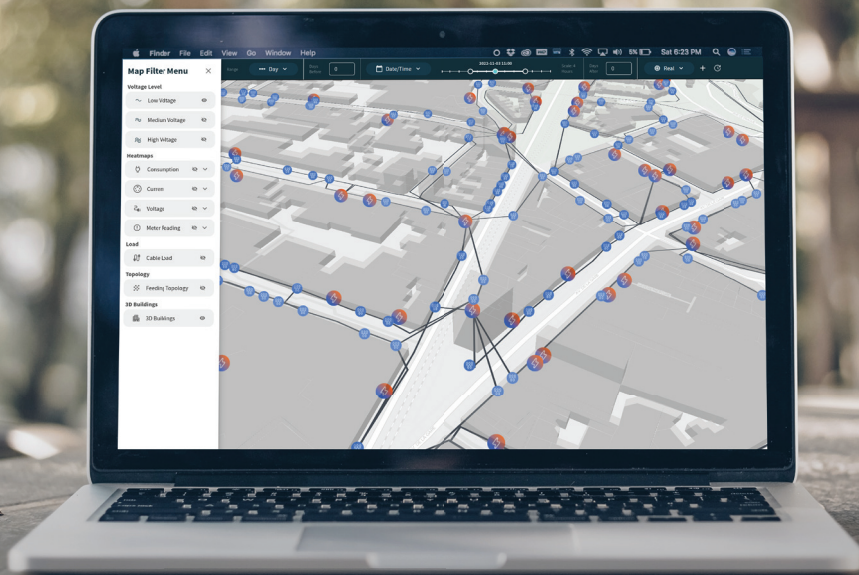




ALVA

THE SMART GRID AI TWIN THAT SUPPORTS THE ENERGY TRANSITION



DATATHINGS

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ENERGY CRISIS

Managing electricity distribution is a constant technical challenge, recently exacerbated by the energy crisis. Furthermore, the currently needed **energy transition** is pushing the integration of renewable energies, like solar panels or wind turbines, and a growing number of electric vehicles and heat pumps into the distribution grid. These new production and consumption devices are more and more plugged into the grid and progressively increase the pressure on the distribution capacity of the current infrastructure.

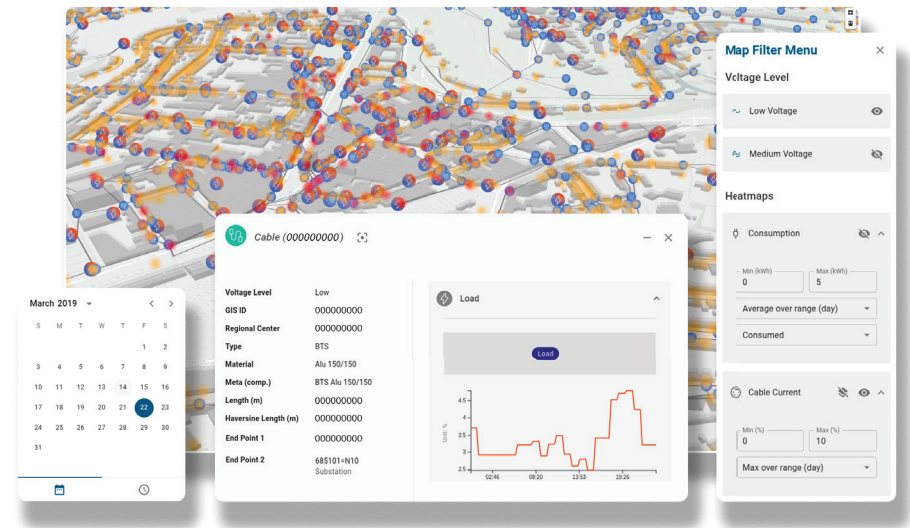
OUR SOLUTION

To prepare for these events, DataThings has elaborated **ALVA**, an **AI Twin solution** that enables to unify several databases, systems, and functionalities that constantly learns from the increasing amount of daily data. This operational decision helper analyzes, learns, and augments data visualization from various systems into a single map-view format of a country's grid infrastructure. All relevant data coming from the GIS, ERP, metering infrastructure, and real-time sensors are correlated and contextualized with the weather forecast, calendar specifics, and patterns of all grid's clients.



