

Bocconi

IEFE
Annual Report
2012



Università Commerciale
Luigi Bocconi

Preface

Dear Reader,

2012 has been a transition year at IEFE, with the conclusion of the 2010-12 Three-Year research plan and a wide discussion within the Center on the main themes to include in the 2013-15 period. Novel projects have started and new researchers joined the Center, while others, due to important external appointments, have left. In this Report we describe the main projects that have been developed in 2012 and the other activities that have involved IEFE researchers, including observatories, conferences and seminars, policy reports and working papers. In a separate document we illustrate the main lines of research of the next three years agenda.

Research on global energy markets focused on three main issues: the development of gas hubs in Europe, which present a diversified landscape and offer interesting insights on the different phases of the process; an overview and econometric analysis of the different generation capacity payments schemes adopted in the main OECD countries to ensure adequacy of generation capacity; the evolution in the ownership of electricity and gas TSOs in Europe arising from the unbundling of original incumbents and the entry of new actors. The researchers active on Climate and Energy Policies have covered a wide array of topics: an application of the computational modeling platform developed in recent years to the impact of climate change on Mediterranean regions and of virtual water markets; an analysis of the impact of investment in renewables taking into account inter-sectoral spillovers; the determinant of emissions in urban systems in a low-carbon city perspective; the design of environmental regulation aimed at valorizing EMAS programs; the environmental certification and communication of production processes with reference to a large beer producer. Within the Macro-Subject on Regulation of Liberalized Markets, two main topics have been addressed: the potentials of storage facilities in the management of electricity grids given the increasing role of renewable generation sources, and its market design implications; a support to the Italian regulatory authority in the redesign of water tariffs and, more broadly, in setting up the new competencies on water and sanitation services.

IEFE has promoted several events and seminars over the year, including the conference, a part of the EnEn Forum held by Commissioner Oettinger on 16 July at the Italian Senate, a workshop on the Draft of the National Energy Strategy issued by the Italian Government, the series of joint seminars organized with Eni-Fondazione Enrico Mattei. IEFE has also continued its partnership with the Brussels-based CERRE, Center on Regulation in Europe, preparing a position paper on European gas markets presented at the workshop on 13 September, and

with EnergyLab, a research foundation founded in Milan in September 2007 with the goal of creating a network between universities, the business world and regional and local government to support research, development and innovation and to promote awareness of energy-related matters among the public, government institutions, private bodies and the media. The output of IEFÉ research activity, as before, found its way from numerous seminars and meetings into working papers and the recently-added research reports line, and eventually into publications in books and scholarly journals.

In 2012 some changes occurred in the group of researchers at IEFÉ, both outgoing and incoming. Angelo M. Cardani was appointed as President of the Autorità di Garanzia per le Comunicazioni, the Italian telecoms and media regulator; Annalisa D’Orazio left to serve as chief economic advisor to President Cardani. We warmly congratulate our former colleagues for this prestigious and challenging new job. Elena Fumagalli, from Politecnico di Milano and Carlo Cambini, from Politecnico di Torino, joined IEFÉ and will develop research on regulation of electricity distribution. Alberto Cavaliere from the University of Pavia is back at IEFÉ to work on gas distribution issues. Elisabetta Iossa from the University of Rome, Tor Vergata, will help IEFÉ in addressing issues of public-private partnership schemes in energy infrastructure investments. Lastly, Manfred Hafner will bring his wide expertise enriching the group that works on gas markets.

All these new developments will improve the effort of IEFÉ members in their research activities. The new Three Year Research Plan, that we present in a separate document, will be the appropriate framework to finalize our work and reach new challenging targets. I thank all the IEFÉ members for their valuable and dedicated contribution during the last year and welcome both old and new researchers to our new ambitious tasks.

The Director

A handwritten signature in black ink, appearing to read 'Manfred Hafner', written in a cursive style.

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1. Introduction

The Center for Research on Energy and Environmental Economics and Policy (Istituto di Economia e Politica dell'Energia e dell'Ambiente - IEFE) is the research center of Università Bocconi which co-ordinates and conducts applied research in the fields of:

- a) Energy economics, focusing on energy markets as well as on natural resources
- b) Environmental economics, focusing both on environmental policy and environmental management and sustainability concerning private companies and public agencies
- c) Economics of public utilities focusing on energy, water and waste

This report summarizes the research activity carried out by IEFE in 2012.

2. Research Activity

The description of IEFE research activity in 2012 for both completed and ongoing projects is organized according to macro-subjects. These were presented in the IEFE Three-Year Research Plan (RP3) 2010-2012, which identified the guidelines as well as the resources required to implement them. The RP3 for the 2010-2012 period was approved by the Steering Committee on 18 November 2010 and is available on IEFE website at www.iefef.unibocconi.it.

The three macro-subjects of the RP3 2010-2012 are:

- RP3/1 Towards global energy markets
- RP3/2 Integrated climate and energy policies
- RP3/3 The role played by regulation in liberalized sectors

Below we provide a short description of the research projects that were completed or were ongoing in 2012. Some of these projects were included in the Research Plan 2010-2012, others were new and additional.

RP3/1 – Towards Global Energy Markets

The Development of Gas Hubs in Europe

Research Director: Michele Polo

Research Team: Guido Cervigni, Caterina Miriello, Leen Dickx

Timing: 2011-2013

One of the most important issues in the liberalization of gas markets in Europe is the development of wholesale gas markets (gas hubs). Although quite heterogeneous in their degree of development, functions and interaction with the gas systems, gas hubs may represent a key tool to promoting competition in retail markets, but they also pose difficult questions in the equilibrium of the gas markets, still dominated upstream by long term contracts with take or pay obligations and prices indexed to oil.

The research projects analyzes the role of wholesale gas hubs in a gas system, first as a tool to ensure the provision of balancing services and then following other steps towards a mature and liquid market. Balancing is analyzed considering the technical tools and the commercial instruments that are needed for moving from a gas system dominated by a single, vertically integrated, operator towards an articulated setting with vertical and horizontal unbundling, where many shippers and suppliers interact to import and distribute gas to the final users.

Three phases are identified, the first one where a wholesale market provides basic balancing trade, characterized by short term transactions and low liquidity; a second phase where the increase in volumes attracts operators that trade on the hub, with an increase in the churn rate and liquidity. In the third phase, financial instruments providing risk management tools are developed and new operators from outside the

industry take a role. The research analyzes the determinants in the development of the different phases, including the upstream market structure and the role of domestic production and long term contracts, the regulatory regime in the wholesale market and the downstream market structure in the distribution phase.

This framework is then applied to analyze in detail the regulatory framework and the main qualitative indicators in six wholesale gas markets in Europe, the NBP in the UK, the TTN in the Netherlands, the Austrian CEGH, the Italian PSV, the Belgian ZTP, the PEG's in France, the NGC and Gaspool in Germany, identifying the main sources of success and delay in the development of the gas hubs.

Generation Capacity Support Schemes Across OECD Countries: An Empirical Assessment

Research Director: Guido Cervigni

Research Team: Simona Benedettini

Timing: 2012

Capacity support schemes are regulatory mechanisms aimed at addressing resource adequacy concerns in liberalized electricity markets. Specifically, capacity support schemes incentivize investments in new generation capacity and the availability of existing generation resources to ensure that electricity generation capacity is sufficient to serve demand and to meet security conditions at all times.

Given the lively debate across European countries about the adoption of capacity support schemes – and the implementation in 2017, in Italy, of a capacity support scheme based on a centralized market – the research empirically tested the effectiveness of different capacity support schemes in addressing resource adequacy concerns on the basis of the experience of a sample of twenty-two high-income OECD countries.

