

ERRIN calls for increased public support for R&D to combat Climate Change

Statement in support of European Commission goals for COP15 - UN Climate Change Conference, Copenhagen, December 2009¹

The European Commission released its communication 'Towards a comprehensive climate change agreement in Copenhagen' on 28th January 2009². Among the key messages of this communication is the call to double energy-related research and development (R&D) by 2012, and quadruple it by 2020, shifting the emphasis to low-carbon technologies and renewable energy sources.

The climate change clock is ticking and we need action on the ground. ERRIN, the European Regions Research and Innovation Network,³ fully supports this call and asks the European Union representatives at COP15 to be as ambitious as possible in increasing public support for research and development and efforts for international cooperation including key regional climate change projects and initiatives.

Increased public support is essential to catalyse and provide incentives for the private sector and research actors to drive forward innovation and R&D aiming at real impact on reducing greenhouse gas emissions.

- **European regions play a key role in creating innovation and research-friendly environments and in bringing together public, private and research sectors to develop innovative solutions** – Regions work to promote pilot projects in the field of research and innovation; promote the development of market orientated products and solutions; create specialised clusters and professional skills to tackle the challenges of climate change; sustain the importance of supporting existing regional clusters and centres of excellence, and develop complimentary regional excellence and specialisation in specific fields;
- **Investment - not just more money, but using it wisely** – Regions are well placed, as part of their regional strategies, to monitor the impact of investments and identify gaps which exist. Building on existing initiatives and cooperating with and learning from others is fundamental in good use of public funds, both at a regional level between public administrations, universities and SMEs, and developing international collaboration.
- **The research base and infrastructure exist – for quick wins we need to build on current projects and excellence** - Good practice and excellent research programmes and infrastructure exist in the ERRIN regions and have the capacity to hit the ground running, turning additional financial support into tangible and workable solutions;
- **We must work across borders to find the best solutions** – Climate Change is an issue for us all and ERRIN regions have considerable experience in exchanging best practices and experiences, encouraging international collaboration between

¹ <http://en.cop15.dk/>

² COM(2009) 39 final

³ www.errin.eu

researchers, and adding value to individual regional research and innovation projects by joining forces and capitalizing on common knowledge developed in other countries and regions;

- **Co-benefits are for all** - Not only will investing in research and development for climate change solutions increase skills, create jobs, improve health and well-being and reduce reliance on dinosaur technology and polluting energy sources; but it is a necessary factor in finding solutions to reverse the downward spiral of damage to our planet.

ERRIN regions are key partners in addressing this challenge.

A selection of projects and initiatives from ERRIN regions which illustrate this listed in the annex:

- **GREEN BUILDINGS (design tools and innovative technologies) from Ile-de-France, France**
- **NaREC (New and Renewable Energy Centre) from North East England, UK**
- **Wave Hub - Region: South West of England, UK**
- **POLYCITY – Meeting energy needs in an urban setting from Stuttgart, Germany**
- **European Bioenergy Research Institute (EBRI) from West Midlands, UK**
- **The Diamond – A new solar generation plant from Tuscany, Italy**
- **Simplified Energy Certification from Navarra, Spain**
- **Joule Centre, a network of research institutions from England’s Northwest, UK**
- **The European Marine Energy Centre for wave and tidal energy devices, Scotland, UK**
- **S’TILE – Development of semiconductors materials for solar energy, Poitou-Charentes, France**

Annex – Examples from ERRIN regions

GREEN BUILDINGS (design tools and innovative technologies).
Region: Ile-de-France, France

Making an impact: The building sector has a major impact on use of energy, water and materials and this initiative works to reduce it, for positive benefits on the environment. It assists the relevant parties in making the right decisions in the building process, concerning regulations, design, construction and product development.

Technology development: Development of professional software (computer aided design tools) and new technologies that can be tested on site. Activities include modelling, thermal simulation, life cycle assessment, development of professional design tools, assessment of innovative technologies, design and monitoring of demonstration projects and training.

