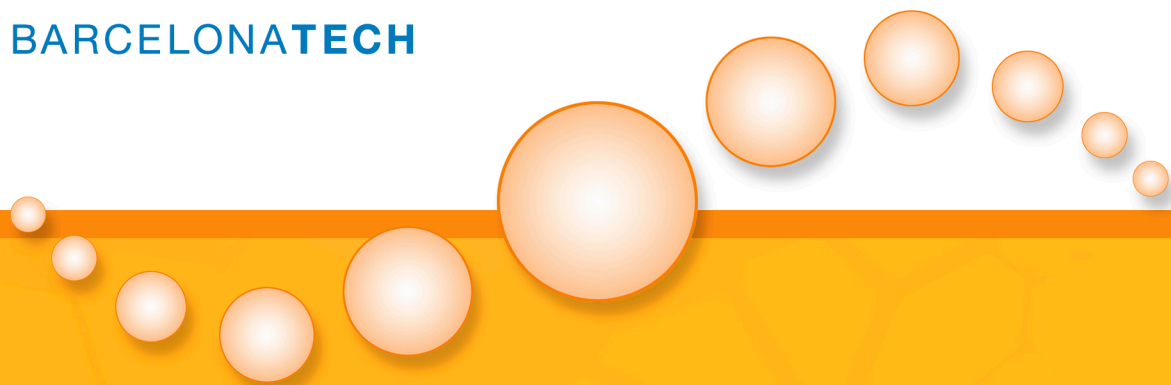


**IS.UPC - Research Institute
for Sustainability Science
and Technology.**

2012 ANNUAL REPORT



**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 endeavor 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 specialized 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. In this sense, a new master degree has been developed and implemented for the 2012-2013 period: Technology for Human Development and Cooperation.
- 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.

This second Annual Report covers the activities of IS.UPC during the year 2012. This year is the first one that I am in charge of the Institute since I was elected in December 2011.

During this 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.

The IS.UPC has its own Master's degrees on both Technology for Human Development and Cooperation and Sustainability Science and Technology (2013-2014). Besides the PhD studies in Sustainability, Technology and Humanism, and the support for interdepartmental PhD studies in Environmental Engineering.

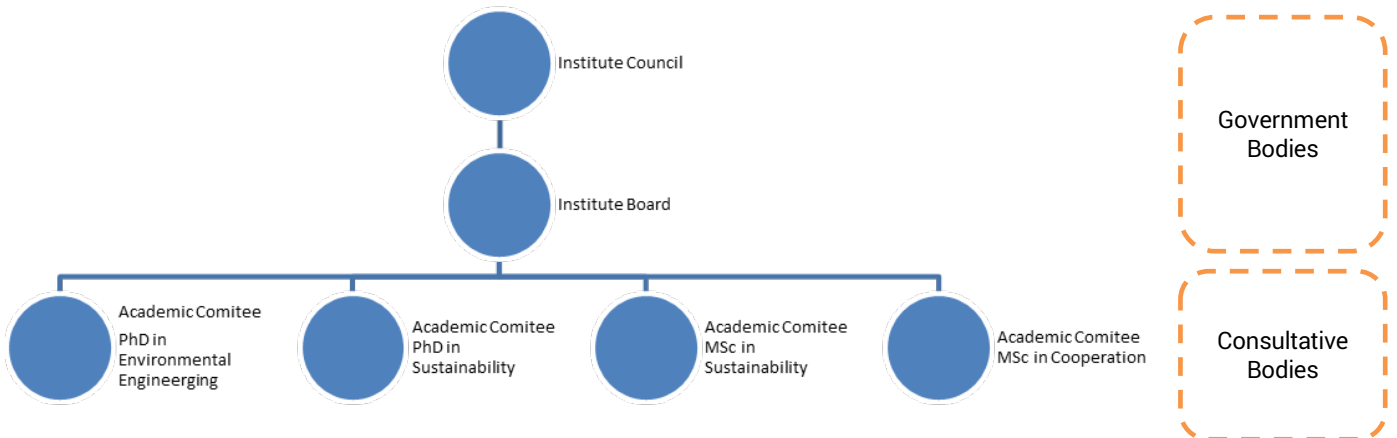
Year 2012 was a year of many changes; a new administration unit was created to provide services to our Institute as well as to the Education Science Institute, in this sense I would like to mention the effort of Esperança Portet and Marta Prats to manage our Institute. On the other hand, IS.UPC budget decreased very much due to the crisis; however we could keep several activities in the frame of UPC 2015 Sustainability Plan.

The Institute is fully committed with continuously improving the contribution of UPC to sustainability science and sustainable technologies. As my predecessor Agustí Pérez-Foguet said: Institute staff expects 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.

Joan de Pablo
Director

2. ORGANIZATION STRUCTURE

2.1. ORGANIZATION CHART



2.2. INSTITUTE BODIES

Single-member bodies

Joan de Pablo Ribas	Director
Enrique Velo García	Secretary
Agustí Pérez Foguet	Deputy Director
Alejandro Josa García-Tornel	Master's degrees Coordinator
Esperança Portet Cortes	Head of administration
Jordi Morató Farreras	Head of the UNESCO Chair of Sustainability

2.3. COLLEGIATE BODIES OF GOVERNMENT AND REPRESENTATION

Institute Council

Joan de Pablo Ribas	Director
Enrique Velo García	Secretary
Agustí Pérez Foguet	PhD studies coordinator
Alejandro Josa García-Tornel	Masters' degrees coordinator
Esperanza Portet Cortes	Head of Administration
Jordi Morató Farreras	Head of the UNESCO Chair of Sustainability
Josep Lluís Moner Tomas	Representative of the administrative and service staff
Óscar Flores Baquero	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	Chair and Director
Marta Prats Beltran	Secretary
Alberto Cuchí Burgos	
Alejandro Josa García-Tornel	
Albert Masip Álvarez	
Enrique Velo García	
Maria Ribera Sancho Samsó	
Jordi Segalàs Coral	

Academic Comitee of the Master's in Technology for Human Development and Cooperation

Enrique Velo García	Chair and Director
Marta Prats Beltran	Secretary
Agustí Pérez Foguet	
Jose M ^a Gil Roig	
Eva Vidal López	
Míriam Villares Junyent	

Academic Committee of the Phd programme in Sustainability

Antoni Roca Rosell	Chair and Director
José María Gil Roig	Secretary
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	Chair and Coordinator Dept. of Engineering Projects
Miquel Casals Casanova	Dept. of Construction Engineering
Martí Crespí Rosell	Institute of Textile Research and Industrial Coop. of Terrassa
Joan de Pablo Ribas	Dept. of Chemical Engineering
Xavier Flotats Ripoll	Dept. of Agricultural Engineering and Biotechnology

Joan García Serrano	Dept. of Hydraulic, Maritime and Environmental Engineering
Maria Teresa Martínez-Seara Alonso	Dept. of Applied Mathematics I
Andrés Navarro Flores	Depat. of Applied Mathematics I
Agustí Pérez Foguet	Research Institute for Sustainability Science and Technology
Jordi Romeu Garbí	Dept. of Mechanical Engineering
Teresa Vidal Llúcia	Dept. of Textile and Paper Engineering
Alejandro Josa García-Tornel	Representative of the Master of Environmental Eng

2.5. TEAM

2.5.1. ADMINISTRATIVE AND MANAGEMENT TEAM

Esperanza Portet Cortes	Head of Administration
Marta Prats Beltran	
Araceli Adam Salvatierra	
Ofèlia Alba Soca	
Carme Alcalá Val	
Ana Andres Lleo	
Ma. Montserrat Añor Jávega	
Carme Bernaus Garcia	
Mercé Civit Payan	
Clara Cullell Tebe	
Isabel Darnell Martin	
Ma. José Delgado García	
Yolanda Delgado Rodríguez	
Josefina Estepa Maria	
Josep Maria Galabert i Pujol	
Boris Lazzarini	
Felisa Lopez Lopez	
Josep Lluís Moner Tomas	
Joaquim Morte Aixandri	
Montserrat Pla Soler	
Maria José Pérez Cabrera	
Maica Sanz Gomez	
Sisco Villas Espitia	

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

Arranz Piera, Pol
 Giné Garriga, Ricard
 Jiménez Fernández de Palencia, Alejandro
 Boris Lazzarini
 Meluni, Alessandro
 Tejedor Papell, Gemma
 Yacoub López, Cristina

Project Leaders – Research

Martínez Farré, Xavier
 Miralles Esteban, Núria
 Perez Foguet, Augustí
 Ribera Sancho Samsò, Maria
 Segalás Coral, Jordi
 Velo García, Enrique

Project leaders - 2012 Seeds of Sustainability

Fernández Salas, Elena
 Fontseca Casas, Pau
 García Serrano, Joan
 Gomis Bellmunt, Oriol
 Josa García-Tornel, Alejandro
 Mata Perelló, Josep Maria
 Riba Romeva, Carles
 Sabaté Nolla, Jordi
 Sánchez Carracedo, Fermín
 Seguí Santacana, Víctor
 Velo Garcia, Enrique
 Vidal López, Eva
 Zamora Mestre, Joan Lluís

2.5.3. TEACHING

Master's in Sustainability.

The faculty responsible for the organization and planning of master's subjects (2011/2012) were:

Barceló, Miquel	Morató, Jordi
Caballero, Antoni	Perez Foguet, Agustí
Candela, Lucía	Riba, Alexandre
Cuchi Burgos, Alberto	Rosas, Martí
Etxebarria, Miren	Segalas Coral, Jordi
Felipe Blanch, Jose Juan de	Velo Garcia, Enrique
Gil, José María	Vidal, Eva
Magrinya Torner, Francesc	Villares, Miriam
Miralles Esteban, Nuria	Xercavins Valls, Josep

Master's in Technology for Human Development and Cooperation, THDC.

During 2012 the UPC Governing Council adopted the Master THDC that was started in September 2012. The faculty responsible for the organization and planning of master's subjects (2012/2013) were:

Candela, Lucía	Magriñà, Francesc
Cañameras, Nuria	Perez Foguet, Agusti
Etxebarria, Miren	Reig, Lourdes
Ferrer, Ivet	Riba, Alexandre
Gil, Garola, Alvar	Romero, Roser
Gil, Jose M ^a	V. Wunik, Lucas
Izquierdo, Jordi	Velo Garcia, Enrique
Josa, Alejandro	Vidal, Eva
Llop, Carles	Villares, Míriam

PhD programme in Sustainability.

UPC researchers responsible for the mentoring and/or supervising of doctoral theses (2011/2012) were:

Alvarez Del Castillo, Javier	Gil Roig, Jose Maria
Barceló Garcia, Miguel	Josa Garcia-Tornel, Alejandro
Barrado Muxi, Cristina	Miralles Esteban, Núria
Candela Lledó, Lucila	Pérez Foguet, Agustí

Casas Pons, Ignaci
de Pablo Ribas, Joan
Felipe Blanch, Jose Juan De

Serra Devesa, Teresa
Velo García, Enrique
Xercavins Valls, Josep

PhD programme in environmental engineering.

