems. In spite of different positions, there is a certain consent within the various stakeholder groups (actor cohesion) on the effectiveness of national support schemes for electricity from renewables with regard to a number of key market aspects and the rejection of an harmonisation European support system.
- The optimum set-up of support instruments for electricity from renewables can vary widely from one country to another depending on its peculiar electricity market and economic and social conditions. FIT represent the most widespread and successful instrument.
- In some cases the two main support schemes for electricity from renewables, namely TGC and FIT could be complementary rather than competing. Analyses on the appropriateness of support mechanisms should be carried out together with an assessment of the maturity of the technology.
- Trading schemes for greenhouse gas emissions, green certificates and white certificates must be carefully designed to keep the different markets separate.

Creating renewable energy market places for investors and regional actors in rural areas (RES market places)

Programme area:	ALTENER, Electricity from renewable energy sources
Status:	ongoing
Coordinator:	Andreas Hübner Gertec GmbH - Ingenieurgesellschaft E-mail: Andreas.Huebner@Gertec.de Tel. +49 201 245 64 51
Partners:	AESS, Italy ApE, Slovenia ESS, Sweden ESV, Austria Prospektiker, Spain SWS, Ireland
Website:	www.resmarketplaces.org
Objective:	Creating virtual market places for renewable energy and energy efficiency in each participating region
Benefits:	To force the use of renewable energies and to save energy
Keywords:	renewable energies, energy efficiency, virtual market place
Duration:	01/2005 – 07/2007
Budget:	€ 746,407 (EU contribution: 50%)
Contract number:	EIE/04/124/S07.38590

RES market places

Short description

The project RES market places supports the set up of regional market places to increase the use of renewable energy sources (RES), as well as energy efficiency measures (EE) in new construction projects and in the refurbishment of buildings in rural areas in the EU. The project covers the entire range of technological and economical feasible RES and EE measures.

To strengthen the consideration of RES/EE in new construction projects and in the refurbishment of buildings regional market places will be established. The project concentrates on rural areas as these offer fundamentally better conditions for the use of RES/EE than urban regions. The starting point is that private and public investors are rarely well-informed about the possibilities to use RES/EE for their projects. Very often this goes along with a lack of information about suppliers/service providers in the field of RES/EE. To change this situation, suppliers/service providers of RES/EE on the one hand, and private and public investors on the other hand will be brought together to develop common activities.

Expected and/or achieved results

- to create 7 regional virtual market places
- to bring together suppliers and end-users
- the potential end-user will be supported to consider RES/EE in the planning of new construction projects and in the refurbishment of buildings

Lessons learnt

Although the project has not been completed it is possible to draw the following preliminary conclusions:

- To learn how other countries handle the use of renewable energies and energy efficiency as well as they force it.
- To create regional market places from the beginning (choice of agencies, logo and layout) up to the end (a finished website).
- The use of existing networks in the participating regions is very helpful to create virtual market places.

Boosting renewable electricity in 11 European regions (RES-E REGIONS)

Programme area:	ALTENER, Electricity from renewable energy sources
Status:	ongoing
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Website:	www.res-regions.info
Objective:	Boosting renewable electricity production in 11 European regions through regional targets and strategies for electricity from renewables
Benefits:	Mobilising regional actors in administration and companies and supporting them in their activities for electricity from renewables
Keywords:	Renewable electricity, region, strategy
Duration:	01/2005 - 04/2007
Budget:	1,379,520 € (EU contribution: 50 %)
Contract number:	EIE/04/234/S07.38605

Short description

Local action is essential to achieve the European targets for electricity from renewables (RES-e): not only are many initiatives for new RES-e installations started on local level but also some of the main obstacles can only be overcome regionally and locally. The project aims at boosting renewable electricity production in 11 European regions (Andalusia, Castilla y Leon, Copenhagen, Liguria, Navarra, Oberösterreich, Rhônes-Alpes, Saarland, Slovenia, Västra Götaland, Wales) by defining regional RES-e targets and developing and implementing regional RES-e strategies. These identify the main barriers (such as administrative obstacles, public opposition, grid access, lack of information, frequent changes in funding regimes) and address them by well targeted information and promotion activities, thereby significantly increasing regional RES-e shares.
Additionally, a number of activities to further interregional co-operation are being implemented, including an international conference, site-visits to other project regions and a declaration confirming the commitment of European regions to sustainable energy production and use.

Expected and/or achieved results

- developing regional RES-e strategies for 11 European regions
- informing and motivating different regional actors, e.g. by organising a total of 66 events (with an expected total participation of around 1800), by producing and disseminating more than 30 full-colour publications or by providing advice to more than 100 RES-e projects.
- providing insight into specific aspects of the regional RES-e situation by producing 11 "RES-e maps" as well as representative surveys.
- triggering and supporting inter-regional co-operation, for example, so far 16 European regions have signed the declaration "European regions for Energy Efficiency and Renewable Energy Sources".

Lessons learnt

Although the project has not been completed, it is possible to draw the following preliminary conclusions:

- there is a significant interest and willingness among a number European regions to act in favour of renewable energy sources.
- there is a need to increase the visibility of these efforts, both within their regions and countries as well as on European level.

