bc3

BASQUE CENTRE
FOR CLIMATE CHANGE
Klima Aldaketa Ikergai

ACTIVITY REPORT 2015

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1. INTRODUCTION

The year 2015 will be remembered as the year of the United Nations Framework Convention on Climate Change, COP21, held in Paris. A milestone in Climate Change Policy multilateral international policy making, which lead the scientific community to firmly conclude that we are facing one of the greatest human challenges.

Consequently, understanding and fighting against climate change fortunately got to occupy the highest priorities on political and social agendas around the world and the role of institutions like ours, capable of responding to this challenge from the Basque Country, became even more fundamental than before. Although, we are well aware, the nature of the challenge posed during COP21 is global, multidisciplinary and multi-sectoral.

It is remarkable, therefore, the fact that during 2015, our institution was awarded as the fourth most influential think tank in the world in economics and climate change policy (referring to the activity carried out in 2014). More precisely, we were ranked fourth in the ICCG's International Think Tank (ICCG) Ranking, ahead of 244 public and private organizations working in the field of climate change economics and politics.

An additional challenge that we faced during the year, also related with Paris, was the selection of the new Scientific Director, which entailed an open and international selection process with the participation of 53 candidates from different nationalities and scientific disciplines, and the constitution of an International Selection Committee. Finally, Prof. María José Sanz Sánchez was selected as the new Scientific Director of BC3 (being the appointment formalized in January 2016), and given the assignment of adapting our strategy to the new challenges arisen after the Paris climate change summit.

Furthermore, in 2015 we were also awarded by the European Commission with the HR Excellence in Research after a thorough analysis of our human resources policy, which in our believe shows our commitment with continuous improvement in the management of human resources strategies for researchers. We also kept on growing and our team reached 42 people at the end of the year.

In terms of funding, we were increasingly successful in obtaining funds from different calls and agreements in Spain, the European Union and even more widely, and nearly 59% of our funding came from such sources within the tax year.

As a centre of excellence, with our funding model and primarily evaluated in terms of our scientific output, we also continued making a name for ourselves. Thus, in 2015 we increased the number of our publications; mainly in scientific journals, but also in books and monographs, and overall, we produced 62 articles, as well as 5 books and 17 chapters. At the same time, aware that as a research centre focused on climate change and working in the socio-economic domain of the issue, we have the responsibility to become and stay relevant, we participated in major fora where the subject was discussed, including the annual Conference of Parties to the Framework Convention on Climate Change.

Besides, we developed collaborative agreements with institutions all over the world throughout the year. It is our belief that a complex goal like ours may only be successful being fully integrated into the network of research centres working on the same topic. With this purpose, we contributed to the IPCC (Intergovernmental Panel for Climate Change) and IPBES (Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services), which bring together the state of knowledge on research on climate and makes it accessible to policymakers. Finally, yet importantly, we prepared policy briefs and technical reports for various governments.

In conclusion, 2015 was not also a milestone in the fight against climate change, but a year of significant steps within our centre, which will contribute to strengthen our capacities at different levels for the achievement of the global goals raised in Paris.

BC3, Basque Center for Climate Change, was regognized in 2015 by the European Commission with the HR Excellence in Research Award.

HR EXCELLENCE IN RESEARCH

2. THE CENTRE

2.1 PRESENTATION OF THE CENTRE

BC3 (Basque Centre for Climate Change) is an excellence research centre that contributes to long-term research on the causes and consequences of climate change. Our main goal is to foster the creation of knowledge in this multidisciplinary science, as well as to engage a highly-qualified team of researchers with the primary objective of achieving excellence in research, training and dissemination.

Our Centre was created in 2008 jointly by the Basque Government and the Basque University, under the so-called BERC programme (Basque Excellence Research Centres), with the aim of focusing on the socio-economic aspects of climate change, within an interdisciplinary framework that includes both natural and social sciences, and

BC3 is currently a world-class climate change research centre aimed at informing decision-making at the Basque, Spanish, and International level by integrating natural and social sciences to address the socio-economic implications of global climate change.

The centre also highlights the importance that the Basque Government, through both the Basque Environmental Strategy for Sustainable Development for 2002-2020, and Environmental Framework Programme 2020 of the Basque Country, gives to the creation of knowledge and strategies to reconcile the improvement of the population's quality of life with the preservation of the environment and its resources.

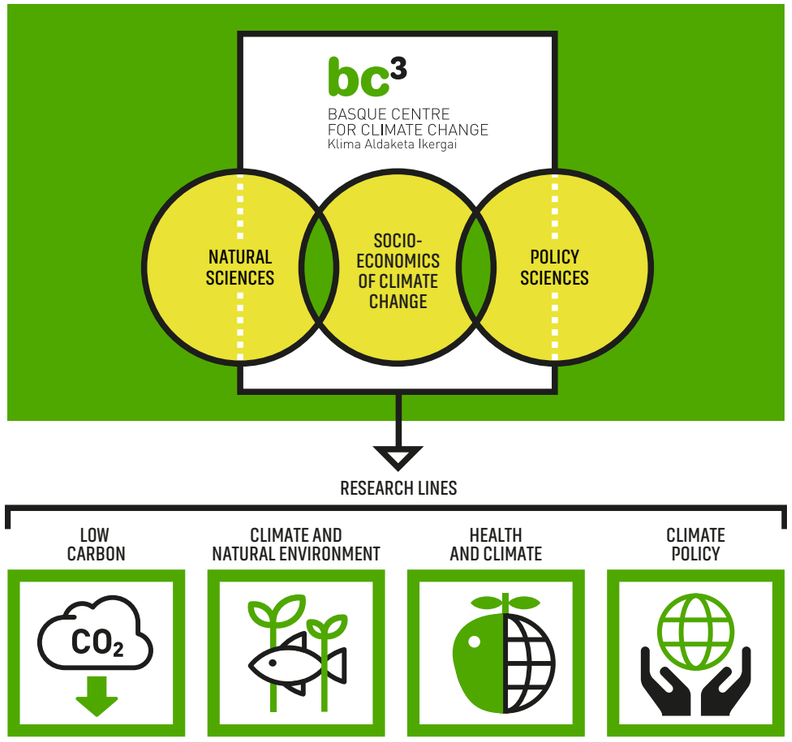
Our research lines fall broadly into the following groups:

- **LOW CARBON**
- **CLIMATE AND NATURAL ENVIRONMENT**
- **HEALTH AND CLIMATE**
- **CLIMATE POLICY**

The Strategic objectives that underlie the BC3 strategic plan, support the centre's vision and focus on its aspiration: To be a world-class climate change research centre aimed at informing decision-making at the Basque, Spanish, and international level by integrating natural and social sciences to address the socio-economic implications of global climate change.

BC3 STRATEGIC OBJETIVES:

- **SO1.** To develop an excellence–based, innovative and multidisciplinary Climate Change research programme.
- **SO2.** To participate and develop high-level training programmes on Climate Change.
- **SO3.** To contribute to increase local/national/international development and citizens standard of living by Climate Change knowledge transfer to society.
- **SO4.** To promote collaboration and cooperation with Governments, universities, research centres, technology centres, social agents and companies at local, national and international level.
- **SO5.** To implement an excellence-based Financial and People Management in order to attract funding and top-ranking talents.



2.2 PARTNERS

We are a non-profit association formed by the following associate members:

ikerbasque
Basque Foundation for Science

eman ta zabal zazu
Universidad del País Vasco
Euskal Herriko Unibertsitatea

ihobe

2.3 MISSION - VISION

MISSION

The BC3 is a Research Centre based in the Basque Country, which aims to contribute to long-term research on the causes and consequences of climate change, in order to foster the creation of knowledge in this multidisciplinary science.

We seek to prepare a highly qualified team of researchers with the primary objective of achieving excellence in research, training and dissemination.

It is our goal that our methods and analytical tools allow to widen the frontiers of human scientific knowledge, making our organisation a worldwide benchmark on climate change research.

VISION

To be a world-class climate change research centre aimed at informing decision-making at the Basque, Spanish, and international level by integrating natural and social sciences to address the socio-economic implications of global climate change.

This synergy is realized through our research on low carbon transitions, natural environment and ecosystem services, health, economics and policy.

2.4 INTERNATIONAL SCIENTIFIC ADVISORY COMMITTEE

The International Scientific Advisory Committee (ISAC) is a consultative body of independent experts created to provide advisory opinions and analysis on science to our centre. Its remit includes matters concerning research program and general strategy.

Members are appointed for four years, as independent scientific experts on the basis of their specific skills, abilities, experience and knowledge.

In 2014, our International Scientific Advisory Board was updated, and five of its six members were newly appointed. The following members compose the current committee:

ISAC MEMBERS:

Neil Adger

PROFESSOR OF
HUMAN GEOGRAPHY

—

University of Exeter

Xavier Labandeira

PROFESSOR OF
APPLIED ECONOMICS

—

University of Vigo

Reinhard Mechler

DEPUTY DIRECTOR OF
"RISK, POLICY, VULNERABILITY"

—

International Institute for Applied Systems Analysis (IIASA)

Pete Smith

PROFESSOR OF
SOILS & GLOBAL CHANGE

—

University of Aberdeen

Valentina Bosetti

ASSOCIATE PROFESSOR
OF ECONOMICS

—

Bocconi University

Teresa Ribera

DIRECTOR

—

Institute for Sustainable Development and International Relations (IDDRI)

2.5 BC3 TEAM | 2.5.1 Statistics

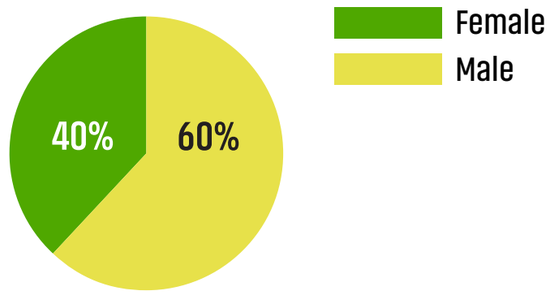
BC3 TEAM DISTRIBUTION BY POSITION

TOTAL BC3 TEAM	**42**
SCIENTIFIC DIRECTOR	**1**
RESEARCHERS	**36**
Research Professors	10
Research Fellows	3
Post Doc Researchers	13
PhD Student	10
ADMINISTRATION TEAM	**5**
Operation Manager	1
Project Manager Outreach	1
Project Officer	2
Management Assistant	1

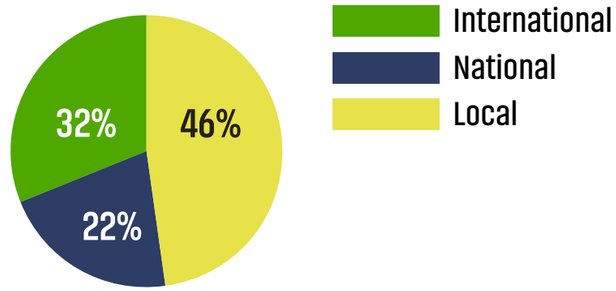
* BC3 team members at 31st of December 2015.
* 6 of the BC3 researchers are IKERBASQUE researchers
(5 Ikerbasque Professors and 1 Ikerbasque Research Fellow).

BC3 TEAM DISTRIBUTION BY GENDER AND NATIONALITY

Distribution by gender



Distribution by nationality



2.5 BC3 TEAM | 2.5.1 Statistics

Prof. María José Sanz Sánchez

In regards to the BC3 team, 2015's most remarkable milestone is the opening of an international selection process to cover the Scientific Director position, since the former Scientific Director, Prof. Anil Markandya, would reach the end of his term at the end of the year.

Prof. María José Sanz Sánchez was finally appointed new BC3 Scientific Director, to take on the position in January 2016. Her appointment was meant to enable an outstanding boost to our capabilities, Thanks to her career and prior experience at the highest tier in academia, as well as her involvement in the guidance of political decisions at centres such as the FAO (United Nations Food and Agriculture Organization) or the UNFCCC (United Nations Framework Convention on Climate Change).

Prof. Sanz graduated in Biological Sciences in 1985 and obtained her PhD in 1991 at the University of Valencia (Spain). She has been lead author of several reports of the IPCC (4th Assessment Report, Guidelines for 2006 GHG inventories...), and she was also member of the IPCC group that obtained the share Nobel Peace Prize in 2007. She has been member of the National Spanish Delegation of the IPCC (2001-2006) and of other International bodies like the European Commission or the World Bank. Prof. Sanz has been positioned as one of the more cited researchers in her area of research by "The New Highly Cited Researchers List from Thomson Reuters and the Shanghai Ranking (Spain's position and university map)" and counts on with broad experience in national and international projects, as well as publishing in high impact scientific journals.

As stated in previous BC3 Activity Reports our hiring processes are mainly linked to the financial resources obtained through third party funded research programmes, research projects or scholarships that finance the research personnel expenses. Throughout 2015, 7 calls were published, being 3 of them completed in 2016. All the selection processes were open, and except for the renewal of the Scientific Director's position, they all were directly linked to externally funded research projects. These calls involved the reception of 210 applications and 6 researchers recruitments.

The following individual fellowships were active in 2015: MINECO, 2 Ramón y Cajal (Dr. Marc Neumann and Dr. Sérgio. H. Faria), 2 Juan de la Cierva (Dr. Ignacio Palomo and Dr. Stefano Balbi), 1 FPD (Dr. Marta Olazabal) and 1 Marie Sklodowska-Curie Individual Fellowship (IF-EF Horizon2020) (Dr. Leif Vogel).

As mentioned before, another key aspect for our consolidation as a research center of international relevance is the talent retention. Such process pivots on the following axes of action:

- **EFFECTIVE AND INNOVATIVE PROCESSES AND ORGANIZATION**
- **EXCELLENT INFRASTRUCTURE AND LOCATION**
- **LINKS TO LEADING CLIMATE CHANGE CENTERS WORLDWIDE**
- **TRAINING**
- **STAFF SATISFACTION PROGRAM**

Within 2015, BC3 hosted 16 guest-researchers that stayed in the centre a time frame inferior to 6 months. Their stays enabled us to identify new collaborators.

2.5 BC3 TEAM | 2.5.2 BC3 Team

RESEARCHERS - I

For more information, visit our website.

RESEARCH LINES: LOW CARBON · NATURAL ENVIRONMENT · HEALTH AND CLIMATE · CLIMATE POLICY

Anil Markandya
SCIENTIFIC DIRECTOR.
IKERBASQUE PROFESSOR

Ferdinando Villa
IKERBASQUE
RESEARCH PROFESSOR

Unai Pascual
IKERBASQUE
RESEARCH PROFESSOR

Sérgio H. Faria
IKERBASQUE
RESEARCH PROFESSOR

Marc Neumann
IKERBASQUE
RESEARCH PROFESSOR

Aline Chiabai
RESEARCH
PROFESSOR

Ibon Galarraga
RESEARCH
PROFESSOR

Mikel González-Eguino
RESEARCH
PROFESSOR

Luis Maria Abadie
RESEARCH
PROFESSOR

Agustin Del Prado
RESEARCH
PROFESSOR

David Moreno
IKERBASQUE
RESEARCH FELLOW

Elena Ojea
RESEARCH
FELLOW

Iñaki Arto
RESEARCH
FELLOW

Sebastien Foudi
POSTDOCTORAL
RESEARCHER

Eneko Garmendia
POSTDOCTORAL RESEARCHER
OF IKERBASQUE – DKR IN UK

Marta Pascual
POST DOCTORAL RESEARCHER OF
IKERBASQUE – DKR IN AUSTRALIA

RESEARCHERS - II

For more information, visit our website.

RESEARCH LINES: LOW CARBON · NATURAL ENVIRONMENT · HEALTH AND CLIMATE · CLIMATE POLICY

Luis Rey
POST DOCTORAL RESEARCHER

Stefano Balbi
POST DOCTORAL RESEARCHER

Marta Olazabal
POSTDOCTORAL RESEARCHER

Kishore Dhavala
POST DOCTORAL RESEARCHER

Amaia de Ayala
POST DOCTORAL RESEARCHER

Josue Polanco
POST DOCTORAL RESEARCHER

Ignacio Palomo
POST DOCTORAL RESEARCHER

Federico Cardona
POST DOCTORAL RESEARCHER

Ignacio Cazcarro
POST DOCTORAL RESEARCHER

Elena Galan
POST DOCTORAL RESEARCHER

Leif Vogel
POST DOCTORAL RESEARCHER + MARIE CURIE

Javier Martinez
POST DOCTORAL RESEARCHER

Elisa Sainz de Murieta
JUNIOR RESEARCHER - PHD STUDENT

Amaia Albizua
JUNIOR RESEARCHER - PHD STUDENT

Mª Victoria Román de Lara
JUNIOR RESEARCHER - PHD STUDENT

Guillermo Pardo
JUNIOR RESEARCHER - PHD STUDENT

RESEARCH LINES: LOW CARBON · NATURAL ENVIRONMENT · HEALTH AND CLIMATE · CLIMATE POLICY

RESEARCHERS - III

For more information, visit our website.

Xoaquin Garcia
JUNIOR RESEARCHER - PHD STUDENT

Alina Tepes
JUNIOR RESEARCHER - PHD STUDENT

Laetitia Pettinotti
JUNIOR RESEARCHER - PHD STUDENT

Jon Sampedro
JUNIOR RESEARCHER - PHD STUDENT

Dirk Jan Van de Ven
JUNIOR RESEARCHER - PHD STUDENT

Ambika Markanday
JUNIOR RESEARCHER - PHD STUDENT

ADMINISTRATION STAFF

Nerea Ortiz
OPERATION MANAGER

Susana Pérez
MANAGEMENT ASSISTANT

Ainhoa Azkarate
OUTREACH MANAGER

Silvia de Luis
PROJECT OFFICER

Irune Vegas
PROJECT OFFICER

2.5 BC3 TEAM | 2.5.3 HR Excellence in Research

HR EXCELLENCE IN RESEARCH

In April 2015, after a thorough analysis of our human resources policies, the European Commission awarded BC3 with the HR EXCELLENCE IN RESEARCH, in recognition to our commitment with the 40 principles defined in the European Charter for Researchers and the Code of Conduct for the Recruitment of Researchers.

More specifically, the "European Charter for Researchers" outlines the roles, responsibilities and rights of researchers and their employers. The aim is to ensure that the relationship between these parties contributes to the successful achievement of the generation, dissemination and exchange of knowledge, as well as to the professional development of researchers from the early stages of their careers.

