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RENEWABLE ENERGY NEWSLETTER

This issue of RENEWS reports on the European Technology Platforms in the renewable energy sector. These industry-led fora bring together stakeholders so they can agree on the way forward, develop new knowledge and technology, and transfer the results into improving energy security, the environment and growth.

Technology platforms have to work in an open and transparent way to avoid being perceived as closed clubs representing only the interests of the biggest players. They have to integrate the many individual efforts, create partnerships and explore new possibilities – thus creating genuine benefit for all involved.

As you may know, each platform will develop a Strategic Research Agenda, and this will be an important resource for the Commission for the Seventh Framework Programme to ensure that the Work Programme corresponds to the needs of industry. The research agendas will also be of value for the Strategic Energy Technology Plan, announced in the Commission's recent Green Paper on a European strategy for sustainable, competitive and secure energy.

The SmartGrids platform met on 6-7 April 2006, the first General Assembly of the Photovoltaics platform will take place in Brussels on 19 May 2006, and the launch conference for the Biofuels platform is planned for 8 June 2006. I would like to encourage our readers to follow actively the developments of these initiatives. The best way to do this is to be present, otherwise you can visit the websites and, of course, read the RENEWS newsletter.

Wiktor Raldow

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Technology Platforms

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IMPORTANT INFORMATION SOURCES

Many of the web addresses have changed:

The Energy Research website:

■ http://ec.europa.eu/research/energy/index_en.html

The official newsletter of the European Commission Energy & Transport DG:

■ http://ec.europa.eu/dgs/energy_transport/index_en.html

ManagEnergy Newsletter:

■ http://www.managenergy.net/links_e.html

FP6 homepage:

■ <http://cordis.europa.eu/fp6>

FP7 homepage:

■ <http://cordis.europa.eu/fp7>

For information on events see:

■ <http://cordis.europa.eu/sustdev/energy/events.htm>

For more information on International Co-operation see:

■ <http://cordis.europa.eu/inco>

For more information on Marie Curie actions for mobility in research see:

■ <http://cordis.europa.eu/mariecurie-actions>

For information on the Research Infrastructures see:

■ <http://cordis.europa.eu/infrastructures>

To volunteer as an independent expert for evaluation of proposals, and monitoring and reviewing of projects go to:

■ http://cordis.europa.eu/experts/fp6_candidature.htm

Publications:

■ http://ec.europa.eu/research/energy/gp/gp_pu/article_1100_en.htm

■ http://ec.europa.eu/research/energy/nn/nn_pu/article_1078_en.htm

EDITORIAL NOTE

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The Fourth Call for Proposals

The Fourth Call deadline for 'Sustainable Energy Systems – research activities having an impact in the medium and longer term' was on 10 January 2006. The indicative budget was 20 M€, with half to be allocated to renewable energy (RES) projects.

The Call topics included some strategically important ones, which were insufficiently covered by projects selected in the Third Call, as well as items intended to help prepare the transition to FP7, support the running of technology platforms and enhance international co-operation initiatives.

This was the first call in Sustainable Energy where proposals could only be submitted using the Electronic Proposal Submission System (EPSS). Another innovation was the use of a remote evaluation step where the twenty-eight independent experts, who assisted the Commission in the evaluation process, performed their individual evaluations at home via an on-line internet-based system before gathering in Brussels for the consensus and panel stages of the evaluation.

Sixty-four proposals were submitted to the Call, of which an unusually high number, 21, were unfortunately out of scope. This left 43 in-scope proposals, including 12 on RES topics. Following the evaluation, four RES proposals were selected for funding. The largest proposal was an Integrated Project on the biorefinery concept for the production of energy and other products from biomass. The other proposals were for a STREP project on roll-to-roll manufacturing of thin film silicon modules, a Coordination Action on low-cost organic PV cells, and a Specific Support Action for the secretariat of the biofuels technology platform. These proposals will now go forward to the contract negotiation stage with the aim of beginning the projects by the end of the year.

The submitted proposals included a strong representation of SMEs, making up 22% of the proposers, as well as an increased participation from the ten new Member States of 7.2% of ranked proposals and also of organisations from third countries (INCO), with 17.2%. As far as gender was concerned, proposals led by women as coordinators were considerably more successful.

If savings are made during the negotiations of the first four proposals, or if additional funding becomes available, it might be possible to fund one or more projects on the reserve list in the RES area, though this will not be known until later in the year. The first on

the reserve list deals with pre-normative research on solid biofuels for improved European standards.

The full details of the Call can be found on the CORDIS website at http://cordis.europa.eu/fp6/dc/index.cfm?fuseaction=UserSite.FP6ActivityCallsPage&ID_ACTIVITY=315

Inauguration of the Renewable Energy House in Brussels

On 22 March, Commission President José Manuel Barroso, Vice-President Margot Wallström and Environment Commissioner Stavros Dimas, together with Prince Laurent of Belgium and Belgian Prime Minister Guy Verhofstadt, inaugurated the building at Rue d'Arlon 63-65 in Brussels. The newly renovated, historically protected building generates more than 50% of its energy requirements from renewable energies.

All building heating and cooling requirements are met entirely through a combination of renewable energy sources. A biomass wood pellet boiler, 60 m² of solar thermal collectors, four geothermal energy borehole loops (115m), a thermally-driven cooling machine and 3 kW of photovoltaics are all perfectly integrated into the building. In fact, the house provides a particularly good example of how these technologies can work together in a far from ideal location close to several tall buildings.



From left to right: Guy Verhofstadt, Prince Laurent of Belgium, José Manuel Barroso, Arthouros Zervos and Margot Wallström at the Renewable Energy House inauguration

The building houses the majority of the European renewable energy associations and, given its demonstration character, it fully justifies and deserves the name 'Renewable Energy House'.

More information:

<http://www.erec-renewables.org/default.htm>

14th European Biomass Conference



View of the Commission's stand

This major European biomass conference took place in Paris in October 2005. The conference attracted 1,142 participants from 78 countries.

Mr Pablo Fernandez Ruiz, Director for Energy in DG Research, addressed the audience in the opening session, highlighting the importance of the bioenergy field in the present Sixth Framework Programme (FP6) and the state of play with the preparations for FP7.

More than 50 exhibitors presented their products and services in the technology exhibition. One of the exhibition stands was organised by the DG RTD New and Renewable Energy Sources Unit, which displayed its activities in the area of renewable energy research and, in particular, biomass.

