intertrust®

White Paper

Platform

DigiKoo: Data-driven planning for EV charging stations

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Executive summary

Like many other countries, Germany is in the midst of pushing towards a sustainable economy and reducing CO_2 emissions. Electrification of mobility is a crucial part of this. To help encourage the adoption of electric vehicles (EVs), German distribution service operators (DSOs), utilities, and municipalities are trying to rapidly grow public EV charging networks.

However, they are finding that the lack of easy and quick access to grid information is significantly slowing down the siting and construction of new EV charging stations. DigiKoo, a subsidiary of the major European utility company innogy, is using the Intertrust Platform to create an automated grid information access service that gives DSOs the ability to easily support such information requests.

The DigiKoo/Intertrust solution overcomes a barrier that has been an issue until now. Due to German regulations, grid data needs to remain unbundled and any data access must be properly secured. Using the Intertrust Platform, DigiKoo can govern access to distributed datasets and ensure that data can only be accessed by people with appropriate permissions.

The long-term goal of DigiKoo is to let DSOs utilize their data assets more effectively, thereby reducing planning costs and optimizing future investments in the grid. In Germany, DSOs play a crucial role in the decarbonization of energy and DigiKoo is aiming to provide the necessary data layer to support this effort.

Access to accurate grid data as a barrier to CO_2 reduction

Determining the feasibility of adding a new EV charging station depends on several factors. One is determining whether a desired location for a charging station can actually be supported by the grid infrastructure surrounding it; for instance, if there is an electrical line actually near that location. Other factors such as the number and locations of nearby charging stations and the electrical load carrying capacity of the surrounding distribution grid also need to be considered to decide on the feasibility of installing the charging station.

In making these decisions, German municipalities have run into a major issue—their partners need to get timely access to grid information, yet today it requires up to ten hours or more. Although in Germany, municipalities generally own the medium to low-voltage distribution grid infrastructure—i.e., the electrical lines and associated infrastructure that delivers electricity to homes and businesses—the distribution service operators (DSOs) operate these grids. Currently, there are over 800 DSOs operating in Germany, so getting information from all of them takes time.

This delay in getting the necessary grid information, combined with the number of charging stations needed to support EV adoption, is a major barrier to achieving significant reductions in CO_2 emissions.

To help determine whether or not a proposed charging station location is feasible, access is needed to three main grid information datasets: geolocation, electrical load capacity, and asset types. DSOs typically store this information in different databases that are not linked together.

Also, when these datasets are queried, the data often needs to be normalized to eliminate mis-labeling and other issues. The amount of time that it takes to query each of the databases is one of the main reasons behind the inordinate amount of time needed to calculate the feasibility of a proposed charging station location.

To further compound this situation, this information must comply with German regulations. Use of personal data is strictly regulated under the European Union General Data Protection Regulation (GDPR) as well as the German Federal Data Protection Act (Bundesdatenschutzgesetz—BDSG), a law that codifies the provisions of the GDPR into German law. Under these laws, employee information is considered as personal data, so any data such as records of maintenance personnel visits held in the datasets has to be governed according to these laws. German regulations also forbid data sharing between DSOs, further complicating the dissemination of data in some locations served by multiple DSOs.

Moreover, grid information itself is considered a sensitive national security asset and must be treated as such.