The implementation of the Charter & Code was meant to improve our performance in talent attraction, making of us an even more attractive destination for researchers in the coming years, as it ensures, among others, that our selection procedures are fair and transparent. The Charter & Code also provides information about our working environment and development possibilities, as we not only evaluate researcher's performance based on publication production criteria but also based on other evaluation criteria such as education and training, supervision, teamwork, knowledge transfer and public awareness and management activities.

The European Commission adopted the European Charter for Researchers and the Code for their Recruitment, drafting two documents directed to researchers, employers and providers of public and private sector funding. Both documents have become key elements of the European Union's policy, making research an attractive career and stimulating economic growth and employment in the continent.

3. RESEARCH

3.1 RESEARCH LINES | 3.1.1 Low Carbon

OBJECTIVES OF THE RESEARCH LINE

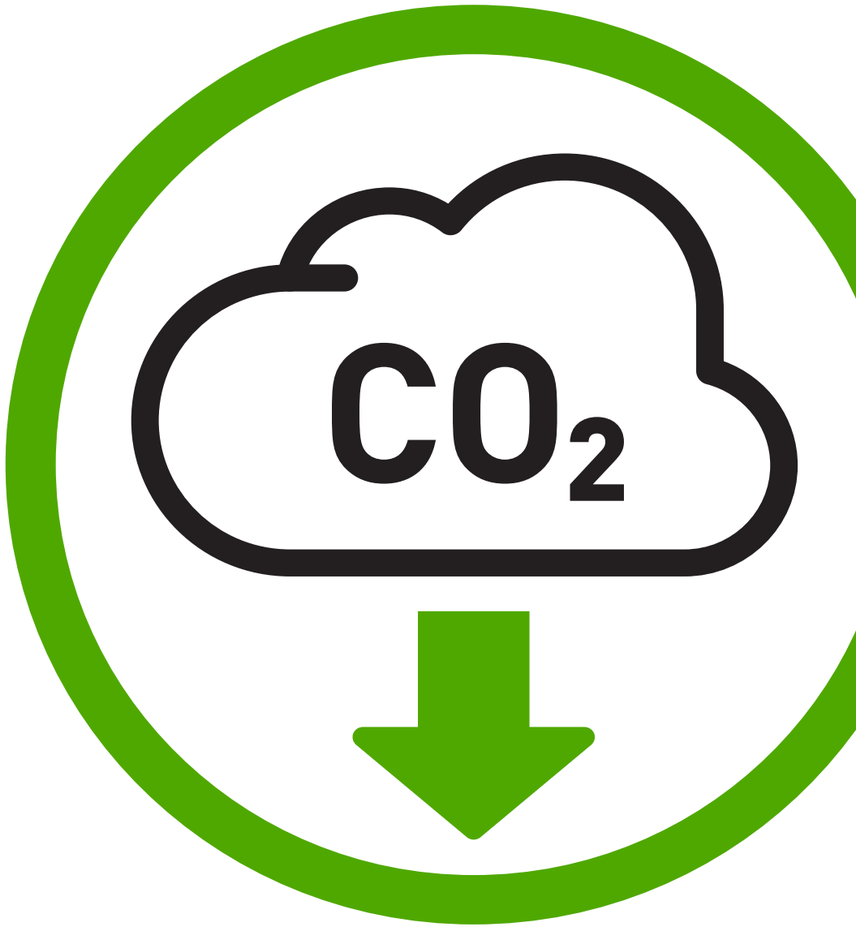
The "Low Carbon" (LC) research line deals with the implications of the transition to a low carbon economy. The major source of carbon emissions is the production and consumption of energy and a great deal of our effort at BC3 is devoted to understand how to reduce emissions without unduly affecting economic and social wellbeing, especially among the most vulnerable people.

This line has been very active over the last years, contributing to many different areas. As an overview, our research covers the transition to a low carbon economy from the micro level (for example, the decision of a firm or consumer to invest in energy efficiency or not) to the global level (such as the implications of different climate agreements). We analyse the economic implications of climate policies (including distributional impacts) and their impact on households, economic sectors and regions. The interrelations and interactions of climate policies with energy, economy, the environment, land use, trade and health policies are also explored, building strong links between our work and our other research lines.

The methodologies applied are very diverse:

- Real option theory and models: used to analyse optimal investments by considering the existing uncertainty in the price of commodities.
- Energy-system models: used to understand in a better way the implications of the transition to a low-carbon economy in some key sectors, such as power.
- Input-Output and CGE models: used to analyse the energy-economy-environment (E3) implications of policies that have economy-wide effects at regional, national and global levels.

Finally, we also explore the interrelations between the economy and the climate system, using Integrated Assessment models (DICER and GCAM-BC3) to analyse different issues related to climate policy, such as the implications of different climate agreements for the energy system and the optimal climate policy considering different estimations for damage functions. Other applications include the consequences of climate policies and scenarios in terms of costs, global temperature change and sea level rise. All these tools are in constant development, enabling us to quantitatively explore the full implications of a low-carbon transition and effectively support decision-making processes.



3.1 RESEARCH LINES | 3.1.1 Low Carbon

2015 RESEARCH IN ACTION: TOPICS

Co-benefits of low carbon transitions: looks at the health and other co-benefits of transition to low carbon in selected cities in Europe, India and China.

The economics of fuel industries in a carbon constrained world: deepens in energy economics and climate change research to help deliver a low carbon future.

Forward-looking methodologies to analyse societal challenges in the area of energy: reviews the performance of forward-looking models to assess grand societal challenges related to energy and develop methods to improve their applicability.

New modelling tools for managing step-change dynamics by working across a wide range of spatio-temporal scales, and integrating the knowledge of many stakeholder communities: develops complex systems in which causal relations are variant over time (as opposed to simple systems where causality is fixed). The approach is used to create tools that are more applicable to decision-making the changing social and technological structures that emerge as we move to a different economic structure.

The role of Migration as an Adaptation and its policy implications: the purpose of the research is to assess the economic impacts of climate change in Delta areas. Impacts of flexibility on biofuels policy: assess the impacts of giving more flexibility to EU's biofuels policy.

SOME ACCOMPLISHMENTS:

In 2015, two European Projects under the Seventh Framework Program were by the research line: CECILIA 2050 and FLAGSHIP.

In addition, the project financed by the H2020 program "TRANSRISK - Transitions pathways and risk analysis for climate change mitigation and adaptation strategies" was granted for 3 years under the pillar of social challenges. BC3 is one of the key partners of the consortium and will contribute to the analysis of the synergies and conflicts associated to the various mitigation routes. Within this framework, two new doctoral students and a doctor were hired to join the team in 2016.

Throughout 2015, we also consolidated and improve the network of collaborators and capacities to compete in attracting European and international. As an example, a consortium coordinated by BC3, with internationally renowned researchers and key stakeholders within IPCC working group III, was set up to prepare a proposal for the new calls for the H2020 program. Moreover, grants from Bizkaia Talent and similar were obtained, attracting senior researchers as collaborators, such as Dr. Kurt Kratena and Prof. Dr. Christopher Bohringer.

Additionally, the team continued improving the capacities in quantitative and qualitative tools and models for carrying out state-of-the-art research on the implications (climatic, macroeconomic, distributive and microeconomic) of different policies (energy, climate, soil, Health) at different levels (global, regional, national and sub-national).

Different collaborations with other BC3 and external groups were also initiated with the aim of bringing together social science knowledge with many other disciplines in the natural sciences, contributing to the multi and interdisciplinary character of the center.

MAIN COLLABORATORS

- UPV/EHU
- Universidad de Valladolid
- Universidad Juan Carlos
- University of Oldenburg
- Ecologic Institute
- Institute for Prospective and Technological Studies (IPTS) – Joint Research Centre
- University of Southampton
- UPN
- Universidad de Alcalá
- RISO-DTU
- University of Newcastle Upon Tyne
- Economics for Energy
- ETH Zurich
- CEEW

MAIN RESEARCH PROJECTS

- TRANSRISK (EU H2020)
- FLAGSHIP (EU FP7)
- DECCMA (CARIAA-IDRC)
- CECILIA 2050 (EU FP7)
- COMPLEX (EU FP7)
- LCP (Repsol Foundation Collaboration Agreement).

SOME HIGHLIGHTED OUTPUTS

- Abadie, Luis M. 2015. **Enhanced Oil Recovery: Growth, Economic and Environmental Benefits and Risks**. Enhanced Oil Recovery: Methods, Economic Benefits and Impacts on the Environment. Nueva York. Nova Science Publishers. -. ISBN 978-1-63463-917-0.
- Gonzalez-Eguino, M. 2015. **Energy poverty: An overview**. Renewable & Sustainable Energy Reviews. 47. 377-385. DOI (10.1016/j.rser.2015.03.013).
- Arto, I., Andreoni, V., Rueda-Cantuche, J.M. 2015. **Global impacts of the automotive supply chain disruption following the Japanese earthquake of 2011**. Economic Systems Research. 27. (3) 306-323. DOI (10.1080/09535 314.2015.1034657).
- Cazcarro, I.; Duarte, R., Sánchez Chóliz, J., Sarasa, C. and Serrano, A. 2015 (Forthcoming). **Modelling regional policy scenarios in the agrifood sector: a case studyof a Spanish region**. Applied Economics. 1-18. DOI (10.1080/00036846.201 5.1102842).
- Abadie, L.M. and Galarraga, I. 2015. **Managing Energy Price Risk**. Compendium of Energy Science and Technology Vol 12. 1st ed. Studium Press LLC, USA. 827. ISBN 978-1-626990-73-9.

RESEARCH APPLICATION IN THE BASQUE COUNTRY

BC3 often uses the Basque Country as a case study to offer Basque policy-makers state-of-the-art knowledge in its progress towards a low carbon economy. In this vein, we work in different areas such as the improvement of the design of the market-based instruments for energy efficiency promotion, comparisons of different schemes of taxes and subsidies or combinations of both, and evaluation of policies with standard economic tools, as well as with new approaches from behavioural and experimental economic.

3.1 RESEARCH LINES | 3.1.2 Climate and Natural Environment

OBJECTIVES OF THE RESEARCH LINE

Climate change has complex impacts on human well-being. In this research line BC3 is concerned with the scientific study of the interplay between climate change and the environment. We address the interlinkages between climate change, natural capital (natural resources and ecosystems), and the benefits that derive from them in terms of human well-being. The Natural Environment Research Line focuses on both, the role of natural capital assets (stocks of natural resources) and the flows of the benefits that derive through their management (ecosystem services), and the ways they interact with climate change. It therefore includes two related areas of research:

- **Natural Resources** (NR)
- **Ecosystem Services** (ES).

The general objective of Natural Resources (NR) is to investigate the links between climate change and the formation, depletion and exploitation of natural systems and reserves of biotic and abiotic resources. Physical, ecological, social, and economic aspects are considered, all of which are of great relevance for local, national, and international decision-making.

Ecosystem services (ES) are the benefits that societies obtain from NR. These include the direct provision of material goods, such as food, fuel and fibre, as well as the regulation of undesired events, such as climate change and flooding. Many non-material benefits, such as spiritual or aesthetic enjoyment, are also obtained from nature.

Our scientific work at BC3 on NR can be best communicated by mastering the discourse on ecosystem services. This is a key mission of the Natural Environment (NE) Research Line. NE uses the ES as a language that has gained momentum in science and policy after the publication of the Millennium Ecosystem Assessment. As a science-policy interface, using an ecosystem services framework, allows NE to focus on connecting climate change with human well-being through the management of NR and ecosystems. The language of ES is unique for being both rooted in science and understood by policy makers. By focusing directly on benefits to humans through ES, form BC3 we can bridge climate change science and decision-making, allowing the consequences of action to be understood by all actors.

The physical, biological, economic and political ecology strands of the NE Research Line necessitate integrative research methodologies. Further, research in NE inherently requires an effort to gather and organize field data for detailed multi-scale analyses and modelling applications. It should be emphasized that our studies are not constrained by the use of existing models and tools. Rather, we also develop our own new mathematical, empirical, and computational models and tools, which are best suited to investigate particular issues out of the many dimensions of Climate Change (spatial, temporal, social, cultural, economic, etc.).

To this aim, we use a variety of methods, ranging from multiscale modelling and renormalization to artificial intelligence and network flow analysis. For example, the NE Research Line is at the forefront of this innovation through the development of novel physical models (e.g. continuous diversity) and methodologies such as ARIES (www.ariesonline.org), one of a few methodologies to quantify physical flows of benefits and model the way they translate into economic value and well-being. Other research methods at the core of NE are based on the use of spatially explicit databases, life-cycle analysis, inventories and socio-economic approaches (e.g. cost benefit analysis, multicriteria analysis, behavioural economics, bio-economic modelling), hydro-economic modelling, and stakeholder participatory analyses. The range of methods and focus on integrating them is one of the core scientific values of the NE.

3.1 RESEARCH LINES | 3.1.2 Climate and Natural Environment

2015 RESEARCH IN ACTION: TOPICS

Development and testing of integrated models to assess the potential of green/natural infrastructure to build climate resilient sustainable development policies:Test and demonstrate approaches to using portfolios of built and natural water infrastructure development to achieve more optimal outcomes for the multiple goals of poverty reduction, water-food-energy security, biodiversity conservation and climate resilience.

Systems-based approaches for integrated mitigation and adaptation strategies in agriculture at different spatial and temporal scales: Modelling the effect of new low-protein cow diets on overall GHG emissions; Review of grassland-based EU farm-level modelling approaches for research on integration of GHG mitigation and adaptation strategies; Modelling N2O emissions from most common cropping systems in Spain using the DNDC model; Modelling GHG emissions from bioenergy cropping systems in the Basque Country; Simulating the effect of climatic and management conditions on the main interactions between carbon and nitrogen and sustainability of dairy farms in the Basque Country; Simulation of livestock housing climate for region-specific barn concepts and climate boundary conditions; Strategies for adapting ruminant livestock systems to climate change in different regions of Europe Potential EU network on mitigation of GHG emissions from agricultural systems;Risk analysis and natural resources to identify optimal adaptation strategies to climate change: Adaptation strategies to environmental risks (drought) in agriculture

Developing theoretical frameworks, and methods to assess the role of biodiversity for ES delivery and its impact on the adaptive capacity of the poor to climate change stressors.

Development of scientific research on ES that supports climate policy in the Basque Country: specific sectorial levels addressed (e.g. agriculture, forest, water and natural protected areas). This includes integrated strategies on: (i) drought and flooding, (ii) forest and agricultural management, (iii) soil management, (iv) sea level rise, (v) freshwater provision and (vi) biodiversity conservation.

Integrating bioeconomic models across temporal and spatial scales that link biodiversity, ecological processes, ecosystem services and social well-being.: Connecting biodiversity to ecosystem services with regard to the role of soil biodiversity in agricultural soils.

Marine ecosystem services and adaptation strategies.

Sea-level rise scenarios for the Basque coast and related economic impacts.

Climate Change in Extreme Environments: The Cryosphere.: We investigate how the cryosphere (ice sheets, glaciers, sea ice, icebergs, snow, and permafrost) records, affects, and responds to climate change on diverse size and time scales.

Climate Change in Extreme Environments: Natural Hazards.

Ecosystem Dynamics in a Changing Climate: Biodiversity Change.

Ecosystem Dynamics in a Changing Climate: Populations with Continuous Diversity.

SOME ACCOMPLISHMENTS:

During 2015 NR and ES areas were very active in reference to scientific production as well as contribution to climate policies.

The science-policy interface development during 2015 was quite productive with numerous interactions with international decision-making groups such as the Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES), the International Global Research Alliance on Agricultural Greenhouse Gas Emissions (GRA) or the European Commission itself. In addition, we continued our relationship with international programs such as UNEP and CGIAR.

MAIN COLLABORATORS

- UPV/EHU
- NEIKER
- CIEMAT
- International Institute for Environment and Development (IIED)
- Northern Illinois University
- University of Wyoming
- Universidad de Alcalá
- University of California at Santa Cruz
- University of Bristol
- Centre d'Ecologie Fonctionnelle et Evolutive – CNRS
- Center for International Forestry Research (CIFOR)
- University of Montpellier
- University of Osnabrück
- University of Aberdeen
- Rothamsted Res
- ATB
- PIK
- INRA
- PBL
- CSIC
- Bangor university
- Wageningen UR
- Aarhus University
- IRSTEA
- University of Reading
- UPM
- UPNa
- CIEMAT
- IBERS
- UMH
- CIFA
- EHU
- BCAM
- NIPR
- Nagaoka Univ. Technol.
- Colorado State Univ.
- New York Univ.
- Univ. of Leicester
- Univ. of Heidelberg
- AWI Bremerhaven
- Univ. Tuebingen
- The Department of Geography and The Conservation Research Institute (University of Cambridge)
- JRC
- Universidad Autónoma de Madrid
- ICRA - Catalan Institute for Water Research
- University of Palermo
- Université Laval
- Eawag and ETH Zurich
- IH Cantabria
- SurfRider Foundation
- New York University (USA)
- Universidade de Évora
- International Centre for Integrated Mountain Development - ICIMOD
- Osnabrueck University
- University of Leicester
- CIFOR - CGIAR Livelihood System Program.

3.1 RESEARCH LINES | 3.1.2 Climate and Natural Environment

MAIN RESEARCH PROJECTS

- AQUACROSS (EU H2020)
- PERSEUS (EU FP7)
- BASE (EU FP7)
- ECONADAPT(EU FP7)
- CAMPIC and PAMPIC (Bizkaia Talent)
- OPTIBARN
  (ERA-NET, MINECO – Spanish Ministry for Economy and Competitiveness)
- CAUSE (MINECO – Spanish Ministry for Economy and Competitiveness)
- NEREA5 (MINECO – Spanish Ministry for Economy and Competitiveness)
- DEFRA (UK Department for Environment, Food & Rural Affairs)
- ATLANTIC ACTION PLAN (EU DG-MARE Contract)

SOME HIGHLIGHTED OUTPUTS

Integrated modelling of coupled human-natural systems under climate change, with an emphasis on ecosystem services integrative modeling methods and decision support systems.

1. Balbi, S., Del Prado, A., Gallejones, P., Geevan, C.P., Pardo, G., Pérez-Miñana, E., Manrique, R., Hernández-Santiago, C., Villa, F., 2015. **Modeling trade-offs among ecosystem services in agricultural production systems**. Environmental Modelling & Software. 72: 314–26. Techniques such as Multiple Criteria Analysis have also been integrated into ARIES to provide rapid and easily communicable analysis and visualization of stakeholder priorities and potential conflicts over alternative goals by different stakeholders at different scales. Trade-offs and synergies between climate change mitigation and adaptation for livestock farming systems were identified using ARIES resulting in a publication that is pioneer in this area and a good example of integration of BC3 efforts.

