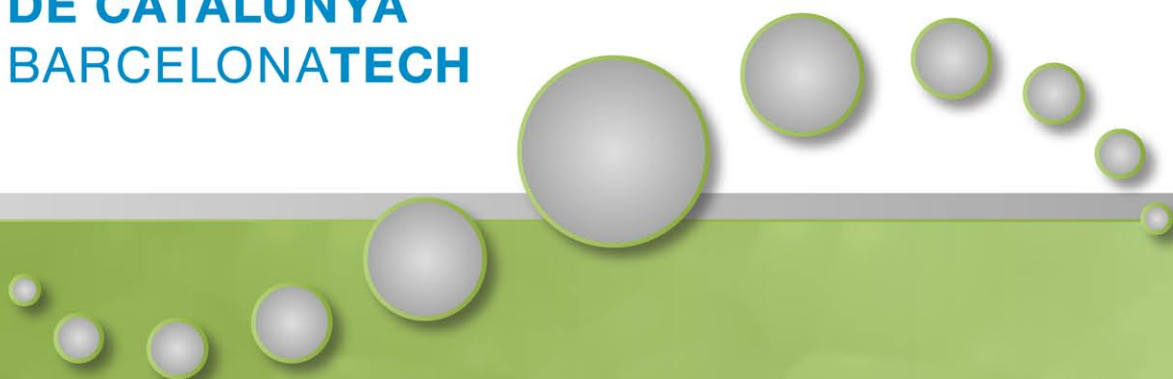


IS.UPC - Research Institute
for Sustainability Science
and Technology.

ANNUAL REPORT 2011



**UNIVERSITAT POLITÈCNICA
DE CATALUNYA
BARCELONATECH**



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1. PRESENTATION

The Research Institute for Sustainability Science and Technology of UPC - BarcelonaTech is the responsible unit for promoting, coordinating and carrying out academic activities in the fields of sustainability science and sustainable technologies.

The Institute's mission is to generate technical and conceptual tools to create a more sustainable production and development model and to collaborate in the UPC's endeavour to provide scientific and technical support for human, social, cultural and economic progress.

The IS.UPC is active in higher education, research and innovation, technology transfer and promotion of sustainability culture.

Its main objectives are as follows:

- Opening up sustainability research to UPC groups and researchers, by coordinating and promoting multi and trans-disciplinary research projects.
- Organizing and promoting specific postgraduate courses and degrees (Master's degrees, PhD programmes and other specialised teaching activities) directly linked with the UPC research in the fields of sustainability science and sustainable technologies, as well as embedding sustainability in other UPC educational programmes.
- Making the UPC management, in itself, a source for research demands in sustainability and a field of study and experimentation.
- Disseminating the results of the research carried out at the IS.UPC, both to the university community and to the society as a whole, and sparking discussion about it.
- Encouraging the commitment and interaction of the UPC within society, and encouraging UPC's support of civic demands for promoting progress towards more sustainable development models.

1.1. LETTER FROM THE DIRECTOR

The Research Institute for Sustainability Science and Technology of UPC – BarcelonaTech (IS.UPC) was formally created by the Generalitat de Catalunya, the Catalanian Autonomous Government in November 9th of 2010. During the preceding year however, the UPC consolidated progressive steps that lead to the new Institute.

After extensive work to reach a consensus among the UPC community, in April 2010, the recently elected UPC Rector Antoni Giró gave the project a final boost by directly



involving a member of the UPC Executive Council in its leadership board. This was myself acting as Vice-rector for Sustainability and Social Responsibility as well as provisional Director of the emerging IS.UPC. By the end of 2011, the institutional formalization of the Institute was completed and the first elected Director replaced me.

This first Annual Report covers the early activities of the Institute during years 2010 and 2011. Major milestones of this period include the above mentioned formal declaration the opening ceremony of the first academic year in September 2011, the approval of the Institute inclusion within the university quality assurance system, the rules for academic staff enrolment, and the roadmap for the future years by the UPC Governing Council in November 9th of 2011.

During this inception period, main efforts have focused on consolidating an interdisciplinary academic space within the UPC community to face the challenges of sustainable human development through science progress and technology innovation. The integration of economic, environmental and social aspects of technology, architecture and engineering, as well as the reference points of closing of cycles and systemic thinking, are some of the distinctive characteristics of the Institute research focus. Academic excellence, strategic international and local networking, and a trans-disciplinary approach to knowledge creation and dissemination are other key characteristics the Institute.

As major strength, the IS.UPC has its own postgraduate degree curriculums. Upon the signing of this report, the new Master in Technology for Human Development and Cooperation has already been launched. This program adds to the Master Sustainability, the PhD studies in Sustainability, Technology and Humanism, and the support for interdepartmental PhD studies in Environmental Engineering, the three academic programs that were running before formal IS.UPC creation. One of the pending challenges after this initial period is the renewal of these three academic programs. Surely, this issue will be addressed in future reports.

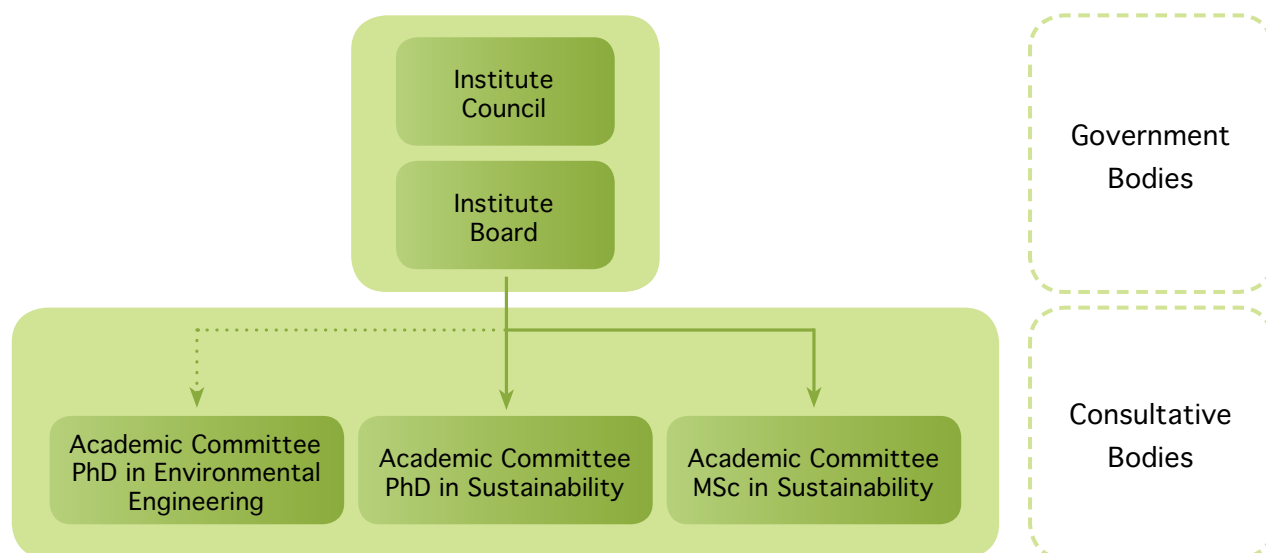
Many people have contributed, in a greater or lesser extent, to this process. A special mention is deserved for the efforts of my predecessor, Prof. Albert Cuchi, who led the process in its early stages, and Prof. Joan de Pablo, the first elected director who assumed this position at the end of 2011, after coordinating the research during the period covered by this report. Formal and institutional consolidation of the Institute could not have been completed without the special dedication of Eugenia Bretones, its first head of administration, of its board and council members, and obviously of the faculty, students, managers and other university members who have participated in the activities related in this report.

We, the people cited in following pages and others not explicitly indicated, are fully committed with continuously improving the contribution of UPC to sustainability science and sustainable technologies. We see this commitment as the best way to build up the future deserved by all of us, especially in the turbulent times we are facing. We expect you to enjoy the reading and consultation of this report. We are gladly committed to share with you in following reports our, hopefully, successful evolution.

Agustí Pérez Foguet
Director

2. ORGANIZATION STRUCTURE

2.1. ORGANIZATION CHART



2.2. INSTITUTE BODIES

Single-member bodies

Agustí Pérez Foguet	<i>Director</i>
Enrique Velo García	<i>Secretary</i>
Joan de Pablo Ribas	<i>PhD studies coordinator</i>
Alejandro Josa García-Tornel	<i>Master's degrees coordinator</i>
Eugenia Bretones Espejo	<i>Head of administration</i>
Jordi Morató Farreras	<i>Head of the UNESCO Chair of Sustainability</i>

2.3. COLLEGIATE BODIES OF GOVERNMENT AND REPRESENTATION

Institute Council

Agustí Pérez Foguet	<i>Director</i>
Enrique Velo García	<i>Secretary</i>
Joan de Pablo Ribas	<i>PhD studies coordinator</i>
Alejandro Josa García-Tornel	<i>Master's degrees coordinator</i>
Eugenia Bretones Espejo	<i>Head of administration</i>

Jordi Morató Farreras
 Josep Lluís Moner Tomas
 Óscar Flores Baquero

Head of the UNESCO Chair of Sustainability
Representative of the administrative and services staff
Representative of the Institute students

Institute Board

(See Institute Council)

2.4. COLLEGIATE BODIES FOR CONSULTATION

Academic Committee of the Master's in Sustainability

Agustí Pérez Foguet	<i>Chair and Director</i>
Eugenia Bretones Espejo	<i>Secretary</i>
Alberto Cuchí Burgos	
Alejandro Josa García-Tornel	
Albert Masip Álvarez	
Enrique Velo García	
Maria Ribera Sancho Samsó	
Jordi Segalàs Coral	

Academic Committee of the PhD programme in Sustainability

Antoni Roca Rosell	<i>Chair and Coordinator</i>
José María Gil Roig	<i>Secretary</i>
Joan de Pablo Ribas	
Antonio Aguado de Cea	
Enrique Velo García	
Miriam Villares Junyent	

Academic Committee of the PhD programme in Environmental Engineering

Santiago Gassó Domingo	<i>Chair and Coordinator Dept. of Engineering Projects</i>
Miquel Casals Casanova	<i>Dept. of Construction Engineering</i>
Martí Crespí Rosell	<i>INTEXTER - Institute of Textile Research and Industrial Cooperation of Terrassa</i>
Joan de Pablo Ribas	<i>Dept. of Chemical Engineering</i>
Xavier Flotats Ripoll	<i>Dept. of Agricultural Engineering and Biotechnology</i>
Joan García Serrano	<i>Dept. of Hydraulic, Maritime and Environmental Engineering</i>
Maria Teresa Martínez-Seara Alonso	<i>Dept. of Applied Mathematics I</i>

Andrés Navarro Flores
 Agustí Pérez Foguet
 Jordi Romeu Garbí
 Teresa Vidal Llúcia
 Alejandro Josa García-Tornel

Depat. of Applied Mathematics I
IS.UPC Research Institute for Sustainability Science and Technology
Dept. of Mechanical Engineering
Dept. of Textile and Paper Engineering
Representative of the Master's of Environmental Engineering

2.5. TEAM

2.5.1. ADMINISTRATIVE AND MANAGEMENT TEAM

Eugenia Bretones Espejo
 Ana Andres Lleo
 Clara Cullell Tebe
 Josep Maria Galabert i Pujol
 Boris Lazzarini
 Josep Lluís Moner Tomas
 Ofèlia Alba Soca

Head of Administration

2.5.2. RESEARCH AND TECHNOLOGY TRANSFER

Academic Staff

Joan de Pablo Ribas
 Alejandro Josa García-Tornel
 Agustí Pérez Foguet
 Enrique Velo García

Technical Staff

Pol Arranz Piera
 Ricard Giné Garriga
 Alessandro Meluni
 Alejandro Jiménez Fernández de Palencia
 Gemma Tejedor Papell

Project leaders - Research

Alejandro Josa García-Tornel
 Xavier Martínez Farré
 Núria Miralles Esteban
 Augustí Perez Foguet
 Maria Ribera Sancho Samsò
 Enrique Velo García

Project leaders - 2011 Seeds of Sustainability

Elena Fernández Salas
 Pau Fonseca i Casas
 Joan García Serrano

Oriol Gomis Bellmunt
 Alejandro Josa García-Tornel
 Josep Maria Mata Perellò
 Carles Riba Romeva
 Jordi Sabaté Nolla
 Fermín Sánchez Carracedo
 Victor Seguí Santana
 Enrique Velo García
 Eva Vidal López
 Joan Lluís Zamora Mestre

Research Assistants

Elisenda Colàs Anguita (PhD in Chemical Process Eng.)
 Bryani Jenice Escorcia Robles (PhD in Sustainability)
 Oscar Flores Baquero (PhD in Environmental Eng.)
 Albert Oliver Serra (PhD in Civil Eng.)
 Albert Martínez Torrents (PhD in Chemical Process Eng.)
 Jordi Pascual Ferrer (PhD in Civil Eng.)
 Ivan Puig Damians (PhD in Geotechnical Eng.)
 David Vilar Ferrenbach (PhD in Sustainability)
 Cristina Yacoub Lopez (PhD in Environmental Eng.)

