

Workshop  
**Developments in Energy Economics**

Madrid, 25 February 2019

# Program

## Monday, 25 February

- 10.00 - 10.10      **Welcome and introduction**  
*Xavier Labandeira (Economics for Energy)*
- 10.10 - 11.50      **Competition among Renewables**  
*Natalia Fabra (U. Carlos III)*
- 10.50 - 11.30      **Fast Charging Stations: Simulating Entry and Location in a Game of Strategic Interaction**  
*Joan-Ramon Borrell (U. Barcelona)*
- 11.30 - 12.00      Coffee
- 12.00 - 12.40      **Competing for (Fake) Certificates: The Case of Smog Checks**  
*Juan-Pablo Montero (Pontificia U. Católica Chile)*
- 12.40 - 13.20      **Exploring Energy Use in Fashion Stores: A Field Experiment**  
*Maria L. Loureiro (U. Santiago de Compostela)*
- 13.20 - 13.30      **Summing up and closure**  
*Ibon Galarraga (AEEE)*

**Competition among Renewables** | *Natalia Fabra (joint with Gerard Llobet)*

We model strategic behavior of renewable suppliers when competing in electricity auctions. We introduce renewables' intermittency by assuming that firms' available capacities are random and private information. In equilibrium, bid functions are a smooth decreasing function of firms' realized capacities. Thus, at times when there is more renewables' availability, supply functions shift outwards and downwards, leading to reductions in the market price. An increase in correlation between firms' available capacities strengthens competition non-monotonically.

**Fast Charging Stations: Simulating Entry and Location in a Game of Strategic Interaction** | *Joan-Ramon Borrell (joint with Valeria Bernardo and Jordi Perdiguer)*

This paper proposes for the first time to use a game of strategic interaction among potential entry firms in this new industry to simulate entry and location of fast charging stations for electric vehicles. Up until the publication of this paper, the analysis of entry and location of charging stations have been analyzed only using flow optimization models that showed locations that minimized the time and distance travelled to recharging, but those models were not taking into account neither the incentives nor the strategies of potential entrants, nor the micro foundations of consumer decisions. The paper evaluates by simulation the equilibrium obtained from such strategic interaction among potential entry firms and consumers in terms of social welfare and firm spatial differentiation. Although the simulation might have delivered multiple equilibria, as the recent literature shows (Sanchez-Espin and Parra, 2018) under mild conditions the simulation converges towards a unique equilibrium (herculean equilibrium). Using Barcelona mobility survey, demographic data and the street graph (891 nodes and 2552 archs) we find that only at an electric vehicle penetration rate above 3% does a dense network of stations appear as the equilibrium outcome of a market with no fiscal transfers. We also find that price competition drives location differentiation measured not only in Euclidean distances but also in consumer travel distances.

**Competing for (Fake) Certificates: The Case of Smog Checks** | *Juan-Pablo Montero (joint with Francisco Gallego and Jose D. Salas)*

It has been documented that the market for vehicle emission inspections (i.e., smog checks) may suffer from corruption problems: granting smog-check certificates to cars that do not comply with the emission standards. Since consumers only care for the certificate, we can isolate the effect of competition on certificate quality provision. We develop a model of competition with consumers owning different type of cars. We then take the model to the data: all inspection tests carried out in Chile during the period 2008-2016. We study the effect of competition by exploiting both the entry of new inspection stations and the fact that some stations are more geographically isolated than others (all stations have their prices capped at levels set at auctions where station owners compete for the inspection concession). We find strong effects of competition. Stations react to more competition not by reducing prices, which remain unchanged at their maximum levels, but by relaxing their standards for passing a smog check. None of this is observed at monopoly stations, if anything, they tend to tightened their standards relative to others. The perverse effect of competition on emissions is large: emissions would be 10-15% lower than if stations were to comply with the standards.

**Exploring Energy Use in Fashion Stores: A Field Experiment** | *Maria L. Loureiro (joint with Xavier Labandeira)*

Optimizing energy use is a growing concern in the commercial sector, particularly for fashion retailers due to its relevance within total expenses and the increasing scrutiny of environmental performance indicators in the textile industry. In this paper we conduct a field experiment (randomized control trial) in a major multinational company to test how information provided to store managers about the environmental impacts of energy use induces changes in selected temperatures within an automated technical platform. Based on a field experiment conducted in 155 stores located in three countries, our results show that managers receiving the information treatment are more likely to change the thermostat manually to reduce the gap between indoor and outdoor temperatures; this is consistent with a more sustainable pattern of heating and cooling.