UPC researchers responsible for the mentoring and/or supervising of the doctoral theses (2011/2012) were:

Alonso Pérez, Silvia
André, Michel
Baldasano Recio, José M.
Barra Bizinotto, Marilda
Bonmatí Blasi, August
Bruno Salgot, Jordi
Cabeza Fabra, Luisa F.
Casals Casanova, Miquel
Casas Pons, Ignasi
Cortina Pallas, José Luis
Crespi Rosell, Martí
Cuevas Agulló, Emilio
Darakas, Efthymios
De Pablo Ribas, Joan
Escalas Cañellas, Antoni
Farré Urgell, Marinel.La
Ferrer Martí, Ivet
Flotats Ripoll, Xavier
Folch Duran, Arnau
Gangoellés Solanellas, Marta
García Serrano, Joan
Gassó Domingo, Santiago
Giménez Izquierdo, Francisco Javier

Ginebreda Martí, Antoni
Gonçalves Ageitos, María
Grivé Solé, Mireia
Jiménez Guerrero, Pedro
Jorba Casellas, Oriol
Latron, Jérôme
Llorens García, Pilar
Martí Gregorio, Vicenç
Miralles Esteban, Núria
Navarro Flores, Andrés F.
Palatsi Civit, Jordi
Pay Pérez, María Teresa
Perez Foguet, Agustí
Pérez García-Pando, Carlos
Puigagut Juárez, Jaume
Riva Juan, Maria Carmen
Roca Ramon, Xavier
Romeu Garbí, Jordi
Rovira Boixaderas, Miquel
Sierra Pedrico, Juan Pablo
Valderrama Angel, César Albert
Vázquez Ramonich, Enric
Viñas I Canals, Marc

2.5.4. UNDERGRADUATE TRAINEES

UPC students who received a training undergraduate scholarship were:

Berdún Peñato, Jesús

Salvadó Rius, Judit

Comes Pon, Joaquim

Esteban Etchamendi, Josep Maria

Bonet Alomar, Miquel

Romagosa Rovira, Anna

Sanjuan Olleta, Teresa

Raigosa, Juliana

Elisa Hurtado, Carmen

Castellanos, Carolina

Muñoz Cervantes, M.Carmen

Olazabal Alberdi, Maria

Vicente Tónico, Marc

Sauza Reyes, Catalina

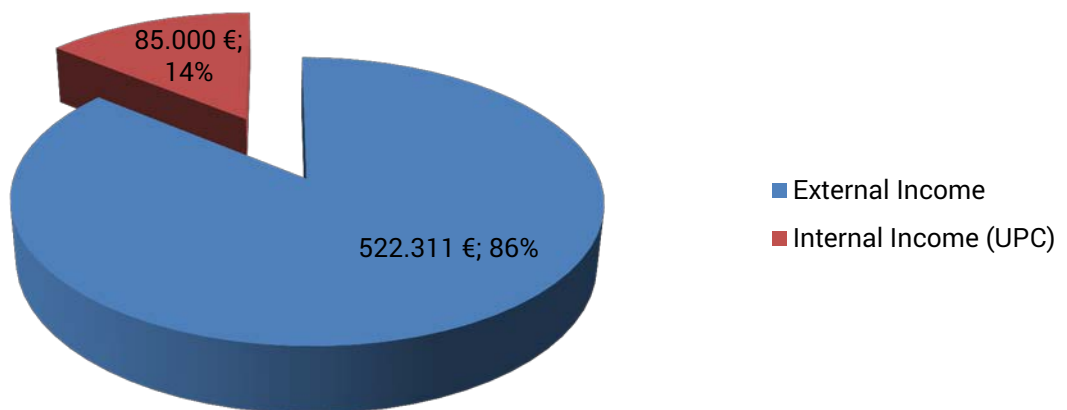
3. FINANCIAL INFORMATION

A description of IS.UPC financial accounts for the fiscal year 2012 is summarized in this section.

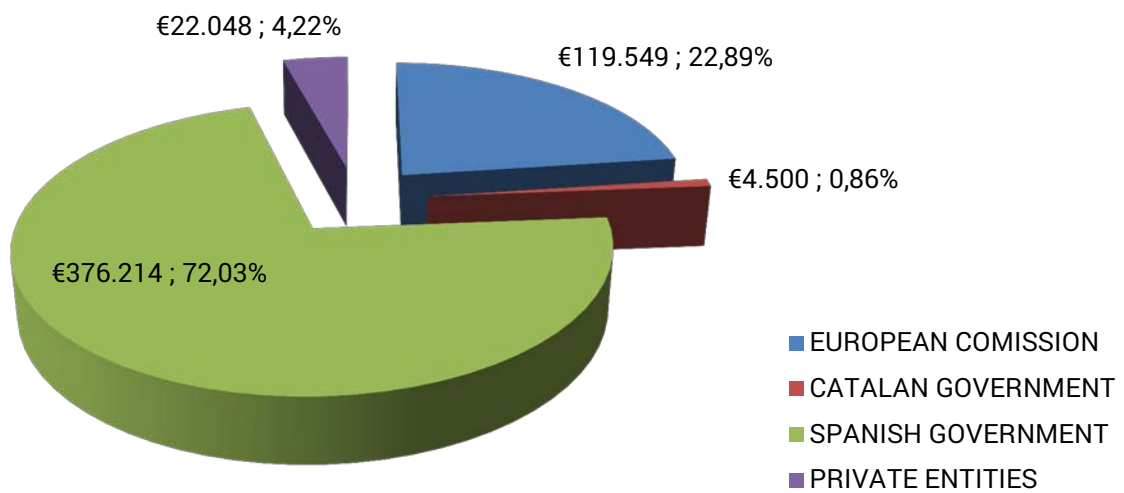
- FINANCIAL ACCOUNTS
- 2012 OPERATIONAL INCOME

	UPC	EUROPEAN COMMISSION	CATALAN GOVERNMENT	SPANISH GOVERNMENT	PRIVATE ENTITIES	TOTAL
INTERNAL						
2015 Sustainable UPC Plan	85.000					85.000
EXTERNAL						
Competitive Projects		119.549		376.214		495.763
Others			4.500		22.048	26.548
TOTAL	85.000	119.549	4.500	376.214	22.048	607.311

OPERATIONAL INCOME



EXTERNAL INCOME



4. UPC 2015 SUSTAINABILITY PLAN

The aim of the UPC 2015 Sustainability Plan was expanding the UPC's strategic vision to focus on the challenges of sustainable human development. It was institutionally approved in 2006. Then, the strategic insights and tools were defined in the first cycle of the Plan (2006-2010). Further details of the background of the Sustainability plan (mission, vision, structure and developed projects) and also of the second cycle of the plan, can be found in the IS.UPC annual report 2011.

The IS.UPC coordinates and streamlines the second cycle of 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.

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.

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. 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. The thematic lines are summarized by:

- Energy and climate change
- Waste and zero emissions
- Health, air quality and food
- Supplies and responsible consumption
- Water cycle
- Territory and mobility

Additionally, the Institute of Sustainability is engaged in the Social Responsibility values committed by the UPC, especially to the Global Compact related activities. The Global Compact is an international initiative of the United Nations that asks organizations to support and enact ten principles derived from key international declarations and conventions. The principles focus on four areas: human rights, labor standards, environment and anti-corruption. The Institute of Sustainability develops three of the ten principles that the UPC was committed by the Global Compact:

- Principle 7: Businesses should support a precautionary approach to environmental challenges.
- Principle 8: Businesses should undertake initiatives to promote greater environmental responsibility.
- Principle 9: Businesses should encourage the development and diffusion of environmentally friendly technologies.

4.1. PROJECTS OF THE PLAN

Actions of teaching initiatives developed by the Institute of Sustainability are particularly significant in terms of their impact. The commitment of the UPC is visualized in the master`s degree courses and doctoral courses developed at the institute among others. Briefly the Institute of Sustainability offers the following courses:

- Master`s degree in Sustainability,
- Master`s degree in Technology for Human Development and Cooperation,
- Doctoral degree in Sustainability and,
- Doctoral degree in Environmental Engineering

Additionally, the Institute realized the following initiatives:

Integration of the competency “sustainability and social commitment” in bachelor`s degree curricula

In line with the institutional policy set out in the Framework for the Design of Bachelor's Degree Curricula, verified curricula for all new EHEA-adapted UPC courses include the transversal competency “sustainability and social commitment”.

As a result, upon completion of their studies UPC graduates will have acquired this competency, which is broadly defined as follows:

“Being aware of and understanding the complexity of the economic and social phenomena characteristic of a welfare society; the ability to relate social welfare to globalization and sustainability; and the ability to use know-how and technology in a way that is balanced and compatible with economic considerations and the goal of sustainability.”

Establishment of the STEP 2015 programme

The STEP 2015 programme is one tool for tackling the challenge of incorporating the transversal competency “sustainability and social commitment” in UPC bachelor’s degree curricula. The programme’s main mission is to develop conceptual foundations, identify specific models, and make practical tools available to stakeholders to ensure that students develop this competency.

It is important to stress the active participation of the stakeholders involved: teaching and research staff, administrative and service staff, and students. For instance, participants in the Step Students sub-programme produced a document entitled “The Education We Want: Social Commitment and Responsibility at the UPC”, which sets out the students’ analysis, objectives and proposals concerning social commitment as reflected in UPC curricula.

15th Environmental and Sustainable Ideas Competition UPC – “Rio +20 reinforce commitment to sustainability”

The objective was to seek ideas to promote innovative projects and activities that contribute to the major changes that the world needs this century to transform the current economic model and move towards new models of development in accordance with the objectives of Millennium Development Goals.

The ideas provided should enable a quantum leap in assuming social responsibility in front of the technological environment and sustainable human development and specifically has an impact especially on our university environment and our interaction with society.

This year the calls for projects submitted taken as a reference of the Conference on Sustainable Development of the United Nations took place from 4 to 6 June. .

The call for proposals particularly valued questions about how to help raise awareness and evaluate the changes caused in our territories with our actions over the last 15 years, our responsibility in social and environmental terms and what we can contribute strategically to promote this change towards sustainability.

UPC believes that the university community has an important role to play in global sustainability. For example, we want to educate our students and all people from the UPC on the effects of climate change, on the reduction of CO₂ emissions, saving on water and materials, on the prevention of waste on mobility, infrastructure and land or noise levels produced by the activities...



Then ideas, convey information and / or relevant actions that increase public awareness of our commitment to academic institutions towards sustainability were promoted in this competition.

5. RESEARCH AND PROJECTS

This section details Research projects, Agreements and collaborations, and “Seeds of Sustainability” projects undertaken by IS.UPC researchers during 2012.

5.1. RESEARCH AND KNOWLEDGE TRANSFER PROJECTS

STARTED PROJECTS

Building and strengthening ARA-Norte capacities for the planning and management of water resources in the basins of Cabo Delgado, Mozambique

The new Mozambican water policy (2007), is a step forward to improve country’s policy and regulations relating to water, setting as priorities: i) to satisfy basic needs of water for human consumption; ii) to improve sanitation conditions, and iii) to develop an efficient use of water for economic development; iv) to guarantee water for environmental conservation; v) to reduce floods’ and droughts’ vulnerability, and vi) to promote regional integration. Main responsibilities recall on basin authorities. The aim of this project is to improve capacities of ARA-Norte (basin authority for the northern basins of the country) in the management of the internal watersheds of Montepuez Messalo, Megaruma Sea Side and in relation to: (1) Monitoring of resources water, (2) evaluation of water infrastructure, (3) environmental management, planning and control of the water resources, leading the participation and involvement of the involved stakeholders.

Scope: International.

Partners: ARA-Norte (Mozambique), Amphos 21 (Spain), Augas de Galicia (Spain), Universidade da Coruña (Spain) and UPC (Spain). Led by: Augas de Galicia.

Funded by: EuropeAid.

Start Date: 03.01.2012. **Estimated date of completion:** 09.01.2014.

Principal Researcher: Agustí Pérez Foguet

Andean Network of Graduate Studies in Integrated Water Resources (RAP-GIRH)

This project has identified the growing need for professionals to have an integrated approach to water management, interdisciplinary and regional guidance. The project aims to develop graduate programs with an innovative learning methodology, with a link with the labor, business and public, and methods that promote applied research and a permanent network of exchange and cooperation inter-university. Among others, include the following objectives:

- Strengthen educational programs on sustainability tools and mechanisms that promote active learning based on analysis of current social problems.
- To promote educational programs and research across the UPC considering the mass of water ecosystems as life support, beyond consideration as an economic resource and water planning.
- Promote partnerships with institutions (academic and non academic) working in the field of sustainability and cooperation.

Scope: International.

