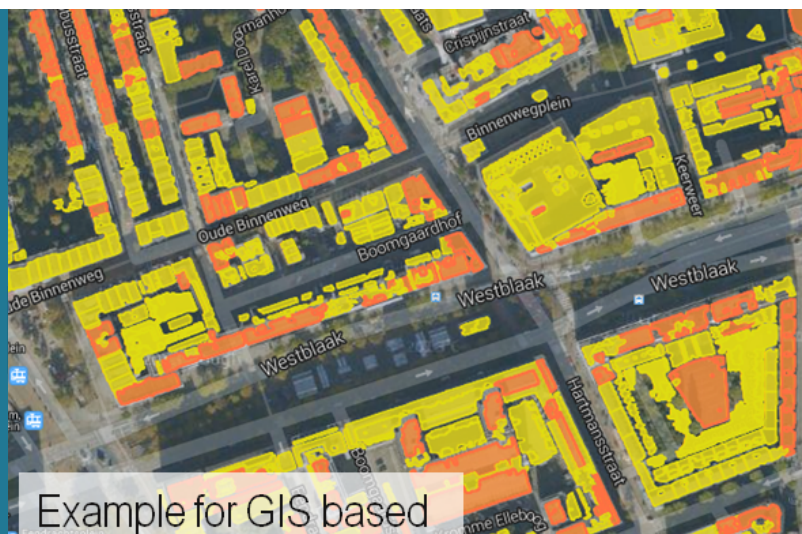


## REInGrid

Investigating grid integration measures to increase capacity for high shares of fluctuating renewable energy sources in urban electrical grids.



Example for GIS based

### Inspiration

Global climate change, finite fossil resources and the political will to decrease dependency on energy imports are driving the changes in our energy supply towards decentralized, renewable energy sources, such as solar or wind energy. However, this transition also presents a number of challenges. In addition to the natural limits on the potential of renewable resources, the technical environment can also place limits on development: our electrical grid, specifically the power distribution grids, may reach their capacity limits with an increase in, fluctuating power sources. Therefore, a good balance between decentralized consumption and production, specifically the temporal correlation between production and demand, is important and can increase the hosting capacity of the grid. The technical potential, costs and efficiency of grid integration measures, and the relationship between them, are at the core of this research project.

### Innovation

The REInGrid project will investigate how and to what extent different grid integration measures can increase the hosting capacity of distribution grids in urban areas. Such measures could be active, such as decentralized storage or tap-changing transformers, or they could be passive, such as changing the inclination and orientation of photovoltaic systems in order to achieve a better temporal correlation with the consumption profiles.

LIST researchers will use dynamic simulations of electricity consumption, decentralized power sources, consumption patterns and the distribution grid to test different integration measures and estimate their interrelations and impact from the perspective of technical performance, economic efficiency, and environmental soundness. This holistic approach and the integrated evaluation of different measures in a single simulation environment is what makes the project innovative and relevant for future energy scenario evaluations in other contexts.

### Impact

The project will have an impact on both the city and national level. By estimating the local potential for renewable energy and designing a well-balanced energy mix for the city of Esch, the city as project partner will directly benefit from the project. The identification of the optimal choice and mix of renewable energy sources and grid integration measures will enable higher shares of renewable energy in our national power grids in the future. The REInGrid project aims to contribute to this development by providing insight into these technical opportunities and assuring cost efficient, environmentally sound and powerful solutions.

### Partners

Sudstrom & Co (LU)

### Financial Support

Sudstrom & Co (LU), City of Esch-sur-Alzette (LU)

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