2.5.3. TEACHING

Master's in Sustainability. The faculty responsible for the organization and planning of master's subjects (2010/2011) were:

Candela, Lucía
 Cuchi Burgos, Alberto
 Etxeberria, Miren
 Felipe Blanch, Jose Juan de
 Garola, Alvar
 Magrinya Torner, Francesc
 Martínez, Juan
 Miralles Esteban, Nuria

Ortego, Maribel
 Perez Foguet, Agusti
 Segalas Coral, Jordi
 Sempere, Daniel
 Stahel, Andri
 Sureda, Bàrbara
 Velo Garcia, Enrique
 Xercavins Valls, Josep

PhD programme in Sustainability. UPC researchers responsible for the mentoring and/or supervising of doctoral theses (2010/2011) were:

Aguado de Cea, Antonio
 Alvarez del Castillo, Javier
 Barcelo Garcia, Miquel
 Bosch Tous, Ricard
 Cayuela Marin, Diana

Morato Farreras, Jordi
 Pablo Ribas, Joan De
 Roca Rosell, Antoni
 Rosas Casals, Marti
 Sabater Pruna, Assumpta

Cuchi Burgos, Alberto
 Felipe Blanch, Jose Juan de
 Ferrer Balas, Didac
 Garcia Serrano, Joan
 Gil Roig, Jose Maria
 Magrinya Torner, Francesc

Segalas Coral, Jordi
 Torres Lopez, Antonio Luis
 Velo Garcia, Enrique
 Villares Junyent, Miriam
 Xercavins Valls, Josep

PhD programme in Environmental Engineering. UPC researchers responsible for the mentoring and/or supervising of the doctoral theses (2010/2011) were:

Amante Garcia, Beatriz
 Andre, Michel
 Baldasano Recio, Jose M.
 Barra Bizinotto, Marilda
 Bonmatí Blasi, August
 Bruno Salgot, Jorge
 Calafell Monfort, Margarita
 Casals Casanova, Miquel
 Casas Pons, Ignasi
 Cortina Pallas, Jose Luis
 Crespi Rosell, Marti
 Ferrer Marti, Ivet
 Flotats Ripoll, Xavier
 Garcia Serrano, Joan
 Gasso Domingo, Santiago

Gimenez Izquierdo, Francisco Javier
 Gonçalves Ageitos, Maria
 Lopez Grimau, Victor
 Marti Gregorio, Vicenç
 Miralles Esteban, Nuria
 Navarro Flores, Andres F.
 Pablo Ribas, Joan De
 Perez Foguet, Agusti
 Roca Ramon, Xavier
 Romeu Garbi, Jordi
 Rovira Boixaderas, Miquel
 Sierra Pedrico, Juan Pablo
 Vazquez Ramonich, Enric
 Viñas I Canals, Marc

2.5.4. UNDERGRADUATE TRAINEES

UPC students who received a training undergraduate scholarship were:

Agea Carrera, Joan
 Balbastre Soler, Laura
 Comes, Joaquim
 Encina Iñiguez, Josu
 Esteban, Jose Miguel
 Marquez Malen, Melani

Nuñez Arroniz, Maria
 Romagosa Rovira, Anna
 Sabate Ibañez, Josep
 Salvado, Judit
 Subirana Iborra, Moises
 Tejedor, Gemma

3. FINANCIAL INFORMATION

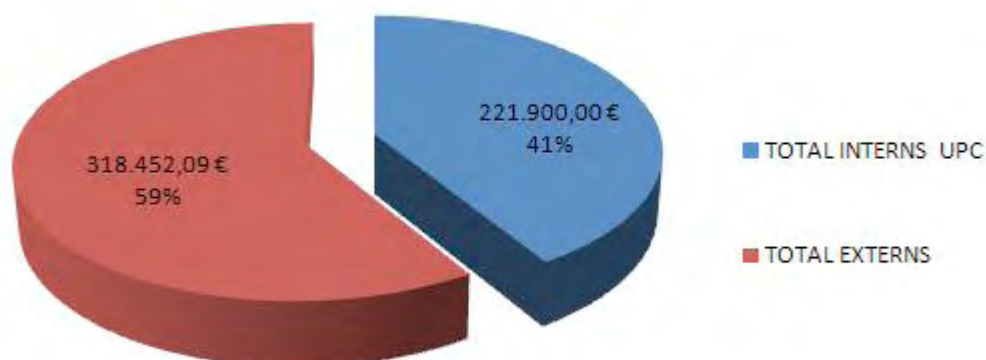
The following is a detailed description of IS.UPC accounts for the fiscal year 2011.

FINANCIAL ACCOUNTS

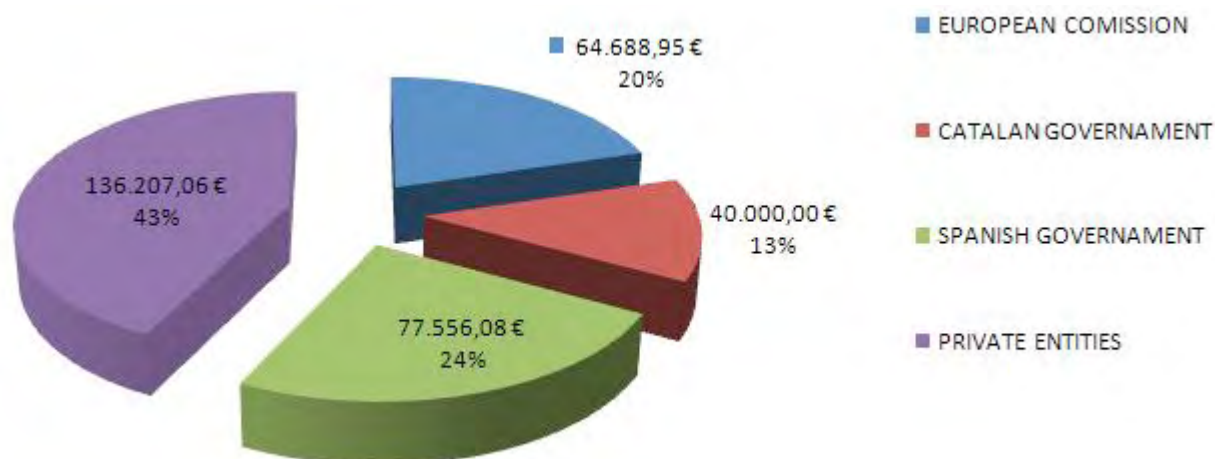
2011 OPERATIONAL INCOME

	UPC	EUROPEAN COMMISSION	CATALAN GOVERNMENT	SPANISH GOVERNMENT	PRIVATE ENTITIES	TOTAL
INTERNAL						
Current expense budget	140.000,00					140.000,00
2015 Sustainable UPC Plan	81.000,00					81.900,00
EXTERNAL						
Competitive Projects		39.779,91		77.395,00		117.174,91
Others		24.909,04	40.000,00	161,08	136.207,06	201.277,18
TOTAL	221.900,00	64.688,95	40.000,00	77.556,08	136.207,06	540.352,09

OPERATIONAL INCOME



EXTERNAL INCOME



2011 EXPENSES

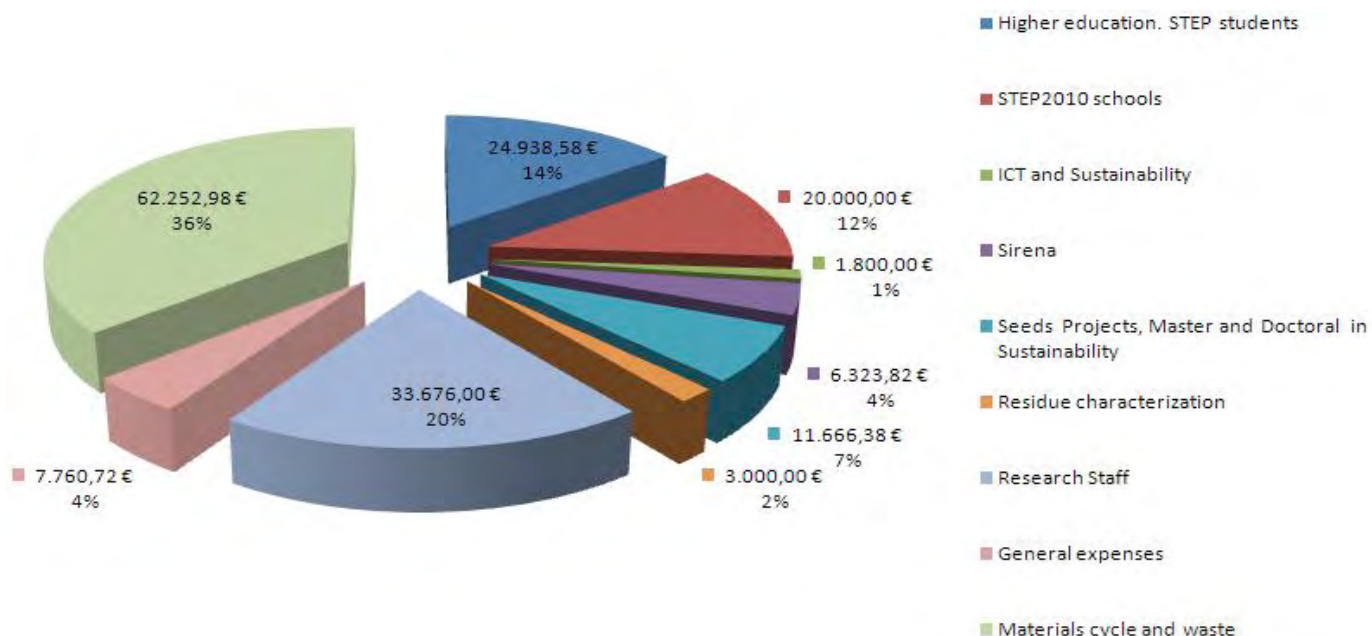
Destination UPC Income, by Projects

Higher education. STEP students	24.938,58
Higher education. STEP schools	20.000,00
Report of ICT and Sustainability	1.800,00
Reports Sirena UPC	6.323,82
Seeds of Sustainability - Support to Master and Doctoral studies	11.666,38
UPC waste characterization campaigns	3.000,00
UPC waste management supplies	62.252,98
Research Staff	33.676,00
General expenses	7.760,72
TOTAL	171,418,48