Innovative partnership: Since 2005, thanks to political will and funding from Ile-de-France's local authorities, the region brought together all the laboratories dealing with sustainable development (ecologists, biologists, engineers, economists, etc.) into a research network called "research network on sustainable development". Both regional and EU funds made possible the implementation of the "green buildings" project which brings together the industry and the researchers in a public private partnership. The partners include: Paris Tech, the Universities of Karlsruhe, Trondheim, Budapest and Colorado, The Fraunhofer Institute for solar energy systems (Freiburg), SINTEF (Norway), CIRCE (ES), KTH (SE), VINCI, Lafarge, GDF-Suez.

International impact: Cooperation has resulted in the project being transferred to Chile, with resultant PhD thesis and courses at the University of Magallanes. The project is useful in such developing countries where resource scarcity will create important social problems if eco-design is not rapidly implemented, particularly in the building sector and social housing.

Barriers and future: More staffing needed to get this information out further – particularly permanent staff in research institutes.

More information: www.r2ds.centre-cired.fr/spip.php?article116
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NaREC (New and Renewable Energy Centre).
Region: North East England, UK

Existing research centre: NaREC (New and Renewable Energy Centre) offers development, testing and consultancy services in emerging new and renewable energy technologies with world-class testing facilities and expertise in wind, photovoltaics, marine, microgeneration and distributed energy.

Regional innovation to set up – becoming self-sustaining: One North East, the Regional Development Agency for North East England, has provided significant public investment to establish and support NaREC. This Centre of Excellence is now recognised as a critical UK innovation asset with capability specifically designed to enable the commercialisation of technologies, particularly in the offshore sector. After 5 years NaREC is now moving towards being self-sufficient as it generates income from private sector commercial work.

Co-benefits proven: The results are benefiting the local economy with jobs created and safeguarded and increased business for local suppliers. Wider results across the region include new opportunities in the offshore wind supply chain. NaREC is also benchmarking and partnering with leading international innovation centres including NREL (USA) and ECN (NL) to share best practice in innovation.

Barriers overcome: A key barrier was the public sector backing required to establish NaREC. The organisation operates as a public good agency, overcoming state aid issues. NaREC's related commercial activities are completed via a separate subsidiary arm.

With more R&D funding: The focus has been on building capability in terms of innovation assets and high-value R&D activity. The key is to link this R&D funding with the large-scale developers now commercialising the next generation of low-carbon technologies. In the UK, Government intends to bring-on-line 33GW of offshore wind generating capacity by 2020, which has a value of c. €100bn and potential for 57000 new jobs. This represents major inward investment and economic development for the UK, and presents a clear urgent large-scale opportunity for NaREC to exploit and enhance their existing R&D capabilities and feed their expertise into major deployment programmes.

More information: www.narec.co.uk/
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Wave Hub
Region: South West of England, UK

Developing demonstration centre: Wave Hub is a demonstration site for devices that generates electricity from wave power. This site offers companies a location where they can deploy quickly and economically groups of devices in vigorous sea conditions.

Addressing the gaps in knowledge: Research into marine energy has been taking place for several decades but without, as yet, developing machines with a proven track record and without the demonstration of actual environmental and other impacts. Wave Hub attempts to address this gap and is on a large enough scale to deploy arrays of devices over long timescales.

Public and Private finance and action: Wave Hub is funded by both public and private. It involves partners at regional level (University of Plymouth, University of Exeter, Plymouth Marine Laboratory, businesses and consultancies, and funding from the Regional Development Agency) and at national level (UK Government Departments for Climate Change, Business and Rural Affairs). Funding is also received from the European Regional Development Fund.

Barriers and future: Budget has been not a limiting factor thus far, but the benefits of the project will only be fully realised if effective collaborations can be developed nationally and internationally so that R&D activity is carried out on a consistent basis, on a sufficiently long timescale and avoids unnecessary duplication.

