

## FlexBeAn

Modelling the potential of flexibility in households, industry, SMEs and the e-mobility sector to support electricity grid operators in the energy transition.



### Inspiration

Our future energy system is faced with the challenge of integrating high proportions of fluctuating renewable energy sources into the distribution grid. Additionally, the rapidly progressing electrification of sectors such as heating and mobility also requires smart solutions, due to the increasing demand for heat pumps and electric vehicles.

Grid operators are contributing to the energy transition by reinforcing the grid and investing in smart and flexible grid components. But a successful energy transition will also require the active participation of energy consumers in order to provide flexibility to the grid when necessary and while consumers would also profit from it.

By the flexible adaptation of the electricity demand in households, industry, SMEs and the e-mobility sector, the grid operator will be able to optimize the use of its grid capacity. The potential of this flexibility is currently unknown (at a local level) and depends on technical aspects, user behaviour and market / economic factors.

### Innovation

The main task of FlexBeAn is to study and model the potential of flexibility in households, industry, SMEs and the e-mobility sector, considering three perspectives: The technical dimension of flexibility, its potential and limitations; the behavioural aspects of consumers, their influences, knowledge and motivation regarding flexibility provision; the economic and market perspective, to assess the influence of future market developments on customer flexibility.

In this collaborative research project, the multi-disciplinary project team consists of researchers and energy experts from LIST, the SnT from the University of Luxembourg and CREOS. LIST's environment department is leading the development of a model to estimate the technical availability of flexibility within households, industry, SMEs and the mobility sector. IT and social science experts from the IT department are developing surveys to obtain insight into user behaviour and will develop user models to better assess how to motivate consumers for an active participation in the energy transition by flexibility provision. Partners from SnT model the influences of economic aspects and relate user behaviour to the market environment.

### Impact

Flexibility will be the key aspect for the integration of a high proportion of renewable energy and to enable the shift towards e-mobility for our electricity grid. The outcomes of this project will contribute directly to energy transition in Luxembourg, since the results will be achieved in close collaboration with the main local grid operator. The project will directly result in: a better understanding of how much flexibility could be expected from households, as well as from industry sector and SMEs, and when this could be available. FlexBeAn will also provide more insights into the motivation and concerns of different stakeholders, in order to potentially offer flexibility to their grid operator. This will further increase knowledge on the value of flexibility and how this potential could be mobilized by market-based incentives.

In the long run, this innovative project aims to contribute to the active participation of households, SMEs, industries and e-mobility stakeholders in the energy transition, with the aim of them becoming active participants in the energy market. A further objective of FlexBeAn is to support the economic optimization of grid assets (on the side of DSOs) and distributed energy resources (PV, batteries, demand side management) at the premises of prosumers and companies. This should help to attenuate potentially rising grid fees, caused by the investments of the grid operators necessary for enabling the energy transition. Finally, the project aims to reduce the carbon footprint of energy consumption (more quickly) by accelerating the energy transition, e.g. via a deferral of grid investments, without hampering the increase of the integration of renewable energy sources.

Let's join forces to enable the energy transition in Luxembourg: Contribute to the FlexBeAn project, whether as a private household, industry or SME, or another business.

### Partners

CREOS (LU) , University of Luxembourg (LU)

### Financial Support

CREOS (LU)

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