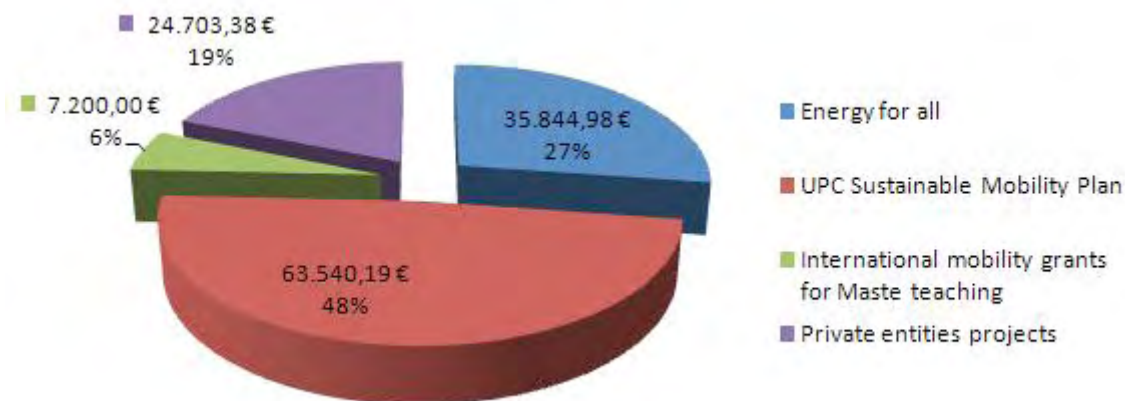
Destination of External Income, by Projects

Energy for all	35.844,98
UPC Sustainable Mobility Plan	63.540,19
International mobility grants for Maste teaching	7.200,00
Private entities projects	24.703,38
TOTAL	131.288,55

DESTINATION OF UPC INCOME BY PROJECTS



DESTINATION OF EXTERNAL INCOME BY PROJECTS



4. UPC 2015 SUSTAINABILITY PLAN

The IS.UPC coordinates and streamlines the UPC 2015 Sustainability Plan by:

- Promoting and coordinating inter and trans-disciplinary research, development and innovation in Sustainability and Environment.
- Designing, implementing and coordinating postgraduate and lifelong-learning studies in Sustainability Science, Sustainable Technologies and Environmental Engineering.
- Promoting the inclusion of skills about sustainability and social commitment in UPC studies.
- Promoting and coordinating the implementation of sustainability principles within the university itself.
- Advising on University management and quality control processes.
- Supporting the UPC Sustainability Committee.
- Engaging in external collaboration, participating in working groups and networks.

4.1. BACKGROUND

Following an initial period where two environmental plans (1996-2005) were unveiled, the UPC 2015 Sustainability Plan was institutionally approved in 2006, with the aim of expanding the UPC's strategic vision to focus on the challenges of sustainable human development.

The first cycle of the UPC 2015 Sustainability Plan (2006-2010) in conjunction with other actions that have merged with its objectives, has left as a legacy a series of strategic insights and tools that have enabled UPC to define further goals for the 2nd phase, 2011-2015. Key achievements include:

- The Declaration of Sustainability.
- The Commission on Sustainability.
- The institutional decision to include the competence of Sustainability and Social Commitment in all UPC degree programs of the UPC, in coordination with the Institute of Educational Sciences.
- The development of tools and processes of implementation of this competence in the plans of study (through the Sustainable Technology Excellence Program, STEP).
- The creation of the Research Institute of Science and Technology for Sustainability to collect and enhance related academic and research activities.
- The processes, tools and actions of experimentation and learning to promote the introduction of sustainability in management, research and teaching directed by different academic units and individuals of the university community.

The university community, through participatory debate, has evaluated the first five years of the implementation of the Plan as positive. It has prompted the Plan's renewal with a long-term vision and a proposal for objectives to be achieved by the year 2015.

■ 4.2. DESCRIPTION OF THE 2ND PHASE OF THE PLAN (2011-2015)

■ 4.2.1. VISION

The UPC envisions a just society that ensures the well-being of its people without compromising that of the future generations:

- Where people live in a healthy, unpolluted environment and can be guaranteed that their food supply is adequate, healthy and linked to their cultural traditions and local markets;
- A society able to design production systems to close the cycles of matter and energy and reduce metabolic fluxes of human systems;
- With decentralized energy production and proximity that is not dependent on fossil fuels;
- A society that protects the ecological quality of their natural systems beyond human needs and the economic value they may have;
- A society based on models of knowledge.

■ 4.2.2. MISSION

The UPC, as a public organization of knowledge, has the duty to enhance their critical view of development models that have led to the current crisis and to propose alternatives to the society from its mission. In this context, the UPC must apply models of consistency, ethics and social responsibility. This involves the voluntary integration in its governance, management and strategy of social concerns, labour, environment and respect for human rights arising from the relationship and transparent dialogue with its stakeholders. This also means taking responsibility for the consequences and impacts that result from their actions.

The concept of transition towards sustainability, which is configured as a framework for sustainability from the global and local levels, is assumed as an institutional commitment to contribute academically and with its own performance, towards the definition of sustainable development models.

This plan picks up the commitment of the UPC in its Declaration of Sustainability, specifically committed to:

- Train professionals aware of the social and environmental responsibility of their activity, and able to exercise the new skills required to achieve it.
- Promote research dedicated to generate the technical and conceptual tools necessary for transforming our production model towards sustainability.

- And to apply sustainability criteria in their institutional activity and management, monitoring and regular accountability.

In short, the UPC assumes its leadership role in achieving a sustainable society.

4.2.3. STRUCTURE OF THE PLAN

The UPC 2015 Sustainability Plan includes two strategic dimensions: Four transverse lines and six thematic lines. Each of these lines includes several objectives and each objective has an associated set of actions.

The **transverse lines** define transdisciplinarity and respond to the complexity and how we should develop the activities and functions of the university: we talk about governance, values and how the university relates to its environment.

- 1 Governance and sustainability
- 2 Demands of the environment
- 3 Campuses as laboratories
- 4 Community culture

The **thematic lines** define the great challenges of sustainability in which the UPC as a technological university can provide different levels of experience and contribute to existing environmental demands.

- 5 Energy and climate change
- 6 Waste and zero emissions
- 7 Health, air quality and food
- 8 Supplies and responsible consumption
- 9 Water cycle
- 10 Territory and mobility

4.2.4. PROJECTS OF THE PLAN

UPC Sustainable Mobility Plan

In recent decades, accessibility and sustainable mobility have become one of the core challenges faced by our society. The current legislation obligates public companies with more than 200 employees to draw up mobility plans. Simultaneously, the Mobility Master Plan of Barcelona (PDM) establishes sustainable access to workplaces as one of its lines of action. Beyond legal requirements, the UPC is aware that it must take steps to ensure more sustainable access to their campus and create mechanisms that

facilitate mobility management. That is why a project to develop sustainable mobility plans for the Campus Nord and Sud of Barcelona, the Campus of Sant Cugat, the Campus Baix Llobregat and the Campus de Terrassa was implemented with the economical support of the Spanish Ministry of Public Works during 2009-2011.

STEP. Sustainable Technology Excellence Program

The STEP programme has helped introduce the competency in “Sustainability and Social Commitment” in all UPC degrees. In the first phase of the program, 2009, four teaching centres participated with the objective to define the goal of the curriculum, create faculty teams and generate supporting materials. In its second phase, 2010, the program expanded to up to ten centres and incorporated the students explicitly, through two subprograms: STEP Centres (competitive call for school focused programs) and STEP Students (projects organized by students with institutional support). The STEP Students project lasted until 2011.

C3 Local. Organisation of Catalonia Climate Change Policies at Local Level

This project was commissioned in 2009 by the Department of Planning and Sustainability of the Generalitat of Catalunya, and funded by the Obra Social of La Caixa. It was aimed at improving municipal management in relation to the strategies of local action against climate change. In particular, the project involved the study of various alternatives for developing and implementing local organisational structures in Catalonia to promote the fight against global warming and reduce the impacts caused by human activity

4.2.5. REPORTS DELIVERED IN 2011

SIRENA UPC

- IS.UPC (May 2011) “Sirena 2010”
- IS.UPC (September 2011) “Sirena. Waste 2011”

UPC Sustainable Mobility

- D. Balbás and E. Roca (April 2011) “Sustainable Mobility Plans of ETSAV of Baix Llobregat Campus”
- M. Estrada and V. Uribe (April 2011) “Sustainable Mobility Plan of North and South Campus”
- F. Astals and F. Martínez (April 2011) “Sustainable Mobility Plan of Terrassa Campus”

ICT and Sustainability

- IS.UPC (October 2011) “TIC and Sustainability”

5. RESEARCH AND PROJECTS

This section details Research projects, Agreements and collaborations, and “Seeds of Sustainability” projects undertaken by IS.UPC researchers during 2011.

5.1. RESEARCH AND KNOWLEDGE TRANSFER PROJECTS

Energy Access for the poor in Sub-Saharan Africa to meet the Millennium Development Goals. Energy for All 2030

Access to energy services is essential for achieving the eighth Millennium Development Goal (MDG). In Sub-Saharan Africa, 2 out of 3 families, especially in rural areas, live without electricity or access to modern energy services. Solutions based on decentralized infrastructures and renewable energy sources are often the only feasible option for users with low energy demands in remote areas. The main objectives of this project are i) to contribute to the achievement of the MDGs in marginalised rural and urban areas in the poorest Sub-Saharan Africa countries, through improved energy access at local level; and ii) to raise public and political support across the EU for a the European Union resolution on energy access for the poor and to ensure that support of energy access is turned into action.

Internal code: IS-P10/01

Scope: European Union

Partners: Practical Action (UK), Stockholm Environment Institute (Sweden), EDUCON (Czech Republic) and Universitat Politècnica de Catalunya (Spain)

Led by: Practical Action

Funded by: EuropeAid

Code: DCI-NSA ED/2009/201-885 (with co-financing of CCD - 0.7% UPC funds)

Dates: 01.2010-01.2013

Principal Investigator (PI): Velo, Enrique

Recovery of organic waste in the Mediterranean Technology Park

This project aims to meet the need for treatment of organic waste generated in the Mediterranean Technology Park (PMT). The project is being carried out by administrative staff, teaching and research staff, and students of the ESAB, in collaboration with members of the EETAC and experts in the field, and is in agreement with the university’s environmental policy and regional laws on solid waste management. The overall objective is to implement a separate collection system for the organic fraction, in addition to raising awareness among the community of the PMT and involving it in the activity. The project has two stages: separate collection of organic waste generated by the campus restaurant and treatment of part of the organic fraction in 330-litre composters.

Internal code: IS-P11/01

Scope: Regional

Partners: Diputació de Barcelona and Universitat Politècnica de Catalunya

Funded by: Diputació de Barcelona and Universitat Politècnica de Catalunya (Llavors de Sostenibilitat 2010)

Dates: 11.2010-11.2011

Principal Investigator (PI): Martínez Farré, Xavier

Improving monitoring and evaluation of WASH services in rural areas and small towns, from a human rights perspective

Access to water, sanitation and hygiene (WASH) is a priority for the international community because of its clear link to development and poverty reduction. In recent years various strategies have been applied to ensure safe access to these basic services. The aim of this study is to develop specific tools for improving the assessment and planning of WASH services at the local level. The study will be carried out in the town of Manhiça and will consider both the peri-urban area of the municipality and the rural area. Main goals of the action include i) an identification of reliable and relevant indicators for evaluating the sector; ii) strengthening of the capacity of local public institutions; and iii) development of urban planning projects that integrate the provision of basic services.