To this aim, the first part of the research involved a survey of the different types of capacity support schemes implemented across the countries included in the sample. More precisely, to obtain information about whether a capacity support scheme was in force in each country – and if so, which type and the relative time-horizon of implementation – we surveyed the national regulatory authorities.

Once the information about the characteristics of the capacity support scheme in place in each country were obtained, we performed an econometric analysis to investigate the performance of different designs of capacity support schemes in ensuring resource adequacy.

The results of our research were disseminated in December 2012 with a seminar attended by both Italian scholars and generators operating in the Italian electricity market. The presentation of the research has been the starting point for further research commissioned to IEFÉ for the January-July 2013 period by an Italian association of generators.

Network M&A: Does Ownership Still Matter?

Research Director: Matteo Di Castelnuovo

Research Team: Caterina Miriello and Stefano Gatti, Francesco Corielli, Gimede Gigante from the Department of Finance, Università Bocconi

Timing: 2012-2013

Gas and power networks have been playing an increasingly critical role in making sure that the objectives underlying the so-called “trilemma” – i.e. climate change, economic efficiency and security of supply – of European energy policies can actually be achieved. In these last few years there has been a considerable increase in the num-

ber of M&A activities targeting European energy networks. These changes in networks' ownership have occurred (and are still occurring) in several European countries and equally involve both power and gas infrastructures, at both transmission – including offshore – and distribution level. Overall, while it appears rather straightforward which reasons are driving several European utilities to divest their network assets, the fact that also “new buyers” from other, sometimes radically different sectors (like pension funds) are trying to acquire such assets is not equally clear.

This project aims to investigate two research questions:

- i Why are (unbundled) network companies and financial actors currently the “most active” buyers of network assets? This question, which looks at past and present changes in ownership, will be addressed in the first part of the study.
- ii The second part, however, will investigate the economic and regulatory impact that such changes in network ownership may have upon future European electricity and gas markets.

RP3/2 – Climate and Energy Policies

ENCLIMOD - Environmental and Climate Modeling

Research Director: Roberto Roson

Research Team: Marzio Galeotti, Martina Sartori

Foreign Partner: The World Bank (Washington DC, USA)

Timing: 2009–2012

ENCLIMOD purports to develop a computational modeling platform to analyze various issues in the area of energy and climate policy at the Italian, European, as well as world levels. The project benefits from a partnership with the World Bank, where IEFE contributed to the development of ENVISAGE. This project is included in the IEFE 2010-12 Three-Year Research Plan. More generally, this research agenda aims to develop models and modeling capabilities in the field of Computable General Equilibrium models at IEFE.

The research has developed a dynamic computable general equilibrium model of the world economy, which is paired with a numerical climate model aimed at carrying out Integrated Assessment Modeling exercises. The model is based on the GTAP (Global Trade Analysis Project) database and structure. Two papers were published in 2012. Members of the ENCLIMOD team have started applying general equilibrium modeling techniques in other projects of interest for IEFE, such as THINK and the European project WASSERMed. This work has led to other publications and presentations. The acquired modeling capability is now being taken into account in the formulation of new research proposals and fundraising activities.

Environmental Policies, Innovation Systems and Competitiveness of The Industrial Sector

Research Director: Annalisa D’Orazio

Research Team: Enrico Botta, Annalisa D’Orazio

Timing: 2011-2012

The European Union’s ambitious targets of a 20% reduction in greenhouse emissions and a 20% increase in energy efficiency by 2020 resulted in the creation of large technical and economic potentials. The industry can largely contribute to achieving these

targets because of its huge possibilities in emissions reduction and improvement in energy efficiency. However, this potential can be unlocked only if the appropriate investments in clean technologies are made. Within this framework, these investments are not only likely to reduce the costs imposed by regulation on the industry but also to trigger important innovation effects within the clean tech sector. As such, the project has investigated the role that an innovation system, as constituted by the main relevant actors (suppliers of clean technologies, consumers of clean technologies, institutions and policymakers), can have in more efficiently achieving the objectives of EU environmental and energy policies.

The first phase (from October 2011 to October 2012) had the following objectives: (i) a review of the European energy efficiency and emission reduction legislation with relevant impacts on large companies and SMEs and the quantification of constraints (ii) the analysis of both the carbon and energy intensity of Italian industries and sectors; (iii) development of a framework on the necessary conditions to develop a green industry.

The completion of the first phase led to (i) building of extensive datasets and of ad-hoc developed models on energy and emission intensity of the Italian manufacturing industry; (ii) development of a theoretical framework to properly assess necessary conditions to develop a green innovation system. This framework has been tested against the development of the Danish and Chinese wind turbine industries and led to the publication of a working paper on green growth and the wind turbine industry (See: “Green Growth: A Case Study on the Danish and Chinese Sectoral Innovation Systems” IEFE Working Paper n. 53)

MOSIRI

Research Director: Arturo Lorenzoni

Research Team: Niccolò Cusumano, Federico Pontoni

Timing: 2012-2014

In 2012 GSE, the company in charge for the support of RES on behalf of the Italian Government, was made responsible for energy statistics and energy trend studies in Italy. With the aim of understanding the effects of renewable energy investments on the whole economy, greenhouse gas emissions and the number of jobs created, GSE asked IEFE to carry out a study on the impact of RES investments in Italy. With a € 10bn annual expense for incentives paid by Italian consumers, it seems quite important to understand long-term effects.

The research project aims to evaluate the overall effects, along the value chain and on intersectoral spillovers, of the investments made over recent years, setting a methodology that will be then adopted by GSE to evaluate future support. More precisely, IEFE contribution aims to evaluate economic impacts with an input-output approach for both investments and plant management. The work related to renewable electricity was completed in 2012 and continues in 2013 with investment on RES thermal energy and energy efficiency investments.

Low Carbon Cities: Determinants of GHG Emissions at an Urban Level

Research Director: Edoardo Croci

Research Team: Sabrina Melandri, Tania Molteni

Timing: 2011-2012

According to IEA's estimates, cities are responsible for two-thirds of the world's ener-

gy use and for more than 70% of CO₂ emissions. The contribution of individual cities to global emissions can be very different: values published in literature are in the range 2-30 tCO₂e per capita. Energy consumed in buildings and ground transport are among the main sectors responsible for urban GHG emissions.

What are the main determinants that cause such relevant differences between cities' emissions?

This issue was studied in 2012 by the research team with a quantitative perspective, in collaboration with other researchers of IEFE. The research focused on emissions from ground transport of European cities. Available data at a European level have been used to evaluate, through a linear regression, a set of variables and to determine their relevance in influencing emissions from urban mobility. The main results of the analysis confirmed the relevant and negative correlation of population density with transportation emissions, even when considered jointly with other explanatory variables, as ensued from previous studies published in the literature. This research phase has resulted in a paper, which was accepted and presented at the ISEE 2012 conference on Ecological Economics held in Rio de Janeiro in June 2012. The paper was subsequently updated with new data and presented at the PROMITHEAS 5th Energy and Climate Change conference held in Athens in October 2012. The new results confirmed the relevance of the negative correlation of population density with emissions. They also highlighted the significance of the relative price of public transportation to private transportation and how an increase in such a relative price can have an upward effect on emissions.

TAM-TAM Project

Research Director: Edoardo Croci

Research Team: Sabrina Melandri, Tania Molteni

Timing: 2012-2014

Mobility is a critical issue for urban areas and their surroundings, and it is a key strategic area for a region's economy and development. Infomobility services can help citizens and city-users to make smarter mobility choices. They are also key areas for innovation and for the development of "smart" applications.