Partners: Wageningen University & Research centre (Holland), Universidad Mayor de San Simón (Bolivia), Universidad del Valle (Colombia), Universidad Central del Ecuador (Ecuador), Pontificia Universidad Católica del Perú (Peru), Universidad Nacional Pedro Ruiz Gallo (Peru) and Universitat Politècnica de Catalunya (Spain).

Led by: Wageningen University & Research centre.

Funded by: EuropeAid.

Start date: 01.04.2012. **Estimated date of completion:** 01.04.2015.

Principal Researcher: Núria Miralles

Collective action, management of water resources and adaptation to climate change in the central region of Nicaragua

The aim of this study is to improve knowledge about the relations between collective action and water management for domestic and agricultural purposes in Jinotega and Matagalpa Departments. This is a pertinent field in Nicaraguan rural context due to the recent Nicaraguan Water Law (2007) and Water Users Associations Law (2010) which promote collective action formalization through Water Users Association (CAPS) and irrigation districts. Even more, it is especially interesting in a situation of climate variability, climate change and uncertainty, where local institutions performance and their collective action capacity to guarantee access to water resources is an essential but often less considered and analyzed mechanism.

Scope: International.

Partners: Universidad Nacional Autónoma. Managua –UNAN-Managua- (Nicaragua), Centro Agronómico Tropical de Investigación y Enseñanza –CATIE- (Costa Rica), Colegio de Posgraduados (Mexico), Universidad Politécnica de Madrid (Spain), Universidad Complutense de Madrid (Spain) and Universitat Politècnica de Catalunya (Spain). Led by: Universitat Politècnica de Catalunya.

Funded by: AECID. Code: AP/035017/11.

Start date: 01.02.2012. **Estimated date of completion:** 01.02.2013.

Principal Researcher: Agustí Pérez Foguet

ONGOING 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)

Start Date: 01.04.2010. **Estimated date of completion:** 01.04.2013.

Principal Researcher: Enrique Velo

Website: <http://grecdh.upc.edu/projectes/altres/e4a-2030>

Development of a participative system on the ecological quality of rivers in the region of Cajamarca

Applied research project based on the environmental quality of water in the basin Jequetepeque in northern Peru. In the region of Cajamarca, mining is an activity that can affect large-scale social and environmental terms. Then need to have accurate knowledge about the state of the environment and the possible effect of using a water resource monitoring water, sediments, and macroinvertebrate assessment of sediment toxicity is imperative. Specifically the project aims to develop a complete index to assess the state of water resources and rising easily be used for the affected population, especially the rural population, as a tool for surveillance water in ecological terms.

Scope: International.

Partners: Universidad Nacional de Cajamarca (Peru), Universitat de Barcelona (Spain) and Universitat Politècnica de Catalunya (Spain). Led by: Universitat Politècnica de Catalunya.

Funded by: AECID. Code: AP/036126/11.

Start Date: 13.12.2011. **Estimated date of completion:** 12.3.2013.

Principal Researcher: Núria Miralles

Improving assessment and planning services of water, sanitation and hygiene in rural and suburban context through the development of management tools based on rights

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.

Lines of action:

1. To identify reliable and relevant indicators for evaluating the sector.
2. To strength the capacity of local public institutions.
3. To develop urban planning projects that integrates the provision of basic services.

Scope: International.

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

Funded by: AECID. Code: 11-CAP2-1562. With the co-funding of CCD - fons 0,7% UPC.

Start date: 01.11.2011. **Estimated date of completion:** 31.3.2013.

Principal Researcher: Agustí Pérez Foguet

Establishing Modern Master-level Studies in Industrial Ecology (IEMAST)

The project aims to create a Master program that prepares engineers able to work on the design of technological systems, industrial and urban, industrial processes and consumer products, taking into account environmental problems and social and economic constraints in Azerbaijan, Belarus, Kazakhstan and Ukraine.

Scope: International.

University-partners: KTH-Royal Institute of Technology, Universitat Politècnica de Catalunya, TU Delft, Qafqaz University, National Aviation Academy, Belarussian National Technical University, Mogilev State University of Food Technologies, Baranovich State University, Kazakh National Technical University, Caspian State University of Technology and Engineering, Atyrau Institute of Oil and Gas, National Technical University of Ukraine "Kiev Polytechnic Institute", Chernihiv State Technological University

Society partners: National Agency for Higher Education, Sweden, Association of power efficient engineering of Ukraine, Kazphosphate LLC, Baku City Department of Ecology and Natural Resources, Institute for Nature Management, National Academy of Science, Belarus

Led by: Universitat Politècnica de Catalunya.

Funding agency: EACEA

Contract number: 2-517346-TEMPUSIEMAST

Project number: 517346

Start date: 15-10-2011. **Estimated date of completion:** 14-10-2014

Project responsible: Olga Kordas (KTH), Jordi Segalàs at UPC.

Training Courses for Public Services in Sustainable Infrastructure Development in Western Balkans (SDTRAIN)

The project is designed to establish system for training of public authorities aimed at improving level of environmental expertise, facilitating good governance and sustainable infrastructure development in Western Balkan countries. To meet this overall objective, the project team will develop training programme for capacity building of the staff of public authorities in sustainable infrastructure, energy efficiency and good governance at partner Universities, that will be pilot in cooperation with EU teachers in BiH, Montenegro and Serbia; Key partner Universities teachers capacities in providing training in sustainable public infrastructure, will be improved at EU universities through retraining. A web-based toolkit will be developed as an interactive learning environment for training of public authorities. The project will ensure continuity of the training Programme and the web toolkit beyond Tempus Programme funding.

Scope: International.

University-partners: KTH-Royal Institute of Technology, Universitat Politècnica de Catalunya, TU Delft, Qafqaz University, National Aviation Academy, Belarussian National Technical University, Mogilev State University of Food Technologies, Baranovich State University, Kazakh National Technical University, Caspian State University of Technology and Engineering, Atyrau Institute of Oil and Gas, National Technical University of Ukraine "Kiev Polytechnic Institute", Chernihiv State Technological University

Society partners: National Agency for Higher Education, Sweden, Association of power efficient engineering of Ukraine, Kazphosphate LLC, Baku City Department of Ecology and Natural Resources, Institute for Nature Management, National Academy of Science, Belarus

Led by: Universitat Politècnica de Catalunya.

Funding agency: EACEA

Contract number: 2-TEMPUS 530530-SDTRAIN

Project number: 530530

Start date: 15-10-2011. **Estimated date of completion:** 14-10-2014

Project responsible: Olga Kordas (KTH), Jordi Segalàs at UPC.

Erasmus Intensive Program: International Seminar on Sustainable Technology Development (STD)

The International Seminar on Sustainable Technological Development is a way of exchanging knowledge and information about an annual topic within the field of sustainability. It will be developed during two weeks and conducted by professors from different European universities experts on future studies

analysis (TUDelft, Chalmers UT, KTH, TUGraz among others). The constructive-learning activities will be focused on the connections between technology development, environmental problems and societal change. The seminar will develop case studies, round tables, practical visits, and others.

University-partners: KTH-Royal Institute of Technology, Universitat Politècnica de Catalunya, TU Delft, Chalmers University, Graz TU, Maribor University.

Funding agency: OAPEE-Unidad de Educación Superior 2012-1-ES1-ERA10-54367

Contract number: 2-ERA10-54367

Number of Agreement: 2012-1-ES1-ERA10-54367

Start date: 2011. **Estimated date of completion:** 2014

Contact persons: Jordi Segalàs, Gemma Tejedor

Further information:

<http://is.upc.edu/seminaris-i-jornades/seminaris/international-seminar-std>

<http://is.upc.edu/seminaris-i-jornades/seminaris/std-2013>

Creation of third cycle studies - Doctoral Programme in Renewable Energy and Environmental Technology (CREDO)

This project is designed to advance capacity in education, research, exploitation of knowledge and innovation in the area of Sustainable Energy and Environmental Technology in Ukraine and Kyrgyzstan through structured and integrated cooperation with European Universities within framework of joint Doctorate Program in this field. To reach this goal Project consortium will introduce advanced Bologna-compliant Doctorate Program in the area of Sustainable Energy and Environmental Technology at seven partner Universities, the project team will pilot joint PhD courses and provide co-supervision of the doctoral thesis as the initial stage on the way to introduction of the Joint Doctorate Program among the project partners.

Scope: International.

University-partners: KTH-Royal Institute of Technology, University of Sarajevo, University of Banja Luka, KSUCTA, Osh Technological University, Universitat Politècnica de Catalunya, TU Delft, TUT, Technical University of Moldova, State Agrarian University of Moldova, NTUU "KPI", National University of Water Management & Natures Resources Use

Society partners: National Agency for Higher Education (Sweden), European Energy Company (Ukraine), National Association for Promotion of Renewable Energy Sources (Moldova), Chamber of Economy of Federation of Bosnia and Herzegovina (Bosnia and Herzegovina), Ministry of Education and Science (Kyrgyzstan), Kyrgyzhouscommunonion under Ministry of Energy (Kyrgyzstan), Kyrgyz Scientific-Technical Centre "Energy" (Kyrgyzstan)

Funding agency: EACEA

Contract number: CREDO510952

Start date: 15-10-2010 **Estimated date of completion:** 14-10-2013

Project responsible: Olga Kordas (KTH), Jordi Segalàs at UPC.

Organic waste valorisation in the Mediterranean Technology Park

This project aims to meet the need for treatment of organic waste generated in the Mediterranean Technology Park (PMT). It is a Seed Project funded by the Sustainability Institute of the Universitat Politècnica de Catalunya • BarcelonaTech (UPC).

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.

Quantifying the organic fraction is an important factor for determining the daily and yearly amounts generated. Part of the organic fraction has been composted with plant waste and two batches of compost have been produced since the beginning of the project. The quantification was carried out by ESAB students on grants as part of their bachelor's theses.

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: 2012

Principal Researcher: Martínez Farré, Xavier

Website: <http://compostpmt.cbl.upc.edu/>

Development of a Demonstration System to Support Water Resources Management in the Pucara Basin, Bolivia (SID-AGUA)

The SID- AGUA program intends to provide conceptual and methodological basis to the National Watershed Plan (NWP) from the Ministry of Environment and Water. The PNC seeks to develop a number of steps to generate a comprehensive water management in Bolivia, to be complemented by measures to protect and conserve watershed experiences. The objective of the SID- AGUA program is based on the potential impact on water policy through the development of information systems and technical tools to support the planning and management of water resources, material resources being considered the center point of the intervention

The overall objective of SID- AGUA contribute to the development of technical support tools that facilitate the generation of knowledge about the water cycle and planning and decision-making for participatory watershed management. Then, their results are inputs to consolidate an approach and a strategy for the integrated management of water resources in Bolivia. The specific objectives to be achieved are:

- Generate a process of capacity building at the level of water professionals, local institutions and user organizations ("pedagogical basin "), which sets forth the various actors and constitutes an experience that supports and fed back to the PNC.
- Establish the dynamics and relationships of surface and groundwater, modeling the hydrological cycle in the basin and incorporating tools of information management in support of a knowledge base to facilitate future discussions and decisions.
- Develop and implement a system of information and indicators to collect the information and allow the exploitation of a didactic and accessible to different types of stakeholders in the basin shape, and thus facilitate planning, establishing and making agreements making in a multi-sectorial framework.
- Develop information on the status and quality of surface water and sediments in order to make estimates of toxicity at the basin, allowing the development processes of pedagogical discussion basin.

Scope: International.

Partners: Universidad Mayor de San Simón (Bolivia) and Universitat Politècnica de Catalunya (Spain).

Led by: Universitat Politècnica de Catalunya.

Funded by: AECID. Code: A1/036122/11.

Start Date: 13.12.2009. **Estimated date of completion:** 12.3.2013.