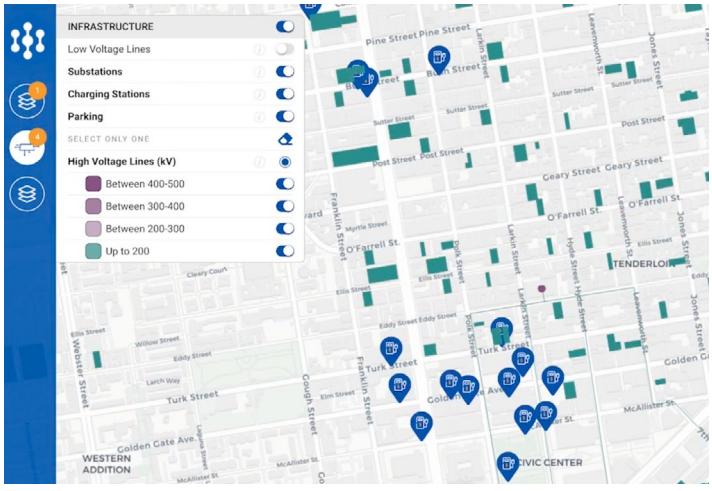
The DigiKoo solution

DigiKoo is a grid transparency tool designed to efficiently access the grid data needed to assess the feasibility of EV charging stations. DigiKoo's primary focus is to provide access to the data needed to help DSOs, utilities, municipalities, and other partners cooperate with each other in building EV charging networks.

Today, DigiKoo serves Westnetz, Germany's largest DSO and a subsidiary of innogy, but it can serve other DSOs as well. This business model relies on intelligently separating and distributing data to multiple customers. DigiKoo selected the Intertrust Platform to solve the technical challenges associated with this business model. DigiKoo provides a suite of applications called DigiPAD. These modular apps are customizable to different stakeholders, such as municipalities, utilities, DSOs, or for internal sales and analytical usage.

Municipalities can use Parkship, an app that helps municipality employees and network operators (and even ordinary citizens), quickly determine the 'right' location for a charging station. Employees can use the Parkship app to drop pins on locations they want to recommend for public charging stations and upvote other suggested locations within their region/municipality.

They can also upload pictures and add comments to support recommendations. The DSO can use another app, called gridPAD, to combine, blend, and provide protected views of maps, medium and low voltage grid lines, transformer stations, substations, and gas lines. Informative views about local parking garages, homes and structures with or without solar PV rooftop potential, and customer demographic data (such as their affinity to adopt an electric vehicle), can be further overlaid.



Example view of existing EV chargers, substations, parking locations, high and medium voltage lines

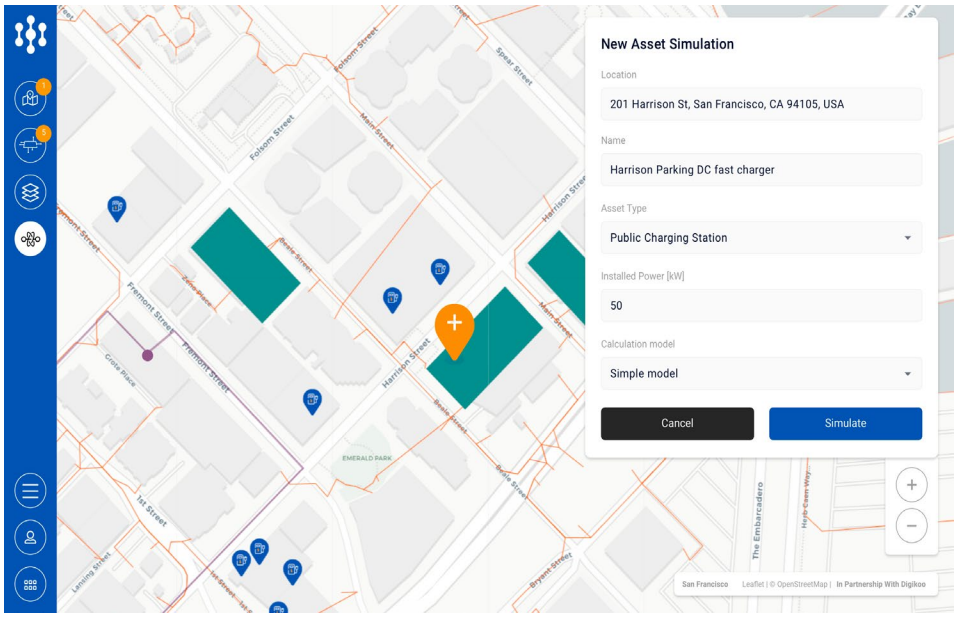
DigiKoo gathers this information and aggregates it for the use of municipality planners. After using the information from these apps and other sources to come up with recommended locations, EV charging network planners use another app, called Integrated Grid Planning (IGP), to determine the viability of selected charging locations from a grid infrastructure point of view. IGP is an app that combines different datasets of grid information into one view, so that planners can see the street-level information they need to make decisions.