TAM-TAM is an R&D project that aims to develop new information tools for citizens, which will help them in making more sustainable mobility choices. This 2-year project will develop a web-based infomobility platform, that will also be accessible through a mobile-application. The platform will provide users with information on the available alternatives to perform a selected route, including "non-traditional" modes of transport (i.e. bike sharing, car sharing, car pooling, etc.). The system will provide users with information on the features of each modal alternative, in terms of timing, comfort, costs, and environmental impacts of the selected transport option. The platform will also allow the sharing of user-generated contents regarding mobility and traffic through a social networking system.

The platform will be developed with reference to the Region of Lombardy, with a particular application to the metropolitan area of Milan in view of the forthcoming Expo 2015 event. The project has been presented and won on a call for R&D projects promoted by the Region of Lombardy and the Italian Ministry for Education, University and Research (MIUR), by a consortium composed of several partners (Muoversi, B Human, Link I.T., Mobility Lab, Università degli Studi di Milano Bicocca).

IEFE will be involved in project activities related to the modeling of the travel utility function underlying the TAM-TAM platform and to the evaluation of environmental aspects of transport modes.

BRAVE – Better Regulation Aimed at Valorizing EMAS

Research Director: Michela Melis

Research Team: Michele Barberio, Irene Bruschi

Timing: 2011–2014

BRAVE (www.braveproject.eu) is a project funded within the European Commission's LIFE+ Program and aimed at supporting the full integration of EMAS in EU environmental legislation as a leverage to facilitate implementation by single organizations (better regulation) and to remove, reduce and simplify the administrative costs and burdens for registered organizations as a way to encourage the adoption and dissemination of EMAS (regulatory relief). In 2012, the BRAVE partners carried out the following actions within the Project:

- Action 3:
 - Analysis of how the state of the art and effective regulatory reliefs are supporting EMAS registered organizations at European, national and regional levels
 - Investigation of the available opportunities to include EMAS-incentives in European Directives in force or at a preparatory stage
 - Overview of the existing experiences dealing with incentives for EMAS registered organizations and carrying out of national and regional case studies (Austria, Germany, Italy, Portugal, Spain, Lombardy, Tuscany, Friuli-Venezia Giulia, Basilicata, Andalucia, Valencia)
 - Analysis of current and potential opportunities to include measures supporting EMAS adoption at national and regional levels
- Action 4:
 - Activation of working groups for the elaboration of better regulation and regulatory relief proposals:
 - › a Regional Working Group in each region involved in the project for proposals concerning regional legislation
 - › National Working groups (one in Spain and one in Italy), for the regulatory relief proposals concerning national legislation
 - › an EU-wide working group to elaborate proposals to be introduced in European legislation;
 - › a Project Consultation Board, to share with relevant stakeholders and approve simplification proposals elaborated in the National and EU working groups
 - › a Regional Consultation Board, to share with the relevant regional stakeholders the simplification proposals elaborated by the Regional Working Group

ETA-BETA – Innovation and Sustainability in Productive Areas

Technical Assistance to the Milano Metropoli Agency

Research Director: Fabio Iraldo

Research Team: Michele Barberio

Timing: 2012

The European LIFE+ project ETABETA aims to strengthen and promote the development of Environmentally Equipped Productive Areas, within the EU economic and legislative framework. These areas intend to provide a policy tool to promote sustainability in territorial governance, support and favor environmental innovation and disseminate environmental technologies among SMEs, removing those obstacles and barriers related to lack of human, organizational, technical, financial and economic resources. The IEFER research team supported the ETA-BETA partners in the implementation of the actions of the project carried out in 2012:

- Finalization of the ETA BETA Approach, called Ecologically Equipped Productive Areas
- Management Approach
- Identification of priorities for action by means of an Orientation Map
- Definition of an Environmental Technologies Action Plan and implementation in the selected productive areas

Life Cycle Assessment (LCA) of Beer Brands Carlsberg, Tuborg, BAP Chiara Originale and BAP Bock Produced by Carlsberg Italia

Research Director: Fabio Iraldo

Research Team: Andrea Fontanella

Timing: 2010–2012

Beers produced by Carlsberg Italia are distributed in four different ways: steel kegs, non-returnable glass bottles, aluminum cans and D Master kegs, a new technology of PET kegs developed by Carlsberg Italia. The project carried out a Life Cycle Assessment (LCA) of the four distribution systems with a special focus on the real environmental benefits of the new technology compared to traditional technologies. On the basis of the project's LCA analysis, together with Carlsberg's aim of communicating the environmental properties of its products, in December 2010 Carlsberg Italia became the first beer producer in the world to obtain an Environmental Product Declaration (EPD®) for the “beer product”, a certified environmental declaration developed in accordance with the standard ISO 14025 (EPD 264 “Carlsberg and Tuborg beer”). The EPD obtained in 2010 was pre-certified because of the absence of specific Product Category Rules (PCR) within the EPD system for the beer product. In 2011, the project carried out the development of beer PCR, that went through an open consultation with main Carlsberg stakeholders, and new LCA and EPDs according to the approved PCR. Unlike the previous year, Carlsberg chose not to renew the EPD for Carlsberg and Tuborg beer, but to develop four different EPDs for the four main brands distributed in Italy: Carlsberg, Tuborg, BAP Chiara Originale and BAP Bock. In 2012, an in-depth LCA analysis on the beer production process was carried out to evaluate the environmental impacts of the different production phases and identify potential room for improvement of the environmental performances of the product. Moreover, the LCA study and the four EPDs have been updated with 2011 data and aluminum cans distribution scenario for Carlsberg and Tuborg brand have been added to the study. The activities also included support to Carlsberg Italia for the communication of the environmental benefits of the new technology within the market launch of the new PET kegs.

Green Procurement Guidelines for EXPO Milano 2015 Participants

Research Director: Fabio Iraldo

Research Team: Michela Melis, Rubens Bernascone

Timing: 2012-2013

The project aims to identify and assess the available methodologies and elaborating the criteria for a “green procurement” (GP) of the goods and services that are needed for planning, organizing and carrying out the EXPO 2015 Universal Exposition in Milan. The project focuses on the purchasing decisions of the countries participating in the event – as well as of the other official and non-official participants – in order to provide them with guidelines to correctly integrate environmental criteria within their procurement system for the event. The project focuses on some key cat-

egories of supplies for EXPO Milano 2015, producing a significant environmental footprint in their life-cycle:

- Food and beverages and catering services – Since Expo Milano 2015 is dedicated to food sustainability, this is a fundamental category of supply within the procurement processes. Participants shall thus involve their suppliers in adopting environmentally friendly standards in food and beverages purchasing, preparation, packaging and distribution.
- A second category is represented by merchandise products, whose environmental impacts may significantly vary depending on the wide variety of possible items and goods licensed. Still, merchandise is a key “relationship-building” tool for a Universal Exposition, whose symbolic valence and actual impact both play a crucial role for the sustainability of the event.
- Furniture – this category encompasses a broad product group that includes very different types of goods (e.g. chairs, tables, wardrobes, shelves) with very different uses, whose supply is essential for the setting up of the Exhibition spaces and pavilions.
- Packaging – A sound environmental vision for packaging is also a core issue for Expo Milano 2015. This commitment requires the active involvement of all participants as well as their supply chains, who shall be encouraged to adopt the most advanced solutions within their packaging needs.
- Events organization – Expo Milano 2015 will host a number of theme-related events and meetings organized by participants during the entire Exposition period, whose proper environmental management substantially contributes to the success of the Exhibition.

The GP criteria selected rely on the most recent methodologies, best practices relating to similar events and, lastly, existing guidelines and voluntary standards and/or normative references in this area. By providing a reference framework for GP criteria, best practices and a benchmark for future Expos, the guidelines will be an integral part of the sustainable legacy of EXPO Milano 2015.