The event underlined the rapidly growing market in energy and other products derived from biomass, agricultural residues and energy-rich vegetation, and showed how they can contribute to alleviate the world's pressing climate and environmental problems.

More information:

http://www.conference-biomass.com/Biomass2005/Welcome_intro.asp

Sino-European Bilateral PV Workshop

The New and Renewable Energies Unit participated in this workshop, which was held in Shanghai in October 2005. It was organised by the Chinese and European Materials Research Societies just before the 15th International PV Science and Engineering Conference. It was attended by a wide range of stakeholders, including established European and Chinese

researchers and some leading industrial companies (not only PV manufacturers but also glass and feedstock producers). The opportunities for Sino-European collaborative research in PV were highlighted, and the preliminary timetable for FP7 was presented by David Anderson from the Unit. The workshop produced many stimulating and constructive exchanges between the Chinese and European participants about the research priorities and state of the art in both regions.

VISION FOR A EUROPEAN ENERGY STRATEGY

The first ideas for a common European Energy Policy have been set out by the European Commission in a recent Green Paper, which invites comments on over 20 suggestions for possible new actions. The Commissioner for Energy, Andris Piebalgs, said, "The completion of the internal market, the fight against climate change, and security of supply are common energy challenges that call for common solutions. It is time for a new European energy policy." The Green Paper identifies the following six priority areas:

- Completing the internal energy market
- Increasing the security of supply at European level
- Developing a sustainable, efficient and diverse energy mix
- Introducing measures to address global warming (e.g. energy efficiency)
- Supporting European competitiveness with a strategic energy technology plan
- Developing a common external energy policy.

The Green Paper cites EU leadership in many renewable energy technologies, and recognises the role of energy research in increasing efficiency and energy diversity. The development of a strategic energy technology plan is proposed to strengthen European energy research, focusing on target-driven research and a more strategic approach to financing.

Based on responses to the public consultation, as well as the conclusions of the European Council and Parliament, the Commission will propose a comprehensive series of concrete measures.

More information:

http://ec.europa.eu/energy/green-paper-energy/index_en.htm

FP7 Update

The agreement reached on the Financial Perspectives of the EU Budget for the period 2007 to 2013 at the climax of the UK Presidency in December 2005, together with the subsequent agreement between the European Parliament and the Council, have allowed further progress to be made on the Commission's proposal for FP7. The seven-year budget for FP7 will be in the order of 54 B€, which represents a significant increase in the average annual budget compared to FP6. The period between now and the end of the year will be taken up with intensive activities as the FP7 proposal goes through the co-decision process between the Council and the European Parliament, and the details of the Work Programme are fleshed out. A significant step was taken on 13 March 2006 when the Council reached a political agreement in principle on the four specific programmes of FP7: Capacities, Ideas, People and Co-operation. The first reading on FP7 in the European Parliament is expected to take place on 4 May 2006. It is hoped that the first calls for proposals might be published towards the end of 2006 or early in 2007, with deadlines in spring 2007. The FP7 Launch Conference will take place in Brussels on 7 March 2007.

The Commission's proposal for the Seventh Framework Programme is designed to help realise the renewed Lisbon objectives of building the knowledge society, and promoting growth and creating jobs through knowledge and innovation. Europe has to concentrate its efforts on its true strengths if it is to face the mounting global competition in a sustainable way. With its content, organisation, implementation modes and management tools, FP7 is designed as a key contribution to the re-launched Lisbon strategy. Even if the continuation is the main feature of FP7, there are important new elements which include the following: emphasis on research themes rather than on 'instruments'; significant simplification; focus on developing research that meets the needs of European industry through the work of Technology Platforms and the new Joint Technology Initiatives; establishment of a European Research Council funding the best of European science; integration of international co-operation in all four programmes; development of Regions of Knowledge; and a Risk-Sharing Finance Facility aimed at fostering private investment in research.

As for energy research, the pressing challenges to be met are security of supply, climate change and competitiveness. The long-term goal is a transformation of the current fossil fuel-based energy system into a more sustainable one that is based on a diverse portfolio of

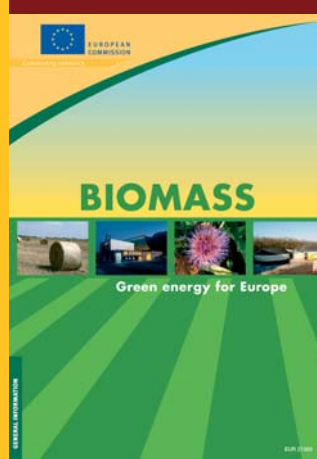
energy sources combined with enhanced energy efficiency. Renewable energy technologies are key to a better environment and increased security of supply, and appear in three of the nine activities proposed for FP7 under the theme of energy: renewable electricity generation, renewable fuel production, and renewables for heating and cooling. It is proposed to fund projects under these three RES activities alongside other projects on energy efficiency and savings, CO₂ capture and storage technologies for zero emission power generation, clean coal technologies, hydrogen and fuel cells, smart energy networks, and knowledge for energy policy-making.

To help define the work programme for FP7 and the topics for the first calls, it is planned to consult stakeholders in various ways to allow concerned parties to express ideas for research priorities within the different themes. In particular, the technology platforms will be consulted.

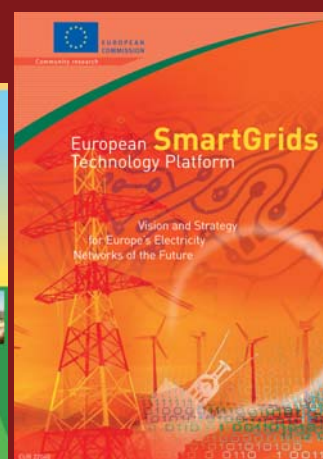
Further details can be found on the CORDIS website at the following address:

<http://cordis.europa.eu/fp7/faq.htm>

RECENT PUBLICATIONS:



Catalogue n°
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Catalogue n°
KI-NA-22040-EN-C

These publications can be downloaded at
<http://ec.europa.eu/research/energy/>

Renewable Energy for Europe – Research in Action

More than 600 representatives from research, industrial and funding organisations attended the Commission's 'Renewable Energy for Europe – Research in Action' conference in Brussels in November 2005. The aim was to highlight the importance of EU research into RES, and to raise awareness of opportunities for further development and coordination at EU level.