Principal Researcher: Agustí- Pérez-Foguet

5.2. AGREEMENTS AND COLLABORATIONS

ONGOING 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. **Estimated date of completion:** 08.2013

Agreement manager: Ribera Sancho, María

Develop a SIS (Support Information System) for GVC WASH activities in occupied Palestinian territories

The aim of the agreement is to set up a Support Information System that should respond to (i) monitoring of GVC activities on the field, (ii) measurement of impact of GVC activities; and (iii) Communication of GVC activities. The system developed should be integrated in GVC daily activities and should present the following characteristics:

- The forms for data collection should be adapted with database fields (and a GPS point will be added for the community)
- Easy data entering (decentralized – every field worker could insert his data coming back from the field)
- Possibility to have an upgradable database:
- Capability of having some automatic analysis of data already inserted (and other analysis that could be added in future)
- Capability to have community profiles for monitoring of indicators per project, per sector and per geographic area.

Scope: International

Partners: GVC

Led by: Universitat Politècnica de Catalunya

Funded by: GVC

Start Date: 07.2011. **Estimated date of completion:** 3.2013

Principal Researcher: Pérez Foguet, Agustí

FINALIZED AGREEMENTS AND COLLABORATIONS

Study for 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 (PROPESCA), 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 macroinvertebrates 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- 6.2012

Principal researcher: Miralles, Núria

Technical assistance: Prototype design of a biomass gasifier

This study provided a technical assistance for modeling a biomass gasifier and provided the reference specifications.

Internal code: C-08762

Scope: National

Agreement signed with: Centre Tecnològic de Manresa, CTM

Partners: AIGUASOL Cooperation

Led by: Universitat Politècnica de Catalunya

Dates: 6.2012- 12.2012

Principal researcher: Velo, Enric

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

Upcycling 50/50. Developing sustainability projects by students at UPC

Internal code: PLL11/05

Project leader: Sabaté Nolla, Jordi

School/department: 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/department: 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/department: 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/department: 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/department: ETSECCPB / DEHMA

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

Dates: 12.2011- 07.2012

Getting material for the conference "Recycle"

Internal code: PLL11-02.

Project leader: SÁNCHEZ CARRACEDO, Fermín.

School/Departament: FIB / DAC

Other: Marcos Etevez (student), Xavier Pegenaut (PAS).

Dates: 11.2011-07.2012.

Program for collaboration with the Advanced Power and Energy Program (APEP) (UC-Irvine, CA)

Internal code: PLL11/07.

Project leader: VELO GARCIA, Enrique.

School/Departament: ETSEIB / DMMT.

Other: Pol Arranz Piera (PAS), Bryani Escorcia Robles (student).

Dates: 02.2012-02.2012.

Mining and sustainable environment

Internal code: PLL11/10.

Project leader: MATA PERELLÓ, Josep Maria.

School/Departament: EPEM / DEMRN.

Other: David Parcerisa (PDI), Pura Alfonso (PDI), Ferran Climent (student).

Dates: 01.2012-06.2012.

Analysis of the environmental quality of the project for the construction for a building for the new school of industrial engineering at the "Diagonal Besòs" university campus

Internal code: PLL11/18.

Project leader: JOSA GARCIA-TORNEL, Alejandro.

School/Departament: ETSECCPB / DETCG.

Other: Ivan Puig Damians (student), Albert Marqués Marqués (PAS).

Dates: 01.2012- 06.2012.

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 rigor 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.

In addition to these general specific skills, see the website of the Master's Degree to find out those skills that correspond to the five specialist areas: Industrial Ecology and Technological Innovation; Sustainable Education; Infrastructures, City and Region; International Cooperation for Development; Evaluation and Policies of Sustainability.

Additionally, there are cross-disciplinary skills emphasized. Then, among others the students will be able to:

- Consider the global problem, beyond the specific situation and time, and develop a transversal vision and treatment of problems.
- Think critically based on the analysis, synthesis and evaluation of the different alternatives.
- Move within a world of increasing complexity and make decisions based on diverse criteria.
- Be sensitive to socio-environmental questions based on concern for the environmental impact of solutions and an understanding of the social dimension of problems.
- Look for information, select it, reflect on it, discern its content and create their opinions based on this.
- Show knowledge of the field of study and of the profession
- Understand the points of view of others and adapt to new situations.
- Show social sensitivity and solidarity between and among generations.
- Be aware of professional ethical responsibilities.

Master in Sustainability was offered the following courses during 2011-2012:

Compulsory courses:

Code	Subject	Professor
32500	Environmental Economics and Ecological Economics	José M ^a Gil
31106	Sustainable human development	Agustí Pérez Foguet
32501	Ecology and natural resources management	Jordi Morató
32502	Systemic and complexity	Martí Rosas
32504	Urban ecology and territory	Francesc Magrinà
32505	Culture, Technology and Innovation	Miquel Barceló
32570	Introduction to master's thesis	
32571	Master's thesis	

Elective courses:

Code	Subject	Professor
35121	Information and communication technologies for development	Eva Vidal
32515	Interdisciplinary workshop	Alberto Cuchí
32530	International cooperation and social responsibility of organizations	Miriam Villares
32532	International cooperation projects for development	Agustí Pérez Foguet
32535	Housing construction and social infrastructure in cooperation	Miren Etxebarria
32536	Basic services and local development in cooperation contexts	Enrique Velo
32539	Measurement of Sustainability	Jose Juan de Felipe
32543	modelling Sustainability	Jose Juan de Felipe
32544	Governance, sovereignty and participation	Josep Xercavins
32549	International seminar on sustainable innovation	Jordi Segalàs
32551	Sustainable urbanism	Francesc Magrinà
31555	Water resources in developing countries	Lucila Candela
32559	Sustainable building	Alberto Cuchí
32560	Water cycle and building	Alberto Cuchí
32561	The Life cycle of building materials	Antoni Caballero
32562	Energy efficiency in building	Alberto Cuchí
32569	Sustainable technologies for water management	Núria Miralles

Graduated Students 2011-2012

Arango Nader, Natalia

Castelltort Mascó, Adrià

Clavera Ibáñez, Glòria

Del Chicca Romano, Paola

Duque Dehesa, Amaia

Fuentes Ruano, Nayara

García Lozada, Tatiana

Godoy Muñoz, Alfonso De Jesús

Hurtado Figueroa, Carmen Elisa

Maldonado Bueno, Claudia Daniela

Marion Moron, Gonçal Oriol

Papachristou, Ioanna Anna

Pedraza Isaza, Daniel

Peterson, Benjamin David

Pretel Wilson, Manuel

Pujol Rodon, Roger

Raigosa Montoya, Juliana

Rosabal Lopes Da Silva, Damaris

Ruiz Almeida, Adriana

Saborío Víquez, María Del Mar

Sánchez Sumelzo, Natalia

Serrano Vásquez, Hernán Alonso

Sola Hurtado, Ana Ángeles

Travasset Baró, Oriol

Velázquez López, Martín

6.2. MASTER'S DEGREE IN TECHNOLOGY FOR HUMAN DEVELOPMENT AND COOPERATION

The first edition of the Master's in Technology for Human Development and Cooperation started in September 2012. The Master is oriented to applied research and innovation in the areas of intersection between technology, sustainable development and cooperation for development. The master's degree in Sustainability Science and Technology aims to provide students with advanced interdisciplinary training to facilitate understanding of interactions between society, the economy and the environment. Graduates will also have a sound understanding of scientific and technical options and trends for tackling key challenges for the sustainable development of current socio-environmental systems.

The course will train students to become entrepreneurs and agents of change in the field of sustainable development. Based on their specialization in areas related to biodiversity, the environment, the built environment, services, the production system and information management, graduates will be able to design, implement and evaluate sustainable solutions in different fields of engineering and technology. Graduates will work in various cultural and professional contexts, applying a transdisciplinary approach based on scientific and technical rigor.

The overall objective is to train experts able to provide innovative responses to problems in the field of Sustainable Human Development and International Cooperation. On the basis of a solid education that allows them to understand the complex causes (technical, economic, social and/or environmental) that hinder the progress of disadvantaged populations, graduates will be able to provide solutions in a rigorous relevant and creative way.

This area includes also the capacity for analysis, evaluation and improvement of policies, programs, or human development projects, with special focus on the technological options. It also includes the design adaptation and improvement of the analytical tools necessary to achieve a more efficient decision-making processes.

Researchers trained in the Master's degree must also be able to establish specifications and technological innovation objectives in accordance with the embedding, assimilation and dissemination conditions of the most disadvantaged sectors, with a special focus on the strengthening and extension of local capacities.

Graduated students will achieve the ability to collaborate in all the tasks described above with specialists from different areas in multidisciplinary contexts.

The Master will offer the following courses during 2012-2013:

Compulsory courses:

Code	Subject	Professor
480521	International Cooperation and Development	Miriam Villares- Alvar Garola
480501	Measuring Development and Sustainability	Alexandre Riba
480522	Development Cooperation Projects	Enrique Velo
480502	Development Economics	José M ^a Gil
480531	Technology For Sustainable Human Development	Agustí Pérez Foguet
480511	Urban And Land Development	Francesc Magrinyà
480532	Research Workshop: Development Cooperation Action	Lucas V. Wunnik
480512	Rural Development	José M ^a Gil
480700	Master's Thesis	Alejandro Josa

Elective courses:

Code	Subject	Professor
480600	Engineering of Ict	Eva Vidal
480601	Water, Sanitation and Hygiene	Agustí Pérez Foguet
480602	Construction and Building Construction Engineering and Technologies	Miren Etxebarria
480603	Water Resources and Infrastructure	Lucila Candela
480604	Energy Engineering and Technologies	Enrique Velo
480605	Environmental Engineering and Technologies	Ivet Ferrer
480606	Architecture, Urbanism and Habitability	Carles Llop
480607	Food Processing and Preservation	Roser Romero
480608	Agroecosystems, Agriculture and Food	Nuria Cañameras
480609	Animal Production	Lourdes Reig
480610	Vegetable Production	Jordi Izquierdo

6.3. 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 analyze 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 2011-2012

Research (Rd 1393/2007)

Agredo Cardona, Gustavo Adolfo
 Ahmed Nasreldin, Osama
 Arellano Escudero, Nelson Alejandro
 Arrache Santibañez, Lizbette
 Arranz Piera, Pol
 Avitia Rodríguez, Jessica Alejandra
 Avolio, Ciro
 Baba El Mokhtari, Yasmina
 Bosch Gonzalez, Montserrat
 Cañadó Expósito, Marta
 Carres Gonzalez, Jordi
 Cerda Díaz, Francisca
 Clavera Ibáñez, Glòria
 Cubí Montanyà, Eduard
 De Balanzo Joue, Rafael
 Enguita Rovira, Oscar
 Escobar Gonzalez, Cristina
 Escorcia Robles, Bryani Jenice
 Fonseca Casas, Antonio
 Guesmi , Bouali
 Jimenez Redal, Ruben

Lomeña Gelis, Monica
 M. I. K. Hassouneh, Islam
 Martinez Magaña, Juan
 Masseck, Torsten
 Mattos De Andrade, Christiano
 Molins Duran, Gemma
 Ortega Espes, Delphine Jacqueline Yvonne
 Ortiz Balderas, María De Los Angeles
 Pérez Vázquez, Cristina
 Pinzón Botero, María Victoria
 Poli, Elena
 Pons Pons, Marc
 Proano , Liliana
 Resano Moreno, Alfredo
 Ridaura Aldana, Gregorio
 Sánchez Balvás, Lizeth Artemisa
 Torres Acosta, Leonel Stevens
 Vallejo Rojas, Virginia Beatriz
 Vilar Ferrenbach, David
 Yanguí, Ahmed

Research (Rd 778/2007)

Adrados Ruiz, Bárbara
 Alvarez Del Castillo, M. Dolores
 Antequera Baiget, Jose
 Bernal Pérez, Rolando Javier
 Bofill Abello, Jordi
 Busquets Rubio, Pere
 Casañ Guerrero, María José
 Cifuentes Ruiz, Paula Andrea
 Cortés Cardona, Adriana Carolina
 Cucina, Manuela
 Estrada Asito, Lena Yanina
 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 Iván
 Pires Carneiro, Alex
 Salas Prat, Josep Maria
 Salas Zapata, Walter Alfredo
 Sanjuanero Caballero, Luis Ramon
 Tollin, Nicola
 Vargas Collazos, Monica

6.4. 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. Additionally, it has the purpose of increasing internationalization and quality requirements defined by the "mention to excellence" of the PhD program in Environmental Engineering.