FIDIAS – Innovative Financial Instruments for Sustainable Development in Alpine Space

Research Director: Fabio Iraldo

Research Team: Anna Lisa Paglialonga, Michele Barberio, Irene Bruschi

Timing: 2012-2013

FIDIAS is a project running under the Alpine Space Program; its objective is to promote innovative mechanisms, financial instruments and services able to attract private and public capital and to support sustainable development and competitiveness in Alpines territories.

Alpine space regions are all characterized by the needs of increasing and improving sustainable development policies. The project starts from the analysis of the partners' experiences; in particular, it provides a mapping of the financial instruments, the services and the public and private initiatives implemented and demanded at regional levels to support eco-innovation and sustainable development.

The analysis of the existing supply provides an overview of the state of the art in project areas; the demand-side analysis investigates the impressions of the attitude of local actors, involved with green technology, to available credit, other financial instruments and services and of their priorities, preferences and needs. Considering the high eco-innovation potential of Alpine space, FIDIAS aims to support local regional authorities, green-tech SMEs and local financial operators to take advantage of the

opportunities coming from the new EU regulation on financial instruments in order to reinforce existing processes of local development.

LAIKA – Local Authorities Improving Kyoto Actions Technical Assistance to the Municipality of Bologna

Research Director: Fabio Iraldo

Research Team: Sabrina Melandri, Tania Molteni

Timing: 2012-2013

LAIKA is a three-year project co-financed by the European Commission under the framework of the LIFE+ Environment program. The project aims to support the experimentation by 4 Italian local authorities (Milan, Bologna, Turin, Lucca) of a new approach for the definition and planning of a territorial strategy to reduce greenhouse gas emissions. The methodological approach which is being used within the project (“CARTESIO Guidelines”) has been developed by a group of partners, including IEFE, under the framework of the “CARTESIO” network of Italian Regions.

The CARTESIO Guidelines have developed proposals to obtain economic benefits from GHG reduction plans and projects, in order to support economically interested local authorities in meeting Kyoto objectives and EU 20-20-20 objectives. Several options were considered for this purpose: the use of existing mechanisms of credits valorization (Gold Standard, VCS 2007, VER+, etc.); as well as the introduction of new mechanisms that could be adopted at the local, regional or national levels (i.e. issuance of specific credits from GHG reduction projects; credits exchange between Regions and public operators; hypothetical integration and mutual recognition of the new credit system with ETS; elaboration of assignment criteria for Regional Funds based on reductions achieved from the projects).

The LAIKA project aims to make the CARTESIO methodological approach operational, and in particular to:

- support European and Italian institutions to activate a scheme which will allow the contributions of local authorities be valorized towards the achievement of GHG reduction objectives foreseen by the Kyoto protocol and the EU energy and climate package. This can be achieved through the definition of a cross-check procedure for emission trading and the creation of a national register
- develop and check methods for the appraisal, evaluation, and assignment of economic incentives directed towards the voluntary decrease of greenhouse gas emissions, which could be included in European, national and local calls for funding
- implement and simulate a voluntary market for emission reductions generated during the LAIKA project lifespan

Within LAIKA, IEFE Bocconi has supported the Municipality of Bologna in the elaboration of a Climate Commitment Plan and is currently supporting the Municipality in activities related to the identification of eligible projects and their valorization through credits on the LAIKA voluntary market.

Analysis and Support of the Environmental and Energetic Chains in the Province of Milan

Research Director: Marco Frey

Timing: 2012

The project is aimed at supporting *Assolombarda* – the largest territorial association

of the entire entrepreneurial system in the country – in analyzing sustainability chains within the Province of Milan. Starting from data collected from Assolombarda-associated firms, in 2010 the project led to a support of the network of enterprises working in environmental and energy sectors within the Province of Milan, with a focus on distribution of competences, opportunities to work together, experiences and research and innovation activities. In 2011, the *Assolombarda Green Economy Network* was activated, as a consequence of the interest shown by the enterprises for the sustainability themes during the survey and related activities.

In 2012 the project supported the Green Economy Network activities with specific seminars aimed at strengthening the mutual acquaintance of enterprises and the valorization of the related opportunities in specific green economy subsectors. In particular, seminars focused on photovoltaic and biomass market evolution and opportunities.

Social Report of the University of Ferrara 2010//2011 (2012 Edition)

Research Director: Marco Frey

Research Team: Michele Barberio, Irene Bruschi

Timing: 2012

After six years since its first edition, the University of Ferrara's Social Report continues to be a tool for social accountability aiming at delivering accurate information to all those stakeholders the University has interaction with: students and their families, institutions, the scientific community, firms, citizens and the territory. The document, being an innovative tool for a transparent and complete account of the importance and social spillovers of the University's academic and research activities, as well as of its contribution for local development, has gathered consensus by stakeholders and institutions. As a consequence, having the first edition of the University of Ferrara Social Report issued before the 2008 governmental guidelines, it has provided the Italian university system with a reference for social accountability.

For the 2012 edition, the University of Ferrara has broadened the aspects considered introducing an *ad hoc* section dedicated to Gender Accountability. The Gender Account is a tool allowing an organization to analyze those choices made toward men and women, and has a double value: outwardly, it aims to transparently raise citizens' awareness about impacts on the local social tissue; inwardly, it is a tool by means of which the University can assess and monitor the coherence and correspondence of its activities and actions with the objectives set with regard to equal opportunities and non-discrimination.

RP3/3 – Regulation of Liberalized Markets

Maintaining Electrical System Reliability to Integrate Large Amounts of Variable Renewable Energy. The Role of Energy Storage

Research Director: Annalisa D'Orazio

Timing: 2011-2012

As Italy progresses towards its goal of 30-40% renewable energy sources in the power system, the potential for flexible resources and energy storage takes on great relevance. New solutions and technologies, in fact, help integrate variable renewable resources (such as wind and solar) and maintain a reliable and stable electric grid. In 2011 the Italian Government adopted D.Lgs. 28/2011 and D.Lgs. 93/2011 includ-

ing, among others, an assessment of the impacts of variable renewable energy on the power system.

The research project concluded in 2012 aimed to analyze additional efforts required by large amounts of renewable energy into existing power systems and assess the potential role of energy storage in mitigating the impact. The main issues addressed are summarized in the following paragraphs.

The introduction of variable renewables is now one of the primary drivers behind renewed interest in energy storage. A common claim is that renewables such as wind and solar are intermittent and unreliable, and require backup and firming to be useful in a utility system. In fact energy produced by wind and solar should be “smoothed” or shifted to times when the wind is not blowing or the sun is not shining using energy storage. These statements are generally qualitative in nature and provide little insight into the actual role of renewables in the grid, or the potential use of energy storage or other enabling technologies.

Recent renewed interest in energy storage has been motivated by at least five factors: advances in storage technologies, an increase in fossil fuel prices, the development of deregulated energy markets including markets for high-value ancillary services, challenges to siting new transmission and distribution facilities, and the perceived need and opportunities for storage with variable renewable generators. The greatest motivation for proposals to build new energy storage is the creation of markets for both energy and ancillary services including regulation, contingency reserves, and capacity.

Increased recognition of the role of energy storage has stimulated increased research, development, and demonstration efforts addressing both new battery materials and chemistries, less expensive and more robust designs, and enhanced grid storage systems analysis. In addition, there have been full-scale demonstration projects. Many challenges remain and those that are at the center of this program are cost, reliability, value proposition, competitive environment, and regulatory environment.

Although there have been numerous changes to the utility market over the past decades, including deregulation, understanding the differences between markets is an ongoing challenge. Furthermore, the highly integrated nature of the evolving grid will likely encourage a use of assets in ways that defy traditional classifications. Storage can potentially play multiple roles in the grid of the future, but only if institutional processes appropriately represent the contribution storage can provide. The research carries out a comparative analysis of countries that have introduced policies and measures in favor of storage systems (including Italy).