More information: www.wavehub.co.uk
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POLYCITY – Meeting energy needs in an urban setting
Region: Stuttgart, Germany

Meeting urban energy needs: This project is developing energy networks in cities and demonstrating innovative energy supplies and demand technology combined with energy management structures for different urban sites. POLYCITY, funded by the EU-programme Concerto, focuses on large scale urban developments where living and working areas are integrated to result in sustainable city quarters with short distances and low transport energy consumption.

Transferring know-how: The project will handle different aspects of urban conversion in three different European locations: new constructions on sites with little development on the outskirts of Barcelona, the conversion of an old city quarter in Torino and a mixture of rehabilitation and new construction on a large former military ground near Stuttgart.

Testing technologies: A range of innovative technologies are implemented and optimised in the different sites. These include ORC technology and its optimisation potential, Biomass gasification in a large trigeneration system and solar cooling plants.

More information: <http://www.polycity.net/en/index.html>
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European Bioenergy Research Institute (EBRI)
Region: West Midlands, UK

Meet Climate targets: The City of Birmingham has set a target of 60% reduction in CO₂ emissions by 2026 and has initiated a joint collaboration with regional universities to help meet it. By dealing with local waste: the technology developed by EBRI will turn ash rich biomass feedstock (waste wood, sewage sludge) into clean syngas which can be used to produce CO (for heat and power) and hydrogen, or can co-fire power stations.

Regions as catalysts: EBRI is creating a unique platform for the development and implementation of bio-energy systems in local, national and European contexts and reaching to the international community. The partnership includes universities across the region, UK and Italy, Germany, Hungary and Austria; major industrial partners, including the large utility companies and international partners from India and the USA.

Learning from others: Knowledge will be transferred with Odenwald in Germany and already other UK cities are looking to use the same system.

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The Diamond – A new solar generation plant
Region: Tuscany, Italy

Innovation and design: The Diamond is a new-generation, small scale, solar power station which can both produce and store energy. Added to that it's a beautiful piece of sculpture that looks amazing in public spaces.

Practical and effective: The idea developed from the need to find a system to generate electricity which would be suitable for protected natural or urban locations. An interdisciplinary team of engineers, physicists and architects created this steel and glass structure consisting of 38 triangular photovoltaic panels. One Diamond can permit the reduction of 20-30 tonnes of CO₂ per year.

Reaching the market: The Diamond has now been patented in Europe.

More information: www.enel.it/azienda_en/ricerca_sviluppo/dossier_rs/diamante/gennaro.demichele@enel.com

Simplified Energy Certification
Region: Navarra, Spain

Using new technologies: Software has been designed to allow simple and flexible calculations of the energy rating of new buildings: CES (simplified energy certification).

Faster and better for energy and design: The main advantage of CES is the speed in obtaining results, this allows a large number of alternatives to be tested to find the best solution for each case, allowing better building designs in order they can be more efficient, consuming less energy and emitting less CO₂ to the atmosphere. The program automatically displays the most cost-effective measures that can be implemented in the building and generates the administrative documents that are necessary to justify the minimum standards on energy - saving time and energy for the engineer

Benefits for the environment: The main environmental benefit is the facility to evaluate CO₂ impact of the building in the first steps of its design, allowing the architect to study new alternatives to further reduce the building's energy consumption. If the building consumes less energy, less greenhouse gases will be emitted and less money spent on energy for the building.

Future vision: CES Software is based on energy simulations with its own weather database. As the weather database grows, it will be possible to transfer the technology to

other countries. It is also currently focussed on residential buildings but the non-residential buildings software (CES-PT) is under construction and getting first results.
Public private partnership: Miyabi is a public enterprise from the Government of Navarra (75% of their capital is public), but it also has private capital from companies.
More information: www.miyabi.es or mapascual@miyabi.es

Joule Centre

Region: England's Northwest, UK

Region as a catalyst: Regional funding from the Regional development Agency provided the initial costs to spearhead a collaboration for low carbon energy research in the region, involving industry and academia.

Different roles for common purpose: Academic researchers across the regions leading research universities (approximately 260), all sectors of industry through cluster organisations and individual businesses, Northwest Regional Development Agency to promote capabilities of the region and public sector organisations for instituting trials and deployment strategies all provide essential parts of the process.