Wind energy in urban areas (WINEUR)

Programme area:	ALTENER, Electricity from renewable energy sources
Status:	ongoing

Coordinator:	Patrick CLEMENT Axenne, France E-mail: p.clement@axenne.fr Tel : (33) 4 37 44 15 80
Partners:	IT Power, United Kingdom Horisun, The Netherlands City of Amsterdam, Environmental & Building Department, The Netherlands Ademe, France
Website:	www.urban-wind.org

Objective:	Promoting and raising awareness about urban wind turbines technologies and removing regulatory and economical barriers
Benefits:	Emissions reduction, lower fossil use, new renewable energy market and job creation

Keywords:	Decentralised generation, policy, sustainable communities

Duration:	01/2005 – 03/2007
Budget:	€ 909,704 (EU contribution: 50%)
Contract number:	EIE/04/130/S07.38591

Short description

Urban turbines are a fairly new product. The market for them is underdeveloped and there is apparent lack of knowledge with these products. Wineur brings information to partner countries' decision makers, mainly local authorities, in order to sensitize to this new renewable energy technology and permit its potential development.
To mobilise key actors and to involve local authorities, Wineur provide information related to the existing technologies, the economics, the regulations, procedures and guidelines specifically related to Urban Wind Turbines.
Wineur also leads in partnership with some cities feasibility studies for urban turbines implementation and the project ensure close consultation with key stakeholders throughout workshops, seminars, community consultation.

Expected and/or achieved results

- A comprehensive typology of wind machines potentially useful in the city
- Identification of technical barriers: need for clarifying the conditions of connection to the network
- Identification of the principal regulatory barriers: needs for defining specific town planning rules dedicated to these new technologies
- Identification of the principal economic barriers: needs for defining, as for other RE technologies, a specific feed in tariff dedicated to Urban turbines

Lessons learnt

Although the project has not been completed it is possible to draw the following preliminary conclusions:

- The project made it possible to attract a real and important interest on behalf of the local communities for this new renewable energy technology.
- The successful appliances on numerous urban locations show that this technology could become an important option in the future in the context of decentralized energy generation.
- However, before the market introduction of urban turbines can really start it is fundamental to define clear rules regarding the physical and electrical integration and the value of generated electricity.

New Projects (start 2007)

The projects outlined in this part of the document were submitted under the 2005 call for proposals of the Intelligent Energy – Europe programme and have successfully passed the evaluation. They are therefore very likely to start later in 2006 or in early 2007.
The information provided is of a provisional nature and given for information purposes only. It does not bind legally any of the involved parties.

Wind Power Integration and Exchange in the Trans-European Power Markets (TRADEWIND)

A large fraction of the European electricity demand in the future can be met by wind energy, in the same order of magnitude as individual contributions from conventional generating technologies. Advanced studies show that this is technically feasible, while maintaining a high degree of system security and at moderate or even negative additional system costs. The experts agree that the principle barriers to large scale integration of wind power in Europe are constituted by regulatory, institutional and market constraints.
Based on modelling of the interaction of a growing amount of wind power on the European electricity system, considering Trans-European onshore and offshore network upgrades and improved power market rules TradeWind will formulate recommendations for the improvement of the Internal Electricity Market to better adapt it for the accommodation of substantial amounts of wind power. Recommendations will address improved market rules, and will constitute the technical and economic arguments for strategic decisions for further development of European grid and generation infrastructure such as intended in TEN-E Process.

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Participating Countries

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Renewable Electricity Supply Interactions with Conventional Power Generation, Networks and Demand (RESPOND)

The growing amount of RES-E and DG supply affects the electricity system, and could only be economically efficiently integrated if it provokes economically efficient, market-based responses by different stakeholders. The RESPOND project aims at identifying efficient market response options that actively contribute to an efficient integration of (intermittent) RES-E and DG in the European electricity system and it recommends policy and regulation framework improvements that effectively support these market response options.
The RESPOND project puts emphasis on the market side of the electricity system. Efficient response options that (may) arise from the market form the basis on which policy on RES-E and DG should be based.
It specifically considers the interactions between different segments of the electricity system: generation, demand, trade, and the networks. The electricity system is a “complex network” in which the constituent segments dynamically interact with each other.

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Skills Network for European Wind Energy (WINDSKILL)

The Windskill project is designed to overcome critical non-technical barriers to exploiting the growth potential of green electricity through wind energy. Despite the emergence of a truly European market regulations on the qualification of installation and maintenance staff (70% of the sector's workforce) are still local and national in scope and unaligned to the European market and thereby pose administrative barriers to achieving the Union's RES targets. The industry-based network initiative seeks to enrol authorities and sector stakeholders in the

development of a European Qualification Profile for the key onshore and offshore process assignments, develop an appropriate modularized curriculum and pilot training courses to meet these requirements. Existing expertise from national pioneer initiatives will feed the process. The involvement of further European Key Actors like EWEA is provided for. Finally, the project's full circle will include Europe-wide recognition and adoption of the established minimum standards via the extension of the network.