Land Use and Agriculture climate smart solutions.

2. Pardo G, Moral R, Aguilera E, del Prado A. 2015. **Gaseous emissions from management of solid waste: A systematic revie**w. Global Change Biology. 21, 1313-1327. In the context of improving GHGs emissions estimates that are fundamental for producing more accurate carbon budgets at regional, national and global level, this publication is one of the latest and more complete systematic reviews of emissions from management of solid waste. This is a high impact paper and it will be key for updating emission factors to calculate GHGs and NH3 emissions from solid waste management, and also relevant for the next update of the Intergovernmental Panel on Climate Change 2006 Guidelines for GHGs Inventories that will start in 2017.

Understanding ecosystem resilience to past climate changes to restore degraded areas.

3. Moreno-Mateos D, Meli P, Aronson J, and Vara, MI. 2015. **Ecosystem response to interventions: Lessons from restored and created wetland ecosystem**s. Journal of Applied Ecology 53: 1528–1537. DOI (10.1111/1365-2664.12518. On ecological restoration, a meta-analysis, exploring the effects that human interventions were having on restored and created wetlands, found no effects of actions beyond the hydrological restoration. In particular, revegetation, one of the most widely used restoration actions, could even deter the recovery process. These results have major implications for the practice of wetland restoration where hundreds of millions of dollars are spent annual on planting. It also alerts that, with present knowledge, we still do not accelerate assemblage processes in restoration.

Water infrastructure planning.

4. Hauduc, H., Neumann, M.B., Muschalla, D., Gamerith, V., Gillot, S., Vanrolleghem, P.A. 2015. **Efficiency criteria for environmental model quality assessment: A review and its application to wastewater treatment**. Environmental modelling & software. 68. 196-204. DOI (10.1016/j.envsoft.2015.02.004).
5. Neumann, M.B., Rieckermann, J., Hug, T., Gujer, W. 2015. **Adaptation in hindsight: Dynamics and drivers shaping urban wastewater systems**. Journal of Environmental Management. 151. 404-415. DOI (10.1016/j.jenvman.2014.12.047).
6. Vanrolleghem, P.A., Mannina, G., Cosenza, A., Neumann, M.B. 2015. **Global sensitivity analysis for urban water quality modelling: Terminology, convergence and comparison of different methods**. Journal of Hydrology. 522. 339-352. DOI (10.1016/j.jhydrol.2014.12.056).

APPLICATION IN THE BASQUE COUNTRY

The Basque Country is an ideal region to analyse the interlinkage between climate change and human well-being through the impacts on the natural environment. The multi-tiered institutional structure of the Basque Country creates a fertile ground for applying the research conducted under the CNE research line in order to understand how its institutional structures can be optimized in the face of climate change through an integrated management of natural capital assets and the flow of ecosystem services at multiple social and ecological scales.

At BC3 through the NE Research Line we are committed to developing new tools to support policy in the Basque Country with an ecosystem services-centric decision making prism to achieve environmentally sustainable, economically efficient and socially acceptable management of natural habitats as well as the definition of new incentives and mechanisms for an integrated management of ecosystems services.

3.1 RESEARCH LINES | 3.1.3 Health and Climate

OBJECTIVES OF THE RESEARCH LINE

Climate change addresses not only environmental and development issues, but it also represents a big threat to human health, and in the public mind, this impact gives rise to great concern. Health assessment in BC3 focuses on these threats, and analyses in this context the social, economic and behavioural factors that influence vulnerability of people, communities and social systems. This social dimension is however not fully integrated in the decision policy yet, and BC3 research line on health attempts to contribute in filling this gap.

Climate affects health through direct and indirect pathways. The expected increase in temperature will have a direct impact on both the incidence and the geographic distribution of climate-sensitive health outcomes, such as those related to heat waves, floods and infectious diseases. Human health will also be indirectly impacted by increased pressure via other pathways affecting natural and socio-economic systems, such as air pollution, ecosystem services, water, agriculture and food. On all these pathways, there are still considerable uncertainties. Yet the need for policy action is strong, in the form of capacity building, drawing up appropriate adaptation plans, and ensuring that health is appropriately considered in decision making related to other sectors, such as energy, transportation and agriculture.

In addition to the above, another important link between climate policy and health is in the area of co-benefits. Measures taken to reduce emissions of GHGs (e.g. sustainable policies on household energy, agriculture, transport) can often also reduce local pollutants such as particulate matter that have a detrimental effect on the health of the population. This means that the cost of a shift to sources of energy that have low GHG emissions is lower than would be the case of such benefits were not taken into account. At the same time, these benefits can provide strong political motivation.

The Health Research Line can be seen as a seed area that is developing along with all the other related research lines (Low Carbon, Natural Environment and Climate Policy). We are working with some of the leading research groups in the world on these issues in well-defined areas that address some important questions. The methodologies employed are diverse, including epidemiological and socio-economic models in the frames of health economics, environmental economics, health impact assessment, environmental impact assessment, environmental fate analysis, and uncertainty analysis.

3.1 RESEARCH LINES | 3.1.3 Health and Climate

2015 RESEARCH IN ACTION: TOPICS

Health impacts and costs/benefits of adaptation and mitigation strategies

Health vulnerability indicator

Human health and ecosystems

Application to national and local contexts

MAIN COLLABORATORS

- UPV/EHU
- Vicomtech
- Instituto Carlos III
- Universidad of Alcalá
- Universidad de Valencia
- UPM
- Aarhus University
- Centro Euro-Mediterráneo per i Cambiamenti Climatici
- London School of Hygiene and Tropical Medicine
- Charles University
- TERI
- Queen's University
- University of Leicester
- Amherst College
- University of Massachusetts
- University of Texas
- National Taiwan University
- Université de Bordeaux
- Universidad de las Palmas de Gran Canaria.

MAIN RESEARCH PROJECTS

- BASE (EU FP7)
- ECOHEALTH (F. BIODIVERSIDAD)
- GLANCE (MARIE SKLODOWSKA CURIE (NSC-H2020))
- Transportation Policies:
  Emissions Reductions, Public Health Benefits and Acceptability (BIZKAIA TALENT).

SOME HIGHLIGHTED OUTPUTS

1. Martínez-Juárez, P., Chiabai, A., Taylor, T., Quiroga Gómez S. 2015. **The impact of ecosystems on human health and well-being: A critical review**. Journal of Outdoor Recreation and Tourism. 10. 63-69. DOI (10.1016/j.jort.2015.06.008).
2. Chiabai, A. 2015. **Climate Change Impacts on Tropical Forests in Central America: An Ecosystem Service Perspective**. 1st ed. Abingdon, Oxon, UK. Routledge (Verlag). 224. ISBN 978-0-415-72080-9.
3. Chiabai, A. 2015. **Ecosystem services in tropical forests: contribution to human well-being and implications for economic valuation. Climate Change Impacts on Tropical Forests in Central America: An Ecosystem Service Perspective**. 1st ed. Abingdon, Oxon, UK. Routledge (Verlag). 224. ISBN 978-0-415-72080-9.
4. Shrubsole, C; Das, P; Milner, J; Hamilton, IG; Spadaro, JV; Oikonomou, E; Davies, M; Wilkinson, P. 2015. **A tale of two cities: Comparison of impacts on CO2 emissions, the indoor environment and health of home energy efficiency strategies in London and Milton Keynes**. Atmospheric Environment. 120. 100-108. DOI (10.1016/j.atmosenv.2015.08.074).

3.1 RESEARCH LINES | 3.1.4 Climate Policy

OBJECTIVES OF THE RESEARCH LINE

The research line "Regional, National and International Climate Policy" focuses, as the title suggests, on the policy-side of climate research. Sound policy of course is based on the results of work done under the other research lines (Low Carbon, Natural Environment, and Health), but it also involves some further lines of investigation. This research line therefore involves drawing out the policy implications of the research undertaken under the other lines as well as undertaking research on issues directly related to the formulation of policy.

The methodologies employed are diverse and include – amongst others – micro-simulation models, CGE-modelling, multi-criteria analysis, cost-benefit analysis, game theory, and integrated assessment modelling.

Both adaptation and mitigation policies are topics of the research in this research line and much of it is aligned with energy aspects (e.g., using economic instruments to influence energy use in a sustainable way, vulnerability of the electricity sector). With respect to international policy, thematic foci of the mid-term research strategy are international environmental agreements and international climate finance. These involve aspects such as ancillary benefits, green bonds and private financing, instruments to ensure fairness and sustainable development while pursuing climate goals. Concerning national policy, the mid-term strategy is concerned with market-based instruments (e.g. environmental tax reform), technology and innovation policy and adaptation to climate change.

The role of regional and local governments in climate protection plays also an important role in the research line with special emphasis in supporting the Basque Climate Policy.

One of the most relevant activities of this group is related to the participation of BC3 researchers as scientific experts in the most important international scientific organization that deals with climate change: the IPCC (Intergovernmental Panel of Climate Change) of the United Nations. We have actively contributed to its 5th Assessment Report (AR5), released in 2014 and we are also contributing to the next (6th) Assessment Report. This is the main report that this organization produces every 6 years and has deep global policy implications.

At BC3 we also help to define with the policy makers the strategic positioning of regional and national bodies in climate negotiations (such as the Conference of the Parties or COP or the EU). We closely follows and attend all COP meetings and have actively participated in the drafting of the Climate Change Plan for the Basque Government.

See Section POLICY RELEVANT KNOWLEDGE TRANSFER.

3.1 RESEARCH LINES | 3.1.4 Climate Policy

2015 RESEARCH IN ACTION: TOPICS

Exploiting the full potential of economic instruments to contribute to achieving the EU's greenhouse gas emissions reduction objectives for 2050

Economic valuation of climate change adaptation in Spain: the case of water

Design and evaluation of Energy Efficiency Programmes.

Exploring the potential for Environmental Fiscal Reform in Spain.

Better measurement of emissions from land use and policies to improve IPCC/GHG inventories for agriculture and land use methodologies.

Support in the elaboration of plans and programs linked with climate change.

Collaboration Agreement with Bilbao City Council

BC3 continued to collaborate with policy makers in 2015 to define the strategic positioning of regional and national actors in the face of future negotiations at the level of International Conventions or at European level.

MAIN RESEARCH PROJECTS

- RESIN (EU H2020)
- ECONADAPT (EU FP7)
- CICEP (Collaboration Agreement)
- BRODISE (EU H2020)
- LOW CARBON PROGRAMME (Repsol Foundation Collaboration Agreement)

MAIN COLLABORATORS

- UPV/EHU
- City Council of Bilbao
- CICERO
- Fondazione Eni Enrico Mattei
- TNO, Netherlands Organisation for Applied Scientific Research
- European Environmental Agency
- IHOBE
- Centro de Investigaciones Energéticas, Medioambientales y Tecnológicas – CIEMAT
- Danish Board of Technology
- University of Bath
- Economics for Energy
- World Bank
- Nagaoka University of Technology.

RESEARCH APPLICATION IN THE BASQUE COUNTRY

The Basque Country counts on with a high level of self-government, including taxation. In terms of specific policies, the region has been recognized by EU institutions and the United Nations as one of the most active regions in climate change policy during the last years. Hence, it can be stated that the Basque Country has not only the capacity and the legal framework to deal with climate change policy, but also the willingness to do so. Specifically, the research activities applicable to the context of the area are the following:

- Mitigation Policy related issues: Design of instruments to reduce greenhouse gases at regional level; Policies to promote low-carbon economies; Uncertainty and climate policy: diverse tools to design best policies to address climate change in the face of huge uncertainties and the long time periods involved.
- Adaptation Policy related issues: Biophysical and socioeconomic impact assessment: health, agroforestry, ecosystems, water and infrastructure related; Costs and benefits of adaptation measures; Design of optimal adaptation strategies.
- Support and dissemination.

See Section POLICY RELEVANT KNOWLEDGE TRANSFER.

SOME HIGHLIGHTED OUTPUTS

On top of the publications produced, the researchers of this line took active part as expert observers in the most relevant international climate change summit annually organized by the United Nations Framework Convention on Climate Change, COP21.

Publications

1. Ansuategi, A., Delgado, J and Galarraga, I. (Eds.) 2015. **Green Energy and Efficiency**. 1st ed. Switzerland. Springer. 428. ISBN 978-3-319-03631-1.
2. Arto, I., Amores, A., Rueda-Cantuche, J.M. 2015. **Measuring the intra-EU employment driven by the EU exports to the rest of the world. In The Sustainability Practitioner's Guide to Social Analysis, Assessment and Reporting**. 1st ed. Champaign, Illinois, USA. Common Ground Publishing. 239. ISBN 9781612298122.
3. Arto I, Kratena K, Amores AF, Temurshoev U, Streicher G. 2015. **Market-based instruments to reduce air emissions from household heating appliances. Analysis of scrappage policy scenarios**. Luxembourg: Publications Office of the European Union. ISBN 978-92-79-50850-9.
4. Watkiss, et al. 2015. **Overview of costs and benefits of adaptation at the national and regional scale**. In Climate Change Risks and Adaptation: Linking Policy and Economics. Paris. OECD Publishing. ISBN 9789264234604

3.2 RESEARCH PROJECTS

RESEARCH PROJECTS - I

European Commission or other international funding programs

ISAGE - Innovation for Sustainable Sheep and Goat Production in Europe	H2020-SFS-2015-2
INHERIT - INter-sectoral Health Environment Research for InnovaTions	H2020-PHC-4-2015
CLOCK - Climate Adaptation To Shifting Stocks	H2020 ERC-StG-2015
BRODISE - BROWNFIELD Decontamination In Southern Europe	H2020-SC5-2014
TRANSRISK - Transitions pathways and risk analysis for climate change mitigation and adaption strategies	H2020-SC5-3-2014
RESIN_Climate Resilient Cities and Infrastructures	H2020-DRS-9-2014
AQUACROSS - Knowledge, Assessment, and Management for AQUAtic Biodiversity and Ecosystem Services aCROSS EU policies	H2020-SC5-6-2014
GLANCE - calculatinG heaLth impActs of atmospheric pollutioN in a Changing climatE	H2020-MSCA-IF-2014-EF - Marie Sklodowska-Curie Individual Fellowships (IF-EF)
H2020_ DG MARE TENDER	H2020
EASME Atlantic Action Plan	H2020

BASE "Bottom-up Climate Adaptation Strategies towards a Sustainable Europe"	EC FP7-ENV-2012-two-stage (European Commission)
COMPLEX "Knowledge Based Climate Mitigation Systems for a Low Carbon Economy"	EC FP7-ENV-2012-two-stage (European Commission)
ECONADAPT "Economics of climate change adaptation in Europe"	EC FP7-ENV.2013.6.1-6
ASSETS "Attaining Sustainable Services from Ecosystems"	NERC-ESPA Programme (Ecosystem Services for Poverty Alleviation)
WISER "Which Ecosystem Service Models Best Capture the Needs of the Rural Poor?"	NERC-ESPA Programme (Ecosystem Services for Poverty Alleviation)
"Optimising the efficiency of dietary nitrogen use to reduce emissions and waste in dairy systems"	UK Department for Environment, Food & Rural Affairs
GHG Platform-Nitrous Oxide Emissions Factors	UK Department for Environment, Food & Rural Affairs
WISE-UP "Water Infrastructure Solutions from Ecosystem Services Underpinning Climate Resilient Policies and Programmes"	International Climate Initiative 2012 (German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety)
DECCMA "DEltas, vulnerability and Climate Change; Migration as an Adaptation"	Collaborative Adaptation Research Initiative in Africa and Asia (CARIAA)

3.2 RESEARCH PROJECTS

RESEARCH PROJECTS - II

MINECO or Spanish Institutions

GOBIERNO DE ESPAÑA / MINISTERIO DE ECONOMÍA Y COMPETITIVIDAD	**CAUSE** - Comparative Assessment and Valuation of Ecosystem Services in Agro-Forest systems: a methodology for Land Use Policy prioritization	MINECO – Spanish Ministry for Economy and Competitiveness - Plan Nacional de Proyectos de investigación fundamental no orientada 2012
	REBECOM - Estimación del tiempo de recuperación de bosques templados tras impactos antropogénicos históricos a lo largo de un gradiente de complejidad	Programa Estatal de I+D+i Orientada a los Retos de la Sociedad 2015
	CLIMAECON - Políticas climáticas y transición a una economía baja en carbono	Programa Estatal de I+D+i Orientada a los Retos de la Sociedad 2015
	ESPERA - La Equidad Social en los Pagos por Servicios Ambientales (PSA): Una Perspectiva Socio- Ecológica.	Programa Estatal de I+D+i Orientada a los Retos de la Sociedad 2015 MINECO
	NEREA5 - New approaches to efficient use of N for sustainable agriculture.	MINECO-Spanish Ministry for Economy and Competitiveness
INIA Instituto Nacional de Investigación y Tecnología Agraria y Alimentaria	**OPTIBARN** "Optimised animal specific barn climatisation facing temperature rise and increased climate variability"	FACCE ERA-NET, MINECO – Spanish Ministry for Economy and Competitiveness

Basque Government or Basque Institutions

EUSKO JAURLARITZA GOBIERNO VASCO	"The role of Social Equity in the Governance of Nature: A Social-Ecological approach"	Basque Government
bizkaia ::talent BFA DFB	"Incorporating climate change into spatial fisheries modeling: designing optimal adaptation", Prof. Costello	Bizkaia Talent
	"Developing a model for economic, energy and environmental policy analysis in the Basque Country", Prof. Krutena	Bizkaia Talent
	"Transportation policies: emissions reductions, public health benefits, and acceptability"	Bizkaia Talent

Other Funding Agencies

°CICERO Center for International Climate Research	**CICERO** - BC3 agreement	Cicero. Center for International Climate Research
UNIVERSITÄT OSNABRÜCK	**Collaboration agreement**	Universität Osnabrück

3.2 RESEARCH PROJECTS

RESEARCH PROJECTS: HIGHLIGHTS

European Commission or other international funding programs

H2020 BRODISE

GRANT AGREEMENT:	GA 642045
NAME OF THE PROJECT:	BRODISE - "BROWNFIELD Decontamination In Southern Europe"
FUNDING AGENCY:	The European Union Horizon 2020 research and innovations programme
TYPE:	H2020-SC5-2014
TIME FRAME:	2015-2016
FUNDING:	47.438 €
PARTNERS:	City Council of Bilbao -Coordinator Moragues And Scade Abogados SA Bedin Sara Associacao Parque De Ciencia E Tecnologia De Almada/ Setubal-Madan Parque Municipio Do Seixal Ente Per La Zona Industriale Di Trieste Consorzio Per L Area Di Ricerca Sci Entifica E Tecnologica Di Trieste Consorzio Area Baia Do Tejo, SA Fundacion Tecnalia Research & Innovation Cittalia-Centro Europeo Di Studi Ericerche Per I Comuni E Le Citta-Fondazione Di Ricerche Dell' Anci Stockholm University Stockholm Resilience Centre (SU-SRC) Danube Delta National Institute for Research & Development (INCDDD) Eawag, the Swiss Federal Institute of Aquatic Science and Technology International Union for Conservation of Nature (IUCN) BC3 - Basque Centre for Climate Change

Project Description

BRODISE project wants to mobilize public and private purchasers and networks of cities in the field of soil decontamination, not (just) to networking and to create awareness, but to put the innovation process in action, to understand in-depth the technology state of the art and the innovation gap to be addressed by significant R&D, to structure and design a joint R&D procurement initiative, leveraging the complementarity of the consortium partners to bring together the demand in order to create a critical mass to acquire cost effective and innovative solutions, whilst creating new jobs and opportunities for business growth in Europe, with particular reference to SMEs.

