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Press Release: Measuring the potential energy flexibility of EU building stock

Analysing the suitability of buildings for energy saving services is a costly process. The Sim4Blocks project has been examining the effectiveness of two approaches for assessing the demand response capabilities of buildings, with the aim of increasing the implementation of flexible energy services across the EU on a large scale in a quick and cost-effective way.

Due to a lack of widespread data on the DR potential of buildings in the EU, Sim4Blocks has used classification and clustering models to analyse and judge the DR capabilities of **residential** building stock so that flexible energy services can be applied to blocks of buildings, districts and municipalities.

Both techniques categorise buildings according to their **thermal or power characteristics** to pre-assess whether DR services can be implemented.

EUROPEAN BUILDING STOCK

Knowing whether buildings are suitable for DR can be challenging. The European building stock (the structure and composition of each house and its relation to its energy efficiency in the EU) is large and varied making it extremely difficult to build DR systems. More data is needed on buildings' potential exploitable energy flexibility.

Sim4Blocks examined the effectiveness of two approaches, classification and clustering, for pre-assessing buildings on a much larger scale to see which flexible energy services are suitable for different groups of buildings.

PILOT SITE

Wismar in Germany is the testing site for the clustering and classification models due to its large diversification of building types and high-quality data set.



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The energy sector faces many challenges, including unbalanced grids, peak load problems and power failures. For demand response services to overcome some of these, personal household interests need to be addressed. Utility companies and aggregators need initiatives that incentivise demand response services for residents that ultimately benefit the grid.

However, measuring the potential energy flexibility of one building is time consuming and costly. The lack of widespread available data also makes it hard for utility services to demonstrate and explain to households the benefits and demand response services suitable for their building type.

Sim4Blocks, an EU-funded project, has been testing models to make it easier to estimate the demand response capabilities of large residential EU building stock so they can contribute to flexibility and grid stability. Working closely with researchers from HFT Stuttgart and University College Dublin's Electricity Research Centre, two techniques have been tested: classification and clustering.

Classification uses domain knowledge and expertise to determine which class each building belongs to from a set of predefined classes. 3D building models can be generated using the technical data available for the building, providing data on the

age, use, number of floors, type, refurbishment year, window surface and insulation.

Clustering uses algorithms to filter data points into groups to identify whether there are any similarities between them. A cluster might represent buildings with similar attributes in demographic, economic, geometric and annual heating demand. This technique not been widely used before for the thermal determination of buildings.

The data these two techniques provide will make it easier to group buildings based on certain characteristics and data sets and how this affects their ability to deliver flexible energy. Utilities will be able to use this data to deliver the most appropriate demand response services to specific blocks of buildings, districts and municipalities.

Both techniques can help aggregators, cluster managers and retail electricity companies see when there is high and low energy intensity, seasonal functions, time of day patterns and help set more personal electricity tariffs for customers.

An explanatory factsheet has been produced by Sim4Blocks to explain in more detail how each technique works and the data it can gather. Read it here:

<http://bit.ly/2QdOsLE> 

Sim4Blocks

Sim4Blocks is a four-year project funded by the EC's Horizon 2020 programme that will develop innovative demand response services for residential and commercial applications. The project will combine decentralised energy management technology at the blocks-of-buildings-scale to enable demand response.

Three pilot sites in Germany, Spain and Switzerland each have diverse energy systems with the infrastructure necessary for testing demand response strategies. The project will aim to increase energy flexibility in the electrical grid and will hopefully introduce cost savings for consumers as well, whilst helping to decarbonise the power sector.

The Sim4Blocks website can be found here: www.sim4blocks.eu

To talk to someone about the project or to arrange an interview, please contact Amelia Brice: amelia@ipl.eu.com


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**Simulation Supported Real Time Energy
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