Internal code: IS-P11/06

Scope: International

Partners: UN Habitat (Mozambique), Municipalitat Manhiça (Mozambique), Fundació FCBarcelona (Spain) and Universitat Politècnica de Catalunya (Spain)

Led by: Universitat Politècnica de Catalunya

Funded by: AECID

Code: AECID 11-CAP2-1562 (with co-financing of CCD - 0.7% UPC funds)

Dates: 01.2011-10.2012

Principal Investigator (PI): Pérez Foguet, Agustí

5.2. AGREEMENTS AND COLLABORATIONS

International Master's in Sustainability, Technology and Innovation

The Master's in Sustainability, Technology and Innovation is an international master's created by a consortium of three universities: Dublin Institute of Technology (DIT); Purdue University (PU) and UPC. In particular, the master's curriculum is based on the existing Master's of Sustainability, Technology and Innovation (DIT), Master's in Technology (PU) and Master's in Sustainability (UPC). The Master's STI is a quality program, designed under the framework of the Atlantis project for the development of joint degrees between the European Union and the United States of America in the field of Sustainability, Technology and Innovation.

Internal code: IS-P09/01

Scope: International

Agreement signed with: EU-US Transatlantic Degree Program (Atlantis)

Partners: Dublin Institute of Technology (Ireland), Purdue University (USA), and Universitat Politècnica de Catalunya (Spain)

Funded by: Fund for the Improvement in Post-Secondary Education - FIPSE (USA), Education, Audiovisual and Culture Executive Agency - EACEA (EU)

Dates: 02.2010-08.2013

Agreement manager: Ribera Sancho, María

Framework for UPC Postgraduated Training degrees in the area of Sustainability

The UPC, through the Polytechnic Foundation of Catalonia (FPC), offers a wide of range of postgraduate programs related to their field of expertise. To guarantee that these programs are qualified and relevant it is necessary to review and classify the set of programs currently taught at the FPC. This project aims to reflect on and analyze the training that is offered in the field of sustainability. The objective of this study will be to determine if gaps and/or overlaps in the program exists and to establish a map of complete and adequate degree programs relevant to the professional context of Catalonia. The proposed methodology will first identify the training needs of professionals and then evaluate the trends in related sectors. Then it will compare it with the training currently offered by FPC. Based on the result of this analysis and its conclusion, a proposal will be made to develop the degree programs for the future academic years.

Internal code: IS-P10/02

Scope: Local

Agreement signed with: Fundació Politècnica de Catalunya

Dates: 10.2010- 01.2011

Agreement manager: Josa, Alejandro

Development of a multi-year WASH Sector Action/Investment Plan for water, sanitation and hygiene service delivery in Suba and Homa Bay Districts (Kenya)

In Homa Bay and Suba, access to safe water and improved sanitation remains elusive; which is strongly correlated to the outbreak of waterborne diseases such as diarrhoea, typhoid and cholera. Both districts have recurrently been cholera prone. The investment in water and sanitation therefore appears as a key strategy to improve health. In recognition of this fact, and to support the Districts of Homa Bay and Suba in its efforts to promote regional development and reduce poverty, this project aims to prepare a strategic plan for the delivery of water, sanitation and hygiene (WASH) services to the population. This has been identified as a core area of support, since such plan should contribute to a coordinated and focused implementation of WASH activities. In brief, the plan will achieve sustainable and equitable growth in the sector, being a comprehensive road map on how

to increase sustained access to safe water and adequate sanitation as well as to improve hygienic behaviour.

Internal code: IS-P11/05

Scope: International

Agreement signed with: UNICEF - Kenya Country Office

Partners: UNICEF (Kenya), Alternative Programme Solutions (Kenya), District Water Offices of Homa Bay and Suba Districts (Kenya), and Universitat Politècnica de Catalunya (Spain)

Led by: Universitat Politècnica de Catalunya

Funded by: UNICEF (with co-financing of CCD - 0.7% UPC funds)

Dates: 11.2010-09.2011

Principal Investigator (PI): Pérez Foguet, Agustí

Assessment of three irrigation projects in Central Rift Valley (Ethiopia)

Ethiopia's economy is mainly based on agriculture, but productivity of this activity is low. Intermón Oxfam has a project in the country to improve their productivity through the construction of three irrigation systems for users' cooperatives in rural communities in the district of Arsi Zone. Irrigation infrastructure costs are not insignificant, in addition to effects on water and soil in which it develops. But having a correct technical execution and a proper systems' management, they can provide a significant amount of income in the communities. The project consisted of technical support to Intermón Oxfam for validation studies prior to construction of the three systems, studying the feasibility and relevance to ensure the effectiveness, and impact on investment. Main aspects considered were water availability, infrastructure design, budget, economic aspects (definition, revenue, etc) and targeted population.

Internal code: IS-P11/04

Scope: International

Agreement signed with: Intermon Oxfam

Partners: Intermon Oxfam (Ethiopia) and Universitat Politècnica de Catalunya (Spain)

Led by: Universitat Politècnica de Catalunya

Funded by: Intermon Oxfam

Dates: 02.2011-06.2011

Principal Investigator (PI): Pérez Foguet, Agustí

Study for the development of an environmental monitoring system for the Titicaca Lake (Peru)

This study falls within the framework of the Programme of Support to Artisanal Fisheries, Aquaculture and Sustainable Management of the Environment (PROPECA), whose management unit has identified the need to establish a cross-cutting environmental management system based on the ecosystem, fisheries and aquaculture. The aim is to design and implement an environmental monitoring system

with a dual approach: i) to determine the current ecological quality of the study area (the baseline) in order to establish policies and standards for protecting and conserving environmental quality and natural resources; and ii) to determine whether trace metals have caused alterations in the region that may affect the sustainable use of water resources. This study was conducted in the northern part of the Titicaca basin in November 2011. Sediments and microinvertebrates were monitored and studied using indices developed for assessing the ecological quality of the Puno region. The study is currently in the sediment analysis stage, which is expected to conclude by the end of May.

Internal code: IS-P11/08

Scope: International

Agreement signed with: Fondo de Cooperación Hispano Peruano (Peru)

Partners: Unidad de Gestión de PROPESCA (Peru), Ministerio de la Producción (Peru), and Universitat Politècnica de Catalunya (Spain)

Led by: Universitat Politècnica de Catalunya

Funded by: AECID (with co-financing of CCD - 0.7% UPC funds)

Dates: 10.2011- 12.2011

Principal Investigator (PI): Miralles, Núria

5.3. "SEEDS OF SUSTAINABILITY" PROJECTS 2011-2012

Energy resources and crisis. The end of an unrepeatable period of 200 years

Internal code: PLL11/19

Project leader: Riba Romeva, Carles

School/Department: ETSEIB / DEM

Other: Elena Blanco (PAS)

Dates: 01.2011-12.2012

Support for teaching the subject ICT4D

Internal code: PLL11/04

Project leader: Vidal Lopez, Eva

School/Department: ETSETB / DEE

Other: Jordi García Almiñana (PDI)

Dates: 09.2011- 07.2012

Sustainable lifestyle in the LOW3 solar house at Sant Cugat Campus

Internal code: PLL11/17

Project leader: Seguí Santana, Víctor

School/Department: ETSAV / DCAI

Other: Cesc Viñas (student), Andreu Carpi (student)

Dates: 09.2011- 07.2012

Getting material for the conference Recycle

Internal code: PLL11-02

Project leader: Sánchez Carracedo, Fermín

School/Department: FIB / DAC

Other: Marcos Etevez (student), Xavier Pegenaute (PAS)

Dates: 11.2011- 07.2012

Upcycling50/50. Developing sustainability projects by students at UPC

Internal code: PLL11/05

Project leader: Sabaté Nolla, Jordi

School/Departament: ETSAV / DEGA

Other: Jordi Ibars (student), Carla Mas (student), Johathan Navarro (student)

Dates: 11.2011- 06.2012

System for simulating an integrated energy and environmental analysis for new and rebuilt buildings

Internal code: PLL11/06

Project leader: Fonseca I Casas, Pau

School/Departament: FIB / DEIO

Other: Antoni Fonseca i Casas (student)

Dates: 11.2011- 06.2012

Zero Energy Building Lab. Small-scale experimental platform physically emulating electric power system of buildings

Internal code: PLL11/13

Project leader: Gomis Bellmunt, Oriol

School/Departament: ETSEIB / DEE

Other: Roberto Villafáfila (PDI), Eduard Prieto (student).

Dates: 11.2011- 07.2012

Solar Flare Map. Reconciliation of Energy

Internal code: PLL11/15

Project leader: Zamora Mestre, Joan Lluís

School/Departament: ETSAB / DCAI

Other: Rodrigo A Vásquez (student)

Dates: 12.2011- 05.2012

Innovation Site on Water & Energy Efficiency

Internal code: PLL11/12

Project leader: García Serrano, Joan

School/Departament: ETSECCPB / DEHMA

Other: Ivet Ferrer (PDI), Jaume Puigagut (PDI), Marianna Garfí (PDI), Manuel Espino (PDI), Agustín Sánchez-Arcilla (PDI), Xavier Sanchez Vila (PDI)

Dates: 12.2011- 07.2012

6. TEACHING

6.1. MASTER'S DEGREE IN SUSTAINABILITY

The aim of the Master's degree in Sustainability is to provide advanced training in sustainable human development that enables students to understand the complex interaction between society, technology, the economy and the environment, so that they can tackle the social and environmental challenges inherent to sustainability: climate change, the depletion of natural resources, North-South imbalances, environmental justice, etc. This master's degree prepares students to become entrepreneurial professionals and agents of change for sustainability who will, depending on their specialization, design and assess global, sustainable solutions for the uncertain, complex scenario we are living in. They will take an interdisciplinary approach and ensure scientific and technical rigour in the diverse cultural and professional contexts they work in.

The main profile of the applicant corresponds to a candidate with a degree in Engineering or Architecture, or a Bachelor in Natural Sciences or Environmental Science, Geography or Mathematics, who wants to develop an academic or professional activity oriented to sustainability. In addition, other specific skills include amongst others:

- A global vision of the limits, problems, conflicts and challenges associated with the management of fresh water on the planet, energy production and consumption, the evaluation and resources and the sustainable management of energy and food, in addition to food security.
- Knowledge of the basic principles of the sustainability paradigm, its debates and its environmental, socio-cultural and economic implications.
- In-depth knowledge of the concept of human development and other alternative theories, such as development on a human scale and the debates surrounding this theme.
- Understanding of the dynamics and problems that have emerged within the globalisation phenomenon and their relationship with global sustainability.
- Knowledge of international organisations and their decision-making mechanisms on a global level, analysing their theoretical bases and their proposals for the future that are coherent with the notion of sustainable development.
- Knowledge of the impact that the use of technology has on the society that adopts it and the basic principles for sustainable technology.
- Knowledge of the principles of ecology as a basic discipline for guiding relations between society and nature and progressing towards the sustainable management of natural resources.