Public procurement represents +/-19% of the EU's GDP. Historically a small and slower uptake of innovations has been witnessed along with the fragmentation of public demand. PE represents a fundamental driver of innovation and competitiveness. Urban regeneration conducted by Bilbao confirms that the development of mixed formulas public-private for projects of mutual interest entails higher quality, effectiveness+efficiency in the management of public services. Innovation procurement of products and services can (I) be used to deliver societal objectives requiring new solutions not available on the market or too expensive, (II) solve problems related the commercialization of innovative solution, (III) improve quality+efficiency of public services with better value for money.

BC3's contribution to the project

BC3 is partner of a consortium led by Bilbao Town Hall in joint collaboration with 11 other partners. "Brownfield Decontamination in Southern Europe". Coordination and Support Action for the Commission. PI _Dr. Ibon Galarraga.

Key BC3 researchers involved

Dr. Ibon Galarraga
Ignacio Palomo

Link with BC3 Research Line

Climate Policy

Acknowledgement

This project has received funding from the European Union Horizon 2020 research and innovations programme under grant agreement Nº 642045.

URL Address

http://www.brodise.eu/servlet/Satellite/brodise/eng/home

3.2 RESEARCH PROJECTS

RESEARCH PROJECTS: HIGHLIGHTS

European Commission or other international funding programs

H2020 TRANSRISK

GRANT AGREEMENT:	GA 642260
NAME OF THE PROJECT:	TRANSRISK "Transitions pathways and risk analysis for climate change mitigation and adaption strategies"
FUNDING AGENCY:	The European Union Horizon 2020 research and innovations programme
TYPE:	H2020-SC5-3-2014
TIME FRAME:	2015-2018
FUNDING:	797.331 €
PARTNERS:	University Of Sussex - Coordinator BC3 Basque Centre For Climate Change - Klima Aldaketa Ikergai Cambridge Econometrics Limited Stichting Energieonderzoek Centrum Nederland Fundacja Naukowa Instytut Badan Strukturalnych Eidgenoessische Technische Hochschule Zuerich Stichting Joint Implementation Network Stiftelsen The Stockholm Environment Institute Universitaet Graz University Of Piraeus Research Center National Technical University Of Athens - NTUA Pontificia Universidad Catolica De Chilertner

Project Description

Both the models concerning the future climate evolution and its impacts, as well as the models assessing the costs and benefits associated with different mitigation pathways face a high degree of uncertainty. There is an urgent need to not only understand the costs and risks associated with climate change but also the risks, uncertainties and co-effects related to different mitigation pathways as well as public acceptance (or lack thereof) of low-carbon (technology) options.

The main aims and objectives of TRANSrisk therefore are to create a novel assessment framework for analysing costs and benefits of transition pathways, that will integrate well-established approaches to modelling the costs of resilient, low-carbon pathways with a wider interdisciplinary approach including risk assessments. In addition TRANSrisk aims to design a decision support tool that should help policy makers to better understand uncertainties and risks and enable them to include risk assessments into more robust policy design.

BC3's contribution to the project

BC3 leads one of the key workpackages of the project which will evaluate the synergies and risks of different energy transition to a low carbon economy.

Key BC3 researchers involved

Prof. Anil Markandya
Dr. Mikel González
Dr. Iñaki Arto
Dr. Marc Neumann
Dr. Cristina Pizarro
Dr. Dirk Van De Ven
Jon Sampedro

Link with BC3 Research Line

Low Carbon

Acknowledgement

This project has received funding from the European Union Horizon 2020 research and innovations programme under grant agreement Nº 642260.

URL Address

http://transrisk-project.eu/

3.2 RESEARCH PROJECTS

RESEARCH PROJECTS: HIGHLIGHTS

European Commission or other international funding programs

H2020 RESIN

GRANT AGREEMENT:	GA 653522
NAME OF THE PROJECT:	RESIN "Climate Resilient Cities and Infrastructures"
FUNDING AGENCY:	The European Union Horizon 2020 research and innovations programme
TYPE:	H2020-SC5-3-2014
TIME FRAME:	2015-2018
FUNDING:	258.876 €
PARTNERS:	Netherlands Organisation for Applied Scientific Research (coordinator) Fraunhofer IAIS Tecnalia ICLEI Europe Standardisation Institute of the Netherlands (NEN) Arcadis Nederland ITTI Sp. z o.o. Siemens Österreich Siemens Deutschland Uniresearch The University of Manchester Comenius University of Bratislava BC3 - Basque Centre for Climate Change School of Engineering of the City of Paris (EIVP) Greater Manchester City of Bratislava City of Bilbao

Project Description

With most of its population and capital goods concentrated in urban areas, cities are key to the European economy. One of the major challenges cities face are more frequent extreme weather events due to climate change. The current diversity of approaches and methods available for cities developing an adaptation strategy limits the comparability between cities of vulnerabilities, adaptation options, infrastructures, etc., and, as a result, the resilience capability. The lack of standardized information to prioritize and select appropriate adaptation options restricts the exchange of experiences between cities. The objective of RESIN is to provide standardised methodologies for vulnerability assessments, performance evaluations of adaptation measures, and for decision support tools supporting the development of robust adaptation strategies tailored to the city. To this end, RESIN aims to create a common unifying framework that allows comparing strategies, results and identification of best practices by: Creating an urban typology that characterises European cities based on different socio-economic and biophysical variables. Delivering standardised methods for assessing climate change impacts, vulnerabilities, and risks; providing an inventory of adaptation measures and developing standardised methods to assess the performance of such adaptation measures. Collaborating closely with 4 'case cities' for practical applicability and reproducibility, and with European Standardisation organisations to ensure a systematic (standardised) implementation. Integrating findings in a coherent framework for the decision making process, with associated methods, tools and datasets. The consortium consists of 17 partners from 8 different European countries, experienced in urban resilience and climate change, and combining theory (knowledge institutes/universities) with practice (cities, consultancies, network organisation, standardisation institute).

Key BC3 researchers involved

Prof. Anil Markandya
Ambika Markanday
Dr. Ibon Galarraga
Dr. Sebastien Foudi
Dr. Marta Olazabal

Link with BC3 Research Line

Low Carbon
Climate Policy

Acknowledgement

This project has received funding from the European Union Horizon 2020 research and innovations programme under grant agreement Nº 653522.

URL Address

http://www.resin-cities.eu/home/

3.2 RESEARCH PROJECTS

RESEARCH PROJECTS: HIGHLIGHTS

European Commission or other international funding programs

H2020 AQUACROSS

GRANT AGREEMENT:	GA 642317
NAME OF THE PROJECT:	AQUACROSS "Knowledge, Assessment, and Management for AQUAtic Biodiversity and Ecosystem Services aCROSS EU policies"
FUNDING AGENCY:	The European Union Horizon 2020 research and innovations programme
TYPE:	H2020-SC5-6-2014
TIME FRAME:	2015-2018
FUNDING:	282.736 €
PARTNERS:	Ecologic Institute - Coordinator Leibniz Institute of Freshwater Ecology and Inland Fisheries (FVB-IGB) Intergovernmental Oceanographic Commission of the United Nations Educational, Scientific and Cultural Organization (IOC-UNESCO) Stichting Dienst Landbouwkundig Onderzoek (IMARES) Fundación IMDEA Agua (IMDEA) University of Natural Resources & Life Sciences, Institute of Hydrobiology and Aquatic Ecosystem Management (BOKU) Universidade de Aveiro (UAVR) ACTeon – Innovation, Policy, Environment (ACTeon) University of Liverpool (ULIV) Royal Belgian Institute of Natural Sciences (RBINS) University College Cork, National University of Ireland (UCC) Stockholm University, Stockholm Resilience Centre (SU-SRC) Danube Delta National Institute for Research & Development (INCDDD) Eawag, the Swiss Federal Institute of Aquatic Science and Technology (Eawag) International Union for Conservation of Nature (IUCN) BC3 - Basque Centre for Climate Change

Project Description

AQUACROSS seeks to expand current knowledge and foster the practical application of the ecosystem-based management (EBM) concept for all aquatic (freshwater, coastal, and marine) ecosystems (as a continuum) by contributing to the development of robust and cost-effective responses integrated management practices, and innovative business models addressing current and future changes in major drivers and pressures, integrated management practices, and innovative business models. It thereby provides an unprecedented effort for seeking synergies and overcoming barriers between policy objectives, concepts, knowledge, data streams, and management approaches for freshwater, coastal, and marine ecosystems to support the timely achievement of the targets set out by the EU 2020 Biodiversity Strategy and the Strategic Plan for Biodiversity (2012-2020) adopted at COP10 of the Convention on Biological Diversity (CBD). AQUACROSS has four key objectives:

I. To support the coordinated implementation of the EU 2020 Biodiversity Strategy and international biodiversity targets for an improved functioning of aquatic ecosystems as a whole;

II. To explore, advance and support the implementation of the Ecosystem-Based Management concept across aquatic ecosystems in the EU and beyond for the purpose to enhance human wellbeing;

III. To specifically identify and test robust, cost-effective and innovative management and business models and tools for seizing all the opportunities offered by aquatic ecosystems services that correspond to the objectives and challenges faced by stakeholders, businesses, and policy makers; and,

IV. To mobilize policy makers, businesses, and societal actors at global, EU, Member State, and case study levels in order to learn from real-world experiences with EU policy implementation and to co-build and test assessment frameworks, concepts, tools, management approaches, and business models, to ensureing end-users uptake of project results.

BC3's contribution to the project

BC3, as a partner of the project, is supporting 3 case studies using the ARIES ecosystem service mapping and contributes to the model integration and scenario-building approaches, as well as to the development of the online information platform.

Key BC3 researchers involved

Dr. Ferdinando Villa
Dr. Javier Martínez
Dr. Stefano Balbi
Dr. Marta Pascual
Dr. Marta Olazabal

Link with BC3 Research Line

Climate and Natural Environment

Acknowledgement

This project has received funding from the European Union Horizon 2020 research and innovations programme under grant agreement Nº 642317.

URL Address

http://aquacross.eu/

3.2 RESEARCH PROJECTS

RESEARCH PROJECTS: HIGHLIGHTS

European Commission or other international funding programs

H2020 GLANCE

GRANT AGREEMENT:	GA 659549
NAME OF THE PROJECT:	GLANCE "calculatinG heaLth impActs of atmospheric pollutioN in a Changing climatE"
FUNDING AGENCY:	The European Union Horizon 2020 research and innovations programme
TYPE:	H2020-MSCA-IF-2014-EF - Marie Sklodowska-Curie Individual Fellowships (IF-EF)
TIME FRAME:	2015-2017
FUNDING:	158.122 €

Project Description

Current annual global estimates of premature deaths from poor air quality are estimated in the range of 2.6-4.4 million, and 2050 projections are expected to double against 2010 levels. In Europe, annual economic burdens are estimated at around 750 bn €. Climate change will further exacerbate air pollution burdens; therefore, a better understanding of the economic impacts on human societies has become an area of intense investigation. European research efforts are being carried out within the MACC project series, which started in 2005. The outcome of this work has been integrated into a European capacity for Earth Observation, the Copernicus Atmospheric Monitoring Service (CAMS). In MACC/CAMS, key pollutant concentrations are computed at the European scale and globally by employing chemically-driven advanced transport models. In GLANCE, an integrated assessment model is developed for calculating the health impacts and damage costs of air pollution at different physical scales. It combines MACC/CAMS (assimilated Earth Observations, an ensemble of chemical transport models and state of the art ECWMF weather forecasting) with downscaling based on in-situ network measurements. The strengthening of modeled projections through integration with empirical evidence therefore reduces errors and uncertainties in the health impact projections. In addition, GLANCE will yield improved data accuracy at different time resolutions. This project is a multidisciplinary approach which brings together leading experts from natural sciences and socioeconomic fields. GLANCE benefits the European community by contributing a novel approach to assess impacts of air quality at the local and regional levels, thus benefiting to long running EU commitments, while exploring new pathways for exploiting earth observational data.

BC3's contribution to the project

Marie Sklodowska Curie Felllowship of Dr. Leif Vogel.

Key BC3 researchers involved

Dr. Leif Vogel. (Supervised by Dr. Sérgio H. Faría)

Link with BC3 Research Line

Health and Climate

Acknowledgement

GLANCE received funding from the Horizon 2020 - The Framework Programme for Research and Innovation - European Commission.

URL Address

http://cordis.europa.eu/project/rcn/195811_en.html

3.2 RESEARCH PROJECTS

RESEARCH PROJECTS: HIGHLIGHTS

European Commission or other international funding programs

FP7_BASE

GRANT AGREEMENT:	GA 308337
NAME OF THE PROJECT:	BASE "Bottom-up Climate Adaptation Strategies towards a Sustainable Europe"
FUNDING AGENCY:	7th Framework Programme
TYPE:	FP7-ENV-2012-two-stage (European Commission)
TIME FRAME:	2012-2016
FUNDING:	302.056 €
PARTNERS:	**Aarhus Universitet** (Denmark) - Coordinator **Ecologic Institut** (Germany) **Fundacao da faculdade de ciencias da Universidade de Lisboa** (Portugal) **Centro Euro-Mediterraneo sui cambiamenti Climatici Scarl** (Italy) **Helmholtz/zentrum fuer umweltforschung** (Germany) **The University of Exeter** (United Kingdom) **Stichting Deltares** (Netherlands) **BC3 Basque Centre for Climate Change** (Spain) **Suomen Ymparistokeskus** (Finland) **Istituto Superiore per la Protezione e la Ricerca Ambientale** (Italy) **Centrum Vyzkumu Globalni Zmeny** (Czech Republic) **University of Leeds** (United Kingdom) **Universidad Politécnica de Madrid (Spain)** **Fonden Teknologirådet** (Denmark)

Project Description

Climate change can disrupt ecological, social and economic systems, with some regions and sectors suffering significantly. Therefore, adaptation plays a paramount role in responding to climate change. Progress has been made, but there are still important obstacles. Knowledge of the benefits and costs of adaptation is sparse, unsystematic and unevenly distributed across sectors and countries. Planning suffers from substantial uncertainties in terms of precise impacts. It is also difficult to reconcile the bottom-up nature of adaptation with top-down strategic policy making on adaptation

To address these challenges BASE:

• Improve adaptation knowledge availability, integration and utilization Case studies will be used to understand facilitators of, and barriers to, adaptation. Over 20 cases have been selected to cover the diversity of adaptation, simultaneously paying attention to the need for generalization and comparability. The gap between top-down strategic assessments of costs and benefits and empirical context-sensitive bottom-up analyses will be bridged using novel combinations of models and qualitative analyses.

• Promote and strengthen stakeholder participation in adaptation BASE will support stakeholder involvement through novel participatory and co-design techniques. Successful bottom-up initiatives will be studied, and the use of knowledge, two-way learning, the role of social media and other awareness raising methods and tools will be explored.

• Support coherent, multi-level, multi-sector integrated adaptation policies BASE will provide policy guidelines by integrating lessons from past experiences, case studies, insights provided by modeling and stakeholder participation. Issues of multilevel, cross sectoral and inter-temporal governance that are presently weakly tackled will be highlighted. Potential conflicts and synergies of adaptation with other important policies will be explored to overcome constraints caused by context-related inertias"

BC3's contribution to the project

BC3, partner of the project, is in charge of carrying out a cost-benefit analysis for a specific case study, the uncertainty analysis and contributes to the integration between top-down and bottom-up approaches.

Key BC3 researchers involved

Prof. Anil Markandya
Dr. Aline Chiabai
Dr. Ibon Galarraga
Dr. Marc Neumann
Dr. Sebastien Foudi
Dr. Josue Polanco
Dr. Marta Olazabal

Link with BC3 Research Line

Health and Climate
Climate and Natural Environment

URL Address

http://base-adaptation.eu/

3.2 RESEARCH PROJECTS

RESEARCH PROJECTS: HIGHLIGHTS

European Commission or other international funding programs

FP7_COMPLEX

GRANT AGREEMENT:	GA 308601
NAME OF THE PROJECT:	COMPLEX "Knowledge Based Climate Mitigation Systems for a Low Carbon Economy"
FUNDING AGENCY:	7th Framework Programme
TYPE:	FP7-ENV-2012-two-stage (European Commission)
TIME FRAME:	2012-2016
FUNDING:	145.808 €
PARTNERS:	**University of Newcastle Upon Tyne** (United Kingdom) - Coordinator **Universitet Twente** (Netherlands) **Sigtunastiftelsen** (Sweden) **Sveriges Lantbruksuniversitet** (Sweden) **Universita degli studi di Padova** (Italy) **Centre National de la Recherche Scientifique** (France) **Sintef Energi As** (Norway) **Internationales Institut fuer Angewandte Systemanalyse** (Austria) **Observatorio para una cultura del Territorio** (Spain) **Stockholms Universitet** (Sweden) **Scientific foundation Nansen International Environmental and Remote Sensing Centre** (Russian Federation) **Nederlandse Organisatie voor Toegepast Natuurwetenschappelijk Onderzoek** (Netherlands) **Institut National de Recherche en Sciences et Technologies pour l'environnement et l'agriculture** (France) **Electricite de France** (France) **University of Sussex** (United Kingdom) **BC3 Basque Centre for Climate Change** (Spain) **Max Plank Gesellschaft zur foerderung der Wissenschaften** (Germany)

Project Description

The science of complex systems distinguishes linear from non-linear dynamics. Simpler systems can often be satisfactory described by linear models, but complex systems require non-linear models that can capture more of the characteristics of such systems, such as thresholds, feedback loops, avalanche effects, and irreversibility.

