



Internship Proposal: Investment optimization of residential flexibility with steerable assets

Background

irex Consulting is a straightforward business engineering consultancy specialized in the energy & utility sectors. We are experts in tackling operational business challenges across the entire value chain – production, sourcing & trading, grids, and supply.

Assignment

Context

In a shifting energy landscape, more and more renewable energy sources are introduced in the energy mix. This happens on a large scale (eg windfarms) as well as on a small scale (eg solar home installations). In 2020, irex conducted a study for the Belgian market in which the optimal scenarios of solar investment were highlighted, in the different Belgian regions. The objective of this internship is to extend this analysis with the inclusion of steerable residential assets (battery, EV, heat pump etc.). This entails the development of an existing tool and methodology to automatically determine an optimal configuration of assets and localized production/storage for consumers.

Approach

1. Determine new variables in calculation methodology: define input, constraints, output and optimization formula
2. Market study and data gathering: consumer consumption data, production data and constraints, economic and regulatory information
3. Build model: The model will be implemented in an environment to be defined
4. Results interpretation: Analyze and understand the results and perform sensitivity analysis
5. Include new technologies: The above steps can be iterated for other technologies. This will depend on the progress made so far and will be discussed with the internship supervisor.

Objectives

- Market analysis of renewable production/storage and framework for SMART appliances and/or infrastructure
- Set-up methodology for calculating optimal distribution between production and storage as a function of standard consumption and load shifting potential
- Development of Proof Of Concept of economical optimization tool for different types of configurations

Preparation Material

- Information about energy markets in Belgium: <https://www.vreg.be/en/energy-market>
- Information on subsidy systems:
 - FL: <https://www.energiesparen.be/groenestroomcertificaten>
 - WL: <https://energie.wallonie.be/fr/installations-de-production-d-electricite-verte.html?IDC=9783>
 - BXL: https://www.brugel.brussels/nl_BE/acces_rapide/hernieuwbare-energie-11/mechanisme-van-de-groenestroomcertificaten-35

Schedule Beginning of July -- End of August

Supervisor

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