Phd environmental engineering enrolled 2011-2012

Research (Rd 1393/1998)

Affes, Rim
 Ávila Martín, Cristina
 Badea, Cristian Adrian
 Badia Moragas, Alba

Lopes Del Rei Passos, Fabiana
 López Roldán, Ramon Manuel
 Lopez Xarbau, Josep
 Monforte Vila, Lluís

Bori Dols, Jaume
 Borkel , Christoph
 Calvo Iranzo, Miriam
 Camino González, Carlos
 Flores Baquero, Óscar
 Galvañ Salazar, Carmen
 Gasparini, Andrea
 Giannakis, Stefanos
 Guevara Vilardell, Marc
 Illa Alibés, Josep
 Juznic Zonta, Zivko
 Laurení , Michele

Pedrosa Portugal, Rubén
 Pizarro Loaiza, Carlos Alexander
 Rodríguez Abalde, Ángela
 Roig Planasdemunt, Maria
 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 Braulio
 Domenech Rubio, Luis Miguel
 Garcia Almiñana, Daniel
 Granados Granados, Ricardo Jose
 Haustein, Karsten

Marras, Simone
 Pay Pérez, María Teresa
 Pinto Varela Alberte, Elaine
 Rincón Rodríguez, Ángel Alberto
 Silvestre Tormo, Gracia Maria
 Solé Carbonell, Marta
 Yacoub López, Cristina

7. DISSERTATIONS

This list includes Ph.D. theses defended during 2012 that were supervised by the academic staff of IS.UPC.

Antequera Baiget, Jose

Methodology for the analysis of regional sustainability

Department: Institute of Sustainability

Supervisors: Xercavins Valls, Josep

Date: 10.12.2012

Qualifications: Cum Laude

Avitia Rodríguez, Jessica Alejandra -

Consumer preferences for organic food: Behavior building-up, importance of pricing, information and sensory issues

Department: Institute of Sustainability

Supervisors: Gil Roig, Jose Maria and Costa Font, Montserrat

Date: 4.7.2012

Qualifications: Cum Laude

Bofill Abello, Jordi

Integration of tools and methods for measuring the sustainability of a region in an information system

Department: Institute of Sustainability

Supervisors: Barrado Muxi, Cristina and Felipe Blanch, Jose Juan De

Date: 5.6.2012

Qualifications: Cum Laude

Gallón Londoño, Luciano

Regional Sustainability Model. System Dynamics for addressing poverty in South America.

Department: Institute of Sustainability

Supervisors: Barceló Garcia, Miguel and Gómez Sánchez, Diego Fernando

Date: 7.2.2012

Qualifications: Cum Laude

M. I. K. Hassouneh, Islam

An assessment of the impacts of recent food market shocks on food prices using price transmission analysis

Department: Institute of Sustainability

Supervisors: Serra Devesa, Teresa

Date: 29.2.2012

Qualifications: Cum Laude

Salas Zapata, Walter Alfredo

Design of a Model of Sustainability Analysis Public Health Policy

Department: Institute of Sustainability

Supervisors: Alvarez Del Castillo, Javier and Rios Osorio, Leonardo Alberto

Date: 17.7.2012

Qualifications: Cum Laude

8. PUBLICATIONS

8.1. SCIENTIFIC PRODUCTION

This list includes papers from IS.UPC researchers published in 2012 in Journal Citation Report indexed journals.

Aguado, A., Caño, A.D., De La Cruz, M.P., Gómez, D., Josa, A. 2012. Sustainability assessment of concrete structures within the Spanish structural concrete code. *Journal of Construction Engineering and Management* 138(2), pp.268-276.

Angrill, S., Farreny, R., Gasol, C.M., Gabarrell, X., Viñolas, B., Josa, A., Rieradevall, J. Environmental analysis of rainwater harvesting infrastructures in diffuse and compact urban models of Mediterranean climate. 2012. *International Journal of Life Cycle Assessment* 17(1), pp.25-42.

De Palencia, A.J.F., 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), pp.509-523.

Ferrer-Martí, L., Garwood, A., Chiroque, J., Ramirez, B., Marcelo, O., Garfí, M., Velo, E. 2012. Evaluating and comparing three community small-scale wind electrification projects. *Renewable and Sustainable Energy Reviews* 16(7), pp.5379-5390.

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 (1), pp.575-581.

Giménez, J., Casas, I., Sureda, R., De Pablo, J. 2012. Kinetics of hydrogen peroxide consumption in aqueous phase at different hydrogen partial pressures. *Radiochimica Acta* 100(7), pp.445-448.

Meca, S., Giménez, J., Casas, I., Martí, V., de Pablo, J. 2012. Uranium speciation in river sediments contaminated by phosphate ores. *Environmental Chemistry Letters* 10(1), pp.49-53.

Mendoza, J.M.F., Oliver-Solà, J., Gabarrell, X., Rieradevall, J., Josa, A. 2012. Planning strategies for promoting environmentally suitable pedestrian pavements in cities. *Transportation Research Part D: Transport and Environment* 17(6), pp. 442-450.

Mendoza, J.-M.F., Oliver-Solà, J., Gabarrell, X., Josa, A., Rieradevall, J. 2012. Life cycle assessment of granite application in sidewalks. *International Journal of Life Cycle Assessment* 17 (5), pp.580-592.

Monforte, L., Pérez-Foguet, A. 2012. A multi-mesh adaptive scheme for air quality modeling with the finite element method. ECCOMAS 2012 - European Congress on Computational Methods in Applied Sciences and Engineering, e-Book Full Papers, pp.1100-1115.

Oliva, J., Cama, J., Cortina, J.L., Ayora, C., De Pablo, J. 2012. Biogenic hydroxyapatite (Apatite II™) dissolution kinetics and metal removal from acid mine drainage Journal of Hazardous Materials 213-214, pp.7-18.

Pérez-Fortes, M., Laínez-Aguirre, J.M., Arranz-Piera, P., Velo, E., Puigjaner, L. 2012. Design of regional and sustainable bio-based networks for electricity generation using a multi-objective MILP approach. Energy 44 (1), pp.79-95.

Serrano-Purroy, D., Clarens, F., González-Robles, E., Glatz, J.P., Wegen, D.H., De Pablo, J., Casas, I., (...), Martínez-Esparza, A. 2012. Instant release fraction and matrix release of high burn-up UO₂ spent nuclear fuel: Effect of high burn-up structure and leaching solution composition. Journal of Nuclear Materials 427(1-3), pp.249-258.

Torras, J., Buj, I., Rovira, M., de Pablo, J. 2012. Chromium recovery from exhausted baths generated in plating processes and its reuse in the tanning industry. Journal of Hazardous Materials 209-210, pp.343-347.

Tort, A.; Olive, A.; Sancho, Maria-Ribera. 2012. On checking executable conceptual schema validity by testing. "Lecture notes in computer science", January 2012, vol. 7446, p. 249-264. <doi: 10.1007/978-3-642-32600-4_19>

Valderrama, C., Granados, R., Cortina, J.L., Gasol, C.M., Guillem, M., Josa, A. 2012. Implementation of best available techniques in cement manufacturing: A life-cycle assessment study. Journal of Cleaner Production 25, pp.60-67.

Yacoub, C.; Pérez-Foguet, A.; Miralles, N. (2012) "Trace metal content of sediments close to mine sites in the Andean region," TheScientificWorldJOURNAL.

9. ACTIVITIES

9.1. RESEARCH SEMINARS AND WORKSHOPS

Regeneration and reuse of water in the Mediterranean

Speaker: Miquel Rovira i Boixaderas, Researcher at the Manresa Technologic Center and Associate Professor at the Department of Chemical Engineering, UPC.

Date: 16 January 2012

Climate and infectious disease: the case of Meningoccal Meningitis in sub-Saharan Africa

Speaker: Carlos Pérez García-Pando, NASA Goddard Institute for Space Studies & Dept. of Applied Physics and Applied Math, Columbia University

Date: 1 February 2012

Scientific and technical support to the implementation of sustainable policies in developing countries

Speaker: César Carmona Moreno, JRC project manager for the implementation of the NEPAD-African Centres of Excellence in Water (NEPAD ACE-Water).

Date: 17 February 2012

Computational epidemics: models for malaria control and elimination strategy design

Speaker: Dr. Jordi Ferrer Savall, forthcoming associate researcher at the Ecole Pasteur - CNAM de Sante Publique and a former researcher of the group MOSIMBIO from UPC).

Date: 19 March 2012

Energy Sustainability. A critical Quest

Speaker: Dr. Marc A. Rosen, professor of Mechanical Engineering at the University of Ontario Institute of Technology in Oshawa.

Date: 14 May 2012

5th UPC International Seminar on Sustainable Technology Development. Towards sustainable nourishing systems and agroecology

Date: 4-15 June 2012

Place: Vilanova I la Geltrú

The International Seminar on Sustainable Technology Development was developed in the framework of the Master for Sustainability during two weeks. It was conducted by professors from different European universities experts on future studies analysis (TUDelft, Chalmers UT, KTH, TUGraz and others). The

constructive-learning activities were focused on the connections between technology development, environmental problems and societal change. This edition was focused on agroecology and alimentary model in order to analyze:

- The implications of the implementation of a technological system (biotechnology, agribusiness, etc) based on ecological, agronomic and social processes, versus one that promotes consumption and production at cost price, which could move away the production of these processes and territory.
- The attitudes and habits related to alimentation needs of citizens: “when we buy food, we are deciding the society in which we live”.
- The ecological footprint (EF) derived from a global model of food production and consumption without consumption and production strategies that account for territory, generating social and environmental externalities.

Water management experiences in the area of savannah (Sahel) West Africa: a case study in Senegal, Burkina Faso, Ghana and Nigeria

Speaker: Dr. David Casanova, expert sènior del Banc Mundial en gestió de recursos hídrics, basat a Ghana.

Date: 13 July 2012

Eco-design and innovation = eco-innovation

Speaker: Dr. Joan Rieradevall, Associate profesor at the Department of Chemical Engineering, UPC and Researcher at the Institut de Ciència i Tecnologia Ambientals(ICTA), UAB.

Date: 20 September 2012

BIKE PAL European competition, pedalling towards safety

Speaker: Mr. Ilyas Daoud, Project Officer at the European Transport Safety Council (ETSC)

Date: 26 October 2012

9.2. PRESENTATIONS

Opening the academic year 2012/2013. Masters in Sustainability and Technology for Human Development and Cooperation

Presentation:

On Friday 7 September the opening ceremony of the academic year 2012-2013 was held at the IS- UPC. The event began with a welcome and opening of the course by the Institute director, Dr. Juan Pablo.

Lectures:

Featured lecture by Dr. Jeremie Fosse, an Executive MBA ESADE Business School, co-founder and Director of the Eco-Union Global Eco Forum. He presented the paper "Rio +20: an opportunity for change towards sustainability" which reviewed the challenges, prospects and results of the recent meeting in Rio. Then Dr. George Bruno, CEO and director of the Amphos 21 Enresa AMPHOS - 21 Sustainability and Waste Management – UPC, provided under the suggestive title "We can afford to be sustainable?" an overview about the evolution of ideas the sustainability paradigm and finite resources. Finally, the event was closed by Dr. Juan Pablo, director of the Institute for Sustainability, Dr. Agustí Perez, director of the Master of Sustainability and Dr. Enric Velo, director of the Master in Technology for Human Development and Cooperation.