Linear systems can be validated by aligning models to the past and using the model to predict the future. Non-linear systems, however, are often time-asymmetric - they can be explained with the wisdom of hindsight, but are not always predictable. For example, systems may respond sharply to minor perturbations, and the quality of this response is a measure of the system resilience. In practice, non-linear dynamics are significant both at the micro-scale of small history and at the macro-scale of deep time. The brilliant young scientist, for example, may experience a series of epiphanies that change his/her understanding and behaviour in an unpredictable and irreversible way. The scientific community as a whole may experience an innovation-cascade that has a similar effect on a much larger scale.

Current models of climate change and carbon emission assume the immediate past is a reasonable guide to the future. They struggle to represent the complex causal structures and time-asymmetries of many socio-natural systems. COMPLEX will integrate the quasi-classic models of meso-scale processes with our best understanding of fine-grained space-time patterns and the system-flips that are likely to occur in the long interval between now and 2050. We believe the sub-national region is the key point of entry for studying climate change and its cause-effect interrelations. It is small enough to be sensitive to local factors, large enough to interact with supra-national agencies and stable enough to be historically and culturally distinctive. In addition to undertaking case studies in Norway, Sweden, Netherlands, Spain and Italy, A suite of modelling tools and decision-support systems are being developed to inform national and supra-national policy and support communities across Europe working to make the transition to a low-carbon economy.

BC3's contribution to the project

BC3 one of the partners in a consortium of 17, develops the models for Mitigation Systems for a Low Carbon Economy.

Key BC3 researchers involved

Prof. Anil Markandya
Dr. Mikel González
Dr. Iñaki Arto
Dr. Kishore Dhavala
Dr. Xaquin García

Link with BC3 Research Line

Low Carbon
Climate Policy

URL Address

www.complex.ac.uk/

3.2 RESEARCH PROJECTS

RESEARCH PROJECTS: HIGHLIGHTS

European Commission or other international funding programs

Department
for Environment
Food & Rural Affairs

DEFRA_DIETARY N USE

GRANT AGREEMENT:	AC0122
NAME OF THE PROJECT:	"Optimising the efficiency of dietary nitrogen use to reduce emissions and waste in dairy systems"
FUNDING AGENCY:	UK Department for Environment, Food and Rural Affairs
TIME FRAME:	2013-2018
FUNDING:	57.441 €

Project Description

Dairy farmers typically feed diets with higher concentrations of crude protein (CP) than the animals require, ensuring an adequate supply of metabolisable protein to achieve the maximal production of milk and milk protein. Dietary protein is used inefficiently by dairy cows, with approximately 72% of nitrogen intake excreted in manure. Nitrogen excretion is a significant environmental concern due to nitrate (NO3) leaching contributing to aquatic eutrophication, and nitrogen lost to the atmosphere as ammonia (NH3) and nitrous oxide (N2O). Nitrogen excretion in manure is highly correlated with dietary nitrogen intake, thus one option for reducing nitrogen excretion is to feed less protein. Thus while there may be clear benefits of offering lower protein diets, this strategy will only be acceptable to dairy farmers if it can be achieved without a significant reduction in milk and milk solids production and without having any detrimental effects on health and fertility.

BC3's contribution to the project

BC3 is a subcontractor to modify SIMSDAIRY model, conduct sensitivity analysis and carry out model runs.

Key BC3 researchers involved

Dr. Agustin del Prado

Link with BC3 Research Line

Climate and Natural Environment

URL Address

http://sciencesearch.defra.gov.uk/Default.aspx?Module=More&Location=None&ProjectID=17793

3.2 RESEARCH PROJECTS

RESEARCH PROJECTS: HIGHLIGHTS

European Commission or other international funding programs

Bundesministerium
für Umwelt, Naturschutz,
Bau und Reaktorsicherheit

BMU_WISEUP

GRANT AGREEMENT:	13_II_102_Africa_A_WISE-UP
NAME OF THE PROJECT:	WISE UP "Water Infrastructure Solutions from Ecosystem Services Underpinning Climate Resilient Policies and Programmes"
FUNDING AGENCY:	German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety
TYPE:	International Climate Initiative 2012 (German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety)
TIME FRAME:	2013–2017
FUNDING:	478.276 €
PARTNERS:	The International Union for Conservation of Nature (UICN) - Coordinator BC3 Basque Centre for Climate Change Council for Scientific and Industrial Research University of Nairobi International Water Management Institute University College London Overseas Development Institute

Project Description

Major new climate financing for adaptation is coming on stream with water infrastructure as a priority. Ecosystem services need to be linked more directly and clearly into water infrastructure development, for climate change adaptation and integration into water, food and energy security. If river basins themselves are treated as natural infrastructure, based on the ecosystems services they provide, then infrastructure planning and investment can consider alternate 'portfolios' of built and natural infrastructure. This project will develop, test and demonstrate approaches to using portfolios of built and natural water infrastructure development to achieve more optimal outcomes for the multiple goals of poverty reduction, water-food-energy security, biodiversity conservation and climate resil-ience. WISE-UP will demonstrate the application of natural infrastructure as a 'nature-based solution' for climate change adaptation and more sustainable development in the Volta and Tana river basins of West and East Africa respectively.

The project will increase adaptive capacity for climate change in the Volta and Tana basins through identification of optimised portfolios of built and natural water infrastructure in decision making and consensus building. The project will collect and synthesise hydrological, ecological and economic data, enabling development and testing of innovative applications of cutting edge optimisation of multiple objectives for basin infrastructure. New evidence and tools will be tailored through participatory learning to end user needs, supported by analysis of political, institutional and stakeholder dynamics in decision making. Capacity building and communications will disseminate results, lessons, skills and rec-ommendations from the project regionally and globally. The project will contribute directly to realising the 'nexus opportunities' identified at the Bonn 2011 Conference on water, food and energy security, while facilitating action on the Aichi targets for biodiversity. An open-source platform will make evidence and tools from the project available to national experts and consultants to support development of new national and regional knowledge-based business.

BC3's contribution to the project

BC3 is a partner of a consortium to provide Economic valuation and benefits of Water Infrastructure Solutions from Ecosystem Services Underpinning Climate Resilient Policies and Programmes.

Key BC3 researchers involved

Prof. Anil Markandya
Dr. Marc Neumann
Dr. Amaia de Ayala
Laetitia Pettinotti

Link with BC3 Research Line

Climate Policy

URL Address

https://www.iucn.org/theme/water/our-work/wise-climate

3.2 RESEARCH PROJECTS

RESEARCH PROJECTS: HIGHLIGHTS

MINECO or Spanish Institutions

MINECO_OPTIBARN

GRANT AGREEMENT:	ERA44-OPTIBARN-BC3 618105 FACCE Era Net Plus
NAME OF THE PROJECT:	OPTIBARN "Optimised animal specific barn climatisation facing temperature rise and increased climate variability"
FUNDING AGENCY:	MINECO – National Institute for Agricultural and Food Research and Technology (INIA).
TYPE:	FACCE ERA-NET Plus Initiative Climate Smart Agriculture
TIME FRAME:	2014-2017
FUNDING:	150.000 €
PARTNERS:	**Leibniz Institute for Agricultural Engineering Potsdam-Bornim** - Coordinator **Potsdam Institute for Climate Impact Research** **Aarhus University** **Agricultural Research Organisation of Israel, The Volcani Centre** **BC3 Basque Centre for Climate Change** **Universitat Politècnica de València** **National Centre for Engineering in Agriculture, University of Southern Queensland** (Australia) - Associated partner

Project Description

OptiBarn tends to develop region-specific, sustainable adaptation strategies for dairy housing, focusing on an optimised climatisation of naturally ventilated buildings (NVB). Naturally ventilated buildings are particularly vulnerable to climate change since the indoor climate strongly depends on the extremes and variability of the outdoor climate. Without sound adaptation strategies, increased climate variability will result in a sub-optimal thermal environment in many livestock buildings impairing production and welfare of animals. Appropriate construction methods and management of the buildings can improve the thermal control and provide precise identification of factors affecting the thermal control capacity of the buildings under commercial farm conditions.

BC3's contribution to the project

"ERA-net+" coordinated by INIA. PI, Dr. Agustin del Prado.

Key BC3 researchers involved

Dr. Agustín Del Prado
Dr. Elena Galán

Link with BC3 Research Line

Climate and Natural Environment

URL Address

www.optibarn.atb-potsdam.de/en/optibarn.html

3.3 Collaborators

In BC3, we operate under the philosophy that effective research can only be conducted in collaboration with other research groups. As a result, BC3 researchers were directly involved in collaborative research projects, dissemination and training activities both locally and worldwide. Besides, our international collaboration programs have enabled us to establish collaborations and own networks that span five continents.

This networking involves:

- THE DEVELOPMENT OF SHARED RESEARCH PROJECTS.
- THE EXCHANGE OF RESEARCHERS.
- THE EXCHANGE OF PHD STUDENTS.
- THE TRANSFER OF BEST PRACTICES.
- THE COOPERATION AND PARTICIPATION IN DISSEMINATION AND TRAINING ACTIVITIES.

In 2015, we were actively involved in attracting external funds from international funding bodies, with a special focus on the European Union Research projects (H2020), which also were an interesting way of creating scientific networks, collaboratively with the consortium partners.

The research lines maintained their collaboration with the most prestigious universities and research centres at international level among which we stand out the following during 2015: Nagaoka University. Technology (Japan), University of Belfast (Ireland), University of Leicester (United Kingdom), among others.

Our visiting programme was another important way to attract international and national climate change experts to the Basque Country, as well as to begin new relationships with other institutions.

Al local scope, we would like to remark that the University of the Basque Country (UPV / EHU) is our academic partner and therefore the joint work carried out covers different areas such as research, training and scientific dissemination. Since our centre was created in 2008, we have kept a close relationship with UPV/EHU and, over the years, we have consolidated different programs: joint seminars, the Klimagune Workshop, our participation in the "EUSKAMPUS" initiative, collaboration in various proposals and research projects or in masters and doctoral programs, among others.
More specifically, we led the integration of agents that are currently active in the fields of climate change research in the Basque Country and made an important effort to place the Klimagune initiative as part of the annual agenda of the local research groups and institutions, as well as of the local policy makers. Furthermore, we were dynamic and active part of the Basque Science, Technology and Innovation Network, promoting and collaborating in research projects with the different components of the network. During 2015 we reinforced this network to guarantee the continuation of the collaborations set.

REINFORCING COLLABORATIONS THROUGH NETWORK:

REMEDIA network
In 2011, we fostered the establishment of REMEDIA network (Scientific Network on the Mitigation of GHG Emissions from Agroforestry Activities) to promote exchanges among the researches working the mitigation of GHG emissions from agriculture and forestry sectors, as well as to exchange dissemination of scientific and strategic information with both public institutions and private sector in Spain. At an international level, this network fosters a closer research collaboration with other international networks. In 2015, the Spanish Ministry of Agriculture, Food Administration and Environmental Protection (MAGRAMA), acknowledged the importance of this initiative –nowadays made of around a hundred of researchers, spread through very diverse geographic regions and academic fields- for its contributions to the improvement of the scientific basis of the estimated GHG inventory for the Spanish agroforestry industry.

NUT_Global University Network
BC3 will coordinate the innovative project for a worldwide campus of excellence, led by the Nagaoka Technological University of Japan, which in 10 years will make possible the creation of a "Global University", which will facilitate the international mobility of students and researchers, and will strengthen the international presence of SMEs in the field of sustainable technologies. This exchange model is a strategic initiative of the Japanese government to generate a global campus of excellence, with permanent connections in countries such as Germany, South Africa, Vietnam and Mexico. According to their estimates, the project will be fully deployed in a decade, and will count on with an average of 900 participants annually. The program is entirely financed by the Japanese government, through endowments intended for this purpose.

The agreement was made possible by the work done by the BC3 team, led by Professor Ikerbasque and researcher Ramón y Cajal, Sérgio Henrique Faria, with the collaboration of BIZKAIA: TALENT, the association promoted by the Provincial Council of Bizkaia to attract, retain and link highly qualified people to Bizkaia (Basque Country), in the scientific, technological and business fields.

3.3 Collaborators

Some of our collaborators in 2015

Aarhus University (Denmark)
Aberystwyth University - IBERS International (UK)
Amherst College (USA)
Ayuntamiento de Bilbao (Spain)
Bangor University (UK)
Basque Center for Applied Mathematics BCAM (Spain)
Center for International Forestry Research (CIFOR) (Indonesia)
Centre d'Ecologie Fonctionnelle et Evolutive – CNRS (France)
Centro de Investigación y Formación Agrarias de Cantabria(CIFA)(Spain)
Centro de Investigaciones Energéticas, Medioambientales y Tecnológicas – CIEMAT (Spain)
Centro Euro-Mediterraneo per i Cambiamenti Climatici (CMCC)(Italy)
Charles University Environment Centre (Czech Republic)
CIBIO-InBIO, Universidade de Évora (Portugal)
CICERO (Norway)
CIFOR (CGIAR) Livelihood System Program (International)
Colorado State University (USA)

Danish Board of Technology (Denmark)
Dept. of Fisheries Management and Marine Research, Echebaster Fleet SLU, Bermeo (Spain)
Eawag, the Swiss Federal Institute of Aquatic Science and Technology (Switzerland)
Ecologic Institute International and European Environmental Policy (Germany)
Economics for Energy - University of Vigo (Spain)
Environment and Water – CEEW (India)
ETH Zurich (Switzerland)
European Environmental Agency (Europe)
Fondazione Eni Enrico Mattei (FEEM) (Italy)
ICRA - Catalan Institute for Water Research (Spain)
Ifo Munich (Germany)
IH Cantabria (Spain)
IHOBE (Spain)
INRA (France)
Institute for Polar and Marine Research AWI (Germany)
Institute for Prospective and Technological Studies (IPTS) – Joint Research Centre (European Commission) (Spain)

Instituto Carlos III (Spain)
International Centre for Integrated Mountain Development (ICIMOD), (Nepal)
International Institute for Environment and Development (IIED) (UK)
IRSTEA (Spain)
ISIS (Italy)
Jadavpur University (India)
Leibniz Institute for Agricultural Engineering and Bioeconomy (ATB) (Germany)
London School of Hygiene and Tropical Medicine (UK)
National Authority for Remote Sensing and Space Sciences (Egypt)
National Taiwan University (Taiwan)
NEIKER (Spain)
New York University (USA)
NIPR - National Institute of Polar Research (Japan)
Northern Illinois University (USA)
NUT – Nagaoka University of Technology (Japan)
Osnabrueck University (Germany)

PBL (Netherlands)
PIK, Potsdam Institu für Klimafolgenforschung (Germany)
Queen's University Belfast (UK)
RISO-DTU (Denmark)
Rothamsted Research (UK)
SurfRider Foundation (France)
TERI institution (India)
The Department of Geography and the Conservation Research Institute (University of Cambridge) (UK)
Universidad Autónoma de Madrid (Spain)
Universidad de las Palmas de Gran Canaria (Spain)
Universidad de Valencia (Spain)
Universidad de Valladolid (Spain)
Universidad Juan Carlos (Spain)
Universidad Miguel Hernández de Elche (UMH) (Spain)
Universidad Pública de Navarra (UPNa) (Spain)
Universidade de Évora (Portugal)

Université de Bordeaux (France)
University Barcelona (Spain)
University College of London (UCL) (UK)
University of Aberdeen (UK)
University of Alcala (UAH)
University of Bath (UK)
University of Bristol (UK)
University of California at Santa Cruz (USA)
University of Exeter (UK)
University of Heidelberg (Germany)
University of Leicester (UK)
University of Massachusetts (USA)
University of Montpellier (France)
University of Newcastle upon Tyne (UK)
University of Oldenburg (Germany)
University of Osnabrück (Germany)

University of Palermo (Italy)
University of Southampton (UK)
University of Texas (USA)
University of the Basque Country (UPV/EHU) (Spain)
University of Wyoming (USA)
UPM (Spain)
UPN (Peru)
Vicomtech-IK4 (Visual Interaction and Communication Technologies Centre) (Spain)
Wageningen University (Netherlands)
World Bank (International)

3.4 Publications

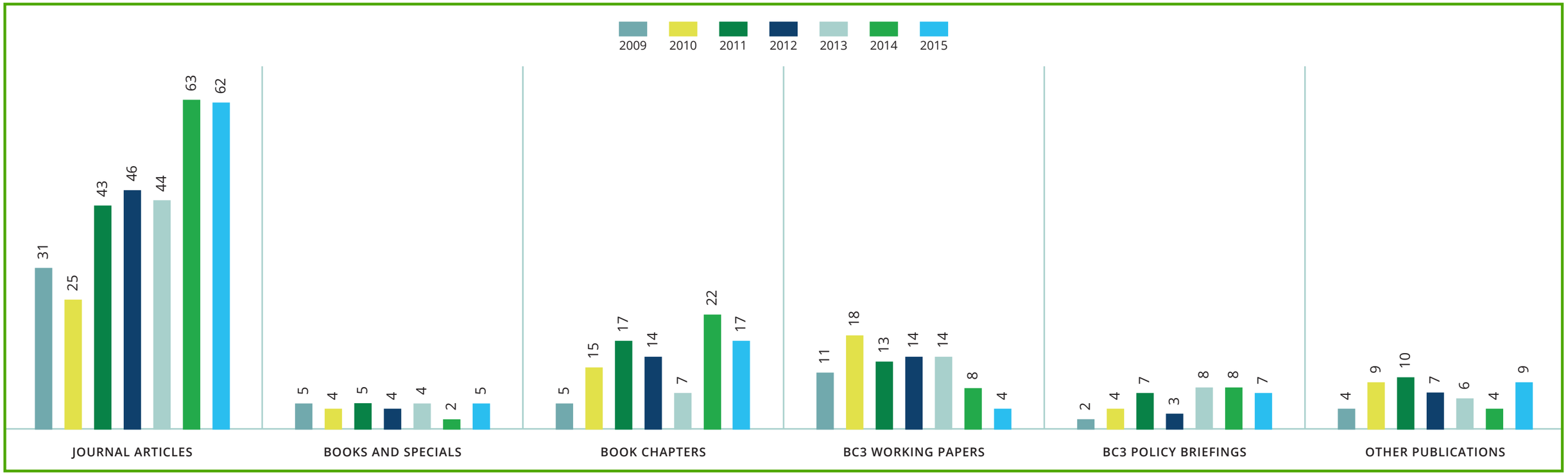
Since our creation in 2008, we have been aimed at publishing in the first-class international peer-reviewed journals and with the world-class most influential leading academic publishers. As a result, our volume of publications has increased, and so has their quality and impact.

