



# **Campus Energía**

## **Energía para la excelencia**

**Executive summary**



UNIVERSITAT POLITÈCNICA  
DE CATALUNYA  
BARCELONATECH

## Executive summary

The energy sector, which has traditionally been a vehicle for renewal of economic activities, innovation in the business sector and changes in land use patterns, is undergoing a profound transformation. The recent liberalisation of the energy market, the growth of distributed generation, the progressive internationalisation of markets and companies and the introduction of low-carbon-emission power sources will create an entirely new energy scenario over the next 20 years. Although this transformation will inevitably generate a degree of social unrest and tension in the business sector, it will also create **new opportunities** for economic development.

The UPC, which was involved in the first major industrial transformation that brought electricity to Spain some 150 years ago, now wishes to take a leading role in these new changes as part of its commitment to social responsibility and as an opportunity for development. Over the last ten years the University has established a reputation for scientific excellence, built a powerful network of partnerships with universities and companies across the globe and earned the respect of the international community.

In the area of **education**, the UPC has adapted its teaching facilities and methodologies to the requirements of the European Higher Education Area (EHEA) and offers a range of EHEA bachelor's degrees and international master's programmes that focus on specific aspects of the energy sector such as new technologies, management techniques and business models. It also boasts more international doctoral students than any other university in Spain and a total of 10 Erasmus Mundus master's degrees for the 2010-2011 academic year.

In the area of **research**, the University works with international consortia in areas such as energy efficiency in transport and construction; new materials for power generation and storage; photovoltaic and wind energy; biomass and fuel cells; smart grids; plant safety systems; high-efficiency converters; and nuclear fusion and fission.

In the area of **social responsibility**, the UPC has helped to create more than 250 companies, shares teaching staff and resources with secondary schools and vocational training centres, develops new campuses that act as nuclei for urban and social development, oversees contracts with corporate partners with an annual value of €5 million, monitors the insertion of its graduates into the labour market and offers full accessibility to people with disabilities.

Although the UPC acted largely independently in promoting electrification some 150 years ago, in the current market it makes less sense to work as a lone agent. The UPC today is an open and inclusive institution that has overseen the creation of more than 20 research centres, trained many of the engineers currently working in Catalonia, and sought active involvement in international initiatives such as KIC InnoEnergy, which it coordinates.

The extensive relationships that the University has built up over the years form the basis of the strategic consortium behind the Campus Energía project, set to be a leading network in the energy sector. The project receives the support from two institutions at the forefront of scientific and technological development in Spain, IREC and CIEMAT.



The partners oversee a group of over 40 affiliated organisations that include scientific institutions, companies, government bodies and associations belonging to civil society, each with specific ties to the energy sector. These organisations are distributed in a Quadruple Helix structure and work under an innovative governance model to make the consortium the leading agent in the transformation of the energy sector in southern Europe, catalysing change at the local level and establishing a solid international reputation.

3

The Campus Energía project seeks to strengthen the consortium by streamlining the implementation of planned activities and integrating new strategic actions with a clear objective: to become an active agent in the transformation of the energy sector through cooperation in research and innovation, harnessing emerging opportunities and bringing international recognition to individual members.

## Vision

The Campus Energía aims to become:

- The leading strategic consortium for energy in Southern Europe, with local impact and broad international recognition.
- A nucleus for knowledge, technology and value generation capable of meeting society's needs and fostering the creation of a sustainable economy.
- A benchmark for quality learning within the framework of the EHEA, training skilled professionals for new employment areas in the energy sector.
- A generator of highly-skilled employment and innovative technology-based companies, helping to transform the economic model.
- A model of social responsibility with respect to the change of energy model and its socioeconomic impact.

## The Campus model

The Campus Energía is assured a strong international presence through the profiles of consortium members, which include major corporations such as Gas Natural Fenosa and Vestas, government organisations like Fusion for Energy, which oversees the ITER project, the KIC InnoEnergy initiative and university networks of excellence.

The Campus Energía consortium consists of over 40 science and technology organisations, government bodies, companies and civil institutions organised under the Quadruple Helix model to pursue a common strategy that harnesses and builds on existing relationships and synergies.

The Campus Energía promotes entrepreneurial spirit by supporting the creation and consolidation of energy companies, creating value from research results and technological innovations and raising awareness of the importance of entrepreneurship in secondary schools and vocational training centres.

The Campus Energía specialises in four key areas: energy efficiency, in particular as applied to housing and transport; smart energy management systems; renewable energy sources and technologies for increasing their efficiency; and nuclear fusion and fission energy.

The Campus Energía combines international projection with a broad local influence through cooperative involvement in vocational training programmes, government-backed Local Innovation Plans and pilot demonstration projects in partnership with government bodies, civil society and local businesses.

4

The Campus Energía governance model draws on the experience of the consortium members to combine and coordinate diverse organisational structures. The model establishes a governance system comprising a Governing Council, an Executive Committee, a General Management Council, a Management Unit and three Advisory Councils, focusing on scientific, business and social matters, respectively.

## Strategic objectives and actions

**SO1.** Attracting international talent and securing investment

**SO2.** Consolidating international projection in the energy sector

**SO3.** Adapting professional profiles to the demands of society

**SO4.** From cooperation to strategic partnership

**SO5.** Consolidating social responsibility and accountability

## Anticipated results

- Introduction of four new Erasmus Mundus master's degrees and a joint doctorate in energy-related disciplines and a pre- and postdoctoral financial support programme, maintaining the UPC's leading role in the implementation of quality Erasmus Mundus programmes and attracting international talent.
- Establishment of joint initiatives between the UPC School of Doctoral Studies and the KIC InnoEnergy PhD School to strengthen doctoral training in energy disciplines, and expansion of international student body: from 45% to 65% at doctoral level and from 40% to 55% at master's level.
- Construction of an energy-efficient building for the university community, offering specific areas and services for international students.
- Specialisation in four working areas – energy efficiency, nuclear fission and fusion energy, smart energy management systems and renewable energy – and implementation of specific “Living Lab” projects to bring technological developments to a wider audience.
- Construction of three energy-efficient research buildings with a total area of 19,000 m<sup>2</sup> devoted to new materials, chemical processes, mechatronic systems and nuclear energy.
- Development of a common communication policy and internationalisation of 60 SMEs through participation in international consortia and technology transfer initiatives.
- Increase of return on research investment through participation in the Seventh EU Framework Programme and involvement in working groups on energy in university networks.
- Introduction of modules and workshops on entrepreneurship designed specifically for secondary education and vocational training.
- Creation of 10 technology-based companies and application for 10 international patents applicable to the energy sector.
- Consolidation of the Energy Observatory as a body for the management and public dissemination of knowledge generated by the consortium and for the preparation of reports on employment statistics and professional profiles in the energy sector.
- Development of an e-learning platform with specific modules for vocational training in energy-related disciplines and creation of new mechanisms for transfer between universities and official vocational qualifications.
- Creation of an organisational structure with three levels of involvement and a governance model with three Advisory Councils, focusing on scientific, business and social matters.
- Expansion of the consortium to 60 affiliated members, with priority given to SMEs, and consolidation of an information system guaranteeing efficient knowledge management and accountability.

## Budget summary

| Assessable aspects                              | Total amounts for the period 2010-2014 |
|---|--|
| Academic improvement and adaptation to the EHEA | €17,296,082                            |
| Scientific improvement and knowledge transfer   | €8,208,500                             |
| Transformation of the Campus                    | €21,587,047                            |
| <b>TOTAL</b>                                    | <b>€47,091,629</b>                     |