Side events included a poster session featuring organisations from New Member States and Candidate Countries, and an exhibition of EU RES industry associations.

The UK Minister of State for Energy, Malcolm Wicks, set the tone for the conference in his keynote address: "There can be few greater challenges facing Europe, and indeed the world, than those linked to the need for secure and sustainable energy." Commissioner Potočnik highlighted the importance of energy research: "Today's research provides the knowledge for tomorrow's energy policy. Enhancing our knowledge of RES through research is an important step to achieving this goal."

Success Stories – Industrial Perspectives

EU RES success stories in wind, bio-energy, PV and solar thermal were presented. While wind and PV have shown impressive growth rates recently, the uptake of RES in the EU still faces significant challenges. The costs of RES are still higher than for traditional energy and the integration of RES into existing distribution networks is at an early stage. Member States have implemented schemes such as feed-in systems or green certificates. The different RES technologies should work together so as to gain grid access, increased research funding and to create synergies.

Renewable Energy in Europe – Research Coordination and Policy

The national research programmes and policies for RES in Sweden and Germany and the FP6 ERA-NET scheme were presented. The aim of ERA-NET is to coordinate national or regional programmes and joint activities, and to increase the integration of New Member States into ERA, the European Research Area.

Socio-economic Challenges

RES has the potential to deliver an additional 750 TWh (64 Mtoe) of electricity and 80 Mtoe of heat in the EU27 by 2020, given a broad approach and significant political support. The main barriers were discussed during the



conference, such as the harmonisation of policies and support mechanisms. Progress may be achieved sooner in such areas as the single electricity market or emission trading schemes.

The International Dimension of RES Research

The environmental problems posed by the modern day energy system are of course global in nature. RES research was placed in the context of international energy research in Japan, the USA and worldwide, comparing research programmes and goals for 2010 and beyond, focusing on consequences of the disparities in energy consumption between developed and developing countries. The session underlined international co-operation and the positive contribution of RES to reducing CO₂ emissions and mitigating climate change.

EU Technology Platforms and Future Research

During the conference, the EU Technology Platforms on PV, electricity networks and biofuels were presented. In domains where RTD has a vital role to play in addressing major economic, technological or societal challenges, Technology Platforms provide a means to foster effective public-private partnerships between industry, the research community, and policy-makers towards achieving a common goal. One of the roles of Technology Platforms is to produce a strategic research agenda – essentially a roadmap for research – which will be an important resource for the European Commission to implement the Seventh Framework Programme.

Energy is one of nine themes in the Seventh Framework Programme. Within the energy theme, renewable energy will be directly supported under three topics: renewable electricity generation, renewable fuel production and renewables for heating and cooling.

In Summary

The conference attracted a wide range of stakeholders involved in different renewable energy technologies. It was underlined that renewable energy has a vital contribution to make in addressing the global problems of a burgeoning energy demand, excessive CO₂ emissions and the insecure provision of energy. The fruits of previous research work were presented, and there was broad consensus on the need to continue and enhance research activity for the accelerated deployment of renewable energy.

More information: http://ec.europa.eu/research/energy/gp/gp_events/action/article_2790_en.htm

EWEK – European Wind Energy Conference and Exhibition

EWEK was held in Athens from 27 February to 2 March with 2,800 attendees and 150 exhibitors from over 50 countries.

A common theme of the conference was the increasing geographical diversification of the wind power market. Denmark and Spain used to account for 90% of the European market, but due to the recent strong growth in France, Portugal and Italy, this figure is now around 58%. The highest world growth rates are in India, the USA and China. Future wind power shares will go from the present 70% for the EU, 17% for the US and 12% for Asia to around one third for each, presenting both opportunities and threats to EU industry.

Commissioner Dimas commented that wind is one of the fastest growing technologies, creating 200,000 jobs, and underlined how EU R&D has reduced the cost of wind power. Mr Zervos, EWEA President, added that the Commission's 40 GW target for 2010 had already been achieved in 2005.

There were interesting presentations, including EU projects on aerodynamics, aero-elasticity, aero-acoustics, control, meteorology and integration. The Unit's project officer, Thierry Langlois D'Estaintot, chaired a workshop on short-term forecasting as part of the EU ANEMOS project.

The next EWEK will be in Milan on 7-10 May 2007.

More information: <http://www.ewek.info/>

Renewable Hydrogen Workshop

The International Partnership for the Hydrogen Economy (IPHE) workshop was held in Seville in October 2005. The Unit organised the workshop in collaboration with DoE (USA), METI (Japan), the Brazilian Ministry of Mines and Energy and Abengoa Hynergreen. One hundred and forty invited world experts gathered to exchange information on H₂ production using RES, to identify research needs, promote collaboration and recommend possible related activities to IPHE.

The workshop included six areas: H₂ from RES, biomass gasification and pyrolysis, distributed reforming with biofuels, biological and biomimetic H₂ production, high-temperature solar thermochemical H₂ production, and photoelectrochemical production for direct water splitting. These are at various stages of development and their RTD needs differ widely: the challenges for RES electrolysis are to reduce costs by optimisation and combining power electronic components, whereas for the biological, thermochemical and photoelectrochemical areas, the problems lie in finding efficient, durable materials.



IPHE workshop participants at the beautiful Abengoa venue

It was emphasised that experimental data and consistent, reliable system analyses are needed to compare various energy paths to H₂ production, to validate different models and identify the most promising technologies.

More information: <http://www.sentech.org/IPHERenewableHydrogenWorkshop.htm>

PV Technology Platform – First Year of Operation

The work of the Photovoltaic Technology Platform began in May 2005 when the Steering Committee met for the first time in Brussels. The Steering Committee is chaired by Emiliano Perezagua (Isofotón), and he is assisted by Joachim Luther (Fraunhofer ISE) and Hans Willemsen (Shell Solar). Four working groups of the platform were subsequently set up: policy and instruments; market deployment; science, technology and applications; and developing countries. Renowned experts from across Europe come together within the various groups, and participation is on a voluntary basis. The activities of the platform receive secretarial support from a consortium of four partners, which is financed by the European Commission.

