From 3 Hours to 15 Minutes: How Über-landwerk Mittelbaden Accelerated Grid Connection Processing Time

Case Study | 2025

Customer Portrait

Überlandwerk Mittelbaden GmbH & Co. KG is a regional grid operator based in Lahr, Baden-Württemberg. The company secures the power supply for about 385,000 residents in 54 municipalities and is responsible for operating, maintaining and expanding the distribution grid.
- Founded in 2019 as a joint venture of Elektrizitätswerk Mittelbaden AG & Co. KG and Süwag Energie AG, Überlandwerk Mittelbaden combines the expertise of both parent companies to meet the growing demands of the energy transition. With about 280 employees, the company operates an intelligent power distribution grid that facilitates the connection of decentralized generating plants such as PV systems. By continuously investing in the grid infrastructure and using cutting-edge technologies, Überlandwerk Mittelbaden ensures a reliable and sustainable power supply throughout the region.

Überlandwerk Mittelbaden GmbH & Co. KG

Overview

„The implementation of this project has made it possible to significantly accelerate and automate the processing of connection requests. That was especially due to the close coordination and constructive cooperation within the project.“

Sebastian Hogenmüller
Program Manager, Digital Grid
at Überlandwerk Mittelbaden GmbH & Co. KG

The issue & what Überlandwerk Mittelbaden set out to achieve

The rising number of connection requests and the high level of manual processing required an adjustment of the existing processes. The goal was to automate and optimize connection processes by introducing the Intelligent Grid Platform and integrating it with the epilot portal to reduce processing times and support grid planners in their everyday work. Additionally, the newly gained transparency in the grid was to be used as a basis for more efficient decision-making and long-term planning.

Project Outcomes

Reduction of the average processing time per connection request from up to three hours to only **15** minutes.

Processing of about **4000** connection requests in eight months,

3500 of them for PV systems.

Introduction of a **complete & computable grid model** for the low voltage and medium voltage grids, laying the foundation for more precise grid calculations and strategic planning.

Background

The energy transition presents distribution system operators with new challenges: The increased usage of generation systems, such as PV systems, and consumption systems, like heat pumps and charging stations, lead to a substantial increase in connection requests.

Regulatory provisions intensified the pressure to take action. The Solar Package I, which was adopted by the German Bundestag in April 2024, has significantly tightened the deadlines for connecting PV systems to the grid. For example, for systems of up to 30 kWp, the connection request is considered approved if the grid operator has not responded within four weeks of its receipt (Section 8 Par. 5 EEG). As for the grid compatibility testing and the subsequent processing of the request, a binding deadline of eight weeks is defined in the package (Section 8 Par. 6 EEG).

As from January 1, 2025, grid operators are also obliged to provide a digital portal for connection requests. This portal is supposed to enable customers to submit connection requests via a completely digital process and to track their status online. For many grid operators, this requires not only a technical reorganization, but also an adjustment of their internal processes in order to efficiently handle the increasing number of connection requests.

These developments also affected Überlandwerk Mittelbaden. Especially connection requests for smaller PV systems have led to a disproportionate amount of processing effort, preventing grid planners from putting their main focus on strategic tasks, such as structural grid expansion. In the light of these developments, Überlandwerk Mittelbaden was looking for a new approach to streamline connection request processes, reduce workloads, and sustainably increase the efficiency of grid operations.

Project objectives

Streamline and automate connection request processes to expedite the procedure and efficiently manage the increasing number of requests

Integrate these processes into the customer portal of the grid operator to facilitate seamless and automated customer feedback

Lighten the workload of grid planners regarding connection requests to unlock capacities for strategic tasks such as structural grid expansion

Implementing an automated, bidirectional interface between epilot and SAP for new grid connections

Intelligent Grid Platform short: IGP

The Intelligent Grid Platform (IGP) is an assistance system that supports a variety of technical processes in the planning and operation of electrical grids. Our collaboration with Überlandwerk Mittelbaden focuses on connection request and grid planning applications.

Basis for the grid planning and connection

Connection Request	Digitalizing and largely automating the entire technical evaluation process for new connection requests for power generators and consumers.
Grid Transparency	Enabling high levels of visibility into the current grid situation. Facilitating and automating the evaluation of the remaining hosting capacity in a given area for the integration of further power generation and consumption systems.