Prove of this is that during 2015, 92% of the BC3 articles indexed in Scopus were published in first quartile (Q1) journals. These outstanding metrics, have taken us to be ranked among the top ten climate change research institutions worldwide (based on standardized ranking of ICCG (International Centre for Climate Governance). All the research lines of the centre contributed to these results through inter and multidisciplinary work in the area of climate and global change.

Following our classification system, the scientific production of the centre in 2015 was as follows:

During 2015, we published:

62 JOURNAL ARTICLES
5 BOOKS
17 BOOK CHAPTERS
4 BC3 WORKING PAPERS
7 BC3 POLICY BRIEFING and
9 TECHNICAL REPORTS.



3.4 Publications | 3.4.1 List of Publications

Journal Articles (published on-line in 2015)

1. Abadie, L.M. 2015. **Operating Flexibility at Power Plants: A Market Valuation**. International Journal of Electrical Power and Energy Systems. 64. 41-49. DOI (10.1016/j.ijepes.2014.07.011).
2. Abadie, L.M., Galarraga, I., Milford, A.B., Gustavsen, G.W. 2015. **Using Food Taxes and Subsidies to Achieve Emission Reduction Targets in Norway**. Journal of Cleaner Production. DOI (10.1016/j.jclepro.2015.09.054).
3. Albizua, A., Williams, A., Hedlund, K., Pascual, U. 2015. **Crop rotation including ley and manure can promote ecosystem services in conventional farming systems**. Applied Soil Ecology. 95. 54-61. DOI (10.1016/j.apsoil.2015.06.003).
4. Animesh K. Gain, Vahid Mojtahed, Claudio Biscaro, Stefano Balbi, Carlo Giupponi. 2015. **An integrated approach of flood risk assessment in the eastern part of Dhaka City**. Natural Hazards. DOI (10.1007/s11069-015-1911-7).
5. Arto, I., Andreoni, V., Rueda-Cantuche, J.M. 2015. **Global impacts of the automotive supply chain disruption following the Japanese earthquake of 2011**. Economic Systems Research. 27. (3) 306-323. DOI (10.1080/09535314.2015.1034657).
6. Balbi, S., Del Prado, A., Gallejones, P., Geevan, C.P., Pardo, G., Pérez-Miñana, E., Manrique, R., Hernandez-Santiago, C. and Villa, F. 2015. **Modeling trade-offs among ecosystem services in agricultural production systems**. Environmental Modelling and Software. 72. 314-326. DOI (10.1016/j.envsoft.2014.12.017).
7. Balbi, S., Giupponi, C., Olschewski, R., Mojtahed, V. 2015. T**he Total Cost of Water-Related Disasters**. Review of Economics. 66. (2) 225-249.
8. Balbi, S., Villa, F., Mojtahed, V., Hegetschweiler, K. T., and Giupponi, C. 2015. **A spatial Bayesian network model to assess the benefits of early warning for urban flood risk to people**. Natural Hazards and Earth System Sciences. 3. (10) 6615-6649. DOI (10.5194/nhessd-3-6615-2015).
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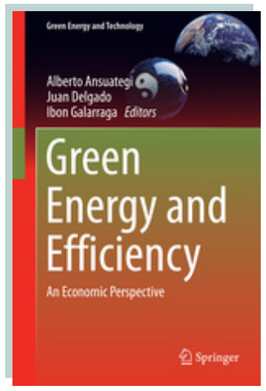

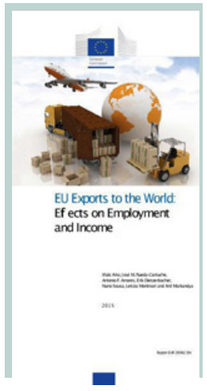

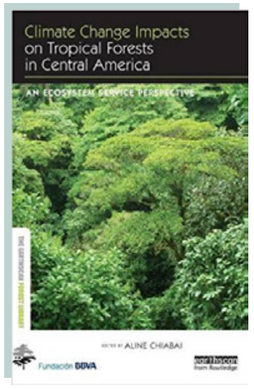

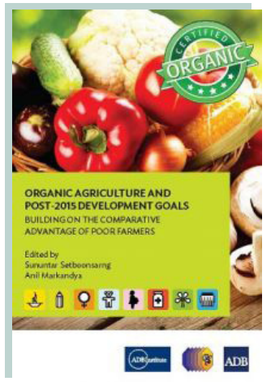

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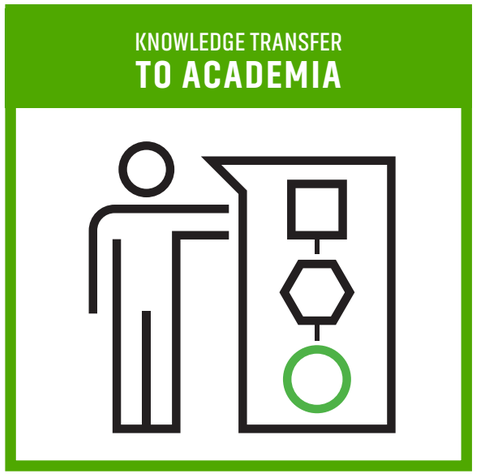
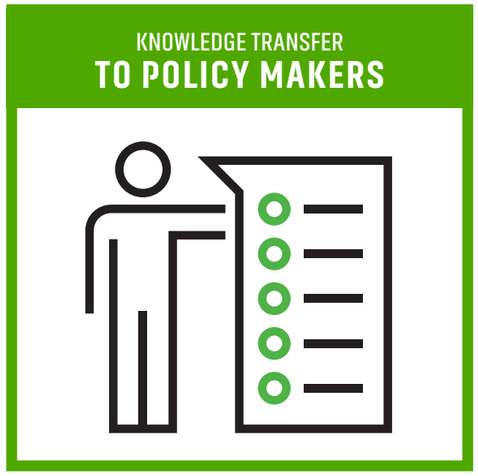
4. KNOWLEDGE TRANSFER

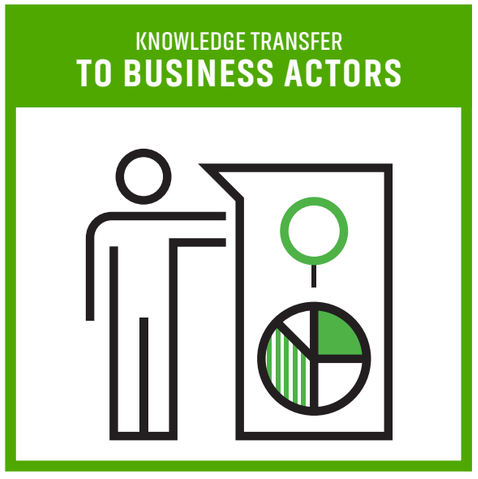
The role of science in shaping climate policies, building capabilities and raising awareness has become increasingly important, since climate change is nowadays at the top of political agendas. In fact, it is a fundamental part of our work is to contribute, through science, to the climate policy making process.

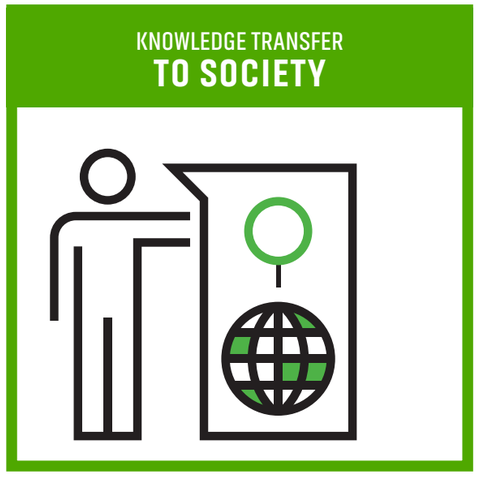
The BC3 Knowledge Transfer deployment is brought into action through the centre's Dissemination and Strategic Communication Plan (SCP) 2014-2017, which was designed in 2013 and it is being implemented since then. This plan pursues excellence in research, training and dissemination making the knowledge generated in our centre broadly available to the following target audiences:

- SCIENTIFIC COMMUNITY (ACADEMIA)
- POLICY MAKERS
- BUSINESS ACTORS
- SOCIETY









BC3's Dissemination, Training & Capacity Building and Outreach permanent initiatives

ACADEMIA | POLICY MAKERS | BUSINESS | SOCIETY

DRIVING ACTIONS

designed to disseminate and disclose rigorous information on climate change.

- **Dissemination:** of research findings in Key Scientific Meetings.
- **Dissemination:** BC3 Seminar Programme.
- **Dissemination:** BC3 Visiting Programme.
- **Dissemination:** BC3 Working Papers Serie.

TRAINING AND CAPACITY BUILDING

activities to "bridge knowledge" in terms of scientific advancements.

- **Training:** Supervised Phd and Master Students.
- **Training:** Classes given in Post graduate Courses.
- **Capacity building:** Workshops: Klimagune and ad-hoc organized events
- **Training & Capacity Building:** BC3 - UPV/EHU Summer School.
- **Training & Capacity Building:** Spring University on Ecosystem Services Modeling.
- **Capacity building:** Policy Briefing Series.
- **Capacity building:** Contribution to UNFCCC COPs.

SCIENCE EDUCATION AND PUBLIC AWARENESS

Raising awareness of Climate Change at Basque Country Scale

- **Science Education:** Training Caravan (Researchers at Classroom).
- **Public awareness in the media.**

4.1 TO ACADEMIA | 4.1.1 Dissemination in Scientific Meetings

During 2015, BC3 researchers participated in major science conferences and congresses related to their specialties all around the world. Selected contributions are listed below.

NAME OF THE CONFERENCE/CONGRESS	CITY	HOST INSTITUTION	TITLE OF THE CONTRIBUTION
11th International Conference of the European Society for Ecological Economics (ESEE)	Leeds	University of Leeds	Industrial water pollution in Uruguay and indirect spillover: sectors' subsystems through input–output analysis and geographic information systems
2015 Conference of the International Society of Industrial Ecology	Surrey	University of Surrey	Hybrid (survey and non-survey) methods for the construction of regional input-output tables with insights for their construction for Deltaic environments
23rd International Input-Output Conference	México	Universidad Nacional Autónoma de México	Policy options for designing a carbon border tax
5th World Conference on Ecological Restoration	Manchester	Society for Ecological Restoration	Ecological restoration as a tool to adapt and mitigate climate change: A social-ecological perspective
8th Ecosystem Services Partnership World Conference	Stellenbosch	Ecosystem Services Partnership	Integrating models of ecosystem services to estimate trade-offs in agro-forestry
9th IWA Symposium on Systems Analysis and Integrated Assessment (WATERMATEX2015)	Gold Coast, Queensland	University of Queensland	The statistical description of model bias as a method to account for model structure errors
EAERE Annual Conference	Helsinki	EAERE	What Role Can Taxes and Subsidies Play in Changing Diets? An Application from Spain
European Climate Change Adaptation conference - ECCA 2015	Copenhagen	Confederation of Danish Industry	Fuzzy Cognitive Mapping to enhance climate change adaptation to heatwaves in the city of Madrid
European Social Simulation Association (ESSA 2015)	Groningen	University College Groningen	Design of an empirical agent-based model to explore rural household food security within a developing country context
Regions and Climate Change: a major challenge for local communities. Side event at the COP 21	Paris	UNFCCC	The Role of Regional Governments in Climate Change Policy
UHINAK - I. Cross border conference on climate and coastal change	Irun	FICOBA Foundation	Economic impacts of sea-level rise on the Basque coast
VI Jornadas de Análisis Input-Output	Barcelona	Universitat de Barcelona	The role of international spill-overs in the distribution of the economic impacts of climate finance
XIII Congreso Español de Salud Ambiental	Cartagena	Sociedad Española de Sanidad Ambiental	Evolución de la Mortalidad Asociada a las Bajas Temperaturas según Grupos de Edad en Madrid.

4.1 TO ACADEMIA | 4.1.2 Supervised post-graduate students

As one of the BC3 training key activities, during 2015 the following PhD and Master students were supervised by BC3's knowledge body.

PhD Students

TITLE	PhD STUDENT	SUPERVISOR
On sea level rise on the Basque Coast: evidence and economic valuation	Elisa Sainz de Murieta	Ibon Galarraga
Economics of Climate Finance	Maria Victoria Román	Dirk Rübbelke and Iñaki Arto
Combined application of cost–benefit analysis and multi-criteria analysis for decision support in air quality management policy: a case study in the metropolitan area of Lima and El Callao, Peru	Gerardo Sánchez	Aline Chiabai
Coupling models and life cycle assessment to evaluate agricultural mitigation strategies involving organic resources management	Guillermo Pardo	Agustin del Prado
Political Ecology of soil management	Amaia Albizua	Unai Pascual
Development of a methodology for optimum design of wastewater treatment plants under uncertainty	Mansour Talebizadeh	Marc Neumann
Distributional implications of environmental policies	Xaquín García	Mikel González Ruiz de Eguino
Energy and climate policy interactions: an Integrated Assessment modelling approach	Iñigo Capellán	Mikel González Ruiz de Eguino
Statistical analysis of climate and paleoclimate records	Gonzalo Morcillo ES	Sérgio H Faria
Modelling of public opinion and awareness of climate change	Itxaso Ruiz	Sérgio H Faria
Implications of uncertainties for adaptation decision making in the agriculture sector	Alina Tepes	Ibon Galarraga
On economics of adaptation	Ambika Markanday	Ibon Galarraga
Integrated Assessment and behavioural options for mitigation	Dirk Jan Van de Ven	Mikel González Ruiz de Eguino and Iñaki Arto
Economics of ecosystem services	Laetitia Pettinotti	Anil Markandya
Integrated Assessment and the co-benefits of mitigation	Jon Sampedro	Mikel González Ruiz de Eguino and Iñaki Arto
A socio-institutional analysis of wildlife conservation in Africa	Giulia Wegner	Unai Pascual
Multicriteria evaluation of sustainable tourism development projects	Juan Luis Eugenio Martin	Unai Pascual

Master students

TITLE	MASTER STUDENT	SUPERVISOR
Multilevel governance and climate change: the case of Zorrotzaurre (Bilbao, Spain).	Venera Pavone	Elisa Sainz de Murieta
International advances towards urban climate adaptation: In-depth analysis on the urban water sector	Sara Altamore	Marta Olazabal
Assessing Ecosystem based Adaptation from a socio-ecological perspective	Imanol Oquiñena	Elena Ojea Fernandez-Colmeiro
Propuesta de Inclusión de Enfoque de Manejo Adaptativo a Planes de Adaptación al Cambio Climático	Xabier Lecanda	Anil Markandya
Aspectos territoriales e impactos ambientales desde la responsabilidad del productor y del consumidor: Una aplicación a las huellas de carbono en España	Diego Sesma	Ignacio Cazcarro
Tesis de Máster: Estimación de los cambios en los stocks de carbono del suelo a escala regional: Impacto de los usos del suelo y del manejo en la Comunidad Autónoma de Aragón	Asma Jebari	Agustin del Prado Santeodoro

During 2015, Sérgio H. Faria also supervised the practices of a student of the Chemical Engineering Master of UPV / EHU, Saray Ramos.

4.1 TO ACADEMIA | 4.1.3 Classes given in post-graduate courses

Among our training activity drivers, we may also find the classes offered by our researchers' body in post-graduate and advanced courses in different international universities during the year.

TYPE OF COURSE	TITLE OF COURSE	UNIVERSITY
Advanced course	ARIES training for urban watershed management.	Metro Vancouver, Canada
Advanced course	Course on Adaptation to Climate Change	Graduate school in Kaunas University, Lithuania
Advanced course	Acción climática local. Postgraduate course on Climate Change. Organised by FLACSO, Seo/BirdLife, WWF España, Greenpeace, FUHEM and Ecologistas en Acción. Collaborating Universidad de Salamanca and Universidad Camilo José Cela.	Universidad de Salamanca and Universidad Camilo José Cela
Advanced course	Transición energética en Euskal Herria: Sostenibilidad y Democracia Energética	UPV/EHU
Advanced course	I Curso de economía ecológica	UPV/EHU
Master course	Climate change policy	European Master of Science in Marine Environment and Resources. Joint European Postgraduate Studies MO2006-00744
Master course	Cambio Climático, el gran reto social de nuestro tiempo	Universidad Camilo José Cela, Universidad de Salamanca, FLACSO España, Ecologistas en Acción, Greenpeace, WWF, Seo/BirdLife, FUHEM
Master course	"Social Multi-Criteria Evaluation" in the master course "M. Phil in Environmental Policy"	University of Cambridge (Department of Land Economy)
PhD Course	The Economics of Climate Change	Danish Technical University
PhD Course	"Metabolismo social y deuda ecológica" in the III Curso postgrado de Economía Ecológica "Hacia una economía circular en materiales"	UPV/EHU (Economía Aplicada III (Econometría y Estadística))

4.1 TO ACADEMIA | 4.1.4 Seminars given

We organized in 2015 a series of interdisciplinary lectures that contributed to climate change knowledge transfer. Focused on key theoretical and methodological issues on climate change, these lectures brought together professors, researchers and PhD students.

BC3-UPV/EHU joint Seminars

DATE	LECTURER	INSTITUTION	SEMINAR TITLE
2015/02/05	**Jose M. Gorostiaga**	Faculty of Science and Technology, University of the Basque Country (UPV/EHU)	What seaweeds are telling us on climate change? A view from a local to a European perspective.
2015/04/21	**Dr. Daniel Montoya**	University of Bristol, (UK).	Species interaction networks, global change and restoration.
2015/06/02	**Dr. Desiderio Romero-Jordán**	Universidad Rey Juan Carlos y FUNCAS (Spain)	La demanda de electricidad de los hogares españoles durante la crisis: efectos sobre el bienestar.
2015/06/18	**Itziar Ruiz de Gauna Ruiz de Loizaga**	Instituto de Políticas y Bienes Públicos, CSIC (Spain)	Green accounting in a multi-sector model with terrestrial ecosystems.