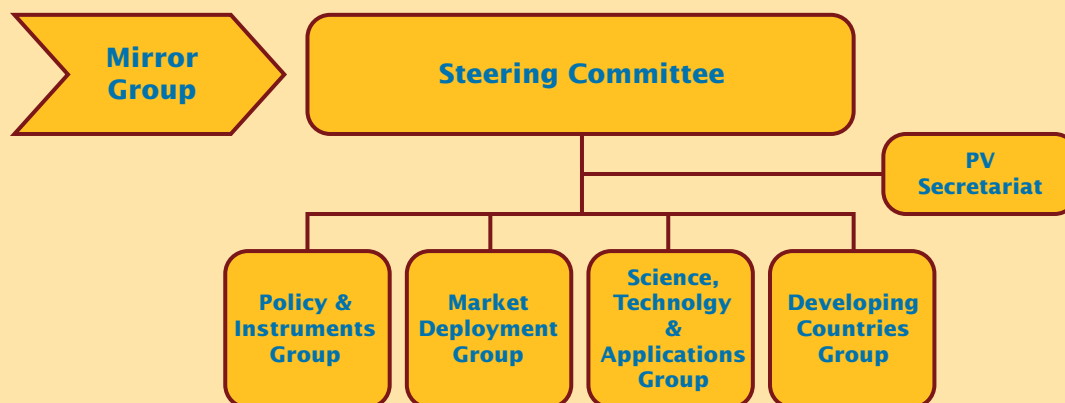
The platform has its origins in a report published in September 2004 by an advisory council of experts, entitled “A Vision for Photovoltaic Technology”, which recommended that such a platform be created in order to work towards common goals. The report also predicted that, as costs continue to decrease, PV will cost less than conventional bulk electricity by 2010 in some parts of Europe, and could provide as much as 4% of electricity across Europe in 2030.

In addition to the working groups, a so-called Mirror Group has been set up so that the activities carried out within the platform can be relayed to the national authorities across Europe. The participants of the Mirror Group are also a valuable resource of information on national research programmes and support policies.

Following the invitations sent to the Permanent Representations of the EU Member States and the Delegations of Associated States and Candidate Countries, the first meeting of the Mirror Group took place on 12 January 2006 in Brussels. The participants selected Mrs De Lillo (Italy) as the chairperson, with Messrs Nick-Leptin (Germany) and Féraux (Belgium) as vice-chairpersons. The second meeting of the Mirror Group took place on 13 March 2006 in Brussels, where the group further defined their intermediate role between the platform and their respective national authorities.

The PV Technology Platform will hold its 1st Annual General Assembly on 19 May 2006 at the European Parliament in Brussels. It is expected that Janez Potočnik, European Commissioner for Science and Research, will address the participants in the opening session. The meeting will be an opportunity for the platform to update stakeholders on the ongoing work in all of the working groups. In view of the upcoming Seventh Framework Programme, the presentation of the draft Strategic Research Agenda will be of particular interest. The main results of FP5 and FP6 photovoltaic projects will be discussed in the PV Technical Days meeting on 17 and 18 May 2006, and these will be summarised during the General Assembly.

Participation in the General Assembly is open to all interested parties, and further information about registration is available on the website of the PV Technology Platform: <http://www.eupvplatform.org/>



Structure of the PV Technology Platform

Biomass and Biofuels High on the EU Agenda

Two of the main energy policy targets of the EU are to increase the share of the Renewable Energy Sources in gross inland consumption to 12% and the share of biofuels in the market to 5.75% by 2010. Recent assessments have concluded that these targets are unlikely to be achieved and further efforts are needed. For the biomass sector in particular, 74 Mtoe more are needed by 2010. This additional biomass production can only be achieved in the short term with strong, targeted measures and actions in all sectors, and a better coordination of EU policies.

The Commission has therefore taken an ambitious and coordinated approach to promote the use of biomass and biofuels. The approach includes a Biomass Action Plan, an EU strategy for biofuels and the establishment of a European Biofuels Technology Platform.

Biomass Action Plan (BAP)

In December 2005, the Commission adopted a detailed action plan designed to increase the use of energy from forestry, agriculture and waste materials. The so-called Biomass Action Plan announces more than 20 actions; most of them will be implemented from 2006 onwards.

The plan includes reviews of how fuel standards could be improved to encourage the use of biomass for transport, heating and electricity generation; investment in research, in particular in making liquid fuels out of wood and waste materials; and a campaign to inform farmers and forest owners about energy crops. The Commission will also work on future EU legislation to encourage the use of renewable energy in heating. "Biofuels obligations" for transport biofuels may be introduced, through which suppliers include a minimum proportion of biofuels in the conventional fuel they place on the market.

EU Strategy for Biofuels

In February 2006, the European Commission adopted an ambitious 'EU Strategy for Biofuels', with a range of potential market-based, legislative and research measures to boost production of fuels from agricultural raw materials (including forestry). The paper, which builds on the biomass action plan adopted in December 2005, sets out three main aims:

- to promote biofuels in both the EU and developing countries
- to prepare for large-scale use of biofuels by improving their cost-competitiveness and increasing research into 'second generation' fuels
- to support developing countries where biofuel production could stimulate sustainable economic growth.

The EU Strategy for Biofuels presents a number of key measures, including stimulating demand for biofuels and capturing their environmental benefits, expanding feedstock supplies, developing production and distribution of biofuels, enhancing trade opportunities, supporting developing countries, and encouraging research and development.

Recommendations for Research in the BAP and the EU Strategy for Biofuels

Both the Biomass Action Plan and the EU Strategy for Biofuels recommend that research and development for biomass and biofuels should receive a high priority in the Seventh Framework Programme. In general, the Commission should support research into the optimisation of agricultural and woody crops for energy purposes, and biomass to energy conversion processes. For biofuels in particular, the Commission should give a high priority to research into second-generation biofuels, and to the concept of bio-refinery (finding a way to produce valuable products and energy from plants).

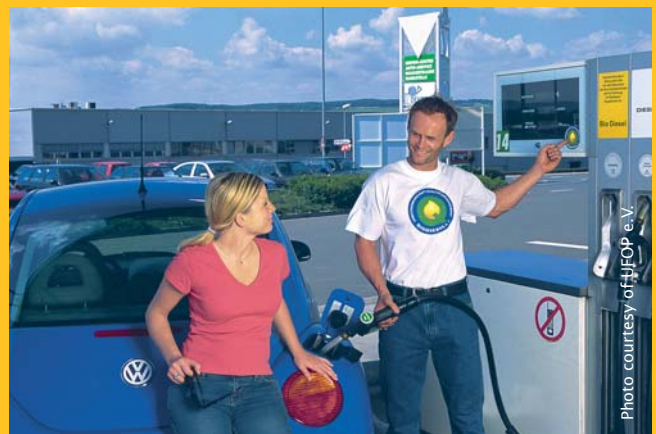


Photo courtesy of HJOP e.V.