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Small Hydro Energy Efficient Promotion Campaign Action (SHERPA)

The overall objective is to develop a Promotion Campaign on Small Hydropower addressing the challenges and coping with the main barriers in Europe. In order to enhance the further market penetration of Small Hydropower (SHP) within the EU-25 an evaluation of the current situation as well as a set of high-level promotion measures is necessary. Indeed, the wrong impression that small hydro plants generally affect adversely natural local environment exists, this impression, together with numerous administrative barriers, and contradictions in the implementation of two European Directives (Water Framework Directive and Renewables Electricity Directive) may result on a reduction on renewable electricity production from SHP plants. Therefore, the proposed action aims at developing a well-targeted SHP promotion campaign addressing the challenges and promoting its benefits, through a mix of information measures (brochures, conference, workshops), through a review on the Status of SHP development and policy frameworks in EU-25, through addressing public image issues and environmental performance of SHP plants, as well as through a comprehensive territorial planning approach.

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Deriving a Future European Policy for Renewable Electricity (FUTURES-e)

The core objective is to better involve Member State stakeholders in the debate on policy optimisation & coordination for renewable electricity (RES-E) and the process of post 2010 target discussion. This will pave the way for a successful and in the long-term stable deployment of RES-E in Europe.
The work is based on outcomes of previous activities (e.g. IEE- project OPTRES, FP5 project Green-X) and includes to discuss consequences of possible policy decisions with respect to the future of RES-E support schemes from a national viewpoint and to elaborate on best practices of the main instruments.
An action plan and targeted recommendations will support policy makers on formulation of a future European policy for RES-E. This will include an in-depth discussion on optimisation & coordination, a methodology to share cost & benefits among Member States and guidelines to achieve the integration of RES-E policies with other key EU objectives, such as rational energy use and GHG reduction.

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Monitoring and Evaluation of the RES Directives Implementation in EU27 and Policy Recommendations for 2020 (RES2020)

RES2020 aims at analysing the present situation in the RES implementation, defining future options for policies and measures, calculating concrete targets for the RES contribution that can be achieved by the implementation of these options and finally examining the implications of the achievement of these targets to the European Economy. A number of future options for policies and measures will be defined and they will be studied with the use of the TIMES energy systems analysis model, in order to analyze the quantitative effects on the RES development. TIMES offers the possibility of developing an aggregate parameter in order to quantify the impact of a wide range of support schemes. The results will be combined to provide recommendations of optimal mix scenarios for policy measures, in order to ensure the achievement of the targets.

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Smart Domestic Appliances in Sustainable Energy Systems (Smart-A)

Demand-side load management is a cornerstone of sustainable energy systems, which feature a higher share of intermittent generation, depending on the availability of renewable energy or demand for heat from CHP processes. Such systems require smart energy loads which can coordinate their operation with current levels of energy supply. Domestic appliances can offer a range of options for load-shifting.
The proposed action will asses the overall potential for load-shifting by domestic appliances and will compare this with requirements from sustainable energy generation both on the local level as well as in electricity systems. A key step of the project will be a detailed assessment of the acceptance of a smart operation of appliances by users, and of measures to increase this acceptance.
The individual work packages will be carried out in close cooperation with manufacturers of domestic appliances and local energy generation systems, and with energy suppliers, which are also represented in the project consortium.

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Promoting Grid-Related Incentives for Large-Scale RES-E Integration into the Different European Electricity Systems (GreenNet-Incentives)

The core objective of this proposal is to promote grid-related incentives for large-scale RES-E integration into different European electricity systems, to identify existing non-technical barriers for RES-E grid integration, and to actively involve key European market actors (grid companies, RES-E generators, regulators, decision makers) in

the discussion process towards “green” electricity grids. This is mainly done by organising expert platforms, a targeted stakeholder consultation focusing on regulators and DSOs/TSOs , training/education workshops and summer schools. The major products of this proposal are tailor-made recommendations and actions plans for several key market actors to establish a common European vision on the implementation of grid-related policies favouring “green” electricity networks. Comprehensive ongoing/final dissemination activities/events through a portfolio of dissemination channels guarantee know-how transfer of several project outcomes to several European countries/regions. The scope of the predecessor project GreenNet-EU 27 is extended towards the Western Balkans.

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Production of Electricity with RES & CHP for Homeowners (PERCH)

The project focuses on the interconnection issues for small RES electricity and micro-CHP applications including contractual, tariff rates, metering, power quality and safety standards, that must be resolved between the owner, the utility and the permitting authorities before the small RES electricity or micro CHP generation system will be connected to the grid. Thus the aim of the project is twofold: to provide to the future owners of these systems (owners of individual dwellings, farms or small business) the appropriate information and supporting framework to help them implement their potential installations and also to provide to regulators, utility engineers, policy makers and professionalisms in the area the up to date information for the situation in the EU and candidate countries, offering them the opportunity to exchange experiences and examine future strategies. In order to address these issues the project partners will implement a series of actions including a comprehensive web site and database, guidelines for interconnection issues and the homeowners, targeted workshops, a European event and other dissemination activities.

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