Support to the AEEG for the Definition of the Water Service Charging Method for the 2012-2013 Regulatory Period

Research Director: Antonio Massarutto

Research Team: Monica Bonacina, Federico Pontoni

Funding: AEEG (National Regulatory Authority for Electricity and Gas)

Timing: 2012

In 2011, the AEEG – the Italian National Regulatory Agency for Electricity and Gas – was made responsible for the economic regulation of water and sanitation services, and in particular for the definition of tariff regulations following the outcome of the June 2011 popular referendum.

IEFE has been involved in wide-ranging supporting activity, entailing training seminars for AEEG board and staff, and participation in a working group aimed at dis-

cussing and supporting the definition of the new tariff scheme for the first regulatory period. Contribution of the IEFE team has regarded:

- methodological and theoretical support in the design of tariff schemes
- simulation of the impact of alternative scenarios and proposals on water companies
- discussion of the robustness of proposed methodologies for standard benchmarking formulas
- medium- and long- term assessment of financial sustainability of investment plans
- fine-tuning of tariff schemes
- independent assessment of the outcomes

In addition to this, IEFE has taken advantage of the access to water company data for a more academic study based on DEA, and dedicated to the comparative assessment of water company efficiency during the previous regulatory periods. This part of the research has produced a paper presented in June at the Florence School of Regulation (Bonacina-Pontoni).

3. Thematic Observatories

In addition to conducting research activities, the Center also manages thematic Observatories, open both to members and non-members, which focus on topics and issues of particular policy interest. These Observatories are high-level working platforms, where researchers, firms and institutions meet to discuss and compare different views and methods of analysis.

Forum on European Energy and Environmental Policies (EnEn Forum)

In recent years, energy and sustainable development have been at the core of the European Union's political agenda. The energy and climate package presented in January 2007 defines a new common policy integrating sustainability, energy security and competitiveness. The Treaty of Lisbon, entered into force in December 2009, introduces a juridical base for a European policy on energy and explicitly refers to the fight against climate change. Within international negotiations on climate change, the European Union has adopted a common position, consistent with its 20/20/20 commitments and with the willingness to maintain a leadership position. At the same time, the European Commission has highlighted the need to further liberalize and integrate national markets for electricity and gas, through European regulations and grid interconnection.

Within this context, European decisions have an increasing impact on the competitiveness of companies and define a binding framework for national governments.

IEFE has been dealing with these topics through research activities and seminars, developed in collaboration with institutions and companies. To respond to an increasing need to further analyze these topics, the "Forum on European Energy and Environmental Policy" has been promoted together with the European Commission – Milan Office.

Through a close and continuous relation with associated members and institutions, the Forum aims to:

- monitor the evolution of European policies in the fields of energy and environment
- evaluate competitive implications of European policies for industry
- promote dialogue among national and international stakeholders
- contribute to defining the Italian position on these topics

The Forum organizes periodical workshops to analyze and discuss the development and the implementation of European Energy and Environmental policies, with regard to all sectors affected. Sustainability, market competition, economic and fiscal policy, innovation and security of supply will be some of the main aspects considered. Participants are top representatives of energy producers and utilities, other operators of the energy sector, professional associations, financial companies and other sectors directly influenced by energy policies.

The Forum was presented in 2011 in Milan at Università Bocconi with the Vice President of the European Commission, Antonio Tajani, as keynote speaker, and with the Rector, Guido Tabellini.

On 18 July 2012 a meeting of the Forum on the development of an integrated European energy market was organized in Rome at the Senate of the Republic, with the participation of the EU Commissioner for Energy Günther Oettinger as keynote speaker, at the presence of the President of the Senate.

Director: Michele Polo

Coordinator: Edoardo Croci

Observatory on Communication and Environmental Information (CIA)

This Observatory was established in 2006 as an observatory on environmental information and participation. In its first two biennia (2006-2008, 2008-2010) it monitored Italian and international legislation and policy on information and participation. Its main purposes have been to promote a uniform implementation of the law and to define policy guidelines for administrative transparency in the environmental sector. In the 2010-2012 biennium the Observatory has widened its scope to environmental communication and information strategies of companies, public administrations and non-profit entities and their competitive impacts.

The European Commission, public institutions such as the Italian Ministry of the Environment, regions, regional environmental protection agencies, consortia of waste recovery and recycling and professional associations participate in this Observatory.

During 2011-2012 the following meetings were held:

- Smart Cities: a focus on the management of information within urban services (28 June 2012)
- Report on environmental advertising in Italy (5 March 2012)
- Energy certification of buildings: the meaning of labels (conference) (12 December 2011)
- Local referenda on environmental topics (6 July 2011)
- Stakeholder involvement and communication aspects within the Covenant of Mayors initiative (20 April 2011)
- Environmental communication in the beverage sector: presentation of two applications of LCA methodology (25 January 2011)

Moreover, a public conference was held on 26 March 2012 to present the report on environmental advertising in Italy.

Within the activities of the CIA Observatory, IEFE has started a collaboration with the Val d'Agri Environmental Observatory (Osservatorio Ambientale Val D'Agri – OAVDA), launched by the Basilicata Region to manage the diffusion of environmental information regarding the oil extraction activities that are taking place in the region, with the objective to also enhance dialogue with the local population and stakeholders regarding this issue.

Coordinator: Edoardo Croci

Observatory on Integrated Environmental Management Systems (OSIGA)

This Observatory, established in 1997, is a qualified venue for discussing and analyzing emerging environmental management issues at the Italian and international

levels. It monitors ISO and EMAS environmental registrations and certifications and provides constantly updated information on the development of new environmental policy tools at the Italian and EU levels. Central and local institutions, accreditation and certification bodies, trade and industrial associations, environmentalist and consumer associations, trade unions and industrial and service companies specialized in environmental management participate in the Observatory.

In 2012, OSIGA addressed the following issues:

- The consequences and implications of the Italian Decree 231/01 extension to environmental liability of private and public entities (e.g. industrial organisations) and synergies with ISO 14001 and EMAS environmental management systems
- Product Environmental Footprint and Organization Environmental Footprint as innovative methodologies to support Sustainable Consumption and Production strategies
- Green Economy: networking and other initiatives to sustain its development
- Regional policies for cluster-oriented environmental management approaches (co-operation with the CARTESIO regional network and, specifically, support to the Region of Lombardy)
- Environmental performance and economic / competitive performance of Italian clusters (by carrying out the ECODISTRETTI survey, in co-operation with Ambiente Italia)

4. Other Activities

CERRE

Providing top quality studies, training and dissemination activities, the **Center on Regulation in Europe (CERRE)** (www.cerre.eu) was setup in 2010 to promote robust and consistent regulation in Europe's network industries. CERRE's members are regulatory authorities and operators in those industries as well as universities.

The possibility for all consumers and users to have access to quality services at reasonable prices is not yet today the general rule for Europe's network industries. Good regulation is thus necessary to improve both the EU process of liberalization of those industries and, more widely, public governance.

CERRE's threefold objective is: 1) promoting robustness and consistency in regulation processes and systems in Europe; 2) clarifying the respective roles of market operators, governments and regulatory authorities; 3) recommending and disseminating top quality regulation practices. CERRE studies are geared towards the concrete strategic and operational needs of its members.

CERRE's Director General is Bruno Liebhaberg, Professor at the Solvay Brussels School of Economics and Management, Université Libre de Bruxelles. Joint Academic Directors are Martin Cave, Professor at the London School of Economics and Political Science; Jean-Claude Maun, Professor and Dean of the Engineering School (Ecole Polytechnique), Université Libre de Bruxelles; Pierre Larouche, Professor and Co-Director of the Tilburg Law and Economics Center (TILEC), Tilburg University; Guido Cervigni, IEFE, Università Commerciale Luigi Bocconi.

