



Thermal Energy and Building Performance Group

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Catalonia Institute for Energy Research

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GOVERNING BODY

IREC is governed by a Board composed of:

- Catalan Ministry of Economy and Finance
- Catalan Ministry of Innovation, Universities and Enterprise
- Spanish Ministry of Science and Innovation (CIEMAT)
- Spanish Ministry of Industry, Tourism and Commerce (IDAE)
- University of Barcelona UB
- Technical University of Catalonia UPC
- Rovira I Virgili University in Tarragona URV
- ENDESA
- GAS NATURAL FENOSA
- AGBAR
- Fundación REPSOL
- ENAGÁS
- Compañía Logística de Hidrocarburos CLH
- ALSTOM Wind





SCIENTIFIC ADVISORY BOARD

The Scientific Advisory Board, appointed by the Council, serves as an advisory body insofar as the Foundation's scientific strategy and to evaluate their activities and members.

The Scientific Advisory Board is composed by:

•Prof. Dr. Esteban Chornet. Chairman of the Board

Emeritus Professor of the Sherbrooke University, Québec, Canada.

•Prof. Dr. John A. Kilner.

Imperial College London, Faculty of Engineering, Dept. of Materials. UK.

•Prof. Dr. Johan Driesen.

Associate Professor K.U.Leuven. BE.

• Prof. Dr. Mattias M. Schuler.

Adjunct Professor of Environmental Technologies, Graduate School of Design, Harvard University, MA, USA.

•Dr. Jürgen Kröning.

Managing Director of DEWI-OCC at Cuxhaven. Onshore and Offshore wind business. NE.

•Prof. Dr. Konstantinos Papamichael.

Co-Director. California Lighting Technology Center, University of California, Davis, CA. USA.



ORIENTATION

The Institute's orientation takes a dual approach:

- **Market orientation**, focusing on technology development, new products and new technical solutions for energy sector companies active in the same fields as IREC's established lines of action.
- Long-term research into different aspects of the established lines of action. It will not initially aimed at the market, but at generating knowledge amongst groups in the Institute itself, with a long-term commercial projection in mind.

The Institute's orientation will consist of a **balance** between these two approaches.





TECHNOLOGY & RESEARCH AREAS

The Institute's **focus of technological** research:



Power Electronics

Socio-Technical Research



TECHNOLOGY & RESEARCH ACTIVITIES

Thermal Energy and Buildings

Group leader: Dr. Jaume Salom

The **buildings** sector is responsible for **40% of the world's primary energy consumption**. **Improving** bioclimatic **design**, applying innovative measures for improved **energy efficiency** and integrating renewable energy systems are pivotal factors for **reducing emissions**.

Principal lines of work:

- Energy Efficiency applied to:
 - Thermal processes of the industry
 - Optimization of centralized generation systems
 - Use of residual heat
- Buildings: minimizing a building's energy demand through design, efficient use and integrating renewable energy technology to meet the power demand.





Member of the IEA SHC Task 40 – ECBCS Annex 52 "Towards Net Zero Energy Solar Buildings"

RESEARCH LINES & AREAS OF APPLICATION

SYSTEMS FOR ENERGY		ENERGY EFFICIENT BUILDINGS
PRODUCTION AND USE	NET ZERO OR POSITIVE ENERGY BUILDINGS	Residential and non industrial uses
Heat and cold production Hybrid systems Low and Medium Temperature RES: solar thermal, geothermal Thermal Storage	DATA CENTERS RETROFITTING EXISTING BUILDINGS DISTRICT HEATING & COOLING NETWORKS EE DISTRICT / COMMUNITIES	New buildings Refurbishment Quality Indoor environment Measurement & Verification
	LOWCARBON INDUSTRIAL PARKS POLICY MEASURES	
REC	ENERGY EFFICIENT INDUSTRY Energy Efficient Factories Efficient thermal processes	



TECHNOLOGY & RESEARCH ACTIVITIES

Thermal Energy and Buildings

Projects

Stand alone R.E. system for industrial application Feasibility study of a stand-alone renewable system for an industrial process using innovative storage concepts.

SOLAR Cooling

Simulation, optimization and measurement and verification of a solar heating and cooling system with absorption chillers and heat pumps.

District heating with biomass

Optimization and measurement and verification of a district heating system using biomass.

NZEB

Net Zero Energy Buildings. Conception, study, simulation and optimization of buildings and/or neighborhoods with zero net energy consumption and zero carbon emissions.



TECHNOLOGY & RESEARCH ACTIVITIES

KIC InnoEnergy, Europe's Network for Energy Excellence

The European Institute of Technology & Innovation EIT has chosen the consortium *InnoEnergy*, which is comprised of 35 companies, universities and research centers throughout Europe, to stimulate and promote research, training and innovation in the energy sector.

The primary **objective** is to try and make it so fundamental research **reaches the market more quickly and efficiently**, so that European companies are able to compete in better conditions globally with the USA and Japan.

IREC, as a leading European center in energy research, forms part of *InnoEnergy* and will participate in the projects to be promoted in the 2010-2016 period.

KIC InnoEnergy



IREC AT THE HEART OF INNOVATION IN EUROPE - KIC



Institut de Recerca en Energia de Catalunya Catalonia Institute for Energy Research

RESOURCES

Locations

IREC has two locations: the headquarters in Barcelona, and the Tarragona Research Center.



The **Barcelona Research Center** handles: Energy Efficiency Projects Electricity and Power Grids

Advanced Materials for Energy Applications





The **Tarragona Research Center** deals with: Bioenergy Offshore Wind Power Energy Efficiency Projects

RESOURCES

A Growing Team

We at the IREC team know we're part of a **project for the future** oriented towards **generating scientific knowledge** and participating in the **technological development** of the energy sector in an environment of **excellence**. At the beginning of this year our team has grown to **100 individuals**.







Sponsors:



Financed by:



European Union European Regional Development Fund