The European Biofuels Technology Platform

The European Biofuels Technology Platform is a focused initiative in the frame of research on renewable energy sources. It aims to develop cost-competitive, world class biofuel technology, contribute to the creation of a European biofuels industry and accelerate the deployment of biofuels.

To prepare the Technology Platform, a high-level Advisory Council has been established (see RENEWS n° 4). The Biofuels Research Advisory Council (BIOFRAC) has delivered its draft Vision report "Biofuels in the European Union – A Vision for 2030 and beyond". This report outlines the current situation of biofuels and presents a long-term view on how to overcome the technical and non-technical barriers for biofuel deployment in the European Union and worldwide.

Technology Platforms

The report presents the ambitious and realistic vision that by 2030, up to one-quarter of the EU's transport fuel needs could be met by biofuels, of which about half is to be provided by a competitive European industry. Achieving this vision would require substantial investment in biomass production and logistics, as well as in conversion to fuels and in engine technologies. Attention should be paid to the issue of cost-effectiveness, and to assessing and monitoring the full environmental impact of biofuels.

The Vision Report recommends that a European Technology Platform for Biofuels should be established. The Technology Platform should support further development and deployment of currently available fuels, and promote the transition towards second generation biofuels. The launch of the Platform is planned for 8 June 2006.

For the latest news on the Platform, the Vision Report and the launch conference see http://ec.europa.eu/research/energy/index_en.htm

SmartGrids Technology Platform

Vision and strategy for Europe's electricity networks of the future

The SmartGrids Technology Platform was set up in 2005 to create a vision for the electricity networks of 2020 and beyond. An Advisory Council including representatives from the electricity transmission and distribution industry, system operators, research bodies and regulators was established to develop a "Vision Report" and a medium to long-term Strategic Research Agenda.

Europe's current electricity grid was developed to cater for large, centralised fossil fuel and nuclear power stations. The trend towards a more diverse energy mix with increasing shares of RES and distributed power generation in the liberalised energy market is changing electricity transmission and distribution needs.

The platform has agreed its initial objectives for research and demonstration projects on electricity networks. The vision includes creating technical solutions enabling existing grids to accept power from all producers; harmonising regulatory standards and protocols for cross-border power supply; developing ICT systems to improve network efficiency; and the interfacing of new and old grid equipment to ensure inter-operability.

The SmartGrids Platform held its first conference in April 2006 in Brussels.

More information: http://ec.europa.eu/research/energy/pdf/smartgrids_en.pdf



Future Network Vision

Coordinated Action for Ocean Energy

Energy from ocean waves can make an important contribution to Europe's renewable energy portfolio, and there are significant ocean energy resources in Europe, notably off the coasts of the United Kingdom, Ireland, France, Spain, Portugal and Norway. In recent years, there has been a resurgence of interest in ocean energy in recognition of the technical potential, and devices to exploit ocean energy are expected to make the transition from the demonstration phase to working prototypes in the near future. However, ocean energy companies and research organisations are currently small and dispersed, and there are many cases where increased co-operation would deliver significant benefits. One example is the need for a harmonised power rating for ocean energy devices, as each system and team currently has its own way of quoting power level and peak power.

The EU project, CA-OE, aims to coordinate ongoing ocean energy research activities. The project started on 1 October 2004 and involves 41 organisations from 13 countries, including Canada. During the project, researchers, industries and utilities will come together through a series of technical and non-technical workshops on:

- Modelling of ocean energy systems
- Component technology and power take-off
- System design, construction, reliability and safety
- Performance monitoring
- Environment, economics, development policy and promotion of opportunities.

In each workshop, the state of the art will be assessed and future R&D actions that would benefit from international collaboration will be identified. The strategic aim is to work towards harmonised measurement and reporting standards, and to establish a roadmap for further technological development. The proceedings will be made available on the project website: <http://www.ca-oe.net/>

Enhanced Geothermal Coordination Network for Europe – ENGINE

There are significant geothermal resources in many countries in the EU, and geothermal energy can make an important contribution to Europe's renewable energy portfolio. However, the use of geothermal energy is limited at present since it relies on the relatively uncommon geological occurrence of rocks being simultaneously water-bearing, hot, permeable and located at economically accessible depths. Nonetheless, there are several approaches to increase the potential of geothermal resources, such as enhanced geothermal systems and supercritical reservoirs, which can be referred to collectively as unconventional geothermal resources.

The challenge of enhanced geothermal systems (EGS) is to increase the use of the resource while decreasing the risks inherent in exploitation. The EGS approach entails stimulating reservoirs in hot dry rock environments to achieve sustainable fluid circulation through the artificially widened cracks in the rocks. Both EGS and supercritical fluid systems require the development of high-temperature downhole tools and instruments.

The EU project ENGINE aims to increase the coordination of the present research and development initiatives for unconventional geothermal resources and enhanced geothermal systems, from the resource investigation and assessment stage through to exploitation monitoring. The consortium is composed of 31 partners from 16 European countries, including six companies. The project will link with the ongoing EC projects, EGS Pilot Plant (see RENEWS n° 2) and I-GET (this issue), and also to national projects involving the geothermal resources throughout Europe.

The project was officially launched on 12-15 February 2006 in Orléans, France. The meeting was hosted by the coordinating institute, Bureau de Recherches Géologiques et Minières, and about 100 researchers attended.