During 2012 IEFE contributed to the activity of CERRE with a position paper "Shaping the European Gas Market" that was prepared by Guido Cervigni, presented and discussed at a workshop on 13 September and published in the CERRE policy series papers.

EnergyLab

EnergyLab Foundation (www.energyfoundation.org) was founded in Milan in September 2007 with the goal of creating a network between universities, the business world and regional and local government. The foundation aims to support research, development and innovation and to promote awareness of energy-related matters among the public, government institutions, private bodies and the media. The founding members are the Lombardy Regional Government, the Milan City Council, Università Commerciale L. Bocconi, Università degli Studi di Milano-Bicocca, Università Cattolica del Sacro Cuore, Politecnico di Milano, Università degli Studi di Milano, the AEM Foundation and the Edison Foundation. RSE – Ricerca sul Sistema energetico S.p.A. is a participant institution in the foundation.

IEFE Director Michele Polo is a member of the Executive Committee of the EnergyLab Foundation, while IEFE Research Fellow Marzio Galeotti is a member of EnergyLab Scientific Committee.

Among other activities, EnergyLab's research is organized around laboratories aimed

at facilitating and promoting interaction between experts in universities, industry and government with respect to energy-related issues that are held to be of significant current interest and/or involve a high degree of innovation. In the 2009-2011 three-year period the foundation launched five Research Laboratories on: 1) Renewable Energy Sources; 2) Nuclear Energy; 3) Smart Grids; 4) Sustainable Mobility; 5) Access to Energy. IEFE research plays an active role in these labs, either as members of each lab's scientific committee or by directly carrying parts of the lab research project. In 2012, a new laboratory on Energy Efficiency was started. IEFE researcher Marzio Galeotti is a member of the scientific committee.

(For more information see, in Italian: <http://www.energylabfoundation.org/attivita/i-laboratori/>)

Policy Notes

Since 2008 IEFE researchers have been contributing to the Italian debate on relevant issues surrounding energy and environmental policy. These policy notes are often also published in specialized fora, typically web sites, magazines or newspapers. Here is the list for 2012.

- 2 January 2012
“Teleriscaldamento: un monopolio da regolare” by Mauro Alberti and Antonio Sileo (Lavoce.info)
- 11 January 2012
“Una road map per le liberalizzazioni” by Michele Polo (Lavoce.info)
- 17 January 2012
“Come la separazione Eni-Snam può diventare un vantaggio” interview with Federico Pontoni (ilsussidiario.net)
- 24 January 2012
“Liberalizzazioni: tre errori da evitare” by Michele Polo (Lavoce.info)
- 27 January 2012
“Le due facce della green economy” by Annalisa D’Orazio (Lavoce.info)
- 6 February 2012
“Un buono per l’acqua” by Antonio Massarutto (Lavoce.info)
- 14 February 2012
“La risposta al grande freddo? Lo stoccaggio” by Alessandro Fiorini, Gionata Picchio and Antonio Sileo (Lavoce.info)
- 15 February 2012
“I giorni critici del gas naturale” by Antonio Sileo (AGI Energia)
- 23 February 2012
“Non solo gas contro il freddo” by Marzio Galeotti (Lavoce.info)
- 1 March 2012
“Smart Metering Gas, la strategia conservatrice della Spagna” by Matteo Di Castelnuovo and Antonio Sileo (Staffetta Quotidiana)
- 11 April 2012
“In difesa degli incentivi all’energia rinnovabile” by Marzio Galeotti (Lavoce.info)
- 11 June 2012
“Energia rinnovabile: oltre il costo degli incentivi” by Marzio Galeotti (Lavoce.info)
- 22 June 2012
“Il consumo di carburanti” by Antonio Sileo and Niccolò Cusumano (Lavoce.info)

- 27 June 2012
“I prezzi del gas e del petrolio lontani e vicini” by Antonio Sileo (AGI Energia)
- 3 September 2012
“La lezione di Ilva e Sulcis” by Marzio Galeotti (Lavoce.info)
- 3 September 2012
“Soluzioni per due emergenze” by Marzio Galeotti (Lavoce.info)
- 4 September 2012
“Le regole d’oro per la Golden Age del gas naturale” by Antonio Sileo (AGI Energia)
- 4 September 2012
“Gasdotti internazionali: i nuovi progetti” by Federico Pontoni (AGI Energia)
- 4 September 2012
“Perché Taranto non è il Sulcis” by Marzio Galeotti (Lavoce.info)
- 6 September 2012
“L’arma in più di Eni” by Marzio Galeotti and Antonio Sileo (Lavoce.info)
- 25 September 2012
“Per un’auto made in Italy” by Antonio Sileo (Lavoce.info)
- 15 November 2012
“L’energia” by Marzio Galeotti (Lavoce.info)
- 15 November 2012
“I limiti della Sen” by Marzio Galeotti (Lavoce.info)
- 20 November 2012
“Agli Stati Uniti l’imprevisto ruolo di paese produttore” by Antonio Sileo (AGI Energia)
- 23 November 2012
“Gare gas, obiettivi e realtà” by Antonio Sileo (Staffetta quotidiana)
- 27 November 2012
“La Sen e il taglio al costo dell’energia” by Simona Benedettini (Lavoce.info)
- 30 November 2012
“La Sen come dovrebbe essere” by Antonio Sileo and Marzio Galeotti (Lavoce.info)

5. Working Papers

IEFE Working Paper n. 47

Debiasing Through Auction? Inertia in the Liberalization of Retail Markets by Paolo Bertoletti and Clara Poletti

We analyze a market in the process of liberalization. Consumers are biased in favor of an incumbent firm and we assume that they can discover the true value of new suppliers only by switching. In an infinitely-repeated game setting with Bertrand competition, we first show that efficient entry might not take place. We then evaluate the effect of organizing a public auction for assigning consumers to a default supplier and show that such a mechanism (which respects the freedom of choice by consumers) would support entry efficiency. However, auctioning might also increase inefficient, although temporary, entry.

IEFE Working Paper n. 48

How Much Do the Neighbors Pay? Economic Costs of International Gas Disputes by Olha Zadorozhna

The paper analyzes financial performance of European companies during Ukrainian-Russian gas disputes in January 2006 and 2009. Investor reactions to the gas disputes is estimated for companies listed on the European stock exchanges and for which natural gas is the main factor of production. Economic costs of the gas cut-offs are estimated using event study methodology. It is found that the most severe decline in value due to the gas disputes was for companies located in the CEE states that are heavily dependent on Russian gas supply. The paper also contributes to the literature on the bargaining power of states, providing an empirical investigation of how much cost is borne by a party with less bargaining power in the dispute.

IEFE Working Paper n. 49

Liberalizing the Gas Industry: Take-or-Pay Contracts, Retail Competition and Wholesale Trade by Michele Polo and Carlo Scarpa

This paper examines retail competition in a liberalized gas market. Vertically integrated firms run both wholesale activities (buying gas from producers under take-or-pay obligations) and retail activities (selling gas to final customers). The market is decentralized and the firms decide which customers to serve, competing then through prices. We show that TOP clauses limit the incentives to face-to-face competition and determine segmentation and monopoly pricing even when entry of new competitors occurs. The development of wholesale trade, instead, may induce generalized entry

and retail competition. This equilibrium outcome is obtained if a compulsory wholesale market is introduced, even when firms are vertically integrated, or under vertical separation of wholesale and retail activities when firms can use only linear bilateral contracts.

IEFE Working Paper n. 50

Electricity Distribution Investments: No Country for Old Rules? A Critical Overview of UK and Italian Regulations

by Simona Benedettini and Federico Pontoni

The increase in distributed generation and the increasingly pro-active role of mass consumers demand smart distribution networks. To this aim, regulation too must be innovated, in order to promote innovative and additional infrastructural investments. This paper develops, first, a methodological framework addressing the relevant drivers for the regulation of distribution network investments. In light of this framework, we then perform a critical overview of the British and Italian regulatory approach to distribution network investments. Finally, we discuss some policy insights for the Italian regulator.