First, planners can use IGP to determine whether their selected location has a reasonably close grid line. If a grid line is close by, the planners can also look at other necessary information such as the grid line's current load capacity, load on the circuit, and load capacity of nearby transformers and substations to see whether the local grid can handle an additional charging station.

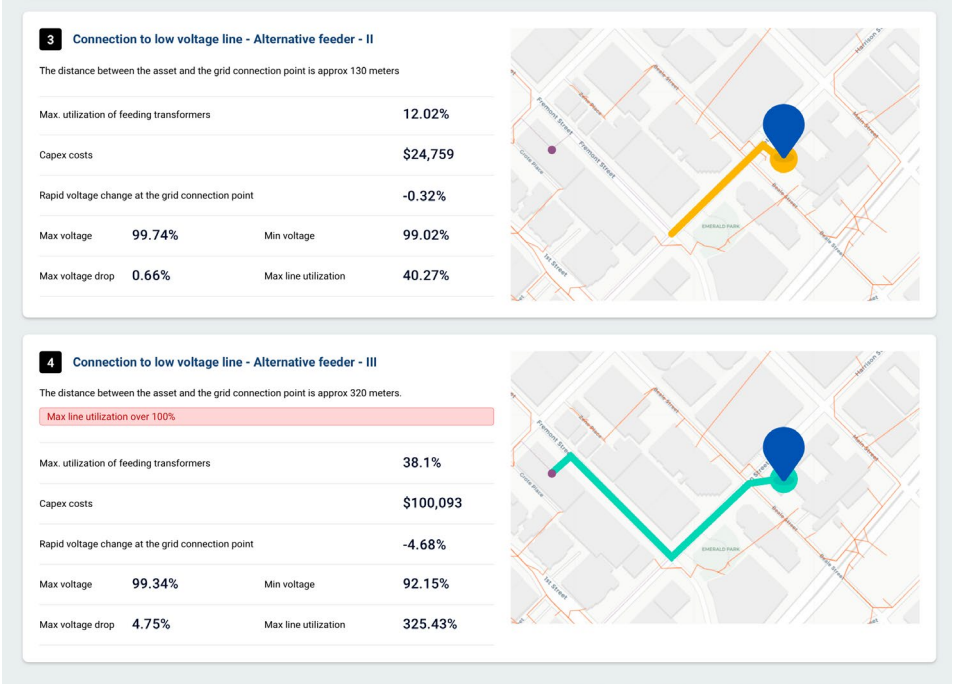
Other apps in DigiKoo's DigiPAD suite include:

- **muniPAD**, which provides transparency for urban development initiatives, through insights generated from municipality-relevant datasets
- **retaPAD**, which uses sales-relevant data to anticipate customer needs, identify market potential, provide personalized services to customers, and more.

By using the DigiKoo applications suite, municipalities can easily come up with recommendations for EV charging station locations. DigiKoo can reduce the time needed to get the necessary grid information to determine their grid viability from ten hours to around five minutes.



