Energy Markets

Academic Year 2017-2018

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Project Calendar

- **09/03/2018:** Project presentation. (**Bring Laptops**)

- **23/03/2018:** First Q&A.

- **30/03/2018:** Second Q&A.

- **27/04/2018:** Final Q&A.

- **01/05/2018:** Project deadline.

- **04/05/2018:** Project defense.

Project outline

- Data download and processing.

- Make use of a market clearing algorithm (EUPHEMIA).

- Evaluate the impact of RES to the energy market price.

- Identify the incentive of the TSO to invest in transmission capacity.

Data download and processing

1. Download data for Belgium and a neighboring country (i.e. Germany) for the year 2017:

    *   Conventional generation capacity (Group them when possible).

    *   Load.

    *   RES generation.

2. Find and motivate the marginal production cost of each technology. Assume that the investment costs are recovered.

3. Process the collected data and create hourly bids and offers for the DA market clearing platform.

4. Assumptions:

    *   Demand is totally inelastic.

    *   Generation bids at its marginal cost.

Make use of EUPHEMIA

1. Determine the impact of RES to the market price:

    - Consider lossless and infinite transmission capacity.

    - Simulate with and without RES.

    - Analyze the price difference.

2.   Quantify the congestion surplus:

    - Consider finite lossless transmission capacity (i.e. Belgium-France).

    - Simulate with and without RES.

    - Discuss the results.

Applying Date:01-03-2017 Hour:07 MCV:2973.7 MWh MCP:32.40 Euro
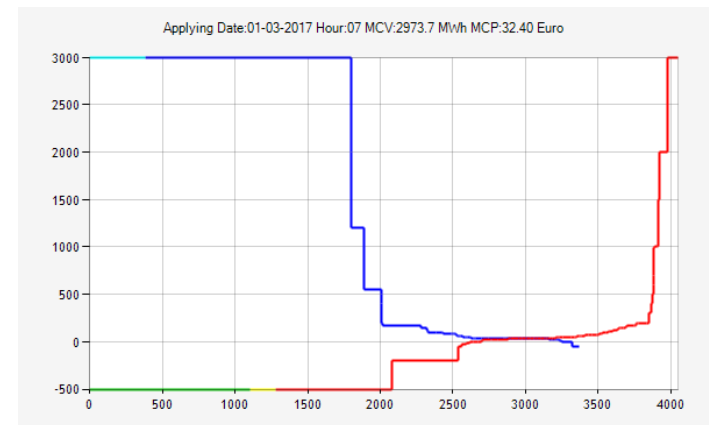
Investing in new transmission capacity

1. Motivate and make assumptions on:

   - The extra capacity.

   - The costs (investment and O&M).

   - The horizon of the investment.

   - The future higher penetration of RES.

2. Use financial measures to:

   - Evaluate the new investment.

   - Discuss the results.

Material

- Suggested data source: Entso-e (https://transparency.entsoe.eu/)

- Python(2.7): https://www.continuum.io/downloads

- Pyomo: http://www.pyomo.org/installation/

- Gurobi solver: http://www.gurobi.com/index

- EUPHEMIA : Project dropbox folder

For any questions related to the project you can come to my office (R108) on Mondays between 12h00-14h00. Please inform me with an e-mail first.