greenventory – Data-driven Decision-making Support in Energy Planning

## A Software Solution for Inventorying and Optimizing Energy Systems

The software developed by the start-up company greenventory enables companies and cities to reach their energy and climate targets more easily, faster, and at less cost. It provides data-based decision-making support in the energy field: with satellite images, IoT data, and AI, greenventory maps distributed energy systems in cities, grids, and supply chains for on-the-fly optimization.

greenventory – a KIT and Fraunhofer Spin-off

greenventory (data-driven decision-making support in energy planning) is a high-tech start-up company based in Freiburg, which has made it its mission to bring the energy transition into cities and supply chains. For this, it offers its customers the decision-making and data basis necessary for forward-looking planning of energy systems. greenventory is a spin-off of the Karlsruhe Institute of Technology and Fraunhofer Institute for Systems and Innovation Research.

Spatially and Temporally Highly Resolved Automated Inventorying of the Energy System
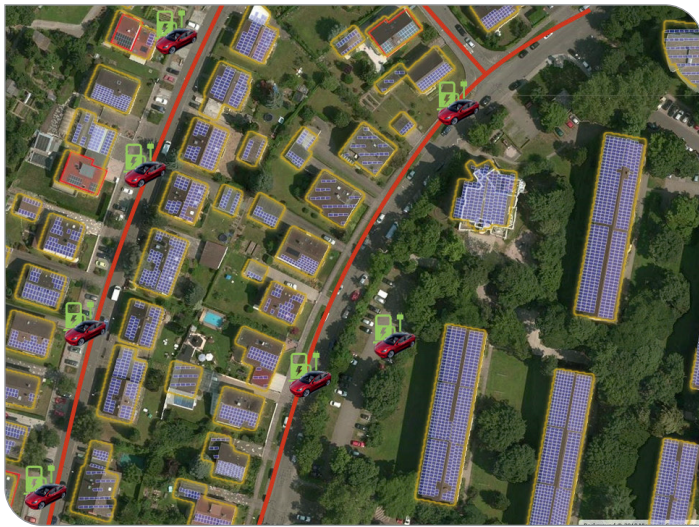
The software solution developed by greenventory provides an automated digital mapping (inventory), analysis, and optimization of customer-specific energy systems. To this end, numerous data sources such as satellite images, climate data, statistical data, and IoT data are compiled in an automated manner. Subsequently, the data are analyzed with AI algorithms, enriched, and linked to energy simulation models. In this way, greenventory creates a specific spatially and temporally highly resolved highest-quality database for the energy system. This database contains all energy-relevant building parameters and includes the grid infrastructure and the potentials for wind power and photovoltaic systems. Synthetic profiles take into account energy consumption and production. In this context, greenventory in a holistic system analysis considers heat, electricity, and mobility together. The customers benefit from a new kind of transparency, which provides an ideal basis for their decisions.
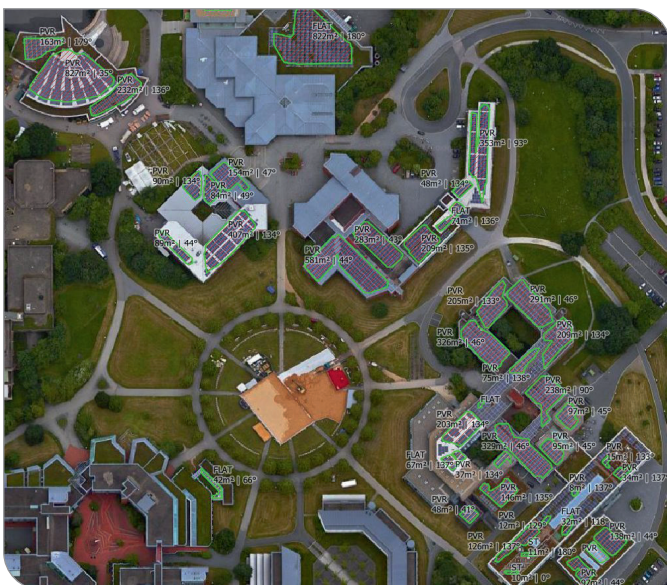
Automated detection and inventory of energy systems using the example of photovoltaic systems (Illustration: greenventroy).

Analysis of energy consumption for electricity, heat, and mobility: the figure shows an analysis of the energetic structure of a building (Illustration: greenventroy).

Automated detection and inventory of energy systems using the example of photovoltaic systems (Illustration: greenventroy).

Improved Planning of Grids

The resulting temporally and spatially highly resolved database can serve as the basis for time series-based grid planning. The possibility to consider technology scenarios and future supply concepts at an early stage in planning can redundantize subsequent network reinforcement.

Optimum Energy Systems at the Push of a Button

In addition, planners and owners of (distributed) properties have the possibility to develop concepts according to their own target criteria, e.g., CO_2 neutrality. They serve to determine the cost-optimal path of transformation of the desired target for each building in an optimization calculation. In this way, energy supply and climate control concepts, e.g., for production sites, distributor networks, or living areas, can be developed in much less time and at a significantly higher quality than before.

Innovation Projects: Data-driven Decision-making Support

The software developed by greenventory has already been used successfully in more than 20 projects with network operators, utilities, and cities. The experts from greenventory support the customers with individual projects, analyses, and tailor-made energy planning services that make decisions in the energy field transparent, understandable, and communicable.

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