IEFE Working Paper n. 51

Climate Change, Tourism and Water Resources in the Mediterranean: A General Equilibrium Analysis

by Roberto Roson and Martina Sartori

This paper presents and discusses some quantitative results obtained in assessing the economic impact of variations in tourism flows, induced by climate change, for some Mediterranean countries. Estimates by a regional climate model are used to build a Tourism Climate Index, which indicates the suitability of climate, in certain locations, for general outdoor activities. As climate change is expected to affect a number of variables like temperature, wind and precipitation, it will have consequences on the degree of attractiveness of touristic destinations. We estimate the macroeconomic consequences of changing tourism flows by means of a computable general equilibrium model. We found that more incoming tourists will increase income and welfare, but this phenomenon will also induce a change in the productive structure, with a decline in agriculture and manufacturing, partially compensated by an expansion of service industries. We found that, in most countries, a decline in agriculture entails a lower demand for water, counteracting the additional demand for water coming from tourists and bringing about a lower water consumption overall.

IEFE Working Paper n. 52

Uncertainty in Integrated Assessment Modeling: Can Global Sensitivity Analysis Be of Help?

by Barry Anderson, Emanuele Borgonovo, Marzio Galeotti and Roberto Roson

The complexity of integrated assessment models (IAMs) prevents the direct appreciation of the impact of uncertainty on the model predictions. However, for a full understanding and corroboration of model results, analysts might be willing, and ought to identify the model inputs that influence the model results the most (key drivers), the direction of change associated with the variation of a given input and the

overall model structure (interaction analysis). We show that such information is already contained in the data set produced by Monte Carlo simulations commonly used in IAM studies and that can be extracted from it without additional calculations. Our discussion is guided by an application of the proposed methodologies to the well-known DICE model of William Nordhaus (2008). A comparison of the proposed methodology to approaches previously applied on the same model shows that robust insights concerning the dependence of future atmospheric temperature, global emissions and current carbon costs and taxes on the model's exogenous inputs can be obtained. The method avoids the fallacy of a priori deeming the important factors based on the sole intuition.

The complete list of IEFE working papers can be found and downloaded from the IEFE website.

6. Research Reports

La riforma della regolazione dei servizi idrici in Italia.

L'impatto della riforma: 1994-2011

IEFE Research Report n. 9 – January

by Antonio Massarutto (ed.)

Rapporto sulla pubblicità ambientale in Italia - Sintesi

IEFE Research Report n. 10 – March

by Osservatorio Comunicazione e Informazione Ambientale

Strategia Energetica Nazionale - Consultazione per la Strategia Energetica Nazionale

IEFE Research Report n. 11 – November

by Simona Benedettini, Monica Bonacina, Niccolò Cusumano, Matteo Di Castelnuovo, Marzio Galeotti, Elisabetta Iossa, Arturo Lorenzoni, Caterina Miriello, Michele Polo, Federico Pontoni, Antonio Sileo

Available on the IEFE website

7. Articles and Books

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- Bosello F., R.J. Nicholls, J. Richards, R. Roson and R.S.J. Tol (2012), “Economic Impacts of Climate Change in Europe: Sea-Level Rise”, *Climatic Change*, 112, 63-81
- Croci E. (2012), “Un pass per l’ecologia”, *Qualenergia*, Anno X, n. 1, February-March, ISSN: 1590-0193
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- Iraldo F., M. Frey and M. Battaglia (2012), “Special Issue on Exploring the link between CSR and competitiveness”, *International Journal of Technology Management*, 58, 1-9
- Iraldo F., M. Battaglia and T. Barsotti (2012), “Politiche del lavoro e distribuzione regionale della disoccupazione: l’Italia nel contesto europeo”, *Scienze Regionali*, 11, 5-38
- Iraldo F., F. Testa, T. Daddi and M. Frey (2012), “Overview of Past and Ongoing Experiences Dealing with the Environmental Management at Cluster Level”, in: Sime Curkovic. *Sustainable Development Authoritative and Leading Edge*

Content for Environmental Management, Rjeka, Intech

- Iraldo F., F. Testa, S. Tessitore and M. Frey (2012), "Strategies and approaches in green advertising: an empirical analysis of the Italian context", *International Journal of Environment and Sustainable Development*, 10, 375-395
- Iraldo F., F. Testa, M. Frey and T. Daddi (2012), "What factors influence the uptake of GPP (Green Public Procurement) practices? New evidence from an Italian survey", *Ecological Economics*, 82, 88-96
- Iraldo F. and M. Battaglia (2012), "Aree produttive, territorio e competitività: il caso delle APEA in Italia", in M. Cavallo, P. degli Espositi and K. Konstantinou, *Green marketing per le aree industriali*, FrancoAngeli, Milano
- Iraldo F., F. Testa and D. Styles (2012), "Case study evidence that direct regulation remains the main driver of industrial pollution avoidance and may benefit operational efficiency", *Journal of Cleaner Production*, 21, 1-10
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- Sileo A. (2012), "Il gas naturale in Italia: sfide e opportunità", *Osservatorio di Politica Internazionale - Sicurezza energetica*, n. 11, May-July
- Sileo A. and A. Fiorini (2012), "Full unbundling e nuovo corso normativo. Il rinnovato ruolo di Snam per la sicurezza e lo sviluppo del mercato del gas naturale", in G. Campa, G. Galeotti, R. Paladini and V. Visco (eds.), *Saggi di economia pubblica*, Jovene editore, Naples, 77-98

8. Seminars and Conferences

IEFE has organized numerous seminars and conferences, listed below. Programs and presentations can be downloaded from the IEFE website (www.iefe.unibocconi.it)

20 January 2012

Conference “**231 e ambiente: novità normative e prospettive di gestione**” organized by IEFE

26 January 2012

FEEM-IEFE joint seminar “**Modeling Labor Supply as a ‘Free Time’ Trade-off in a Multiregional Ramsey Model**” by Frédéric Gherzi (Centre International de Recherche sur l'Environnement et le Développement-CIRED)

10 February 2012

IEFE seminar “**How Much Do the Neighbours Pay? Economic Cost of International Gas Disputes**” by Olha Zadorozhna (Università Bocconi)

16 February 2012

FEEM-IEFE joint seminar “**On Modeling Ambiguity in Expert Elicitation Surveys: Theory and Application to Solar-Technology R&D**” by Stergios Athanassoglou (Euro-Mediterranean Center on Climate Change and FEEM)

2 March 2012

IEFE seminar “**The Delicate Art of Regulating a Decarbonising Power Market**” by Caterina Miriello (IEFE)

16 March 2012

IEFE seminar “**Renewable Energy Target 2020: Regional Burden Sharing**” by Arturo Lorenzoni (Università di Padova and IEFE)

22 March 2012

FEEM-IEFE joint seminar “**The Demand for Energy of Italian Households**” by Ivan Faiella (Banca d'Italia)

26 March 2012

Conference “**Presentazione del 1° rapporto sulla pubblicità ambientale in Italia**” organized by IEFE

13 April 2012

IEFE seminar “**Electricity Distribution Investments: No Country for Old Rules? A Critical Overview of UK and Italian Regulations**” by Simona Benedettini and Federico Pontoni (IEFE)

19 April 2012

IEFE seminar “**Environmental Policy and Directed Technological Change: Evidence from the European Carbon Market**” by Raphael Calel (Grantham Research Institute on Climate Change & the Environment, London School of Economics)