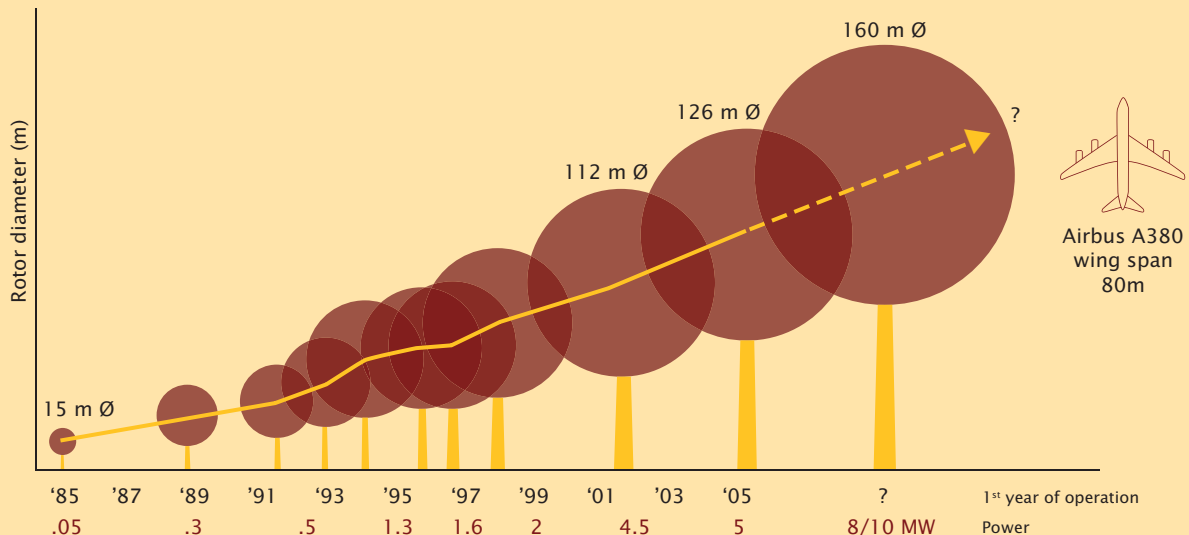
More information: <http://engine.brgm.fr>

Previous issues of the Newsletter can be downloaded at:

http://ec.europa.eu/research/energy/nn/nn_pu/renews/article_1402_en.htm



UpWind – Integrated Project on Wind Turbine Design



Evolution of the size of wind turbines

Courtesy of EWEA

The UpWind Integrated Project looks towards the wind power of the future where very large turbines of 8 to 10 MW, and perhaps even 20 MW, will stand in wind farms of several hundred MW, both on- and offshore.

The project got underway with the kick-off meeting on 3 and 4 April at the Vrije Universiteit, Brussels (VUB). One hundred and fifteen representatives of the 39 partners of the consortium, led by project coordinator Peter Hjulær Jensen of Risø, gathered together with three members of the EC team responsible for following the progress of the project. This most impressive gathering had more the appearance of an international conference than a project meeting, with the combined presence of so many of the EU's leading wind power industry, research and academic experts. But this is only the beginning – undertaking and managing such a project is a major team effort, with the equivalent of 40 people working full-time for 5 years in 11 different EU countries across the length and breadth of Europe. Seeing everyone all together in one room gives a clear impression of the scale of ambition and the challenge involved in running a multi-national enterprise such as this one.

The creation of giant wind turbines – a 20 MW version would have a rotor diameter of almost a quarter of a kilometre if based on current principles – necessitates the highest possible design standards, a complete understanding of external load conditions, materials with extreme strength to mass ratios, advanced control

and measuring systems all geared towards the highest degree of reliability and, critically, reduced overall turbine mass. This entails the re-evaluation of the core units of the wind energy power plant and a search for innovative design concepts. UpWind will develop the accurate, verified tools the industry needs to design and manufacture the complete range of components for this new breed of turbine. These will include design tools for the aerodynamic, aero-elastic, structural and material design of rotors and drive train components.

The UpWind project consists of eight parallel basic research work packages in a matrix relationship with seven technology integration tasks, added to which there are coordinating work packages on communications and management. The basic research topics cover aerodynamics and aero-elastics, rotor structures and materials, foundations and supports, control systems, remote sensing, condition monitoring, wind flow and grid connection. The integration tasks, which steer 60% of the basic research work, address common standards and integrated design, metrology, training and education, innovative blades, transmission and conversion, variable geometry 'smart' blades and up-scaling to 20 MW turbines.

The findings of the project will be disseminated through a series of workshops and through a dedicated website <http://www.UpWind.org>, where first details of the project will soon be available.

This section gives basic information on the recently signed contracts under FP6 in the field of renewable energy.

PHOTOVOLTAICS

PERFORMANCE – A Science Base on Photovoltaics Performance for Increased Market Transparency and Customer Confidence

The rapid development of the PV market requires harmonised, high-quality testing and labelling of products, supported by a sound scientific base. This project covers pre-normative aspects of PV technology, from cell to system level. The limitations of current indoor and outdoor calibration and measurement practices will be investigated, and measurement precision will be improved for traditional technologies and for new and emerging PV concepts. The results of the project will be fed directly into standardisation processes at CENELEC and IEC level.

Coordinator: V. Wittwer, Fraunhofer Institut für Solare Energiesysteme, Freiburg, Germany

More info: <http://www.pv-performance.org/>

FLEXCELLENCE – Roll-to-roll Technology for the Production of High-efficiency, Low-cost, Thin-film Silicon PV Modules

The goal of the project is to develop the equipment and processes for cost-effective roll-to-roll production of thin-film modules based on microcrystalline and amorphous silicon. A crucial issue for such a production system is the deposition rate of the microcrystalline layer, and this will be tackled using three approaches: VHF-PECVD, MW-PECVD and hot-wire CVD*. The equipment and processes developed in the project will be tested or transferred in the different pilot production lines of the partners, and a blueprint will be designed for a complete roll-to-roll production line for modules costing less than 0.5 €/Wp.

* VHF = very high frequency, MW = microwave, (PE)CVD = (plasma-enhanced) chemical vapour deposition

Coordinator: C. Ballif, Université de Neuchâtel, Switzerland

More info: <http://www2.unine.ch/flex/>

LARCIS – Large-area CIS-based Solar Modules for Highly Productive Manufacturing

The aim of the project is to improve the manufacturing potential of thin-film solar modules based on CIS (copper indium diselenide) technology. The project addresses several aspects of CIS solar cell fabrication, including the molybdenum back contact, the buffer layer, the absorber and the process control. Special emphasis is placed on the development of cadmium-free large-area modules and electro-deposition methods for CIS absorbers. The results of the work will be transferred from the laboratory to the pilot production facilities of the project partners.

Coordinator: M. Powalla, Zentrum für Sonnenenergie und Wasserstoff-Forschung (ZSW), Stuttgart, Germany

More info: <http://www.zsw-bw.de/>

FOXY – Development of Solar-grade Silicon Feedstock for Crystalline Wafers and Cells by Purification and Crystallisation

The growth of the PV industry has resulted in an increased demand for silicon feedstock, the price of which has risen significantly. The project will contribute to solving this problem by developing processes of refining, purification and crystallisation for metallurgical solar-grade silicon feedstock and recycled electronic-grade silicon. The refined solar-grade silicon cost target is 15 €/kg, and the electronic quality of the feedstock material will be assessed by fabricating and analysing large-area solar cells.