Connection Request

The Connection Request application enables users to largely automate the technical connection request process for new generating plants and consumers.

- Photovoltaic systems
- Heat pumps
- Charging stations

Challenges

The growing number of connection requests increased Überlandwerk Mittelbaden's workload significantly. Their processes used to be highly manual: For each request, technical metrics had to be transferred from the epilot portal to a grid calculation application. If no model of the low voltage grid existed, they had to create one first. Including the technical evaluation and the corresponding manual documentation in the portal, a request could take up to three hours to process.

Even if a grid model existed, it took up to 30 minutes to process a single request. Given the large number of requests, this caused a great deal of stress for the grid operator.

On top of that, there was an increasing need for more precise grid calculations and a better overview of the current grid state to identify congestions at an early stage. This highlighted the need for greater grid transparency that serves as a basis for strategic decision-making in target grid planning.

Problem-solving approach

Merging data from GIS and EDM in the IGP's GridHub

Creating a digital and computable grid model for the entire low voltage and medium voltage range of Überlandwerk Mittelbaden

Integrating the digital epilot customer portal with the IGP to reduce the processing time for connection requests. In this process, our project partner epilot has developed a standardized endpoint to optimize the flow of information between the two solutions

Introducing the Connection Request app for the technical evaluation of connection requests for generators and consumers on a low voltage level

Introducing the Grid Planning and Grid Study apps, which are to be used for evaluating grid scenarios and for developing strategic grid expansion plans

The interface to our push service by epilot & Intense

An important aspect of the project was integrating the epilot customer portal with the grid connection process of Überlandwerk Mittelbaden. With its modern portal, epilot enables customers to submit connection requests digitally and to track their status transparently. To increase efficiency, IT service provider Intense has developed an endpoint for the push service of the IGP.

Typically, status information is updated via a GET API in regular calls. However, this approach can lead to high volumes of data traffic. For this project, IT service provider Intense has implemented envelio's push service instead. To this end, Intense has developed a standardized endpoint that receives the status information and immediately updates it in the epilot customer portal — for example from „calculated" to „reserved". This reduces data traffic and ensures that everyone involved always receives up-to-date information.

A great advantage for grid planners is that they can see at a glance whether the technical evaluation of a request requires additional steps or not.

The collaboration with epilot and Intense proved to be very successful. Thanks to their considerable experience, we were able to create a flexible solution that can also be used in other projects.

Project results & further milestones

By introducing the IGP, Überlandwerk Mittelbaden now has permanent access to a fully computable grid model for their entire low and medium voltage grid. It was especially striking how astoundingly fast the grid operator went live with the Connection Request app: Only about 2 months passed between the first roll-out of the grid data and the start of operational use. This rapid implementation was facilitated through the dilligent organization by the project team, the simultaneous execution of key tasks, as well as the support from experienced partners.

Within eight months of the go-live, Überlandwerk Mittelbaden had processed about 4,000 connection requests using the Intelligent Grid Platform — 3,500 of them for PV systems. Today, the average processing time per request is only about 15 minutes. Automation has not only simplified the processes, but has also enabled the grid operator to handle a significantly larger number of requests.

In summary, Überlandwerk Mittelbaden was able to yield the following advantages from using the Intelligent Grid Platform:

Permanent data quality improvement in the low voltage grids

Higher degree of digitalization in grid connection processes for the purpose of partially or fully automating them in the near future

Significant reduction of processing times, which has already helped to considerably reduce the workload of grid planners and unlocked capacities for strategic grid planning tasks

Considerable acceleration of the customer feedback process, increasing transparency and strengthening customer relationships

Next steps

- Automating the connection request process to the greatest possible extent by adapting Fast Track* to higher power limits
- Extending the Connection Request app to generators and consumers in the medium voltage grid to establish automated processes also on higher voltage levels
- Continuous improvement of data quality to create the basis for more precise grid calculations and long-term optimizations
- Introducing the Online Connection Check app (OCC) for non-binding connection requests on low and medium voltage levels

*Fast Track is a feature in the IGP that enables the automated processing of grid connection assessments.

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