15th Environmental and Sustainable Ideas Competition UPC – "Rio +20 reinforces commitment to sustainability"

Awards Ceremony

Presentation of the winning projects:

At the awards ceremony held on 13 July 2012 were made public the winners of the fifteenth edition of the Environmental and Sustainable Ideas UPC. The jury decided to declare void the open call, given the very limited presentation of projects and inadequate assessment according to the criteria of the rules. Regarding the call, the jury decided to award a first prize and two second prizes ex aequo the following projects:

- 1st prize – "UPCup". It was conducted by Judith Salvadó, Jose Miguel Esteban and Joaquim Comes.
- 2nd prize – "Sightseeing invisible". It was performed by Mariana Palumbo, David López and Marta Domenech.
- 2nd prize – "MIRROR. Re- roofing of cities: prevent climate change re- building". It was conducted by Oriol Muntané.

Participation at the "II Catalan Strategic Forum: Zero Waste"

On Friday May the II Zero Waste Forum was held at the Casa del Mar in Barcelona. The IS director, Dr. Joan de Pablo, presented the UPC commitment and strategy of waste with zero emissions within the "Universities commitment with zero waste emissions and green economy" panel. In this forum, "reuse program", "Sirena program", vending machine facilities with sustainable criteria set up and activities on urban solid wastes were explained as initiatives developed by the UPC.

Additionally, the IS.UPC future actions within the commitment where presented as:

- Continue with active support in the Zero Waste Universities Network.
- Promote final master and grade theses and PhD theses linked with social demands expressed by municipalities, social organizations and enterprises.
- Encourage the involvement of research groups to the "zero waste" objectives.
- Support the implementation of waste prevention plans campus in accordance with the overall strategy proposed by the Zero Waste Universities Network

10. ANNEX

In this section a brief CVs of permanent academics of UPC with formal adscription to IS.UPC in 2012 are presented in alphabetical order.

- Alejandro Josa
- Joan de Pablo
- Agustí Pérez
- Jordi Segalas
- Enric Velo

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 Responsible for a postgraduate course on LCA and sustainability assessment of infrastructures (Universitat Politècnica de Catalunya)
 (Name of employer)
- Dates (from – to) April 2011 to date
 • Position held Co-director of the UPC University Master program on Environmental Engineering (Universitat Politècnica de Catalunya)
 (Name of employer)
- Dates (from – to) September 2010 to date
 • Position held 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)
 (Name of employer)
- Dates (from – to) September 2010 to date
 • Position held Member of the academic board of the UPC University Master in Sustainable Development (Universitat Politècnica de Catalunya)
 (Name of employer)
- Dates (from – to) March 2006 to date
 • Position held Deputy director of the UPC Department of Geotechnical Engineering and Geosciences (Universitat Politècnica de Catalunya)
 (Name of employer)

- Dates (from – to) July 1990 to date
- Position held Associate Professor at the Geotechnical Engineering and Geo-Sciences Department (Universitat Politècnica de Catalunya)

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 (SELECTED)

PEER-REVIEW JOURNALS

- Angrill, S.; Farreny, R.; Martínez, C.; Gabarrell, X.; Viñolas, B.; **Josa, 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., **Josa, 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.; **Josa, 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.; **Josa, 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.; **Josa, 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.; **Josa, 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.; **Josa, 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**, Professor at the Chemical Engineering Department of UPC-Barcelona Tech (Spain). He is the Director of the University Research Institute for Sustainability Science and Technology (IS.UPC) since 2012. He develops part of his research as Scientific Director of Fundació CTM Centre Tecnològic.

He works in the scientific basis of the nuclear waste management from 1989 mainly in spent fuel behavior in repository conditions, and on the 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.

He is also working on 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 participated in several European Projects. He is author of more than 100 papers in the Environmental field.

WORK EXPERIENCE

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

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
- 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 scientifico-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

- Dates (from – to) / Country MICADO: Model uncertainty for the mechanism of dissolution of spent fuel in a nuclear waste repository (FI6W036366)

- Dates (from – to) / Country FIRST-Nuclides (Fast / Instant Release of Safety Relevant Radionuclides from Spent Nuclear Fuel) (Grant Agreement Number 295722)

- Dates (from – to) / Country Ground Water Pollution from Agricultural and Industrial Sources: Contaminant Fate, Natural and Induced Attenuation, and Vulnerability (MICINN Spanish Minister CGL2008-06373-C03-02)

- Dates (from – to) / Country *Behavior of Actinides and Fission Products in the Environment (MICINN Spanish Minister CTM2011-27680-C02-01)*

PUBLICATIONS (SELECTED)

PEER-REVIEW JOURNALS

- M. Rovira, J. Giménez, M. Martínez, X. Martínez-Lladó, **J. de Pablo**, V. Martí, L. Duro Sorption of selenium (IV) and selenium(VI) onto natural iron oxides: Goethite and hematite
Journal of Hazardous Materials 150 (2008) 279–284
- O. Gibert, **J. de Pablo**, J. L. Cortina, C Ayora
Evaluation of a Sheep Manure/Limestone Mixture for In Situ Acid Mine Drainage Treatment
Environmental Engineering Science, 25 (2008) 52-61
- I. Casas, M. Borrell, L. Sánchez, **J. de Pablo**, J. Giménez, F. Clarens
Determination of UO₂(s) dissolution rates in a hydrogen peroxide medium as a function of pressure and temperature
Journal of Nuclear Materials 375 (2008) 151-156
- S. Meca, V. Martí, **J. de Pablo**, J. Giménez, I. Casas
UO₂ Dissolution in the presence of hydrogen peroxide at pH> 11
Radiochimica Acta 96 (2008) 535-539
- A. Rey, S. Utsunomiya, J. Giménez, I. Casas, **J. de Pablo**, R. Ewing
Stability of uranium (VI) peroxide hydrates under ionizing radiation
American Mineralogist 94 (2009) 229–235
- I. Rojo, F. Seco, M. Rovira, J. Giménez, G. Cervantes, V. Martí, **J. de Pablo**
Thorium sorption onto magnetite and ferrihydrite in acidic conditions
Journal Nuclear Materials 385 (2009) 474–478

- A. Rey, I. Casas, J. Giménez, J. Quiñones, **J. de Pablo**
Effect of temperature on studtite stability: Thermogravimetry and differential scanning calorimetry investigations
Journal Nuclear Materials 385 (2009) 467-473
- F. Seco, C. Hennig, **J. de Pablo**, M. Rovira, I. Rojo, V. Martí, J. Giménez, L. Duro, M. Grivé, J. Bruno
Sorption of Th(IV) onto Iron Corrosion Products: EXAFS Study
Environ. Sci. Technol. 43 (2009) 2825-2830
- O. Gibert, X. Martínez-Lladó, V. Martí, S. Díez, J. Romo, J.M. Bayona, **J. de Pablo**
Changes of Heavy Metal and PCB Contents in Surficial Sediments of the Barcelona Harbour after the Opening of a New Entrance
Water Air Soil Pollution 204 (2009) 271-284
- I. Buj, J. Torras, D. Casellas, M. Rovira, **J. de Pablo**
Effect of heavy metals and water content on the strength of magnesium phosphate cements.
J. Hazard. Mater. 170 (2009) 345-350.
- I. Casas, **J. de Pablo**, F. Clarens, J. Giménez, J. Merino, J. Bruno, A. Martínez-Esparza
Combined effect of H₂O₂ and HCO₃⁻ on UO₂(s) dissolution rates under anoxic conditions
Radiochim. Acta 97 (2009) 485-490
- D. Serrano-Purroy, F. Clarens, J.-P. Glatz, B. Christiansen, **J. de Pablo**, J. Giménez, I. Casas, A. Martínez-Esparza
Leaching of 53 MWd/kgU spent nuclear fuel in a flow-through reactor
Radiochim. Acta 97 (2009) 491-496
- I. Buj, J. Torras, M. Rovira, **J. de Pablo**
Leaching behaviour of magnesium phosphate cements containing high quantities of heavy metals J. Hazard. Mater. 175 (2010) 789-794
- A. Yaroshchuk, X. Martínez-Lladó, L. Llenas, M. Rovira, **J. de Pablo**, J. Flores, P. Rubio
Mechanisms of transfer of ionic solutes through composite polymer nano-filtration membranes in view of their high sulfate/chloride selectivities
Desalination and Water Treatment 6 (2009) 48-53
- E. K. Zholkovskij, A. E. Yaroshchuk, J. H. Masliyah, **J. de Pablo** Ribas
Broadening of neutral solute band in electroosmotic flow through submicron channel with longitudinal non-uniformity of zeta potential
Colloids and Surfaces A: Physicochem. Eng. Aspects 354 (2010) 338-346
- J. Giménez, X. Martínez-Lladó, M. Rovira, **J. de Pablo**, I. Casas, R. Sureda, A. Martínez-Esparza
Cesium sorption on studtite (UO₂O₂ · 4H₂O)
Radiochim. Acta 98 (2010) 1-5
- M. Calderer, O. Gibert, V. Martí, M. Rovira, **J. de Pablo**, S. Jordana, L. Duro, J. Guimerà, J. Bruno
Denitrification in presence of acetate and glucose for bioremediation of nitrate-contaminated groundwater
Environmental Technology 31 (2010) 799-814
- J. Giménez, **J. de Pablo**, M. Martínez, M. Rovira, C. Valderrama
Reactive transport of arsenic(III) and arsenic(V) on natural hematite: Experimental and modeling
Journal of Colloid and Interface Science 348 (2010) 293-297

O. Gibert, **J. de Pablo**, J.L. Cortina, C. Ayora
 In situ removal of arsenic from groundwater by using permeable reactive barriers of organic matter/limestone/zero-valent iron mixtures.
 Environmental Geochemistry and Health 32 (2010)373-378. DOI: 10.1007/s10653-010-9290-1

R. Sureda, X. Martínez-Lladó, M. Rovira, **J. de Pablo**, I. Casas, J. Giménez
 Sorption of strontium on uranyl peroxide: Implications for a high-level nuclear waste repository
 Journal of Hazardous Materials 181 (2010) 881–885

M. Calderer, I. Jubany, R. Pérez, **J. de Pablo**, V. Martí
 Modelling Enhanced Groundwater Denitrification in Batch Microcosms Tests
 Chemical Engineering Journal 165 (2010) 2-9

J. Oliva, **J. de Pablo**, J.L. Cortina, J. Cama, C. Ayora
 The use of Apatite II (TM) to remove divalent metal ions zinc(II), lead(II), manganese(II) and iron(II) from water in passive treatment systems: Column experiments
 Journal of Hazardous Materials 184 (2010) 364-374

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

C. Valderrama, J. Giménez, **J. de Pablo**, M. Martínez
 Transport of Strontium Through a Ca-bentonite (Almería, Spain) and Comparison with MX-80 Na-bentonite: Experimental and Modelling
 Water Air Soil Pollution 218 (2011) 471-478

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

A. Yaroshchuk, X. Martínez-Lladó, L. Llenas, M. Rovira, **J. de Pablo**
 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 (2011) 192-201

R. Sureda, I. Casas, J. Giménez, **J. de Pablo**, J. Quiñones, J. Zhang, R.C. Ewing
 The effects of ionizing radiation and temperature on uranyl silicates: soddyite $(UO_2)_2(SiO_4)(H_2O)_2$ and uranophane $Ca(UO_2)_2(Si_3O_{10})_2 \cdot 5H_2O$
 Environ. Sci. Technol. 45 (2011) 2810-2815

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

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

S. Meca, J. Giménez, I. Casas, V. Martí, **J. de Pablo**
 Uranium speciation in river sediments contaminated by phosphate ores
 Environ Chem Lett 10(1), pp.49-53. DOI 10.1007/s10311-011-0327-1

Llenas L, Martínez-Lladó X, Yaroshchuk A, Rovira M, **J. de Pablo**

Nanofiltration as pretreatment for scale prevention in seawater reverse osmosis desalination.