Coordinator: A. Wærnes, SINTEF Materials and Chemistry, Trondheim, Norway

More info: <http://www.sintef.no>

PV-SEC – The Secretariat of the European Photovoltaic Technology Platform

The PV-SEC action provides secretarial support to the European Photovoltaic Technology Platform.

Coordinator: European Photovoltaic Industry Association, Brussels, Belgium

More info: <http://www.eupvplatform.org/>

BIOMASS

NETBIOCOF – Integrated European Network for Biomass Co-firing

Co-firing of biomass with coal offers a practical solution for increasing the share of renewables in the energy mix. It is particularly suitable in the New Member States of the EU, where a significant coal combustion infrastructure is already installed and land is available for the growth of energy crops. The aims of the NETBIOCOF Coordination Action are to promote European co-operation on biomass co-firing research, and to encourage the uptake of innovative co-firing technologies in new and existing power plants (with emphasis on the New Member States).

Coordinator: G. Schories, Technologie-Transfer-Zentrum (TTZ), Bremerhaven, Germany

NILE – New Improvements for Lignocellulosic Ethanol

The objective of the NILE integrated project is to develop cost-effective production of clean bioethanol fuel from lignocellulosic biomass, such as agricultural and forestry residues. The project will focus on three priorities:

- to develop new enzymes to degrade cellulose in plant material to sugar
- to develop several new strains of yeast to convert all types of sugar in biomass material to ethanol
- to improve process integration in order to reduce energy consumption during processing.

The cost and environmental impact of the technologies developed in the project will be evaluated at the pilot plant of one of the project partners.

Coordinator: F. Monot, Institut Français du Pétrole, Rueil-Malmaison, France

More info: <http://www.nile-bioethanol.org/>

AERGAS II – Biomass Fluidised Bed Gasification with In-situ Hot Gas Cleaning

The objective of the AERGAS II project is to develop a low-cost gasification process with integrated gas cleaning for subsequent power production. The proposed process uses *in situ* CO₂ capture (AER – absorption enhanced reforming), and results in a product gas with low amounts of tar, alkali and sulphur, a high concentration of hydrogen and a high calorific value. The process should allow the use of problematic feedstock thus leading to an increased market potential for biomass gasification. The process will be investigated using a circulating fluidised bed reactor, and gasification tests with different bed materials and feeds will be carried out in a continuously operated 100 kW pilot plant. The project aims to prove the feasibility of scaling-up the concept at an 8 MW_{th} plant in Guessing, Austria.

Coordinator: M. Specht, Zentrum für Sonnenenergie- und Wasserstoff-Forschung, Stuttgart, Germany

More info: <http://www.nile-bioethanol.org/>

BIGPOWER – Advanced Biomass Gasification for High Efficiency Power

The objective of the project is to develop fuel-flexible gasification technologies for second-generation processes, which have the potential for cost-effective electricity production (<0.05 €/kWh by 2015) from a wide range of biomass resources. This project focuses on three promising European gasification technologies:

- air-blow fixed-bed gasifier for 0.5-5 MWe
- steam gasification in a dual fluidised bed gasifier for 5-50 MWe
- air-blown pressurised fluidised-bed gasification technology for 5-100MWe.

The performance and the technical and economic feasibility of the advanced gasification-to-power concepts will be assessed for different European regions.

Coordinator: E. Kurkela, VTT, Espoo, Finland

More info: <http://www.vtt.fi>

HYVOLUTION – Non-thermal Production of Pure Hydrogen from Biomass

The HYVOLUTION Integrated Project is centred on the exploitation of bacteria that freely and efficiently produce pure hydrogen as a by-product during growth on biomass. The main scientific objective is the development of a two-stage bioprocess involving the thermophilic fermentation of feedstock followed by photo-heterotrophic fermentation. On the technical side, the objective is to construct prototype equipment for each stage of the process. The results of the project will be used to design a blueprint for the industrial bioprocessing of biomass for decentralised hydrogen production.

Coordinator: P. Claassen, University of Wageningen, The Netherlands

More info: <http://www.biohydrogen.nl>

BIOCARD – Global Process to Improve Cynara Cardunculus Exploitation for Energy Applications

This project will investigate the potential of the cynara cardunculus crop for solid and liquid biofuel production. Compared with other biomass crops, cynara cardunculus produces high-value by-products, and is particularly suited for growing in Mediterranean regions. The innovative aspects of the project include investigating the relationship between crop nutrition and biofuel impurity levels, developing new machinery for seed separation, and investigating biofuel production via traditional catalytic and new heterogeneous catalytic processes.

Coordinator: A. Sanchez Biesma, Tecnatom, San Sebastian de los Reyes, Spain

GEOHERMAL

I-GET – Integrated Geophysical Exploration Technologies for deep fractured geothermal systems

The project aims to improve the detection of geothermal reservoirs, in particular, the detection of fractures and high-permeability zones. An innovative strategy will be developed that integrates currently available knowledge – from rock physics to magnetotelluric data analysis – and makes full use of seismic and electromagnetic exploration methods. The approaches developed in the project will be employed and evaluated in four European sites with different geological and thermodynamic characteristics (Travale, Hengill, Groß Schönebeck

and Skierniewice). The work will be supported by the development of models to interpret data at both local (individual wells) and regional (whole geothermal systems) scales.

Coordinator: E. Huenges, GeoForschungsZentrum, Potsdam, Germany

ENGINE – Enhanced Geothermal Innovative Network for Europe

The main objective of this project is to coordinate the present research and development work for unconventional geothermal resources and enhanced geothermal systems, from resource investigation and assessment stage through to exploitation monitoring. At the end of the project, a European reference manual for the development of unconventional geothermal resources will be produced, including the publications, information, database and models compiled during the project lifetime.

Coordinator: P. Ledru, Bureau de Recherches Géologiques et Minières, Orléans, France

More info: <http://engine.brgm.fr/> and on page 11 of this issue.