## **Joan-Ramon Borrell**

Joan-Ramon Borrell holds a PhD degree in Economics from the University of Barcelona (1999) and a MA degree in International Political Economy from the University of Warwick (1996). He completed a postdoctoral stay in the Department of Economics at Harvard University (2000-2001). He is an Associate Professor in Economics in the University of Barcelona at the Public Policy Section of the Department of Econometrics, Statistics and Applied Economics, at the Government and Markets Research Group (GiM) of the Institute for Applied Economics (IREA), and at the Public Policy Observatory (OAP). He is also Research Fellow at the University Pompeu Fabra Center for Health Economics (CRES), and at Navarra University IESE Public Private Sector Research Center (PPRS). Author of 14 articles in JCR journals (and 30 other publications) in the area of empirical industrial organization, data analysis, and policy evaluation, he has participated in a number of research projects, in some cases as leader, and has supervised a number of doctoral theses. He is also author of expert reports and opinions for governments, NGOs and firms in the area of regulation and competition policy (pharma, energy, telecoms, water, transportation, postal and local services).

## **Natalia Fabra**

Natalia Fabra is Professor of Economics at Universidad Carlos III de Madrid, Research Affiliate at the Centre for Economic Policy Research, and Research associate at the Toulouse School of Economics. She has received two awards as Spanish Best Young Economist (one awarded by the Banco Sabadell Foundation, and the other by the Madrid regional government). Currently, she is Associate Editor of the *Economic Journal* and the *Journal of Industrial Economics*. She obtained her PhD in 2011 at the European University Institute (Florence). Natalia's research deals with several topics in the field of Industrial Organization, mainly applied to regulation and competition policy issues, with emphasis on energy economics. Her research papers are published in leading journals such as the *American Economic Review*, the *Rand Journal of Economics*, the *Economic Journal*, the *Journal of Industrial Economics*, and the *International Journal of Industrial Organization*, among others. Natalia has received a Consolidator ERC grant to carry out research on Energy and Environmental Economics (2018-2013). For this purposes, she has created a research group, EnergyEcoLab, that gathers first-rated economists working in this area. Natalia has visited several institutions, including the UCEI at Berkeley, Nuffield College at Oxford, the Toulouse School of Economics, and Northwestern University.

## **Maria L. Loureiro**

Maria Loureiro is professor in the Department of Economic Theory in the University of Santiago de Compostela, being her research area environmental economics. She obtained her PhD from Washington State University (USA). Prior to University of Santiago she held faculty and research positions at Colorado State University (USA), Universidad Carlos III de Madrid (Spain), and the Institute of Bioeconomy in Oslo. She has published her work in prestigious journals, including *American Journal of Agricultural Economics*, *Energy and Resource Economics*, *Environmental and Resource Economics*, *European Review of Agricultural Economics*, *Plos One*, *Oxford Bulletin of Economics and Statistics* and *Land Economics*, among others. In terms of practical applications of her work, she was required to provide expert testimony about the economic and environmental costs caused by the 2002 Prestige oil spill in Spain. Currently, she serves as a board member of the *European Association of Environmental and Resource Economics*.

## **Juan-Pablo Montero**

Juan-Pablo Montero is Professor of Economics at the Pontificia Universidad Católica de Chile (PUC Chile) and has held visiting positions at the MIT Sloan School of Management (2000-2001) and at Harvard's Kennedy School of Government (2005-2006). He received a Civil Engineering degree from PUC Chile and M.Sc. and Ph.D. degrees in Economics from MIT. His research work concentrates on industrial organization, environmental and resource economics and has been published in leading academic journals such as the *American Economic Review*, the *Journal of Political Economy*, the *Journal of Economic Perspectives*, the *Journal of Economic Theory* or the *Rand Journal of Economics*. He has served in the editorial boards of the *Review of Environmental Economics and Policy*, the *Review of Environment and Development Economics*, among others, and now is Associate Editor of the *Journal of Economic Behavior and Organization*. He has also been a consultant for the Government of Chile, private corporations and international organizations in topics of industrial organization and environmental regulation. In 2007 he was named 'Chilean Economist of the Year' by *El Mercurio*, the main Chilean newspaper.



# economics<sub>for</sub> energy