Results: Research on large scale tidal energy, hydrogen fuel cells, aviation, low carbon manufacturing and 3rd generation solar cells; 40 new jobs in energy research sector and individual business assisted.

Future vision: Joule Centre well established to build on existing programme and develop further specialisation. Additional funding would be welcomed to be able to stimulate interdisciplinary research projects and build outward connections.

More information: www.joulecentre.org

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The European Marine Energy Centre for wave and tidal energy devices

Region: Scotland, UK

Unique existing test site: The European Marine Energy Centre (EMEC) is the only grid connected test site in the world for full scale wave and tidal energy devices. The world's first grid connected floating deep water wave energy converter PELAMIS was initially tested at EMEC in 2004 and OpenHydro's open centred tidal turbine was the first tidal turbine to generate to the UK national grid in 2007.

Fostering technology transfer: Both the lessons learned from the operation of the test site and also the development of new technologies are being dispersed across the globe. EMEC is working with other possible test centres around the world as they become established and is leveraging value from the IP it has created. Consultancy services are also being developed using this IP. Companies who have worked at EMEC have gone on to secure development sites elsewhere, notably PELAMIS in Portugal and OpenHydro in Canada and France. The deployment of the technologies around the world is being accelerated by the experience and learning gained at EMEC and has been a key selling point to the companies concerned. The learning will be durable as it will become embedded within designs and for the foundation of a new truly sustainable industry.

Sharing world-class knowledge internationally: EMEC has secured more consents for the deployment of devices than anybody else. Consequently, regulators are more experienced than elsewhere and the regulatory landscape has been surveyed and is being reorganised to make the processes fit for this new purpose. The learning from this nucleus of expertise has been incorporated into guidelines, some of which are in the process of international ratification and development as standards.

Future ambition and potential barriers: The second full scale wave and tidal machines are presently being installed and preparations are underway for a further four machines within the next two years. Following a lack of past activity in the sector, the relatively recent step change has been catalysed by Government investment. However, a lack of generous and sustained investment from Government or the private sector

remains a barrier to progress. Without further step changes to increase finance, the course ahead of marine renewables will remain hazardous.

More information: <http://www.emec.org.uk/>

S'TILE – Development of semiconductors materials for solar energy
Region: Poitou-Charentes, FR

Low Carbon Technology development: Taking a technique from the ceramic industry and applying to the production of silicon wafers and solar cells, S'Tile has developed a new way to press silicon powder to form wafers. Prior to this silicon slices were cut from larger pieces which was much more energy and resources intensive. The tiles are then used in differing shapes and sizes to make the best use out of photovoltaic and solar technology. The new method of production means lower costs, less energy consumption and less CO₂ emissions.

Bringing new partnerships together: Based on R&D research at Poitiers University, the process has received the support of CNRS (National scientific research center), OSEO and Poitou-Charentes Region. The S'tile Company has been created in 2007 to develop the process and equipment and has obtained the financial support from EMERTEC.

Creating jobs for the region: This initiative is part of the Regional renewable energy scheme focused developing the solar and photovoltaic sector, creating new industrial production activity and therefore new jobs.

Further developments: The enterprise is building partnerships with CEA, National and European Institutes on Solar Energy : INSA Lyon and with German partners such as ISE Fraunhofer and Solar World, for improving technology and for the implementation of patents.

More information: <http://www.silicontile.com/>
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Notes

ERRIN (European Regions Research and Innovation Network) was established in 2001 as an informal network. After two years of EU support within the 'Regions of knowledge' action, ERRIN was made sustainable through the creation of an independent not for profit organisation under Belgian law.

Operating through the EU regions Brussels offices, ERRIN currently brings together regional decision makers, practitioners and R&D players from over 70 European regions in 16 different Member States. ERRIN specifically deals with research and innovation-related issues and aims at improving collaboration and joint trans-national projects between the research and innovation organisations in member regions and at facilitating regular dialogue with the European institutions in order to promote the regional dimension of research and innovation and the participation of member regions in European debates and consultations.