CONCENTRATED SOLAR THERMAL

SOLHYCO – Solar-Hybrid Power and Cogeneration Plants

The objective of this project is to develop a solar-hybrid micro-turbine system for power and heat generation. A commercial 100 kW_e micro-turbine will be modified for operation with varying contributions of solar power and combustion fuel, incorporating an innovative tube receiver. The combustion system will be designed for multi-fuel operation, including biofuels. The micro-turbine will be installed at the solar tower test site at Plataforma Solar de Almería, Spain, and its operation in fuel and solar-hybrid mode will be evaluated.

Coordinator: P. Heller, Deutsches Zentrum für Luft- und Raumfahrt e.V., Köln, Germany

SOLHYCARB – Hydrogen from Solar Thermal Energy: High-temperature Solar Chemical Reactor for Co-production of Hydrogen and Carbon Black from Natural Gas Cracking

The project will explore an unconventional route for hydrogen production based on the thermal decomposition of natural gas in a high-temperature solar chemical reactor. This process results in two products, a hydrogen-rich gas and a fine powder known as carbon black. The advantage of the process is that carbon can be sequestered prior to fuel usage. In the project, novel solar reactor prototypes will be designed, constructed and tested on a small-scale (1 to 10 kW), and both direct and indirect heating designs will be evaluated. Based on this work, a pilot-scale reactor (50 kW) will be developed, leading to a conceptual design for a full-scale reactor.

Coordinator: G. Flamant, Centre National de la Recherche Scientifique, Paris, France

HYDROSOL II – Solar Hydrogen via Water Splitting in Advanced Monolithic Reactors for Future Solar Power Plants

The aim of this project is to develop a solar chemical reactor for producing hydrogen via the dissociation of water (water splitting). The reactor is based on innovative ceramic honeycombs incorporating active metal oxide redox pair systems. The honeycomb structures are capable of supporting high temperatures. In the project, a complete pilot unit (100 kW_{th}) will be built, and then coupled to a solar heliostat field and a solar tower for continuous hydrogen production. A detailed technical and economic evaluation of the entire process and its integration in future solar power plants will be carried out.

Coordinator: A. Konstandopoulos, Chemical Process Engineering Research Institute, Thessaloniki, Greece

WIND

UPWIND – Integrated Wind Turbine Design

The UPWIND Integrated Project aims to develop the technology for very large wind turbines (8 to 10 MW) for future wind farms of several hundred megawatts. The project will address a broad range of technological challenges, including the aerodynamics, aero-elasticity, structural and material aspects of rotor design; a critical analysis of the drive-train components; support structures for offshore applications, and pre-normative research (see also page 12).

Coordinator: P. Jensen, RISØ National Laboratory, Roskilde, Denmark

More info: <http://www.upwind.org>

POW'WOW – Prediction of Waves, Wakes and Offshore Wind

In the POW'WOW Coordination Action, a virtual laboratory consisting of data sets from offshore wind farms will be set-up for the evaluation of state-of-the-art wake models. The project will also coordinate the ongoing modelling work in the wind and wave energy communities. The project aims at improving the assessment and prediction of offshore wind power resources, wake effects in wind farms, and short-term wind and wave power output.

Coordinator: G. Giebel, RISØ National Laboratory, Roskilde, Denmark

More info: <http://powwow.risoe.dk/>

Forthcoming conferences and seminars in which DG Research will be an active participant or an organiser.

World Bioenergy Conference and Exhibition

Jönköping, Sweden, 30 May – 1 June 2006

The Conference, organised by the Swedish Bioenergy Association (SVEBIO), brings together all stakeholders in the field of bioenergy with an industrial focus. It will also host a side event organised by DG RTD, entitled 'Industrial Biomass Research – Industrial Perspective'. The aim of this session is to highlight the benefits for industries to participate in EU research framework programme projects. Industrial partners participating in EU projects will present and discuss their respective experiences, while Commission representatives will brief delegates on the upcoming FP7.

For more information on the conference, and for online registration, please visit <http://www.elmia.se/worldbioenergy/>

World Renewable Energy Congress (WREC)

Florence, Italy, 19-25 August 2006

The WREC aims to promote the development of renewable energy technologies and the strengthening of the industry in the context of a sustainable and secure supply of energy, particularly in developing countries. On this occasion, on 23 August, a one-day session entitled 'European renewable energy RTD and international co-operation' will be organised, which will cover the European RTD activities and the potential collaboration of the EU with Asian, African and Latin American countries. The main objective is to raise awareness in third countries about the EU research programmes in renewable energy and to stimulate international co-operation for FP7.

For further information on the congress please refer to: <http://www.wrenuk.co.uk/wrecix.html>

21st European Photovoltaic Solar Energy Conference and Exhibition

Dresden, Germany, 4-8 September 2006

The 2006 European Photovoltaic Conference will take place in the Messe Dresden Convention Centre. Lectures, fora and workshops will be organised on more specific issues including different research areas.

For more information please refer to: <http://www.photovoltaic-conference.com>

European Conference on Biorefinery Research

Helsinki, Finland, 19-20 October 2006

DG RTD will organise, with the support of the Finish Presidency, the European Conference on Biorefinery Research with the aim of presenting the industrial perspectives of current and future biorefineries, and providing a technical review forum for biomass fractionation and conversion technologies. The event will disseminate information on current RTD success stories, evaluate industry needs, and identify challenges and opportunities for the development of biorefineries. Emphasis will also be placed on the EU and national policies contributing to the use of renewable raw materials. The potential of the various biorefinery concepts will be discussed in the frame of market conditions and the upcoming FP7.

For more information please refer to: http://europa.eu/comm/research/energy/gp/gp_events/biorefinary/article_3764_en.htm

International Conference on Ocean Energy

Bremerhaven, Germany, 23-24 October 2006

Marine currents and waves have a large, as yet untapped potential providing renewable electricity. This conference will allow researchers, industry, utilities, policy-makers and other interested parties to present and discuss technical and non-technical matters related to ocean energy.

For more information please refer to: <http://www.otti.de/pdf/guenther/coe2580cfp.pdf>

2nd International Conference on Integration of Renewable and Distributed Energy Resources

Napa, California, USA, 4-8 December 2006

This week long conference aims at knowledge-sharing among North American, European, and Asian utilities, network operators and researchers in the fields of renewable energy and distributed energy sources. The conference will focus on the technical, market and regulatory issues that challenge the integration of these resources into the grid.

For more information please refer to: <http://www.2ndintegrationconference.com/index.asp>