Desalination and Water Treatment 2011;36:310-318.

J. Torras, I. Buj, **J. de Pablo**, M. Rovira

Chromium recovery from exhausted baths generated in plating processes and its reuse in the tanning industry.

Journal of Hazardous Materials 209-210 (2012) 343-347

D. Serrano-Purroy, F. Clarens, E. González-Robles, J.P. Glatz, D.H. Wegen, **J. de Pablo**, I. Casas, J. Giménez, A. Martínez-Esparza

Instant release fraction and matrix release of high burn-up UO₂ spent nuclear fuel: Effect of high burn-up structure and leaching solution composition

Journal of Nuclear Materials 427 (2012) 249-258

J. Oliva, J. Cama, J.L. Cortina, C. Ayora, **J. de Pablo**

Biogenic hydroxyapatite (Apatite IITM) dissolution kinetics and metal removal from acid mine drainage

Journal of Hazardous Materials 213– 214 (2012) 7– 18

J. Giménez, I. Casas, R. Sureda, **J. de Pablo**

Kinetics of hydrogen peroxide consumption in aqueous phase at different hydrogen partial pressures

Radiochim. Acta 100 (2012) 1-4

CV – AGUSTÍ PÉREZ FOGUET

ACADEMIC CAREER

Agustí Pérez Foguet obtained the PhD from UPC with honours with a thesis in the field of nonlinear computational solid mechanics. His doctoral studies included a half-year stay at UC Berkeley. In 2002, he was recognized with the award “Premio Juan Carlos Simó para Jóvenes Investigadores” given by the Spanish Society for Numerical Methods in Engineering (SEMNI)

After some years actively involved in the development cooperation sector, in 2006, he was awarded with the “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 with the award “Menció Jaume Vicens Vives” also recognized his work. From year 2006 to present, he has focused his academic activities in applied math on environmental engineering and sustainable development by two research lines; Management of water resources and Water, Sanitation and Hygiene services in developing contexts, and Numerical modelling and simulation of environmental flows and air quality forecasting at local scale.

He is responsible for postgraduate courses on Technology and Engineering for Sustainable Human Development and teaches Environmental Modelling; he is director of the MSc in Sustainable Development, and member of the PhD academic boards for Environmental Engineering and Sustainability programs. During years 2010 and 2011, he has been actively involved in the consolidation of the UPC Research Institute for Sustainability Science and Technology IS.UPC, in which now has the role of deputy director.

WORK EXPERIENCE

- Dates (from – to) April 2010 to September 2012
 • Position held Vice-rector for Sustainability and Social Responsibility (Universitat Politècnica de Catalunya)
 (Name of employer)
- Dates (from – to) April 2010 – December 2011
 • Position held Director of the UPC University Research Institute for Sustainability Science and Technology IS.UPC (Universitat Politècnica de Catalunya)
 (Name of employer)
- Dates (from – to) October 2007 – March 2010
 • Position held Assistant to the Vice-rector of Academic Affairs (Universitat Politècnica de Catalunya)
 (Name of employer)
- Dates (from – to) January 2007 – August 2010
 • Position held Academic director Cooperation for Development Centre (Universitat Politècnica de Catalunya)
 (Name of employer)
- Dates (from – to) February 2006 to date
 • Position held Co-funder and member of the Research Group on Cooperation and Human Development GRECDH.UPC (Universitat Politècnica de Catalunya)
 (Name of employer)
- Dates (from – to) March 2003 – March 2007
 • Position held Vice-dean of Civil engineering studies, Civil Engineering School (Universitat Politècnica de Catalunya)
 (Name of employer)
- Dates (from – to) July 2002 to date
 • Position held Associate Professor at the Applied Math III Dept. (Universitat Politècnica de Catalunya)
 (Name of employer)
- Dates (from – to) October 2001 – February 2004
 • Position held President (Spanish federation of Engineering without Borders)
 (Name of employer)

- Dates (from – to) July 1999 – December 1999
 - Position held Visiting scholar (University of California at Berkeley)
 (Name of employer)
- Dates (from – to) September 1996 to date
 - Position held Member of the Research Group Laboratory of Computational Methods and Numerical Analysis – LaCàN (Universitat Politècnica de Catalunya)
 (Name of employer)
- Dates (from – to) September 1996 – July 2002
 - Position held Lecturer at the Applied Math III Dept. (Universitat Politècnica de Catalunya)
 (Name of employer)

**RESEARCH PROJECTS
(SELECTED)**

- Dates (from – to) / Country February 2013 – February 2015 / Spain, UK, Italy
 - Partners / Donor UPC (coordinator), Universidad Politècnica de Madrid, Universidad Politècnica de Valencia, Università degli Studi di Trento, Loughborough University, ONGAWA, Training Centre for International Cooperation, Practical Action, and Engineers without Borders / UE EuropeAid - 2011 call for Non State Actors (ref DCI-NSAED/2012/280/929)
 - Main activities and responsibilities Development education, principal researcher
- Dates (from – to) / Country December 2012 – December 2015 / Mozambique, Spain
 - Partners / Donor ARA-Norte (Mozambique), Amphos 21 (Spain), Augas de Galicia (Spain), Universidade da Coruña (Spain) / UE EuropeAid – 10th European Development Fund
 - Main activities and responsibilities Capacity development for Integrated Water Resources Management, principal researcher (UPC team)
- Dates (from – to) / Country July 2012 – December 2012 / Palestine
 - Partners / Donor GVC-Italia
 - Main activities and responsibilities Support information system for monitoring water, sanitation and hygiene programs in Palestina, research director
- Dates (from – to) / Country January 2012 – December 2014 / Spain
 - Partners / Donor ULPCG, U Salamanca / Spanish minister of Science (CGL2011-06003-C03-02)
 - Main activities and responsibilities Predictive numerical models for environmental management / researcher
- Dates (from – to) / Country December 2011 – December 2014 / Andean Region
 - Partners / Donor Wageningen University (Netherlands), Centro AGUA – Uni. Mayor de San Simón (Bolivia), CINARA – Uni. del Valle (Colombia), Uni. Central del Ecuador (Ecuador), Pontificia Universidad Católica del Perú (Perú), Uni. Nacional Pedro Ruiz Gallo (Perú) / UE EuropeAid – ALPHA III
 - Main activities and responsibilities Postgraduate programs in Integrated Water Resources Management, researcher
- Dates (from – to) / Country December 2011 – March 2013 / Nicaragua
 - Partners / Donor UNAN de Managua (Nicaragua), Colegio Postgraduado de Méjico COLPOS, CATIE (Costa Rica), UCM, UPM / AECID Spanish Government – PCI
 - Main activities and responsibilities Collective action and local governance for Integrated Water Resources Management, principal researcher (Spanish team)
- Dates (from – to) / Country November 2011 – June 2013 / Mozambique
 - Partners / Donor UN Habitat / AECID Spanish Government – CAP (ref 11-CAP2-1562)
 - Main activities and responsibilities Water, sanitation and hygiene data collection, analysis and planning tools to support local decision-making in public services and infrastructures, principal researcher

- Dates (from – to) / Country November 2010 – July 2011 / Kenya
 - Name of employer UNICEF Kenya Country Office
 - Main activities and responsibilities Action and investment plan for the delivery of Water, sanitation and hygiene services, principal researcher

- Dates (from – to) / Country January 2010 – February 2014/ Nicaragua
 - Partners / Donor ONGAWA
 - Main activities and responsibilities Technical assistance for monitoring rural development programs and introducing Human right to water perspective in rural water and sanitation governance, principal researcher

- Dates (from – to) / Country January 2009 – December 2011 / Spain
 - Partners / Donor ULPCG, U Salamanca / Spanish minister of Science (CGL2008-06003-C03-02)
 - Main activities and responsibilities Predictive numerical models for environmental management / principal researcher (UPC team)

- Dates (from – to) / Country July 2008 – March 2013 / Bolivia
 - Partners / Donor Centro AGUA (Universidad Mayor de San Simón) / AECID Spanish Government
 - Main activities and responsibilities Capacity development, institutional support and local action – research for Integrated Water Resources Management / principal researcher (Spanish team)

- Dates (from – to) / Country March 2008 – December 2008 / Kenya
 - Partners / Donor Universidad Politécnica de Madrid – Universidad Complutense de Madrid
 - Main activities and responsibilities Assessment of water resources management context of Turkana District, principal researcher (UPC Team)

PUBLICATIONS (SELECTED)

PEER-REVIEW JOURNALS

Pérez-Foguet, A., Monforte, L., "Analysis of an adaptive scheme for three-dimensional convection - diffusion problems", in preparation.

Jiménez, A. Giné. R., **Pérez-Foguet, A.** "Water supply governance in rural areas: the case of Tanzania", *Water*, under revision.

Giné. R., **Pérez-Foguet, A.**, "Sample size determination for local household-based surveys in water, sanitation and hygiene sector", *Ecological Indicators*, under revision.

Giné. R., Jiménez, A. **Pérez-Foguet, A.** "WASH Mapping: an integrated approach for data collection", *Science of the Total Environment*, under revision.

Monforte, L., **Pérez-Foguet, A.**, "A multi-mesh adaptive scheme for Air Quality Modeling with the Finite Element Method", *Int. J. Numerical Methods in Fluids*, under revision.

Giné. R., **Pérez-Foguet, A.**, "Water, sanitation, hygiene and rural poverty: issues of sector planning and the role of aggregated indicators", *Water Policy*, under revision.

Pérez-Foguet, A., "Characterization of local wind patterns in complex mountain valleys", *International Journal of Climatology*, accepted.

Yacoub, C., **Pérez-Foguet, A.**, Miralles, N., "Spatial and temporal trace metal distribution of a Peruvian basin: recognizing trace metal sources and assessing the potential risk", *Environmental Monitoring and Assessment*, accepted.

Flores, O., Jiménez, A. **Pérez-Foguet, A.** "Monitoring access to water in rural areas based on the human right to water framework: A local level case study in Nicaragua", *International Journal of Water Resources Development*, in press.

Monforte, L., **Pérez-Foguet, A.**, "Esquema adaptativo para problemas tridimensionales

de convección-difusión", *Revista Internacional de Métodos Numéricos para Cálculo y Diseño en Ingeniería*, in press.

Yacoub, C., **Pérez-Foguet, A.**, "Slope effects on SWAT modeling in a mountainous basin", *ASCE Journal of Hydrologic Engineering*, in press. doi: 10.1061/(ASCE)HE.1943-5584.0000756

Pérez-Foguet, A., Casoni, E., Huerta, A., (2013) "Dimensionless analysis of HSDM and application to simulation of breakthrough curves of highly adsorbent porous media", *ASCE Journal of Environmental Engineering*, in press (May 2103). doi: 10.1061/(ASCE)EE.1943-7870.0000665

Giné, R., **Pérez-Foguet, A.**, (2013) "Unravelling the linkages between water, sanitation, hygiene and rural poverty: the WASH Poverty Index", *Water Resources Management*, 27:1501–1515. doi: 10.1007/s11269-012-0251-6

Oliver, A., Montero, G., Montenegro, R., Rodríguez, E., Escobar, J.M., **Pérez-Foguet, A.**, (2013) "Adaptive finite element simulation of stack pollutant emissions over complex terrains", *Energy*, in press. doi: 10.1016/j.energy.2012.10.051

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, doi:10.5194/asr-8-105-2012.

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, doi:10.2166/wp.2011.026.

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*, Vol. 2012, Article ID 732519, doi:10.1100/2012/732519.

Jiménez, A., **Pérez-Foguet, A.** (2011) "The relationship between technology and functionality of rural water points: evidence from Tanzania". *Water Science and Technology*, 63(5):949–956, doi: 10.2166/wst.2011.274.