The following courses were offered during 2010-2011:

Compulsory courses:

Code	Subject	Professor
31106	Sustainable Human Development	A. Pérez-Foguet
32500	Environmental and Ecological Economics	A. Stahel
32501	Ecology and Management of Natural Resources	J. Morató
32502	Systemic and Complexity	M. Rosas
32504	Urban Ecology and Land	F. Magrinyà
32505	Culture, Technology and Innovation	M. Barceló
32570	Introduction to the Final Master Project	E. Velo
32571	Final Master Project	-

Elective courses:

Code	Subject	Professor
31108	Sustainable Construction	M. Casals
31114	Environmental Impact of Public Works	E. Ojeda
31518	Infrastructure Projects as Instrument of Env. Regulation	F. Magrinyà
31519	Urban and Regional Analysis	F. Magrinyà
31520	Socio-territorial Impact of Infrastructure	M. Villares
31555	Water Resources in Developing Countries	L. Candela
32513	Workshop on Sustainability in the Area of Building	A. Cuchí
32515	Interdisciplinary Workshop	A. Cuchí
32530	Int. Cooperation and Social Responsibility of Organizations	À. Garola
32532	Projects of Int. Cooperation for Development Humanitarian aid, Eng. and Risk	A. Pérez-Foguet
32533	Manag. in Emergencies	D. Sampere
32535	Construction of Housing and Social Infr. in Coop. Contexts	M. Etxeberria
32536	Basic Services and Local Dev. in the Context of Coop.	M. Ortego
32539	Measurement of Sustainability	B. Sureda
32540	Models of Human Development	A. Stahel
32541	Natural Resources	J. Martínez
32542	Political Ecology	A. Stahel
32543	Modelling Sustainability	J. J. de Felipe
32544	Governance, Sovereignty and Participation	J. Xercavins
32549	Int. Seminar on Sustainable Innovation: Technology	J. Segalàs
32551	Sustainable Urbanism	F. Magrinyà
32559	Sustainable Building	A. Pagès
32560	Water Cycle and Building	A. Cuchí
32561	The Life Cycle of Building Materials	A. Cuchí
32562	Energy Efficiency in Buildings	A. de Bobes
32563	Bioclimatic Architecture	E. Corbat
32564	Cases Studies in Sustainable Building	A. Cuchí
32569	Sustainable Tech. for Integrated Water Management	N. Miralles
32572	Sustainability Policy for the City and the Area	J. Xercavins

Graduated Students 2010-2011

Ahumada Ossio, Ximena A.
 Alvarez Alves, Lilian
 Andreu Lozano, Miguel
 Bellver Martí, Àngel Manuel
 Browne Pinochet, Edmundo
 Busquets Hidalgo, José M.
 Cañadó Expósito, Marta
 Cardenas Guzman, Lorena
 Carminati Bettarello, Mariana
 Casanova Chia, Claudia A.
 Castilla Guerrero, Andrea C.
 Cintas Sánchez, Olivia
 Corridoni, Lucia
 Dethoor, Jeremy
 Diaz Osorio, Andrea
 Florit Moll, Andreu
 Galindo Fernàndez, Mònica
 Garcia Esteban, Sònia

Gardeñes Gómez, Anna
 Gil Pinzón, Laura V.
 Gogiel Salvi, Greta L.
 Gonsalves, Gayle M.
 Hernandez Nakao, Juliana E.
 Jara Gonzalez, César Antonio
 Jiménez Muñoz, Xiomara A.
 Llopis Arroyo, Jose
 Madriz Mejia, Stefanie M.
 Márquez Malen, Melani V.
 Martin Berra, Xenia Elena
 Martins Cavalheiro, Camila
 Mattos De Andrade, Christiano
 Meluni, Alessandro
 Miranda Martins, Alice
 Montoya Reyes, Eduardo
 Musoles Villegas, Eulalia
 Naves Pimentel, Glaucia

Nielfa Llongueras, Ana
 Núñez i Arróniz, Maria
 Olavarrieta Cabezas, Juan P.
 Oliva López, Jordi J.
 Paternoster, Agustín
 Patrón Coppel, Julián A.
 Perez Lopez, Alfonso
 Prandina, Renato
 Primbas, Alejandro J.
 Pulgarín Giraldo, Natalia
 Ramos Mota, Christopher
 Rojas Caro, Patricia Marleny
 Ruiz Martorell, Galdric
 Tejedor Papell, Gemma
 Tijero De Las Heras, David
 Unibazo Carrillo, Marcelo

Graduated Students (before 2010-2011)

Alba Fraga, Diego
 Alonso Pazos, Joaquin
 Campos Rodrigues, Luís
 Del Río San Pío, Juan
 Gay , Eleonora
 Jerez Mesa, Ramon
 Llobet Domingo, Jordi

Marchegiani, Silvia
 Montilla Calvo, Laura
 Motta Noronha, Débora
 Nogueira Berrocal, Gabriela
 Pérez Vázquez, Cristina
 Pons Pons, Marc
 Quintana Suárez, Jimena

Rigau Escavias, Neus
 Rodrigues De Oliveira, Ana L.
 Sanchez Balvas, Lizeth A.
 Torres Acosta, Leonel S.
 Vega Moreno, Guido A.
 Verdu, Alexandre Joan L.
 Weisman, José Luis

6.2. DOCTORAL PROGRAMME IN SUSTAINABILITY

Sustainability research involves specialists from different origins and backgrounds with a variety of disciplinary perspectives but with the common desire to contribute to the development of society by providing future generations with the options and skills required to forge their own path.

The doctoral programme in Sustainability encompasses the research and courses that deal with the current challenges to sustainability: exhaustion, distribution and management of natural resources, including energy and water; climate change impacts and adaptation and mitigation mechanisms; modelling of socio-environmental systems and assessment of their evolution and development; poverty and imbalances in urban and rural environments; technological innovation and integrated concepts in construction, architecture and management of public services and the environment; and preservation

and promotion of environmental and cultural heritage.

Sustainability science and technology is a highly interdisciplinary field of research that offers the opportunity to make original contributions in understanding and solving problems that affect the welfare and development of peoples and societies, and in shaping a new perspective from which to analyse our reality, integrating approaches from different disciplines and embracing the very agents of change.

This doctoral programme opens the door to professionals and researchers with the determination and abilities to meet these challenges and provide solutions through academic contributions with an international impact.

PhD in Sustainability – Enrolled 2010-2011

Teaching (RD 1393/2007)

■ Bosch Gonzalez, Montserrat

■ Enguita Rovira, Oscar

■ Vilar Ferrenbach, David

Research (RD 1393/2007)

Agredo Cardona, Gustavo A.
 Ahmed Nasreldin, Osama
 Arellano Escudero, Nelson A.
 Arrache Santibañez, Lizbette
 Arranz Piera, Pol
 Avitia Rodríguez, Jessica A.
 Avolio, Ciro
 Baba El Mokhtari, Yasmina
 Cañadó Expósito, Marta
 Carres Gonzalez, Jordi
 Cerda Díaz, Francisca
 Clavera Ibañez, Gloria
 Cubí Montanyà, Eduard

de Balanzo Joue, Rafael
 Escobar Gonzalez, Cristina
 Escorcía Robles, Bryani Jenice
 Fonseca Casas, Antonio
 Guesmi, Bouali
 Jimenez Redal, Ruben
 Lomeña Gelis, Monica
 M. I. K. Hassouneh, Islam
 Martinez Magaña, Juan
 Mattos De Andrade, Christiano
 Molins Duran, Gemma
 Ortega Espes, Delphine J.
 Yvonne

Ortiz Balderas, María A.
 Pérez Vázquez, Cristina
 Pinzón Botero, María V.
 Poli, Elena
 Pons Pons, Marc
 Proano, Liliana
 Resano Moreno, Alfredo
 Ridaura Aldana, Gregorio
 Sánchez Balvás, Lizeth A.
 Torres Acosta, Leonel S.
 Vallejo Rojas, Virginia B.
 Yangui, Ahmed

Research (RD 778/1998)

Adrados Ruiz, Bárbara
 Álvarez Castillo, M. Dolores
 Antequera Baiget, Jose
 Bernal Pérez, Rolando J.
 Bofill Abello, Jordi
 Busquets Rubio, Pere
 Casañ Guerrero, Maria J.
 Cifuentes Ruiz, Paula A.
 Cortés Cardona, Adriana C.

Cucina, Manuela
 Fittipaldi Gustavino, Mariana
 Gallón Londoño, Luciano
 Horta Bernus, Ricard
 Landeros Suárez, Arturo
 Llistar Bosch, David
 Londoño Linares, Juan Pablo
 Lopez Lopez, Maria Jose
 López Villegas, Luis Ignacio

Michelutti, Enrico
 Paolini Ruiz, Jorge
 Pires Carneiro, Alex
 Salas Prat, Josep Maria
 Salas Zapata, Walter A.
 Sanjuanero Caballero, Luis R.
 Tollin, Nicola
 Vargas Collazos, Monica

6.3. DOCTORAL PROGRAMME IN ENVIRONMENTAL ENGINEERING

The doctoral programme in Environmental Engineering provides doctoral students with advanced training and a high capacity for research in the field of environmental engineering, that is, having a knowledge and understanding of the impacts on the environment, both derived from human activities and natural processes, with the ability to evaluate the interactions between them, and the ability to propose and define possible actions to protect and recover the environment.

This programme is a multidisciplinary training framework in an international context that allows doctoral students to obtain the scientific, methodological and technical skills to address the challenges of innovation and research that society demands in the field of environmental engineering.

It can be considered the first doctoral programme in Environmental Engineering imparted in Spain.

PhD Environmental Engineering Enrolled 2010-2011

Teaching (RD 1393/2007)

Guevara Vilardell, Marc

Roig Planasdemunt, Maria

Research (RD 1393/2007)

Affes, Rim
Avila Martin, Cristina
Badea, Cristian Adrian
Badia Moragas, Alba
Bori Dols, Jaume
Borkel, Christoph
Camino González, Carlos
Flores Baquero, Óscar
Galvañ Salazar, Carmen

Gasparini, Andrea
Giannakis, Stefanos
Illa Alibes, Josep
Juznic Zonta, Zivko
Laurenì, Michele
Lopes Del Rei Passos, Fabiana
López Roldán, Ramon Manuel
Lopez Xarbau, Josep
Pedrosa Portugal, Rubén

Pizarro Loaiza, Carlos A.
Rodríguez Abalde, Ángela
Samsó Campà, Roger
Scaini, Chiara
Soret Miravet, Albert
Sotres Fernández, Ana
Spada, Michele
Suárez Silgado, Sindy Sofía
Witlox, Katarzyna Jolanta

Research (RD 778/1998)

Basart Alpuente, Sara
Casas Garriga, Sandra
Chaperón Cordero, Wilson B.
Domenech Rubio, Luis M.
Garcia Almiñana, Daniel

Granados Granados, Ricardo J.
Haustein, Karsten
Marras, Simone
Pay Pérez, María T.
Pinto Varela Alberte, Elaine

Rincon Rodriguez, Angel A.
Silvestre Tormo, Gracia M.
Solé Carbonell, Marta
Yacoub López, Cristina

7. DISSERTATIONS

This list includes Ph.D. theses defended during 2011 that were supervised by the academic staff of IS.UPC.

Viñolas, B.

Aplicaciones y avances de la metodología mives en valoraciones multicriterio

Ph.D. Programme in Construction Engineering - UPC

Supervisors: Aguado, A. and Josa, A.

Date: February 11th, 2011

Qualifications: Excellent Cum Laude

Oliva, J.

Avaluació i caracterització d'una apatita biogènica pel tractament in situ d'aigües subterrànies i sòlid contaminats per activitats mineres.

Ph.D. Programme in Natural Resources and Environment

Supervisors: De Pablo, J. and Cortina, J.L.

Date: April 27th, 2011

Qualifications: Excellent Cum Laude

Pérez Fortes, María del Mar

Conceptual design of alternative energy systems from biomass

PhD in Chemical Process Engineering - UPC

Supervisors: Puigjaner, L. and Velo, E.

Date: June 27th, 2011

Qualifications: Excellent Cum Laude

Gonzalez-Robles Corrales, Ernesto

Study of Radionuclides Release in Commercial UO₂ Spent Nuclear Fuels

Ph.D. Programme in Chemical Process Engineering - UPC

Supervisors: de Pablo Ribas, Joan and Serrano Purroy, Daniel

Date: November 22nd, 2011

Qualifications: Excellent Cum Laude

8. PUBLICATIONS

8.1. BOOKS

This list includes books from IS.UPC researchers published in 2011.