BC3 Seminars

DATE	LECTURER	INSTITUTION	SEMINAR TITLE
2015/01/09	**Jose Fernandes**	Plymouth Marine Laboratory (Sea and Society)(UK)	End-to-end assessment of ocean warming and acidification on fisheries: from experiments and models to economic and social impacts
2015/03/18	**Koji Tokimatsu**	Department of Environmental Science and Technology Interdisciplinary Graduate School of Science and Engineering. Tokyo Institute of Technology (Tokyo Tech), Japan.	A Novel Approach to Integrated Assessment Modelling and its Application to Sustainability
2015/05/06	**María Fernanda Sanchez Goñi**	Ecole Pratique des Hautes Etudes (EPHE) Sorbonne-Paris and Palaeoclimatology and marine palaeoenvironments laboratory Bordeaux.	Global past climate changes and their regional impact
2015/05/07	**David M. McEvoy**	Economics Department, Appalachian State University, Boone, NC, USA.	Effective Climate Agreements under Uncertainty
2015/05/21	**Martín Andrés Medina Elizalde**	Geology Department, Amherst College.	Climate change during the Collapse of the Maya Civilization: No hurricanes?... Bad news!
2015/05/28	**Patel Pralit**	Joint Global Change Research Institute (Richland, USA)	The Global Change Assessment Model: An overview and future directions

4.1 TO ACADEMIA | 4.1.5 Visiting Programme

The aim of our Visiting Programme is to promote research and dialogue between BC3 and other institutions by supporting and hosting local and international researchers wishing to establish a link with us. Additionally, this programme allows our institution to contribute to climate change knowledge at the Basque Country by inviting visitors to participate in the BC3 Seminar Programme. Our Visiting Programme may be considered therefore an additional source for talent attraction, as well as a chance to join international research initiatives.

List of 2015 visitors

VISIT DATE	VISITOR	INSTITUTION	POSITION	LINK WITH BC3 RESEARCH LINE
April	**Daniel Montoya**	University of Bristol. Bristol (UK)	Research Fellow	Climate and Natural Environment
May	**María Fernanda Sánchez-Goñi**	Ecole Pratique des Hautes Etudes (EPHE) Sorbonne-Paris and Palaeoclimatology and marine palaeo-environments laboratory Bordeaux. (France)	Professor at EPHE (Ecole Pratique des Hautes Etudes), Director of the Palaeoclimatology and marine palaeoen-vironments laboratory and Head of the Dept Palaeoclimatology and Marine Palaeoenviron-ments inside the EPOC (Environnements et Paléoenvironnements Océaniques et Continen-taux) research unit that is based at University of Bordeaux.	Climate and Natural Environment
May	**Martín Medina Elizalde**	Dept. of Geology, Amherst College, USA and Dept. of Geosciences, University of Massachusetts, Amherst, USA.	Visiting Assistant Professor, Dept. of Geology, Amherst College, USA and Adjunct Faculty, Dept. of Geosciences, University of Massachusetts, Amherst, USA.	Climate and Natural Environment
May	**Daniel M. Mac Evoy**	Economics Department, Appalachian State University (USA)	Associate Professor	Climate Policy
May	**Pralit Patel**	Joint Global Change Research Institute. Richland, WA 99352 (USA)	Researcher	Low Carbon, Climate and Natural Environment Climate Policy
June	**Desiderio Romero-Jordan**	Universidad Rey Juan Carlos	Associate Professor	Public Economics Distributional Implications of Policies Incidence of Taxation

4.1 TO ACADEMIA & POLICY MAKERS | 4.1.6 Organization of Scientific Events

BC3 has played an active role, organizing international Climate Change scientific events and workshops involving the most influential researchers in the field. During 2015, we organized a series of different dissemination activities, such as workshops, directed to nurture ongoing research, support decision-making processes and enhance the engagement of key players (stakeholders) by establishing a dialogue with them.

SOME HIGHLIGHTED WORKSHOPS:

DECCMA Workshop

DELTAS VULNERABILITY AND CLIMATE CHANGE; MIGRATION AS AN ADAPTATION, 18 -20th May 2015, Bilbao.

In 2015 we coordinated this workshop within the international project "DEltas, vulnerability and Climate Change; Migration as an Adaptation", which attracted 20 international experts to Bilbao during the 18 -20th May 2015.

During these days the Northern Team of DECCMA (DEltas, vulnerability and Climate Change; Migration as an Adaptation) research project, met at our premises in Bilbao and discussed the key research decisions of the project focused on the highly vulnerable to climate change deltas, and the wide consequences of climate change on population migration. Being the dual research aims:

- To assess migration as an adaptation in deltaic environments with a changing climate
- To deliver policy support to create the conditions for sustainable gender-sensitive adaptation.

Cecilia 2050 Workshop

EU CLIMATE POLICIES TOWARDS A LOW-CARBON ECONOMY 23th October 2015, Bilbao

In this workshop organized by BC3 on 23th October 2015 the main results of the CECILIA2050 research project were presented with a focus on its ultimate goal: to assess the current EU climate policies in order to formulate near-term and medium-term policy recommendations. In this workshop we addressed relevant questions such as: how effective and efficient have the EU climate policies been in the past? How could and should the EU climate policy mix evolve to put the EU on track towards a low-carbon economy? How should climate and energy policy should interact? What are the risks associated to climate policy fragmentation?

CECILIA 2050
OPTIMAL EU CLIMATE POLICY

Klimagune Workshop 2015

COMMUNICATING CLIMATE SCIENCE: OPPORTUNITIES AND CHALLENGES 23rd of November 2015, Bilbao

Since its first edition five years ago, more than 420 people have participated in the Klimagune Workshop, a yearly science-policy forum on Climate Change jointly organized by BC3 and the University of the Basque Country, open to all agents in the Basque Science and Technology Network, as well as to other social agents interested in climate change. It is its aim to share knowledge, new ideas and developments in terms of scientific and policy advancements on climate change.

"Communicating climate science: Opportunities and challenges" was the title of the sixth edition, which took place in Bilbao. We found the topic interesting because misconceptions about climate change are of great concern to the research community. According to a special Eurobarometer published in 2009, Europeans think that climate change is the second biggest threat facing the world, second only to world hunger, but still hold erroneous interpretations about its causes. The key question posed in the the Klimagune Workshop 2015 was to what extent such erroneous perceptions are related to the role of the mainstream (or mass) media, including newspapers, radio and TV.

Klimagune counted, among other relevant lecturers, with the following keynote speakers:

- **Prof. Maxwell T. Boykoff**, Center for Science and Technology Policy Research (CSTPR), "Who Speaks for the Climate? Making Sense of Media Reporting on Climate Change"
- **Prof. Bienvenido León**, , P.I of the Science Communication Research Group at the UNAV, "Journalism of the Climate Change: Diagnosis"

klima gune

4.1 TO ACADEMIA | 4.1.7 BC3 Working Papers — 4.1.8 Open Access

4.1.7 BC3 WORKING PAPERS

BC3 also produces its own Working Paper Series, which serves to illustrate and disseminate the scientific work developed by our researchers and collaborators, as well as triggers the scientific debate on hot topics. They are accessible via several media channels, including our website, Research Papers on Economics (RePEc) and the public repository of the University of the Basque Country (ADDI).

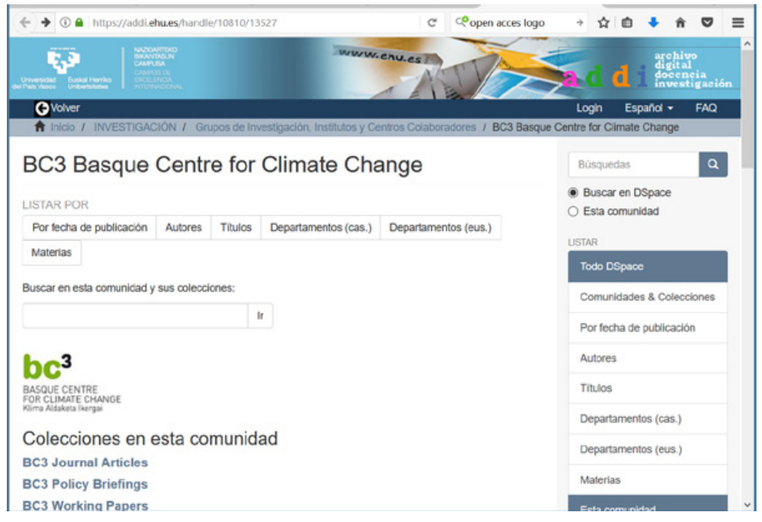
- [2015-04] **US climate policy: a critical assessment of intensity standards**.
  Christoph Böhringer , Xaquin García-Muros , Mikel González-Eguino and Luis Rey.
- [2015-03] **Health impacts of atmospheric pollution in a changing climate**.
  Leif Vogel, Joshua Vande Hey, Sérgio H. Faria , Joseph V. Spadaro.
- [2015-02] **The price of energy efficiency in the Spanish housing market**.
  Amaia de Ayala, Ibon Galarraga and Joseph V. Spadaro.
- [2015-01] **Ecosystems and human health: towards a conceptual framework for assessing the co-benefits of climate change adaptation**.
  Pablo Martinez-Juarez, Aline Chiabai, Sonia Quiroga Gómez and Tim Taylor.

4.1.8 OPEN ACCESS

During 2014, we reached a collaboration agreement with the ADDI platform (public repository of publications of the University of the Basque Country) for the delegated archive of our Working Papers and Policy Briefings in a public repository.

ADDI is interconnected with OPENAIRE in a way that optimizes the visibility of open access BC3 publications series, which are available online:

- **https://addi.ehu.es/handle/10810/13527**



4.2 TO POLICY-MAKERS | 4.2.1 Policy relevant contributions: Highlights

Climate Change is nowadays at the top of political agendas and it is a fundamental part of our work to contribute to the design of related policies, as well as to facilitate, through science, their application in a regulatory framework, consistent with the protection of the planet.

Hence, our involvement in the most relevant organizations, such as IPCC (Intergovernmental Panel on Climate Change), IPBES (Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services) and the UNFCCC (United Nations Framework Convention on Climate Change) is strategic for us, as it shows our ability to play an active role among the most authoritative actors in the field of climate change and climate policy. Such involvement is also a sign of international recognition, and a demonstration of our capacity to build relevant links and connections, addressing policy-makers at the highest levels.

One of our relevant contributions to the EU policy making process is taking part in the UNFCCC Side Events. These were established as a platform for observer organizations to highlight diverse climate change issues at UNFCCC conferences, and are a vital component of the UNFCCC sessions, as they provide opportunities for information dissemination, capacity building, policy discussions and a way to legitimize global governance.

BC3 is recognized by the United Nations Framework Convention on Climate Change (UNFCCC) as a Non-Governmental Organization and in 2015 we contributed to several side events at the Conferences of the Parties at COP21 in Paris jointly with other leading Climate Change scientific and policy institutions. Besides, **we co-organized at the COP21 the official Side Event "Regions and Climate Change: A major challenge for local communities"**, on December 10 in Paris; one of the most relevant contributions to climate policies from a scientific perspective.

This expert meeting, organized under the UNFCCC, attracted representatives of regional authorities and expert scientists who shared successful reproducible experiences in other regions. Besides these contributions,

- BC3 participated in the 3rd Plenary of the Intergovernmental Panel on Biodiversity and Ecosystem Services (IPBES), representing the International Council for Science (ICSU) delegation (Bonn, 12-17 January)
- Agustín del Prado was appointed Spanish representative of the Livestock Research Group of the international Global Research Alliance (GRA) on Agricultural Greenhouse Gas Emissions Manure group. Meeting at Reading University 2015. Likewise, he was elected member of the EU Focus group of EU-EIP Agri "Reducing emissions from cattle farming" (2015).

On top of that, different case studies were conducted at local level at municipalities such as Madrid, in the framework of the BASE European Commission FP7 project to assess interlinkages of Health and Climate (heatwaves) or at Bilbao, under the framework of ECOHEALTH research project.

In the framework of CAUSE project, funded by the Ministry of Economics and Competitiveness of the Spanish Government, a research was carried out to model the biophysical mechanisms in the provision of ecosystem services and their economic implications on society in order to improve land management. Most of the modelling follows the application of ARIES (Artificial Intelligence for Ecosystem Services) platform. A complementary, and more social science oriented, research was conducted in relation to the effect of water irrigation infrastructure for agriculture in Navarre.

4.2 TO POLICY-MAKERS | 4.2.2 Policy making supporting methodology tools

ECOSYSTEM SERVICES

During 2015, we also developed decision making supporting tools in the context of ecosystem services, such as **ARIES** (Artificial Intelligence for Ecosystem Services), a web-based free modelling technology offered to users such as practitioners, scientists and decision-makers, including members of NGOs and academic or governmental institutions worldwide, to assist rapid ecosystem service assessment and valuation (ESAV).

Thus, BC3 developed some of the most advanced methodologies (assembling deterministic or probabilistic models) to quantify and value flows of ecosystem services at the appropriate spatial scale, ecological and socio-economic context. ARIES maps concrete, spatially explicit beneficiaries of ecosystem services, and quantifies their demand for each service. Conceptualizing ecosystem services as a concrete list of benefits for concrete beneficiary groups avoids the problem of "double counting" benefits, which has plagued past valuation efforts.

LOW CARBON TRANSITION PATHWAYS

Regarding low carbon transition pathways, we developed different tools and methodologies that may capture the interlinkages between the socio-economic, energy, environmental and the climate systems to understand in a better way the measures to control GHG emissions at national and global level. These tools/models are very diverse and include different types of CGE/input-output models, integrated assessment models and micro-simulation models.

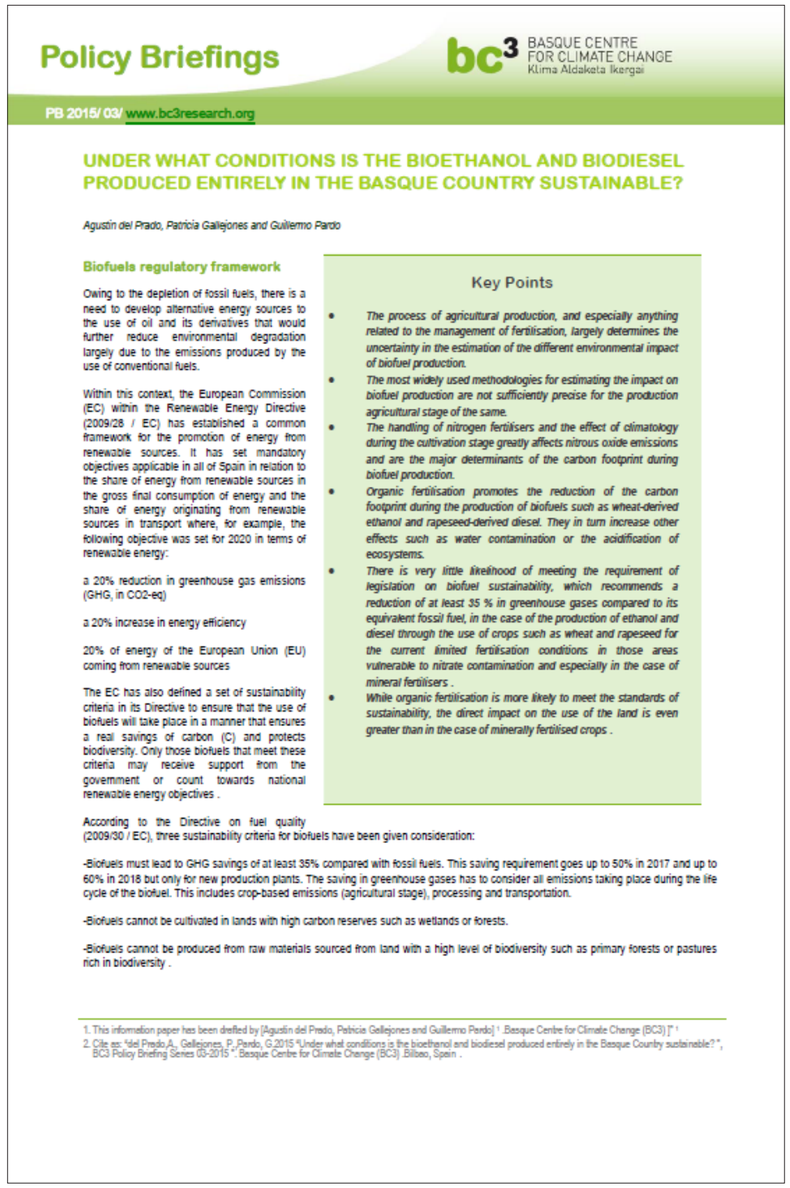
DERIO (Dynamic Econometric input-output Model for the Basque Country)
A team of researchers from the Basque Center for Climate Change (BC3) led by Iñaki Arto, in collaboration with Professor Kurt Kratena (Center for Economic Scenario Analysis and Research, CESAR and Austrian Institute of Economic Research, WIFO) developed an economic- energy-environment model for the Basque Country oriented the analysis of scenarios and policies in different areas of decision. The model was successfully used for the analysis of the economic impact of the Basque Country's 2050 Climate Change Strategy.

The DERIO model, developed under the Bizkaia: Talent program, follows the philosophy of the FIDELIO (Fully Interregional Dynamic Econometric Long-term Input- Output) created by Professor Kurt Kratena together with Iñaki Arto for the Joint Research Center of the European Commission. This model has recently contributed to the analysis of the impact of the Clean Air Package of the European Union.

DERIO is characterized by a detailed description of the Basque economy in terms of sectors (88 sectors), products (105 products), consumers (5 groups of consumers differentiated by income level), categories of final consumption (16 categories), energy system (processing industry, exchanges, final consumption, etc.) and environmental extensions (energy, CO2 emissions and other pollutants). For the development of the model, different official statistical sources such as economic accounts (EUSTAT), family budget survey (INE), energy balances (EVE) or emission inventories (IHOBE) were been used.

One of the main characteristics of the model is that the user can adapt it according to his needs. This feature, together with its multi-dimensional character, makes it especially useful for the analysis of scenarios and policies in different areas of decision. In addition, its flexibility and versatility make it suitable for the analysis of specific policies such as the promotion of energy efficiency (households, industry or transport), Renove plans, tax reforms, etc.

