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Project "OpenMeter" for the Digitalization of Energy Infrastructure

Open Data and Analysis Platform for Greater Energy Efficiency Through Smart Meter

In order to drive forward the digitization of the energy infrastructure, there is a need for real, traceable measurement data from the energy world. Where there is already a good data situation for large generation units - thanks to obligations for transparency - there is still a large amount of blank space for real measurement data from energy consumers. However, this data represents an important basis for innovations in energy system transformation, whether for the creation of smart grids, efficiency measures or business models based on artificial intelligence. The Fraunhofer Institute for Industrial Mathematics ITWM is contributing to the development of the "Open Energy Meter Data" platform, which aims to create a web-based contact point for collecting and analyzing energy consumption data.

Two specific areas of application, which will be used to examine the added value of the platform, were defined at the start of the project: an analysis to verify efficiency measures based on artificial intelligence (AI) and consumption modeling for power grid planning. Further application possibilities are to be collected within the project framework and new partner companies are to be acquired.

"We look forward to using the Open Data Platform to highlight the white spots in the data landscape and are confident that the project will make a good contribution to filling these gaps with meaningful data sets. This should not only help all participants in the energy market, but also promote the energy turnaround itself," says Dr.-Ing. Ulf Häger from the TU Dortmund University, who is in charge of the project.

In terms of data technology, the integration of several thousand measurement time series in the areas of electricity, heating and cooling should be made possible. In the course of this, the consortium will also develop, test and implement concepts for anonymization procedures. This is intended to achieve a balance between a broad, value-added data exchange among all participants and at the same time ensure that no conclusions can be drawn about individual consumers.

Machine Learning for Evaluation and Forecast of Consumption Data

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Based on its expertise in machine learning (ML), the Fraunhofer ITWM will research and evaluate data-based machine learning methods to enable the prediction of energy consumption. Using models developed at the Fraunhofer ITWM based on temporal consumption data, the effects of energetic measures are predicted. Furthermore, the Fraunhofer ITWM is responsible for the evaluation of use cases that can be realized with machine learning methods based on energy consumption data.

"Our contribution to OpenMeter lays a further foundation for benchmarking and AI-based forecasting of energy consumption. We make it possible to analyze the energy consumption of private households, municipal properties and commercial buildings so that we can identify specific measures and calculate their savings potential," explains Dr. Benjamin Adrian, project manager at the Fraunhofer ITWM.

Project Partners Combine Competences From Different Areas

In addition to the Fraunhofer ITWM, five other project partners contribute their expertise: The Institute for Energy Systems, Energy Efficiency and Energy Economics at the TU Dortmund University is responsible for the management of the project network as well as for consumption modeling for power grid planning. The logarithmo GmbH & Co. KG develops the underlying data platform as well as a web-based platform for the provision of data analyses and AI procedures. Discovery GmbH, the environmental and energy management of the city of Wuppertal and the Energieagentur Rheinland-Pfalz GmbH (EARLP) will provide support by testing the applications and sample data sets as well as defining possible use cases, data protection issues and in testing. The project is funded by the Federal Ministry of Economic Affairs and Energy.



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Dr. Benjamin Adrian and Dr. Alex Sarishvili are researching and evaluating data-based machine learning methods to enable the prediction of energy consumption. On this basis, measures and their savings potential are determined.

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About the Fraunhofer Institute for Industrial Mathematics ITWM

The Fraunhofer Institute for Industrial Mathematics ITWM in Kaiserslautern is one of the largest research institutes for industrial mathematics worldwide. We see our task in further developing mathematics as a key technology and providing innovative impetus. Our focus is on the implementation of mathematical methods and technology in application projects and their further development in research projects. The close cooperation with partners from industry guarantees the high practical relevance of our work.

Their integral components are consulting, implementation and support in the application of high-performance computer technology and the provision of tailor-made software solutions. Our various competencies address a wide range of customers: automotive industry, mechanical engineering, textile industry, energy and finance. This also benefits from our good networking, for example in the High performance center "Simulation- and software-based innovation".

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