Riba Romeva, C. “Energy Resources and Crises. The End of 200 Years Unrepeatable”. Polytechnic Digital Initiative, UPC. Barcelona, (2011). ISBN: 978-84-7653-590-5.

8.2. SCIENTIFIC PRODUCTION

This list includes papers from IS.UPC researchers published in 2011 in Journal Citation Report indexed journals, ordered by ISI Impact Factor.

Sureda, R., Casas, I., Giménez, J., de Pablo, J., Quinones, J., Zhang, J., Ewing, R.C., “Effects of ionizing radiation and temperature on uranyl silicates: soddyite (UO₂)₂(SiO₄)(H₂O)₂ and Uranophane Ca(UO₂)₂(SiO₃OH)₂·3.5H₂O”, *Environmental Science and Technology* 45 (6), pp. 2510-2515, (2011).

Ferrer, I., Garfí, M., Uggetti, E., Ferrer-Martí, L., Calderon, A., Velo, E. “Biogas production in low-cost household digesters at the Peruvian Andes” *Biomass and Bioenergy* 35 (5), pp. 1668-1674, (2011).

Oliva, J., De Pablo, J., Cortina, J.-L., Cama, J., Ayora, C. “Removal of cadmium, copper, nickel, cobalt and mercury from water by apatite II™: column experiments”, *Journal of Hazardous Materials* 194, pp. 312-323, (2011).

Gibert, O., Rötting, T., Cortina, J.L., de Pablo, J., Ayora, C., Carrera, J., Bolzicco, J. “In-situ remediation of acid mine drainage using a permeable reactive barrier in Aznalcóllar (Sw Spain)”, *Journal of Hazardous Materials* 191 (1-3), pp. 287-295, (2011).

Torras, J., Buj, I., Rovira, M., de Pablo, J., “Semi-dynamic leaching tests of nickel containing wastes stabilized/solidified with magnesium potassium phosphate cements”, *Journal of Hazardous Materials* 186 (2-3), pp. 1954-1960, (2011).

Yaroshchuk, A., Martínez-Lladó, X., Llenas, L., Rovira, M., de Pablo, J., “Solution-diffusion-film model for the description of pressure-driven trans-membrane transfer of electrolyte mixtures: one dominant salt and trace ions”, *Journal of Membrane Science* 368 (1-2), pp. 192-201, (2011).

Meca, S., Martínez-Torrents, A., Martí, V., Giménez, J., Casas, I., De Pablo, J. “Determination of the equilibrium formation constants of two U(VI)-peroxide complexes at alkaline pH”, *Dalton Transactions* 40 (31), pp. 7976-7982, (2011).

Pérez-Foguet, A., Giné, R., “Analyzing water poverty in basins”, *Water resources management* 25 (14), pp. 3595-3612, (2011).

Martínez-Lladó, X., Valderrama, C., Rovira, M., Martí, V., Giménez, J., de Pablo, J., “Sorption and mobility of Sb(V) in calcareous soils of Catalonia (NE Spain): batch and column experiments”, *Geoderma* 160 (3-4), pp. 468-476, (2011).

Valderrama, C., Giménez, J., De Pablo, J., Martínez, M., “Transport of strontium through a Ca-bentonite (Almería, Spain) and comparison with MX-80 Na-bentonite: experimental and modelling”, *Water, Air, and Soil pollution* 218 (1-4), pp. 471-478, (2011).

Serrano-Purroy, D., Casas, I., González-Robles, E., Glatz, J.P., Wegen, D.H., Clarens, F., Giménez, J., de Pablo, J., Martínez-Esparza, A., “Dynamic leaching studies of 48 MWd/kgU UO₂ commercial spent nuclear fuel under oxic conditions”, *Journal of Nuclear Materials*, (2011).

Jiménez, A., Pérez-Foguet, A., “Water point mapping for the analysis of rural water supply plans: case study from Tanzania”, *Journal of Water Resources Planning and Management* 137 (5), pp. 439-447, (2011).

Jiménez, A., Pérez-Foguet, A., “Implementing pro-poor policies in a decentralized context: The case of the rural water supply and sanitation program in Tanzania”, *Sustainability Science* 6 (1), pp. 37-49, (2011).

Ferrer-Martí, L., Pastor, R., Capó, G.M., Velo, E., “Optimizing microwind rural electrification projects. A case study in Peru 2011” *Journal of Global Optimization* 50 (1), pp. 127-143, (2011).

Giné, R., Pérez Foguet, A., “Application of a revised water poverty index to target the water poor”, *Water Science and Technology* 63 (6), pp. 1099-1110, (2011).

Jiménez, A., Pérez-Foguet, A., “The relationship between technology and functionality of rural water points: evidence from Tanzania” *Water Science and Technology* 63 (5), pp. 948-955 , (2011).

Llenas, L., Martínez-Lladó, X., Yaroshchuk, A., Rovira, M., de Pablo, J., “Nanofiltration as pretreatment for scale prevention in seawater reverse osmosis desalination”, *Desalination and water treatment* 36 (1-3), pp. 310-318, (2011).

9. ACTIVITIES

9.1. RESEARCH SEMINARS AND WORKSHOPS

Energy access and poverty: Energy for All 2030

Speaker: Enric Velo, Associate Professor at the Department of Heat Engines, UPC.

Date: 30 May 2011

4th International Seminar on Sustainable Technology Development

Coordinator: Jordi Segalàs, Associate Professor at the Department of Fluid Mechanics, UPC.

Date: 3-10 June 2011

The State of Sustainability Reporting in Universities

Speaker: Rodrigo Lozano, Professor of Corporate Sustainability at Sustainability Research Institute, University of Leeds, UK.

Date: 6 June 2011

Energy and SIRENA project

Speaker: Milena Ràfols, Research support staff at the IS.UPC.

Date: 27 June 2011

Community Communication Networks and Social Development: CONFINE Project

Speaker: Leandro Navarro, Associate Professor at the Department of Computer Architecture, UPC.

Date: 4 July 2011

Composting the Organic Fraction of Municipal Waste

Xavier Martínez Farré, Associate Professor at the Department of Agri-Food Engineering and Biotechnology, UPC.

Date: 11 July 2011

Development of Reliable Hydrologic Data Sets in Difficult Environments: Case Studies from Benin, West Africa

Stephen Silliman, Professor of Civil Engineering and Geological Sciences at the University of Notre Dame, USA.

Date: 23 September 2011

Geophysical Science and Modelling Activities (with an emphasis in Numerical Weather Prediction) at Alaska's Arctic Region Supercomputing Center

Don Morton, Research Professor of Alaska's Arctic Region Supercomputing Center, USA.

Date: 26 October 2011

Regional Sustainability Model. System Dynamics Applied to the Study of South America

Luciano Gallón, PhD student IS.UPC, MSc. in Technology Management from the Pontificia Universidad Boliviana (UPB) in Medellín, Colombia.

Date: 28 November 2011

9.2. PRESENTATIONS

Inauguration of Academic Year 2011-2012. Masters in Sustainability and Environmental Engineering

Presentation:

Agustí Pérez Foguet, Director IS.UPC.

Xavier Flotats, Co-coordinator of Master of Environmental Engineering UPC.

Lectures:

Rafael Mujeriego. Dr. Engineering from the University of California (Berkeley) and Professor of Environmental Engineering of the UPC, retired.

Carles Riba i Romeva, Professor of Mechanical Engineering UPC.

Josep Enric Llebot, Secretary of Environment and Sustainability, Department of Planning and Sustainability of the Generalitat of Catalonia.

Closing:

Antoni Giró, Rector of the UPC

Date: 12 September 2011

Call for IS.UPC Seed projects

Presentation:

Agustí Pérez Foguet, Commissioner for Sustainability and Social Responsibility UPC.

Marta Subirà i Roca, General Director for Environmental Policy of the Generalitat of Catalonia.

Lectures:

Júlia Garcia Pastor, head of the Department of Environmental Education at the Catalan Foundation for Recreation.

Rosa Garcia Segura, Technical Director of the Foundation for Waste Reduction and Consumption.

Ricard Riol Jurado, President of the Association for the Promotion of Public Transport.

Anna Subirana Iborra, Responsible for communication of the Land Stewardship Network.

Date: 3 November 2011

SIRENA UPC 2011

Presentation:

Eugènia Bretones Espejo, Head of administration IS. UPC.

Josep-Manel Sabaté and Alessandro Meluni, Research support staff at the IS.UPC.

Date: 22 November 2011

10. ANNEX

Two-page CVs of permanent academics of UPC with formal adscription to IS.UPC in December 2011 are presented in alphabetical order in this section.

CV – ALEJANDRO JOSA GARCIA-TORNEL

ACADEMIC CAREER

Alejandro Josa finished his Master Degree in Civil Engineering in 1981. He obtained the PhD from UPC with honours with a thesis in the field of Geotechnics (elastoplastic modelling of partially saturated soils) in 1988. This work got the “Extraordinary Award” for 1988 UPC thesis.

In the 80s and early 90s his research was mainly focused on the experimental analysis and modelling of partially saturated soils, the behaviour of foundations and the application of different types of concretes in low-volume road pavements. In the late 80s and 90s he joined different European groups working in the field of the environmental impact and LCA of cement-based products. Since then his research was mainly focused first on the environmental impact of cement and its applications through the LCA methodology and later, since the beginning of this century, on the assessment of sustainability through the application of the multi-attribute utility theory and the value analysis. His research in recent years has been focused on the LCA of different construction applications (different types of urban pavements, rainwater harvesting infrastructures, electrical mobility), the quantitative assessment of sustainability (theoretical models and application to different infrastructures) and the behaviour of geotechnical structures. The current academic activity is also developed in such fields (soil mechanics and geotechnical engineering, LCA in construction and assessment of sustainability).

He is author or coauthor of 14 books, 20 book chapters, 50 articles in journals (20 in indexed journals), over 100 congress communications and numerous research reports. He has participated in 22 research projects funded by open calls (3 EU) (5 national projects as project director). He has participated in 21 contracts with administrations and companies (9 as principal researcher). He has co-directed 8 PhD theses.

He is responsible for a postgraduate course on LCA and sustainability assessment of infrastructures; co-director of the UPC University Master program on Environmental Engineering; member of the board of the UPC Research Institute for Sustainability Science and Technology IS.UPC, as responsible for University Masters; member of the academic board of the UPC University Master in Sustainable Development; and deputy director of the UPC Department of Geotechnical Engineering and Geosciences.