Powered by DataThings' unique geo-temporal graph database & AI platform named **GreyCat**, ALVA continuously learns from complex systems composed of millions of grid assets that generate billions of data points per year and can profile all grid clients in seconds.

Powered by highly performant AI stack, ALVA helps DSOs to operate and plan their low-, medium-, and high voltage grids more efficiently by providing a fine-grained view of the status, loads and capacities of each grid element.



Not only does it integrate **power-flow calculations**, but it also rationalizes maintenance scheduling and mid-term transition-related investments. It allows **simulation** and **planning** of the effects of any potential grid adjustment, such as new infrastructure commissioning or (un)scheduled reparations.

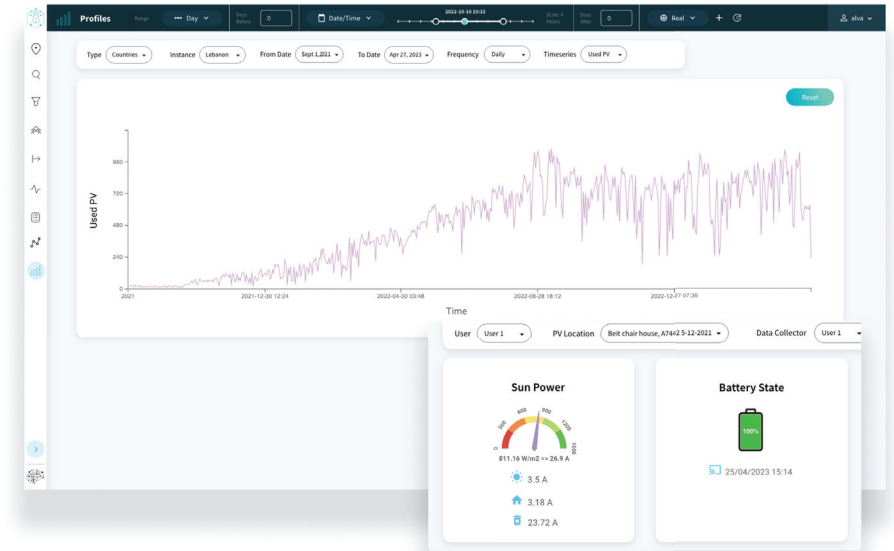
ALVA allows users to access and trace past and current grid-related information in a single application and generate time-based predictions by sliding a time-slider on top of the map view interface to visualize how the grid will behave tomorrow, next week, or next month.



SUPPORTING THE INTEGRATION OF RENEWABLE ENERGIES

In the midst of a major energy crisis, demand for renewable energy sources is increasing at an unprecedented pace. PVs, in particular, are being rapidly installed on private homes, businesses, highways, and even railways.

ALVA, the AI Twin of the Electricity Grid, is at the forefront of this energy evolution, developing new modules to support and optimize PV grid integration. Our cutting-edge technology allows for the monitoring and prediction of PV electricity production while maintaining battery storage capacities in relation to energy utilization over the course of a day.



The maximum solar energy that can be effectively and realistically produced during the day is forecasted based on individual systems installed. Thanks to ALVA's advanced machine learning capabilities, the AI processes in real time information from measurements, capacities, and correlations with weather data (and forecasts) and real or inferred solar radiance. ALVA also enables to visualize the amount of electricity used (consumed and used for battery charging), the impact of CO2 emissions avoided, and computes the value of generated energy in real time.

All of this enables to permanently assess the magnitude of remaining energy that can be re-injected into the grid at the level of a house or an entire country, at any given time, while taking into account the battery wear.

ABOUT DATATHINGS

DataThings is a software development company, which is specialized in developing dedicated **machine learning**, **digital twins**, and **artificial intelligence** solutions for a wide range of industries. From capturing and storing raw data to creating and going live with bespoke software solutions, our team supports our clients in uncovering and utilizing the potential of their data. Our **agile solutions** enable our customers to be **quickly integrated** into their production environments.

Our software solutions are based on the **GreyCat technology** we developed in Luxembourg. **GreyCat** is a platform for creating extremely efficient and **scalable digital twins** combined with **state-of-the-art machine learning models**.

Our technology is already being used successfully in various business areas, e.g., **intelligent power grids, Industry 4.0, but also in the banking sector.**



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