4.2 TO POLICY-MAKERS | 4.2.3 Policy making supporting information: Policy Briefing Series



Policy Briefings

bc3 BASQUE CENTRE FOR CLIMATE CHANGE Klima Aldaketa Ikergai

PB 2015/ 03/ www.bc3research.org

UNDER WHAT CONDITIONS IS THE BIOETHANOL AND BIODIESEL PRODUCED ENTIRELY IN THE BASQUE COUNTRY SUSTAINABLE?

Agustín del Prado, Patricia Gallejones and Guillermo Pardo

Biofuels regulatory framework

Owing to the depletion of fossil fuels, there is a need to develop alternative energy sources to the use of oil and its derivatives that would further reduce environmental degradation largely due to the emissions produced by the use of conventional fuels.

Within this context, the European Commission (EC) within the Renewable Energy Directive (2009/28 / EC) has established a common framework for the promotion of energy from renewable sources. It has set mandatory objectives applicable in all of Spain in relation to the share of energy from renewable sources in the gross final consumption of energy and the share of energy originating from renewable sources in transport where, for example, the following objective was set for 2020 in terms of renewable energy:

a 20% reduction in greenhouse gas emissions (GHG, in CO2-eq)

a 20% increase in energy efficiency

20% of energy of the European Union (EU) coming from renewable sources

The EC has also defined a set of sustainability criteria in its Directive to ensure that the use of biofuels will take place in a manner that ensures a real savings of carbon (C) and protects biodiversity. Only those biofuels that meet these criteria may receive support from the government or count towards national renewable energy objectives .

Key Points

- The process of agricultural production, and especially anything related to the management of fertilisation, largely determines the uncertainty in the estimation of the different environmental impact of biofuel production.
- The most widely used methodologies for estimating the impact on biofuel production are not sufficiently precise for the production agricultural stage of the same.
- The handling of nitrogen fertilisers and the effect of climatology during the cultivation stage greatly affects nitrous oxide emissions and are the major determinants of the carbon footprint during biofuel production.
- Organic fertilisation promotes the reduction of the carbon footprint during the production of biofuels such as wheat-derived ethanol and rapeseed-derived diesel. They in turn increase other effects such as water contamination or the acidification of ecosystems.
- There is very little likelihood of meeting the requirement of legislation on biofuel sustainability, which recommends a reduction of at least 35 % in greenhouse gases compared to its equivalent fossil fuel, in the case of the production of ethanol and diesel through the use of crops such as wheat and rapeseed for the current limited fertilisation conditions in those areas vulnerable to nitrate contamination and especially in the case of mineral fertilisers .
- While organic fertilisation is more likely to meet the standards of sustainability, the direct impact on the use of the land is even greater than in the case of minerally fertilised crops .

According to the Directive on fuel quality (2009/30 / EC), three sustainability criteria for biofuels have been given consideration:

-Biofuels must lead to GHG savings of at least 35% compared with fossil fuels. This saving requirement goes up to 50% in 2017 and up to 60% in 2018 but only for new production plants. The saving in greenhouse gases has to consider all emissions taking place during the life cycle of the biofuel. This includes crop-based emissions (agricultural stage), processing and transportation.

-Biofuels cannot be cultivated in lands with high carbon reserves such as wetlands or forests.

-Biofuels cannot be produced from raw materials sourced from land with a high level of biodiversity such as primary forests or pastures rich in biodiversity .

1. This information paper has been drafted by [Agustín del Prado, Patricia Gallejones and Guillermo Pardo] ' .Basque Centre for Climate Change (BC3)]" '
2. Cite as: "del Prado,A., Gallejones, P.,Pardo, G.2015 "Under what conditions is the bioethanol and biodiesel produced entirely in the Basque Country sustainable? ", BC3 Policy Briefing Series 03-2015 " .Basque Centre for Climate Change (BC3) .Bilbao, Spain .

With the objective of being relevant to policy makers, in 2015 we continued to produce highly accessible Policy Briefings aimed to offer first-hand information to policy makers. More specifically, we produced 7 Policy Briefings altogether during the year.

These documents provide policy recommendations based on our expertise and results from research carried at the centre. The briefings also offer information and training to policy makers and public interest organisations, in order to help them address and respond to the environmental policy related issues.

The documents are accessible through our website and through the public repository of the University of the Basque Country (ADDI), which is interconnected to the "Openaire" repository.

Only at our website, these publications received a large amount of hits in the reference period, and the Basque Parliament called BC3 researchers to present some of their key findings before the political representatives at the Commission for Environment of the Basque Government.

During 2015 the Policy Briefings documents were supported by summary videos aimed to impact on policy maker and society as a whole.

List of 2015 BC3 Policy Briefings:

- [2015-07] **La verdadera pérdida causada por las políticas de compensación de la Biodiversidad.**
  David Moreno-Mateos, Virginie Maris, Arnaud Béchet and Michael Curran.
- [2015-06] **European Biofuels Policy and its Contribution to a Low Carbon Future.**
  Iñigo Capellán-Pérez, Alberto Ansuategi and Ibon Galarraga.
- [2015-05] **Impuestos ambientales sobre la contaminación del aire y el cambio climático: un análisis comparativo de los impactos distributivos para España.**
  Xaquín García-Muros; Mercedes Burguillo; Mikel Gonzalez-Eguino and Desiderio Romero-Jordán.
- [2015-04] **Environmental justice: instrumental for conserving natural resources.**
  Eneko Garmendia, Unai Pascual and Jacob Phelps.
- [2015-03] **Under what conditions is the bioethanol and biodiesel produced entirely in the Basque Country sustainable?**
  Agustin del Prado, Patricia Gallejones and Guillermo Pardo.
- [2015-02] **Modelling ecosystem services trade-offs in agricultural systems.**
  Elena Pérez-Miñana, Agustin del Prado, Patricia Gallejones, Guillermo Pardo, Stefano Balbi and Ferdinando Villa.
- [2015-01] COP 20 **Lima COP20: Another small step on the long road to Paris.**
  Ibon Galarraga and Mavi Román.

4.2 TO POLICY MAKERS & ACADEMIA | 4.2.4 Training & Capacity Building

International Spring University on Ecosystem Services Modelling

BC3 launched in 2013 a very successful training programme, "International Spring University on Ecosystem Services Modelling", in collaboration with Conservation International (USA) and the University of Vermont (USA) and during 2015, the programme was consolidated with a new edition.

This initiative, an annual two week intensive advanced course, enables simple use of complex models through artificial intelligence. The course is meant to build a new generation of scientists and policy analysts, capable of using coupled human-environmental models in research, and policy, to address and solve complex sustainability problems. The training plan covers the theory and practice of collaborative, integrated modelling on networked repositories, applied to concrete ecological and social issues of interest of the participants and of the larger community built around the ARIES project.

BC3- UPV/EHU Summer School

Another relevant course for BC3 is the annual Summer School on Climate Change, launched in 2010 with the collaboration of the University of the Basque Country. The objective of this 3-day school, is to offer an updated and recent view of the ongoing trends in climate change issues, and it gathers leading experts in the field and students from top universities and research centres worldwide.

The 2015 edition, "On the Road to Paris", counted with a dozen lecturers, international experts among which there were 2 IPCC authors. This year's edition received over 60 participants, took place in the ciy of San Sebastian and was focused on the scientific and political keys of climate change that were being carried out at international level from the market's perspective. Directors of the School: Prof. Anil Markandya (BC3) y Prof. Ibon Galarraga (BC3)

4.2 TO POLICY-MAKERS | 4.2.5 Other highlighted contributions

During 2015 we contributed to the update of the Intergovernmental Panel on Climate Change 2006 Guidelines for GHGs Inventories, which will start in 2017. The contribution for updating emission factors to calculate GHGs and NH3 emissions from solid waste management was produced by a multidisciplinary research team led by the BC3 Study "Gaseous emissions from management of solid waste: A systematic review". This study was published in the prestigious journal Global Change Biology and was part of the PhD thesis of Guillermo Pardo.

This piece of research shows evidence that supports the appropriateness of proposing a change in the methodology for estimating greenhouse gases from the management of solid organic waste made by IPCC. The authors of the study demonstrated through this global research that the current emission rates for some key gases such as nitrous oxide (N2O) are not adequate, especially when applied in organic waste composting processes.

In 2015, we also provided scientific policy support by performing Input-Output analysis in "Arto I., Rueda-Cantuche, J.M., Amores, A. F., Dietzenbacher, E., Sousa, N., Montinari and Markandya, A. 2015. EU Exports to the World: Effects on Employment and Income. Luxembourg: Publications Office of the European Union. ISBN 978-92-79-44581-11".

This report aimed to be a valuable tool for trade policymakers. The report features a series of indicators to illustrate in detail the relationship between trade, employment and income for the EU as a whole, as well as for each EU Member State, using the World Input-Output Database (WIOD) as the source for the data.

Climate Change Strategy of the Basque Country, KLIMA 2050

In 2014 it was launched the Basque Climate Change Strategy, Klima 2050, with the production of a strategic focus document in which we were involved as climate change experts.

And in 2015 we conducted a report on the economic impacts of this strategy with a focus on its co-benefits (in terms of local air pollution and energy efficiency). The document was presented on 5 June in Brussels, during the European Green Week in an event organized by the Basque Government.

4.3 TO SOCIETY. Science Education and Public Awareness | 4.3.1 Training Caravan

The role of science in shaping climate policies and raising awareness among the general public has become increasingly important. "Bridging knowledge" is a crucial issue, as we understand at BC3.

Thus, we organize events and activities, which enable us to reach and attract all the sectors of society, making the science produced at the institution available to a broad public. This way, we raise awareness on specific subjects and scientific advancements among the people who will eventually play an important role in demanding policy-makers to reshape their policy agendas or to plan concrete actions.

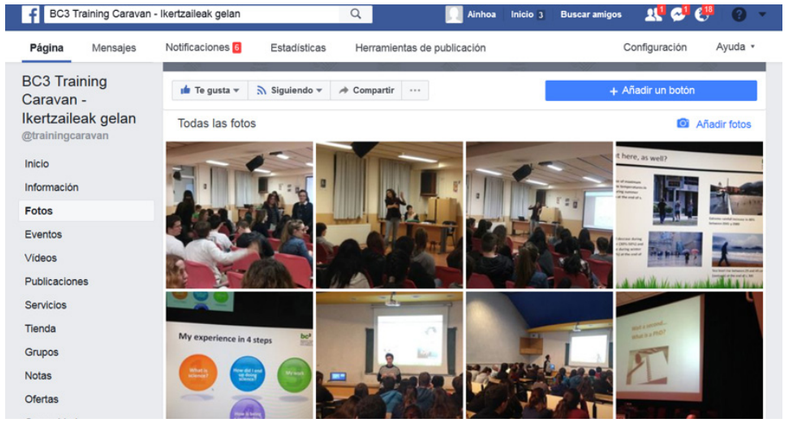
Our activities pursue an impact of the research findings on policy, managerial and professional practices, and social behavior. They are directed to:

- BUILDING CAPACITIES AND DEVELOPING INNOVATIVE WAYS OF CONNECTING CLIMATE CHANGE SCIENCE TO SOCIETY (SCIENCE EDUCATION).
- TAKING THE "CLIMATE CHANGE CHALLENGE" CLOSER TO THE SOCIETY.
- BUILDING A MORE SCIENTIFICALLY LITERATE SOCIETY ABLE TO ACTIVELY PARTICIPATE IN AND SUPPORT DEMOCRATIC PROCESSES.

TRAINING CARAVAN.
Climate Change Researchers at Classrooms

Under BC3's Responsible Research Programme Framework (Sub-area of Science Education), and together with the Basque Ministry of Education and the BERC (Basque Excellence Research Centre), we jointly organize the Training Caravan (Researchers at classroom) initiative since 2010. The main objective of this activity, targeted at Basque student's aged 16-17, is to raise and boost research vocations and careers amongst the students of the Basque Country and inform about climate change research. With this purpose, a selection of BC3 researchers feature the Climate Change Science at the classrooms and present the research career.

Firmly committed with Climate Change Science Education, our philosophy tries to anticipate and assesses potential implications and societal expectations with regard to climate change research in order to foster the design of inclusive and sustainable research. In the past 6 years, we have reached over 4.755 students of the Basque Country Autonomous Community through 63 Training Caravan Speeches altogether. For more info, check our web or their social network activity (#trainingcaravan).



LIST OF TRAINING CARAVAN SPEECHES OFFERED DURING 2015

DATE	SCHOOL	LOCATION	SPEAKER
5-Mar	**Aixerrota BHI**	Getxo	Agustin del Prado
5-Mar	**Colegio Ntra. Sra. de Europa**	Getxo	Agustin del Prado
10-Mar	**IES Koldo Mitxelena**	Errenteria	Maialen Garmendia
10-Mar	**IES Pío Baroka BHI**	Irun	Maialen Garmendia
16-Mar	**Aniturri BHI**	Agurain	Stefano Balbi
16-Mar	**Ikasbidea Ikastola IPI**	Durana	Stefano Balbi
18-Mar	**Uribe-Kosta BHI**	Plentzia	David Moreno
23-Apr	**IES Mungia BHI**	Mungia	Federico Cardona
23-Apr	**Arratia BHI**	Igorre	Federico Cardona
28-Apr	**Lasarte Usurbil BHI**	Lasarte-Oria	Joseph Spadaro
28-Apr	**Beasain BHI**	Beasain	Joseph Spadaro
8-May	**Saturnino de la Peña BHI**	Sestao	Ignacio Palomo
8-May	**IES Miguel de Unamuno**	Vitoria-Gasteiz	Ignacio Palomo

4.3 TO SOCIETY. Science Education and Public Awareness | 4.3.2 BC3 in the media

Besides the publication of our research results in leading scientific journals, at BC3 we make a special effort to build an institutional reputation in order to be a benchmark at the local, national or international level. In 2013, we designed the Strategic Communication Plan with this aim, and settled the different channels and tools to be used in the 2014-2017 period. Thus, our outreach activities are based on a comprehensive stakeholder analysis.

Given that 2015 was a turning point for the inclusion of climate change in the political agendas of all countries due to the Paris Agreement (COP 21), we reinforced our media activity during the year, contributing this way to the awareness of society on this challenge human beings are facing. In fact, we had significant impact in regional, national and international communication media and were regularly consulted by different media as expert advisers in climate change. In numerical terms these results were: 9 press releases were launched, 11 interviews in TV programmes were accomplished, 35 interview in newspapers or magazines, 10 appearances in digital media and 26 radio interviews. Our web page received 48.198 visits along the year.

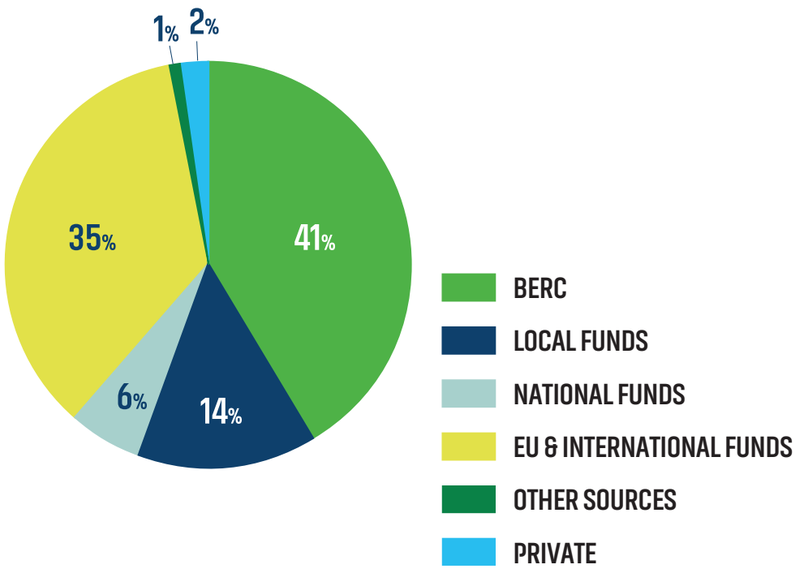
Furthermore, in 2014, we added to our webpage and blog, our social media channels (Twitter, LinkedIn, Vimeo, Slideshare, Facebook, among others) with the objective of reaching targeted stakeholders, and also worked on the reinforcement of the relations with the media at all levels. Among others, we agreed different permanent collaborations with the local television and with several radio programmes.

5. FUNDING

5.1 FUNDING SOURCES

The mobilization of financial resources for research is an increasingly complex and competitive task requiring skilled personnel, not only in national or European, but also in international funding programs. We have gained considerable experience in these areas and achieved self-financing levels of 59% in 2015.

DISTRIBUTION OF BC3 FUNDS



6. SET OF INDICATORS

PUBLICATIONS (Production)

Total number of publications published in the given year (* Published on line)	104
Number of articles published in the given year (* Published on line)	62
Number of Books and Chapters published in the given year	22
Other publications published in the given year	9
BC3 Policy Briefings published in the given year	7
BC3 Working papers published in the given year	4

PUBLICATIONS (Impact Factor)

% of Indexed articles in Quartile 1	92%
Citation number per year	802
H index	20

TRAINING

PhD - Defended thesis	5
PhD - Supervised students	17
Master - Supervised students	6

EXCELLENCE

ERC (Requested)	3
Ikerbasque Researchers	6

FUNDING

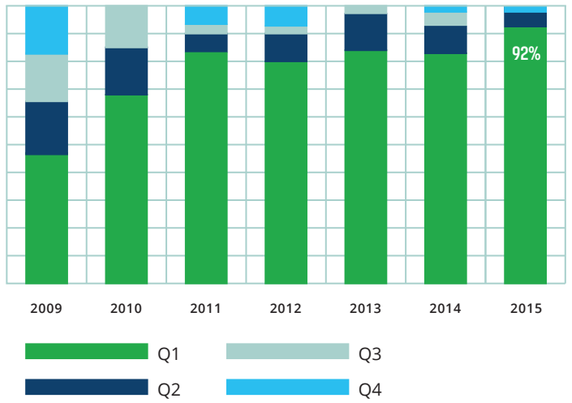
% of Funding (non BERC)	59

PEOPLE

Total BC3 Team	42
Number of researchers	37
Number of administration staff	5

* number of people at 31 of December of the given year.

Fig. 1: Quartile distribution of the articles indexed in SCOPUS:



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