WORK EXPERIENCE

- *Dates (from - to)* June 2012 to date
 - *Position held (Name of employer)* Responsible for a postgraduate course on LCA and sustainability assessment of infrastructures (Universitat Politècnica de Catalunya)
- *Dates (from - to)* April 2011 to date
 - *Position held (Name of employer)* Co-director of the UPC University Master program on Environmental Engineering (Universitat Politècnica de Catalunya)
- *Dates (from - to)* September 2010 to date
 - *Position held (Name of employer)* Member of the board of the UPC Research Institute for Sustainability Science and Technology IS.UPC, as responsible for University Masters (Universitat Politècnica de Catalunya)
- *Dates (from - to)* September 2010 to date
 - *Position held (Name of employer)* Member of the academic board of the UPC University Master in Sustainable Development (Universitat Politècnica de Catalunya)
- *Dates (from - to)* March 2006 to date
 - *Position held (Name of employer)* Deputy director of the UPC Department of Geotechnical Engineering and Geosciences (Universitat Politècnica de Catalunya)
- *Dates (from - to)* July 1990 to date
 - *Position held (Name of employer)* Associate Professor at the Geotechnical Engineering and Geo-Sciences Department (Universitat Politècnica de Catalunya)

CV – ALEJANDRO JOSÀ GARCIA-TORNEL

RESEARCH PROJECTS & CONTRACTS (SELECTED)

- *Title* Cuantificación de la sostenibilidad en ingeniería de la construcción con y sin incertidumbre
- *Dates (from – to) / Country* January 2011 – January 2014
 - *Name of employer* MCINN Spanish Government (ref. BIA2010-20789-C04-01)
 - *Role and Main activities* Principal Researcher
- *Title* Hacia la sostenibilidad en construcción a través del análisis de valor con enfoques determinista y probabilista
- *Dates (from – to) / Country* January 2010 – January 2011
 - *Name of employer* MCINN Spanish Government (ref. BIA2009-14171-C04-01)
 - *Role and Main activities* Principal Researcher
- *Title* Movilidad y distribución de metales en la zona no saturada y sus efectos sobre cambios de calidad de aguas subterráneas. MAROMA
- *Dates (from – to) / Country* 2007 – 2010
 - *Name of employer* MEyC Spanish Government (ref. CGL2007-66861-C04-03/HID)
 - *Role and Main activities* Researcher
- *Title* TRAGA-CONSOLIDER
- *Dates (from – to) / Country* January 2006 – December 2010
 - *Name of employer* CICYT Spanish Government (ref. Consolider CSD2006-0004)
 - *Role and Main activities* Researcher
- *Title* Proyecto Cemento. Desarrollo técnico, medioambiental, de sostenibilidad e institucional de cementos y sus derivados
- *Dates (from – to) / Country* 2003 – 2012
 - *Name of employer* Ciment Català
 - *Role and Main activities* Principal Researcher

PUBLICATIONS IN PEER-REVIEW JOURNALS (SELECTED)

- Angrill, S.; Farreny, R.; Martínez, C.; Gabarrell, X.; Viñolas, B.; **Josà, A.**; Rieradevall, J. (2012) "Environmental analysis of rainwater harvesting infrastructures in diffuse and compact urban models of Mediterranean climate". *International journal of life cycle assessment*, 17(1): 25-42
- Mendoza, J.M., Oliver-Solà, J., Gabarrell, X., **Josà, A.**, Rieradevall, J., (2012) "Life Cycle Assessment of granite application in sidewalks". *International journal of life cycle assessment*, 17(5):580-592
- Aguado, A.; del Caño, A.; de la Cruz, M.; Gómez, D.; **Josà, A.** (2012) "Sustainability assessment of concrete structures within the Spanish structural concrete code". *ASCE Journal of construction engineering and management*, 138(2):268-276
- Oliver-Solà, J.; **Josà, A.**; Arena, A.; Gabarrell, X.; Rieradevall, J. (2011) "The GWP-Chart: an environmental tool for guiding urban planning processes: application to concrete sidewalks". *Cities*, 28(3):245-250
- Valderrama, C.A.; Granados, R.; Cortina, J.; Martínez, C.; Guillem, M.; **Josà, A.** (2011) "Implementation of best available techniques in cement manufacturing: a life-cycle assessment study". *Journal of cleaner production*.25:60-67
- Oliver-Sola, J.; **Josà, A.**; Rieradevall, J.; Gabarrell, X. (2009) "Environmental optimization of concrete sidewalks in urban areas". *International journal of life cycle assessment*, 14(4):302-312
- Izquierdo, M.; Querol, X.; **Josà, A.**; Vazquez, E.; Lopez-Soler, A. (2008) "Comparison between laboratory and field leachability of MSWI bottom ash as a road material". *Science of the total environment*, 389(1):10-19

CV - JOAN DE PABLO RIBAS

ACADEMIC CAREER

Prof. Joan de Pablo is the director of the IS.UPC, and is full professor in Chemical Engineering at the Universitat Politècnica de Catalunya since 2002. He obtained his PhD in Chemistry with a thesis in the field of chemical heat storage in 1984 at the UAB. His doctoral studies included 18 months at the Royal Institute of Technology (Stockholm, Sweden).

As researcher, he has been the project leader of European, Spanish and Catalan Research Projects in the fields of waste management, environmental risk assessment, contaminated soil and groundwater remediation. His R+D group has been involved in the scientific basis for the waste management. In particular, they are working since 1989 in the performance assessment of the spent nuclear fuel disposal in geological formations. The studies focused on the spent fuel behaviour under repository conditions as well as on actinide and fission products chemistry. They are developing models to predict radionuclide release from the interaction between spent fuel and groundwater. Another area of expertise focuses on reactive transport of pollutants in geological systems. The understanding of the mineral-water interface is the main objective in this study. Experimental techniques such as X-Ray Photoelectron Spectroscopy, Atomic Force Microscope, X-Ray Absorption Spectroscopies (EXAFS, XANES), Scanning Electron Microscope as well as powerful reactive transport models are used to characterize and understand the interaction between mineral surfaces and pollutants. Finally, part of their research also includes groundwater remediation by means of Reactive Permeable Barriers. The development and combination of different materials to be used in such systems are of special interest.

He has co-authored more than 160 publications, including 100 in SCI journals. He has organised three international workshops.

As regards teaching activities, he is lecturer of Environmental Science and Technology Courses.

WORK EXPERIENCE

- *Dates (from - to)* January 2012 to date
 - *Position held (Name of employer)* Director of the UPC University Research Institute for Sustainability Science and Technology IS.UPC (Universitat Politècnica de Catalunya)
- *Dates (from - to)* July 2005 - July 2011
 - *Position held (Name of employer)* Head of the Chemical Engineering Department (Universitat Politècnica de Catalunya)
- *Dates (from - to)* 2001 to date
 - *Position held (Name of employer)* Scientific Director of the Fundació CTM Centre Tecnològic
- *Dates (from - to)* February 2002 to date
 - *Position held (Name of employer)* Full Professor at the Chemical Engineering Dept. (Universitat Politècnica de Catalunya)
- *Dates (from - to)* July 1986- February 2002
 - *Position held (Name of employer)* Assistant Professor at the Chemical Engineering Dept. (Universitat Politècnica de Catalunya)

RESEARCH PROJECTS & CONTRACTS (SELECTED)

- *Title* Behavior of Actinides and Fission Products in the Environment
 - *Dates (from - to) / Country* January 2012 - December 2014
 - *Name of employer* MCINN Spanish Government (ref CTM2011-27680-C02-01)
 - *Role and Main activities* Principal Researcher

CV - JOAN DE PABLO RIBAS

- *Title* Fast / Instant Release of Safety Relevant Radionuclides from Spent Nuclear Fuel (FIRST-Nuclides)
 - *Dates (from – to) / Country* January 2012 – December 2014
 - *Name of employer* European Commission (Grant Agreement Number 295722)
 - *Role and Main activities* Workpackage Leader

- *Title* Ground Water Pollution from Agricultural and Industrial Sources: Contaminant Fate, Natural and Induced Attenuation, and Vulnerability
 - *Name of employer* MCINN Spanish Government (ref CGL2008-06373-C03-02)
 - *Role and Main activities* Researcher

- *Title* Natural attenuation processes and passive remediation of groundwater contamination
 - *Dates (from – to) / Country* December 2005 - December 2008
 - *Name of employer* MEC Spanish Government – CAP (ref. CGL2005-08019-C04-03/HID)
 - *Role and Main activities* Principal Researcher

- *Title* ECOSIND Etablissement de bases científico-techniques et de stratégies pour la recherche de nouvelles voies de valorisation régionales de résidus industriels
 - *Dates (from – to) / Country* 2004 – 2006
 - *Name of employer* European Commission (MESVAL. Interreg III)
 - *Role and Main activities* Principal Researcher and Project Coordinator

PUBLICATIONS IN PEER-REVIEW JOURNALS (SELECTED)

- Gibert, O., **de Pablo, J.**, Cortina, J. L., Ayora, C. (2005) "Sorption studies of Zn(II) and Cu(II) onto vegetal compost used on reactive mixtures for in situ treatment of acid mine drainage". *Water Research*, 39: 2827-2838
- Rötting, T., Cama, J., Ayora, C., Cortina, J. L., **de Pablo, J.** (2006) "Use of caustic magnesia to remove cadmium, nickel and cobalt from water in passive treatment systems: Column experiments". *Environmental Science and Technology*, 40: 6438-6443
- Giménez, J., Martínez, M., **de Pablo, J.**, Rovira, M., Duro, L. (2007) "Arsenic sorption onto natural hematite, magnetite, and goethite". *Journal of Hazardous Materials*, 141 (2007) 375-380
- Martínez-Lladó, X., Vilà, M., Martí, V., Rovira, M., Domènech, J. A., **de Pablo, J.** (2008) "Trace element distribution in topsoils in Catalonia background and reference values and comparison with regional geology". *Environmental Engineering Science*, 25: 863-877
- Calderer, M., Jubany, I., Pérez, R., **de Pablo, J.**, Martí, V. (2010) "Modelling Enhanced Groundwater Denitrification in Batch Microcosms Tests". *Chemical Engineering Journal*, 165: 2-9
- Sureda, R., Casas, I., Giménez, J., **de Pablo, J.**, Quiñones, J., Zhang, J., Ewing, R.C. (2011) "The effects of ionizing radiation and temperature on uranyl silicates: soddyite (UO₂)₂(SiO₄(H₂O))₂ and uranophane Ca(UO₂)₂(SiO₃OH)₂•5H₂O". *Environ. Sci. Technol.*, 45: 2810-2815
- Meca, S., Martínez-Torrents, A., Martí, V., Giménez, J., Casas, I., **de Pablo, J.** (2011) "Determination of the equilibrium formation constants of two U(VI)-peroxide complexes at alkaline pH". *Dalton Trans.*, 40: 7976-7982
- Torras, J., Buj, I., Rovira, M., **de Pablo, J.** (2011) "Semi-dynamic leaching tests of nickel containing wastes stabilized/solidified with magnesium potassium phosphate cements". *Journal of Hazardous Materials*, 186: 1954-1960
- Llenas, L., Martínez-Lladó, X., Yaroshchuk, A., Rovira, M., **de Pablo, J.** (2011) "Nanofiltration as pretreatment for scale prevention in seawater reverse osmosis desalination". *Desalination and Water Treatment*, 36:310-318

CV - AGUSTÍ PÉREZ FOGUET

ACADEMIC CAREER

Agustí Pérez Foguet finished the studies of Ing. de Caminos, Canales y Puertos (Civil Eng.) in 1996. He obtained the PhD from UPC with honours with a thesis in the field of nonlinear computational solid mechanics in 2001. His doctoral studies included a half-year stay at UC Berkeley. In 2002, he was recognized with the Juan Carlos Simo Award for Young Researchers (Premio Juan Carlos Simó para Jóvenes Investigadores), given by the Spanish Society for Numerical Methods in Engineering (SEMNI).

After some years being actively involved in the development cooperation sector, in 2006 he was awarded with the Quality in University Teaching Award (Premio a la Calidad en la Docencia Universitaria) by the UPC Board of trustees for his continuous work in promoting sustainable human development in engineering studies. The Catalan government also recognized his work with the Jaume Vicens Vives Distinction Award.

From 2006 to present, he has focused his academic activities in applied maths on environmental engineering and sustainable development through two research lines, i.e. "Modelling, simulation and forecasting air quality at local scale" and "Management of water resources and WASH services in developing countries".

He is responsible for postgraduate courses on Advanced Numerical Methods, Technology for Sustainable Human Development, and International Cooperation Projects for Development; director of the UPC University Master program on Sustainable Development, and is a member of the Civil and Environmental Engineering PhD academic boards.

Between 2010 and 2011, he has been actively involved in the consolidation of the UPC Research Institute for Sustainability Science and Technology IS.UPC.