10 May 2012

FEEM-IEFE joint seminar “**International Cooperation in R&D to Reduce Emissions: The Role of Spillovers and Absorptive Capacity**” by Melanie Heugues (FEEM)

18 May 2012

Conference on “**Energy Markets**” organized by IEFE

8 June 2012

IEFE seminar “**Low Cost Carriers and Airports Performance: Empirical Evidence from a Panel of UK Airports**” by Anna Bottasso (Università di Genova)

21 June 2012

FEEM-IEFE joint seminar “**Uncertainty in Integrated Assessment Modeling: Can Global Sensitivity Be of Help?**” by Emanuele Borgonovo (Eleusi and DEC, Università Bocconi)

12 July 2012

FEEM-IEFE joint seminar “**An Empirical Differential Game for Sustainable Forest Management**” by Pablo Andrés Domenech (GERAD - Groupe d'Etudes et de Recherche en Analyse des Décisions, Canada)

20 September 2012

FEEM-IEFE joint seminar “**Ethanol and Food Prices: Price Relations and Predictability**” by Andrea Bastianin (Università Milano-Bicocca and FEEM)

8 October 2012

Conference on “**L'impronta ambientale dei prodotti**” organized by IEFE

18 October 2012

FEEM-IEFE joint seminar “**Can Dispersed Biomass Processing Protect the Environment and Cover the Bottom Line for Biofuel?**” by Aklesso Egbendewe-Mondzozo (FEEM)

19 October 2012

Conference on “**ELSNIT X Annual Conference on “Trade and Climate Change**” organized by the Euro-Latin Study Network on Integration and Trade (ELSNIT) in collaboration with IEFE

9 November 2012

IEFE Seminar “**Green Growth: A Case Study on the Wind Turbine Sector in China and Denmark**” by Enrico Botta (OECD)

23 November 2012

IEFE Seminar “**Do Capacity Support Schemes Work? An Empirical Assessment Across OECD Countries**” by Simona Benedettini (IEFE)

5 December 2012

Conference on “**La strategia energetica nazionale. Una lettura critica**” organized by IEFE

6 December 2012

IEFE Seminar “**End-Use Residential Energy Demand: A MDCEV-GEV Model for the Joint Estimation of Perfect and Imperfect Substitute Goods**” by Vito Frontuto (Università di Torino)

13 December 2012

FEEM-IEFE joint Seminar “**Implementation of a Full Air Quality Model in an Integrated Assessment Model: The LEAQ Model**” by Laurent Drouet (FEEM)

9. Structure*

Working at IEFE are tenured professors and researchers from Università Bocconi and other universities, along with research fellows with contracts or grants connected to the Center itself, as well as expert consultants in specific areas. The Center is managed by the President, the Steering Committee, the Scientific Committee and the Members' Committee.

President: Alberto Meomartini, Chairman of Assolombarda

Honorary President: Renzo Capra

Director: Michele Polo

Research Fellows: Valentina Bosetti, Carlo Cambini, Guido Cervigni, Edoardo Croci, Matteo Di Castelnuovo, Marco Frey, Elena Fumagalli, Marzio Galeotti, Manfred Hafner, Elisabetta Iossa, Fabio Iraldo, Arturo Lorenzoni, Antonio Massarutto, Michela Melis, Roberto Roson

Junior Research Fellows: Michele Barberio, Simona Benedettini, Rubens Bernascone, Monica Bonacina, Matteo Cai, Niccolò Cusumano, Andrea Fontanella, Caterina Miriello, Tania Molteni, Anna Lisa Paglialunga, Federico Pontoni, Martina Sartori, Antonio Sileo

Affiliates: Angelo M. Cardani, Anna Cretì, Annalisa D'Orazio, Augusto Ninni

Secretarial Office: Lia Bertoglio

Administrative Office: Dora Milanesi

* As of December 2012

10. Steering Committee*

Miguel Antoñanzas, E.ON Italia, Chairman of the Board of Management
Roberto Bazzano, Federutility, President
Giancarlo Cremonesi, Acea, Chairman
Bruno D'Onghia, EdF- Representative Office in Italy, Director
Pasquale De Vita, Unione Petrolifera, President
Paolo Gallo, Edipower, CEO
Edoardo Garrone, Erg, Chairman
Paolo Andrea Colombo, Enel, Chairman
Gian Marco Moratti, Saras, Chairman
Bruno Lescoeur, Edison, CEO
Luigi Roth, Terna, Chairman
Paolo Scaroni, Eni, CEO
Tomaso Tommasi di Vignano, Hera, Chairman
Giuliano Zuccoli, A2A, President of the Management Committee and Assoelettrica,
Chairman**

De Jure Members

Alberto Meomartini, IEFÉ President
Bruno Pavesi, Chief Executive Università Bocconi, or his delegate
Michele Polo, IEFÉ Director
Andrea Sironi, Rector Università Bocconi, or his delegate

* As of December 2012

** To be replaced during the next meeting of IEFÉ associates.

11. Scientific Committee

President: David Newbery, University of Cambridge (UK)

Members

Frank Convery, University College Dublin (IRL)

Claude Crampes, École d'Économie de Toulouse (F)

Thomas C. Heller, Stanford University, (USA)

François Lévêque, École des Mines, Paris (F)

Ignacio Pérez-Arriaga, Comillas University, Madrid (E)

Michele Polo, IEFE Director (de jure)

Pippo Ranci, Università Cattolica del Sacro Cuore di Milano (I)

Carlo Scarpa, Università di Brescia (I)

Jonathan Stern, Oxford Institute for Energy Studies (UK)

Nils-Henrik von der Fehr, University of Oslo (N)

Catherine Waddams, University of East Anglia (UK)

12. Associated Companies and Organizations

1. **ABB:** Alessandro Clerici, Senior Advisor to the President
2. **ACEA:** Paolo Carta, Studies and Research Manager
3. **A2A:** Patrizia Savi, Planning, Finance and Control Director
4. **ANIGAS:** Luciano Buscaglione, Managing Director
5. **ARPA LOMBARDIA:** Elisabetta Parravicini, President
6. **ASSOELETTRICA:** Stefano Pupolin, Managing Director
7. **ASSOGAS:** Sergio Sala, Managing Director
8. **CVA TRADING:** Paolo Giachino, CEO
9. **EdF- Representative Office in Italy:** Bruno D’Onghia, Director
10. **EDISON:** Bruno Lescoeur, CEO
11. **ENEA:** Giovanni Lelli, Commissioner
12. **ENEL:** Simone Mori, Regulatory and Environmental Director
13. **ENI:** Paolo Scaroni, CEO
14. **ENI – DIV.NE GAS & POWER:** Domenico Dispenza, Managing Director
15. **E.ON Italia:** Miguel Antónanzas, Chairman
16. **ERG:** Lucia Bormida, Authorities and Government Relations Manager
17. **FEDERUTILITY:** Roberto Bazzano, Chairman
18. **GME – GESTORE MERCATO ELETTRICO:** Massimo Ricci, Chairman and CEO
19. **GSE – GESTORE DEI SERVIZI ELETTRICI:** Gerardo Montanino, Director of Operations
20. **HERA:** Tomaso Tommasi di Vignano, Chairman
21. **IREN ENERGIA:** Roberto Garbati, CEO
22. **LINEA ENERGIA:** Gianluca Delbarba, Chairman
23. **SAIPEM:** Alberto Meomartini, Chairman
24. **SARAS:** Dario Scaffardi, Managing Director
25. **SOGIN:** Fabio Chiaravalli, Environmental Area Manager
26. **TERNA:** Luigi Roth, Chairman
27. **UNICREDIT:** Giorgio Capurri, Corporate Sustainability - Group Identity and Communications Area
28. **UNIONE PETROLIFERA:** Pasquale De Vita, Chairman

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