Giné, R., **Pérez-Foguet, A.** (2011) "Application of a revised WPI to target the water poor", *Water Science and Technology*, 63(6):1099–1110, doi:10.2166/wst.2011.347.

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, doi:10.1061/(ASCE)WR.1943-5452.0000135.

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, doi:10.1007/s11625-010-0121-1.

Pérez-Foguet, A., Giné, R. (2011) "Analyzing Water Poverty in Basins", *Water Resources Management*, 25(3):3595–3612, doi:10.1007/s11269-011-9872-4.

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, doi:10.1061/(ASCE)EE.1943-7870.0000255.

Jiménez, A., **Pérez-Foguet, A.** (2010), "Building the role of local government authorities towards the achievement of the human right to water in rural Tanzania", *Natural Resources Forum*, 34(2):93–105, doi:10.1111/j.1477-8947.2010.01296.x.

Gine, R., **Pérez-Foguet, A.** (2008), "Sustainability assessment of National Rural Water Supply Program in Tanzania", *Natural Resources Forum*, 32(4):287–302, doi:10.1111/j.1477-8947.2008.00213.x.

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, doi:10.1080/03043790802088723.

<http://www.researcherid.com/rid/H-3953-2011>

<http://www.scopus.com/authid/detail.url?authorId=6603267822>

CV – JORDI SEGALÀS CORAL

ACADEMIC CAREER

Jordi Segalàs (1967) works as associate professor at the Research Institute of Sustainability Science and Technology in the Universitat Politècnica de Catalunya UPC-Barcelona Tech. He is the head of the Research Group on Sustainability Education and Technology in Higher Education. He has been the Director of the Catalan Network of Education for Sustainability.

He obtained his PhD in Sustainability Education in Engineering from Barcelona Tech University. He has been working in curriculum greening policies and actions plans at the Barcelona Tech University since 2000. He is also working in TEMPUS (trans-European cooperation scheme for higher education) projects related to sustainable development in higher education. He has published more than 60 articles on higher education *and sustainability*.

WORK EXPERIENCE

- Dates (from – to) September 2010 to date
 • Position held Member of the academic board of the UPC University Master in Sustainability
 (Name of employer) (Universitat Politècnica de catalunya)
- Dates (from – to) September 2010 to date
 • Position held Associate professor at the Research Institute of Sustainability Science and Technology
 (Name of employer) IS.UPC (Universitat Politècnica de Catalunya)
- Dates (from – to) From 2009 to date
 • Position held Head of the Research Group on Sustainability Education and Technology within the
 (Name of employer) Group Sustainability, Technology and Humanism STH-GR7 (Universitat Politècnica de Catalunya)
- Dates (from – to) From 2006 to 2011
 • Position held Director of the Catalan Research Network of Education for Sustainability (Generalitat de
 (Name of employer) Catalunya)
- Dates (from – to) From 1991 to 2010
 • Position held Lecturer at the de Fluid Mechanics Dpt. (Universitat Politècnica de Catalunya)
- Dates (from – to) From July 2006 to July 2012
 • Position held Vice-Dean for International relations and Sustainability at the School of Engineering of
 (Name of employer) Vilanova I la Geltrú EPSEVG (Universitat Politècnica de Catalunya)

**RESEARCH PROJECTS
(SELECTED)**

- Title TEMPUS – 530530-TEMPUS-1-2012-1-SE-TEMPUS-JPHES: Training courses for public
 services in sustainable infrastructure development in Western Balkans.
 • Dates (from – to) / Country 2012 – 2014
- Title TEMPUS – Joint European Project JEP-517346: Establishing Modern Master-level Studies in
 Industrial Ecology
 • Dates (from – to) / Country 2011 – 2014.
- Title TEMPUS – Joint European Project JEP-510952: Creation of the third cycle studies –
 Doctoral Programme in Renewable Energy and Environmental Technology
 • Dates (from – to) / Country 2010-2013
- Title Erasmus Mundus Action III: SDPromo I Promoting European Education in Sustainable
 Development (Regions: China, Former Soviet Union Countries, South America)
 • Dates (from – to) / Country 2006-2008

Title *Erasmus Mundus Action III: SDPromo II Promoting European Education in Sustainable Development (Regions: Africa, Caribbean, Mediterranean region, South East Asia, United Arab Emirates)*
 • Dates (from – to) / Country 2008-2010

BOOKS AND MONOGRAPHS

Mulder, K.; Ferrer-Balas, D.; **Segalàs, J.**; Kordas, O.; Nikiforovich, E. & Pereverza, K. (2013). Being scared is not enough! Motivators for education for sustainable development. In: Caeiro, S.; Filho, W.; Jabbour, C. & Azeiteiro, U. Sustainability assessment tools in higher education institutions. Mapping trends and good practices around the world. ISBN: 978-3-319-02374-8 (Print) 978-3-319-02375-5 (Online). Springer International Publishing Switzerland, pp. 29-45

Segalàs, J. (2012). The EPS experience at UPC- Barcelona Tech. In: Campos, L.C.; Dirani, E.A.T.; Manrique, A.L.; van Hattum-Janssen, N.. Project Approaches to Learning in Engineering Education ed. 1, 1 vol., ISBN: 9879460919565. Rotterdam: Sense Publishers, pp.109-124

Segalàs, J.; Benson, P. and Esbrí, M.E. (2012). European project semester: A semester of projectbased learning in sustainability with multi-cultural and multi-disciplinary bachelor of engineering student groups. Innovations 2012: World Innovations in Engineering Education and Research, ed. W. Aung, et al., iNEER, Potomac, MD, USA, pp.191-198.

Segalàs, J.; Esbri, M.E. (2011) O projecto semestral Europeu (EPS) na Universidade de Tecnologia de Barcelona. In: De Campos, L.C.; Tadeu E.A.; Manrique A.L. (ed.) Educação em engenharia. Novas abordagens. Educ. Pontificia Universidade Católica de Sao Paulo. ISBN: 978-85-283-0429-9

Segalàs, J. (2010) Educació per la sostenibilitat. In: Carrera, E.; **Segalàs, J.** (ed.). Tecnologia i Sostenibilitat [on line]. Terrassa: Universitat Politècnica de Catalunya Barcelona Tech. Càtedra UNESCO de Sostenibilitat [Last access: 3/1/2012]. <http://tecnologiasostenibilitat.cus.upc.edu>

Carrera, E.; **Segalàs, J.** (ed.) (2010). Tecnologia i Sostenibilitat [on line]. Terrassa: Universitat Politècnica de Catalunya Barcelona Tech. Càtedra UNESCO de Sostenibilitat [Last access: 3/1/2012]. <http://tecnologiasostenibilitat.cus.upc.edu>

Segalàs, J. (2010). *Engineering Education for a Sustainable future*. Lambert Academic Publishing. ISBN 978-3-8383-2801-0

INTERNATIONAL SCIENTIFIC PUBLICATIONS

Segalàs, J.; Mulder, K.F. and Ferrer-Balas, D. (2012), "What do EESD "experts" think sustainability is? Which pedagogy is suitable to learn it?: Results from interviews and Cmaps analysis gathered at EESD 2008", International Journal of Sustainability in Higher Education, Vol. 13 Iss: 3 pp. 293 - 304

Mulder, K.F.; **Segalàs, J.** and Ferrer-Balas, D. (2012), "How to educate engineers for/in sustainable development: Ten years of discussion, remaining challenges", International Journal of Sustainability in Higher Education, Vol. 13 Iss: 3 pp. 211 - 218

Mulder, K. F.; **Segalàs, J.** & Ferrer-Balas, D. (2010) Educating engineers for/in sustainable development? What we knew, what we learned, and what We should learn. Journal of Thermal Science. Vol. 14, No. 3, pp. 625-639

Segalàs J.; Ferrer-Balas, D. & Mulder, K.F. (2010) What do engineering students learn in sustainability courses? The effect of the pedagogical approach. Journal of Cleaner

Production Vol. 18. Nº 3, pp275-284

Segalàs, J.; Ferrer-Balas, D.; Svanström, M.; Lundqvist, U. & Mulder K.F. (2009). What has to be learnt for sustainability? A comparison of bachelor engineering education competences at three European universities. *Sustainability Science*, (ISSN: 1862-4057). Vol. 4, Nº 1, pp. 17-27.

Segalàs, J. (2009) Educating engineers for sustainability: Why? What? How?. *Sostenible? Sostenibilitat I Educació*. (ISSN: 1139-966X). Vol. 10, pp. 117-138.

Segalàs, J.; Ferrer-Balas, D. & Mulder, K.F. (2008). Conceptual maps: measuring learning processes of engineering students concerning sustainable development. *European journal of engineering education*, (ISSN 0304-3797), Vol, 33, Nº 3, pp. 297-306.

Holmberg, J, Svanstrom, M, Peet, DJ, Mulder, KF, Ferrer-Balas, D & Segalàs, J (2008). Embedding sustainability in higher education through interaction with lecturers: Case studies from three European technical universities. *European journal of engineering education*, (ISSN 0304-3797), Vol. 33, Nº 3, pp. 271-282.

Segalàs, J.; Ferrer-Balas, D. & Mulder, K.F. (2006). Embedding sustainability in engineering **Segalàs, J.**; Mulder, K.F. & Ferrer-Balas, D., (2007). Pedagogical strategies for integrating sustainability in technological universities curriculum". Pathways to or common future. AGS meeting. Barcelona 2007. ISBN: 978-91-976534-2-8

CONTRIBUTIONS TO INTERNATIONAL CONFERENCES

Kordas, O.; Mulder, K.; Nikiforovich, E.; **Segalàs, J.**; Pasichny, A. and Pereverza, K. (2013). Advancing ESD in Ukraine: from awareness to orientation towards long-term thinking and societal needs Proceedings of the VI International Conference on Engineering Education in Sustainable Development. September 22-25 2013. Cambridge, UK

Mulder, K; Ferrer, D; **Segalàs, J.**; Kordar, O.; Kidiforovich, E. and Pereverza, K. (2013). Beyond the fear of catastrophe! : motivating students and lecturers for education in sustainable development. Proceedings of the VI International Conference on Engineering Education in Sustainable Development. September 22-25 2013. Cambridge, UK

Segalàs, J. and Tejedor, G. (2013). ERASMUS intensive program in sustainable technology development: multicultural constructive community learning course for EESD applying backcasting. Proceedings of the VI International Conference on Engineering Education in Sustainable Development. September 22-25 2013. Cambridge, UK

Segalàs, J. and Ferrer, D. (2013) Sustainable Design: The role of materials in Sustainability. 5th International Materials Education Symposium. 2013. Cambridge. UK.

Segalàs, J.; Hernandez, M. Mora, M. and Tejedor, G. (2013). Sustainable Technology Excellence Program STEP-2015 : Institutional change for embedding sustainability at UPC–Barcelona Tech. GUNI 6th International Barcelona Conference on Higher Education Barcelona. ES.

Segalàs, J. and Benson, P. (2012). International Design Project Semester. Proceedings of The 14th International Conference on Engineering & Product Design Education. Design education for future wellbeing. 6th-7th September 2012, Antwerp, Belgium. ISBN: 978-1- 904670-36-0

Segalàs, J. and Tejedor, G. (2012). Sustainable technology innovation course. Constructive and community-oriented learning postgraduate education. Proceedings of EDULEARN12 Conference. 2nd-4th July 2012, Barcelona, Spain. ISBN: 978-84-695-3491-5

Segalàs, J. and Benson, P. (2012). *International design project semester: a program to challenge industrial design engineering undergraduates to work and study in teams in both presential and non presential learning environments. Proceedings of EDULEARN12 Conference. 2nd-4th July 2012, Barcelona, Spain. ISBN: 978-84-695-3491-5*

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
(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)

- Title Power generation with modular gasifiers
 - Dates (from – to) / Country October 2008 – October 2011
 - Name of employer ACCIÓ (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