Plan grid connection of new DER asset



See cost, feasibility and performance impacts in real time

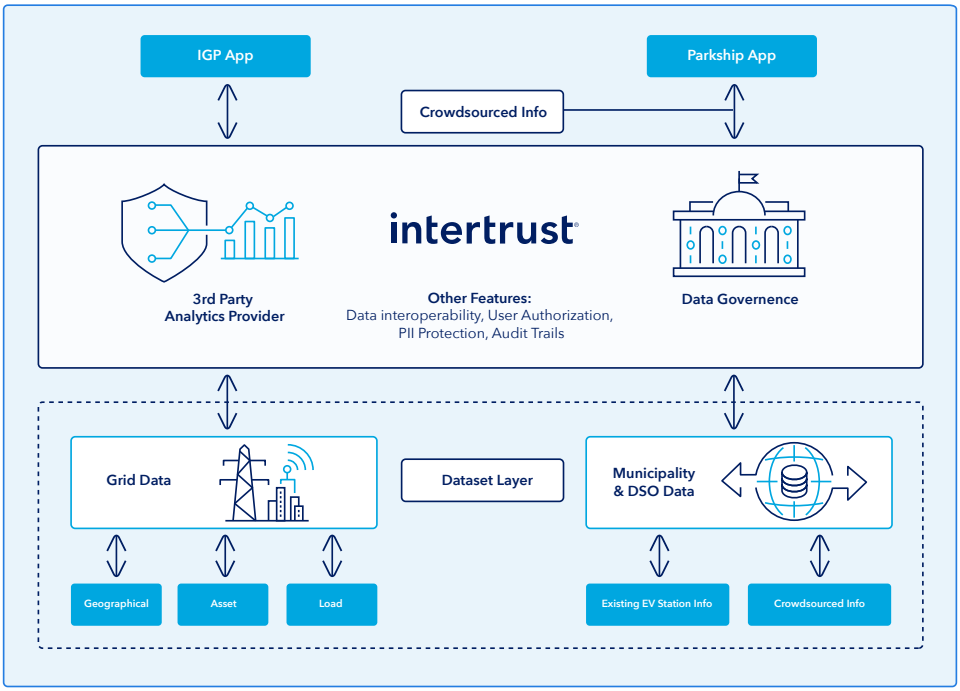
Intertrust and DigiKoo

The Intertrust Platform plays an integral role in the DigiKoo service. It governs access to the DigiKoo data by applying polices complying with relevant regulations to data access requests.

Intertrust creates and enforces fine-grained rules for governing access to data based on the polices that DigiKoo and its partners define in the system. For example, users from one municipality should not be able to access data from another municipality. The Intertrust Platform implements this by matching the geotag associated with the user with geotags on the data. Also, access to personal information is restricted by DigiKoo to certain authorized users. The Platform protects this information by not allowing any data marked as personal to be accessed by a user who is not authorized.

The Intertrust Platform performs a number of other functions in the DigiKoo system as well. For example, it securely logs all access requests and maintains an audit trail. This allows DigiKoo to demonstrate that compliance requirements are met. Intertrust also creates connectors to the various external datasets and databases that DigiKoo works with. These connectors are software layers that integrate with commonly used datastores such as SQL or Excel that implement the Platform's data access governance functions, including data update and deletion. They can work with numerous file systems as well as structured and unstructured data. One crucial feature these connectors perform is ensuring the databases for different DSOs/municipalities are kept separate from each other. This is done to avoid compatibility issues as well as comply with regulatory requirements.

Intertrust ensures that the data used in DigiKoo's IGP and Parkship apps can only be accessed by authorized users. It also allows interoperability between datasets—however many and distributed they might be.



Conclusion

With their solutions, DigiKoo can play an important role in Germany's efforts to reduce CO_2 emissions by expediting the process of EV charging networks for German municipalities and DSOs.

Through the Parkship and IGP apps, DigiKoo helps planners rapidly analyze the feasibility of these projects and apply geospatial and crowdsourcing tools to assist with planning. In this way, the DigiKoo solution helps reduce the cost of Germany's movement towards sustainability.

The Intertrust Platform's data governance and interoperability capabilities play a key part in making sure DigiKoo maintains data security, complies with applicable regulations, and interoperates efficiently and seamlessly with a wide variety of databases and datasets. With Intertrust, DigiKoo is helping to pave the way for data-driven planning of EV charging networks in Germany.

For more information on DigiKoo, visit: https://www.digikoo.de/ (in German).

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