WORK EXPERIENCE

- *Dates (from - to)* April 2010 - September 2012
 - *Position held (Name of employer)* Vice-rector for Sustainability and Social Responsibility (Universitat Politècnica de Catalunya)
- *Dates (from - to)* April 2010 - December 2011
 - *Position held (Name of employer)* Director of the UPC University Research Institute for Sustainability Science and Technology IS.UPC (Universitat Politècnica de Catalunya)
- *Dates (from - to)* October 2007 - March 2010
 - *Position held (Name of employer)* Assistant to the Vice-rector of Academic Affairs (Universitat Politècnica de Catalunya)
- *Dates (from - to)* January 2007 - August 2010
 - *Position held (Name of employer)* Academic director Cooperation for Development Centre (Universitat Politècnica de Catalunya)
- *Dates (from - to)* February 2006 to date
 - *Position held (Name of employer)* Co-founder and member of the Research Group on Cooperation and Human Development GRECDH. UPC (Universitat Politècnica de Catalunya)
- *Dates (from - to)* March 2003 - March 2007
 - *Position held (Name of employer)* Vice-dean of Civil Engineering Studies, Civil Engineering School (Universitat Politècnica de Catalunya)
- *Dates (from - to)* July 2002 to date
 - *Position held (Name of employer)* Associate Professor of the Applied Math III Dept. (Universitat Politècnica de Catalunya)
- *Dates (from - to)* September 1996 to date
 - *Position held (Name of employer)* Member of the Research Group Laboratory of Computational Methods and Numerical Analysis - LaCàN (Universitat Politècnica de Catalunya)
- *Dates (from - to)* September 1996 - July 2002
 - *Position held (Name of employer)* Lecturer at the Applied Math III Dept. (Universitat Politècnica de Catalunya)

CV - AGUSTÍ PÉREZ FOGUET

RESEARCH PROJECTS & CONTRACTS (SELECTED)

- *Title* Improving the monitoring and evaluation of WASH services in small towns
- *Dates (from – to) / Country* November 2011– 2012 / Mozambique
 - *Name of employer* UN Habitat / AECID Spanish Government – CAP (ref 11-CAP2-1562)
 - *Role and Main activities* WASH data collection; Data analysis; Development of planning tools to support local decision-making / principal researcher
- *Title* Development of an Action Plan for the delivery of WASH services in Homa Bay and Suba Districts
- *Dates (from – to) / Country* November 2010 – July 2011 / Kenya
 - *Name of employer* UNICEF Kenya Country Office
 - *Role and Main activities* Development of planning tools to support local decision-making / principal researcher
- *Title* Improvement of the “Territory and Natural Resources Programme” monitoring system in Viejo river upper-basin
- *Dates (from – to) / Country* January 2010 – February 2013 / Nicaragua
 - *Name of employer* ONGAWA
 - *Role and Main activities* Technical assistance for monitoring “Terrena” program and introducing Human Right to water perspective in rural water and sanitation governance / principal researcher
- *Title* Predictive numerical models for environmental management
- *Dates (from – to) / Country* January 2009 – December 2011 / Spain
 - *Name of employer* ULPCG, U Salamanca / Spanish minister of Science (CGL2008-06003-C03-02)
 - *Role and Main activities* Numerical methods for local Air Quality modelling, Multiscale coupling / principal researcher (UPC team)
- *Title* Development of a Demonstration System to Support Water Resources Management in the Pucara Basin
- *Dates (from – to) / Country* July 2008 – December 2012 / Bolivia
 - *Name of employer* Centro AGUA (Universidad Mayor de San Simón) / AECID Spanish Government
 - *Role and Main activities* Integrated Water Resources Management / principal researcher (Spanish team)

PUBLICATIONS IN PEER-REVIEW JOURNALS (SELECTED)

- Oliver, A., Montero, G., Montenegro, R., Rodríguez, E., Escobar, J.M., **Pérez Foguet, A.** (2012), “Finite Element simulation of a local scale Air Quality Model over complex terrain”. *Advances in Science and Research* 8:105-113
- Jiménez, A., **Pérez Foguet, A.** (2012) “Quality and year-round availability of water delivered by improved water points in rural Tanzania: effects on coverage”. *Water Policy*, 14(3):509-523
- Yacoub, C., **Pérez Foguet, A.**, Miralles, N. (2012) “Trace metal content of sediments close to mine sites in the Andean region”, *The Scientific World Journal*, 2012
- Jiménez, A., **Pérez Foguet, A.** (2011) “Water Point Mapping for the analysis of rural water supply plans: a case study from Tanzania”, *ASCE Journal of Water Resources Planning and Management*, 137(5):439-447
- Giné, R., **Pérez Foguet, A.** (2011) “Application of a revised WPI to target the water poor”. *Water Science and Technology* 63(6):1099-1110
- Pérez Foguet, A.**, Giné, R. (2011) “Analyzing Water Poverty in Basins”. *Water Resources Management* 25(3):3595-3612
- Jiménez, A., **Pérez Foguet, A.** (2011) “The challenges of implementing pro-poor policies in a decentralized context: the case of the Rural Water Supply and Sanitation Program in Tanzania”. *Sustainability Science* 6(7):37-49
- Giné, R., **Pérez Foguet, A.** (2010) “Improved method to calculate a Water Poverty Index at local scale”. *ASCE Journal of Environmental Engineering* 136(11):1287-1298
- Boni, A., **Pérez Foguet, A.** (2008) “Introducing development education in technical universities: successful experiences in Spain”. *European Journal of Engineering Education* 33(3):343-354

CV - ENRIQUE VELO GARCIA

ACADEMIC CAREER

Enrique Velo graduated on Chemical Engineering at UPC in 1986. He obtained his PhD with honours with a thesis in the field of antiknock additive for unleaded gasoline in 1992 at the UPC Department of Chemical Engineering. His doctoral studies included two summer internships at UC Davis (CA, USA).

Since 1993, his research is focused on the utilization of biomass and waste as energy resource, specifically through gasification and pyrolysis processes within CEPIMA (Center for Process Engineering and Environment, UPC). Since 2006, his research activity also includes the implementation of renewable energy projects in rural areas of developing countries within the GRECDH (Research group on Cooperation and Human Development).

He is author or co-author of 4 books, 30 book chapters, 50 articles in journals (30 in indexed journals), over 100 congress communications and numerous research reports. He has participated in 18 research projects funded by open calls (7 EU) (5 national projects as project director). He has participated in 18 contracts with administrations and companies (2 as principal researcher). He has co-directed six PhD theses.

He is responsible for postgraduate courses on renewable energy applied to human development projects. He has been the programme director for the MSc in Renewable Energy (an EIT labelled KIC Innoenergy Programme) and the MSc in Technology for Human Development and Cooperation (a UPC official degree) since 2012. He is the UPC programme coordinator for the MSc Environmental Pathways for Sustainable Energy Systems – SELECT (an Erasmus Mundus – KIC Innoenergy programme). Additionally, he is member of the academic boards of the MSc in Sustainable Development (UPC), the PhD programme in Sustainable Development (UPC), and the PhD programme in Thermal Engineering (UPC).

He is co-founder of the UPC Research Institute for Sustainability Science and Technology IS.UPC, acting as the Institute's Secretary from its creation to present day.

WORK EXPERIENCE

- *Dates (from – to)* September 2009 to date
 - *Position held (Name of employer)* Secretary of UPC University Research Institute in Sustainability Science and Technology (IS.UPC)
- *Dates (from – to)* February 2006 to date
 - *Position held (Name of employer)* Co-founder and member of the Research Group on Cooperation and Human Development GRECDH.UPC (Universitat Politècnica de Catalunya)
- *Dates (from – to)* December 1998 to date
 - *Position held (Name of employer)* Associate Professor at the Department of Heat Engines (Universitat Politècnica de Catalunya)
- *Dates (from – to)* December 2002-June 2009
 - *Position held (Name of employer)* Secretary of the Department of Heat Engines (Universitat Politècnica de Catalunya)
- *Dates (from – to)* May 1991- December 1998
 - *Position held (Name of employer)* Lecturer at the Heat Engines Dept. (Universitat Politècnica de Catalunya)

RESEARCH PROJECTS & CONTRACTS (SELECTED)

- *Title* Energy access for the poor in sub-Saharan Africa to meet the millennium development goals (Energy for All 2030)
 - *Dates (from – to) / Country* January 2010 – January 2013
 - *Name of employer* EuropeAid (ref code DCI-NSA ED/2009/201-885)
 - *Role and Main activities* Principal Researcher (UPC Team)

CV - ENRIQUE VELO GARCIA

- *Title* Onsite power generation with modular gasifiers
 - *Dates (from – to) / Country* October 2008 – October 2011
 - *Name of employer* ACC1Ó (CIDEM COPCA) Catalan Government (Project ref VALTEC08-2-0020)
 - *Role and Main activities* Principal Researcher

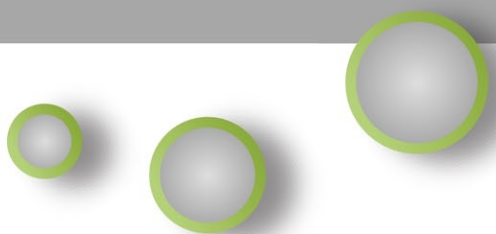
- *Title* Expanding horizons production from the paradox of integration (EHMAN)
 - *Dates (from – to) / Country* January 2010 – December 2012
 - *Name of employer* Spanish Ministry of Science and Technology (Project ref DPI2009-09386)
 - *Role and Main activities* Researcher

- *Title* Research on the characterization of biomass resources and energy consumption in the Amazon jungle areas of Peru
 - *Dates (from – to) / Country* January 2011 – January 2012 / Peru
 - *Name of employer* AECID Spanish Government PCII programme. C-032223-10
 - *Role and Main activities* Principal Researcher

- *Title* Promoting agricultural development in areas not connected to the grid using bio energy technologies and other renewable energy sources
 - *Dates (from – to) / Country* January 2011 – January 2012 / Mozambique
 - *Name of employer* AECID Spanish Government PCII programme. C-032141-10
 - *Role and Main activities* Principal Researcher

PUBLICATIONS IN PEER-REVIEW JOURNALS (SELECTED)

- Pérez-Fortes, M., Láinez-Aguirre, J.M., Arranz-Piera, P., **Velo, E.**, Puigjaner, L. (2012) "Design of regional and sustainable bio-based networks for electricity generation using a multiobjective MILP approach", *Energy*, 44(1): 79-95
- Garfí, M., Ferrer-Martí, L., **Velo, E.**, Ferrer, I. (2012) "Evaluating benefits of low-cost household digesters for rural Andean communities", *Renewable and Sustainable Energy Reviews*, 16: 575-581
- Pérez-Fortes, M., Arranz-Piera, P., Láinez, J.M., **Velo, E.**, Puigjaner, L. (2011) "Optimal location of gasification plants for electricity production in rural areas", *Computer Aided Chemical Engineering*, 29: 1809-1813
- Ferrer, I; Garfí, M.; Uggetti, E.; Ferrer-Martí, I.; Calderon, A.; **Velo, E.** (2011) "Biogas production in low-cost household digesters at the Peruvian Andes", *Biomass&Bioenergy*, 35(5):1668-1674
- Ferrer-Martí, L., Pastor, R., Capó, G.M., **Velo, E.** (2011) "Optimizing microwind rural electrification projects. A case study in Peru" *Journal of Global Optimization*, 50(1):127-143
- Pérez-Fortes, M., Bojarski, A.D., **Velo, E.**, Nogués, J.M., Puigjaner, L. (2009) "Conceptual model and evaluation of generated power and emissions in an IGCC plant" *Energy*, 34(10): 1721-1732
- Gomez, C., **Velo, E.**, Barontini, F., Cozzani, V. (2009) "Influence of Secondary Reactions on the Heat of Pyrolysis of Biomass" *Industrial & Engineering Chemistry Research*, 48(23): 10222-10233



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