

## AN INTEGRATED APPROACH TO SIMULATE THE IMPACTS OF THE EUETS ON THE SPANISH ECONOMY

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### ABSTRACT

#### 1. Overview

This paper deals with the integration of an applied general equilibrium model for the Spanish economy and an oligopolistic supply (partial equilibrium) model of the Spanish electricity sector. Its main objective is to provide a reliable and complete picture of the application of the European Union emissions trading scheme (EUETS) in Spain. Previous approaches either did not consider the macroeconomic and sectoral effects of the EUETS, or did not contemplate a proper modelling of the (complex and crucial) electricity system. Through the integrated approach followed in this paper, we are able to yield the price effects, CO<sub>2</sub> emissions and distributional patterns of different allocations of permits in Spain. Given that Spain is a key actor in the EUETS, the conclusions and policy implications from this paper are indeed relevant.

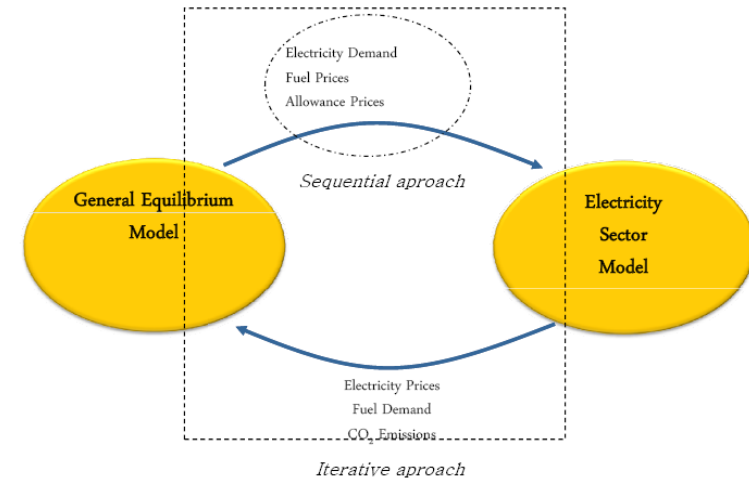
#### 2. Methods

> Standard general equilibrium model for a small open economy, specially designed for the study of environmental and energy policies. 17 sectors, 5 institutions (representative household, public sector, foreign sector, non-profit household-serving institutions, corporations).

> Partial equilibrium model for the electricity sector: firms compete in quantity of output (short-term) and in generating capacities (long-term). There is also a green certificates market and the emissions trading market (modelled as perfectly competitive).

> Models are integrated with the procedure depicted in the figure:

#### Interaction between the models



#### 3. Results

> Three simulations:

- Real (covering industrial + power sectors and grandfathering of allowances)
- Wide (includes all sectors, grandfathering)
- Power sector (similar to the real one, but the power sector receives no free allowances)

A summary of the main results is depicted below:

	Wide	Real	Power sector
Electricity price	2.0	14.5	28.7
Electricity demand	-6.0	-10.4	-15.5
CO <sub>2</sub> emissions	-24.4	-30.9	-54.5
Coal consumption	-25.7	-33.8	-55.7
Fuel consumption	-86.3	-92.8	-99.4
Gas consumption	30.9	28.5	-14.1
Coal price	0.0	0.4	0.9
Fuel price	0.2	2.1	1.9
Gas price	0.4	0.0	0.0

Changes in % from the non-policy situation