



UNIVERSITÀ
DEGLI STUDI
DI PADOVA

**CENTRO STUDI
DI ECONOMIA E TECNICA DELL'ENERGIA
“GIORGIO LEVI CASES”**

Activities – I semester (March-June 2016; December 2016-March 2017)

- A. Literature review
- B. Database activity
- C. Working papers/work in progress
 - 1. *What makes Grids really Smart?***
 - 2. *Who is playing? Analysis of the AEEGSI database on regulated sectors***
 - 3. *Investing in Biogas***

A - Literature review on different topics:

- ✓ Smart Grids and efficiency measures in the electricity market, updating on *what's new* in economic literature on SG
 - ✓ Industrial Organization, with a special focus on public-private partnership action design
 - ✓ Energy markets' regulation, targeting a specific agent: the DSO, that is a critical agent
- ⇒ Many works focusing on show cases and pilots, few literature on generic models
- ⇒ Hard to find a coordinated regulation for SG implementation
- ⇒ Difficulties in empirical testing

B - Database

Construction of a database with location of power plants, producers and DSOs playing in the area (municipal level)

- **AEEGSI Database**: list of operators; DSOs presence at municipal level
Elaboration of strings to make the database usable by a statistic software; labelling of main activities (16.820 records)
 - **GSE**: incentives to RES plants (€) (about 550.000 records)
 - **GSE and TERNA**: active RES plants per year at municipal level
 - **Chamber of Commerce**: all firms and local offices active in energy production (about 22.000 records)
 - **GME**: market prices
- ⇒ **Target: database of all power plants, with a specific producer, at municipal level, and corresponding DSO**

Working papers/Work in progress (1/3)

«*What makes Grids really Smart?*» with M. Buso and L. Greco

In this paper, we

- introduce a new definition of (investments in) smart grids, that are identified by the capacity to curb **market risks** faced by electric firms
- we theoretically analyze the main determinants and implications of smart grids
- We find that the introduction of smart grids by DSO depends on the number of producers, the demand elasticity and the (un)bundling of **DSO** and production

Empirical testing

Relying on Italian data, in the second part of the paper we want to empirically test our theoretical predictions.

Main issues for empirical tests: Proxy of grid's *smartness*

Working papers/Work in progress (2/3)

Who is playing? Analysis of the AEEGSI database on regulated sectors

The paper:

- Describes the **AEEGSI** database, reporting the list of operators of the regulated sectors;
- Provides descriptive **statistics** on market operators, looking at correlated activities;
- Aims at identifying those **agents** who entered the market with the development of distributed generation, becoming relevant in local grid management, and possible targets for further incentives/public-private partnerships for network investments

Working papers/Work in progress (3/3)

«Investing in biogas» with C. D'Alpaos

Currently under discussion and construction

- Investment evaluation in case of option to upgrade from biogas to biomethane
- Investment evaluation in case of flexible production (and supply), with participation to the local SG
- Energy from waste: evaluating production plants linked to garbage plants, with the design of a public-private partnership

All evaluations do not consider current incentive schemes, but aim at identifying market gaps for new market designs.



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Paper (August, 2016):

Bertolini, M., C. D'Alpaos, M. Moretto, (2016), 'Investing in Photovoltaics: Timing, Plant Sizing and Smart Grids Flexibility', Nota di Lavoro 60.2016, Milan, Italy: Fondazione Eni Enrico Mattei

Submitted to *Energy*, still under review



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Thank you

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Bertolini - I semester