



**SYMBIOT**  
Twinner

AI powered Grid  
Digitalization Platform



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# The need for Smart Grids

The ongoing energy transition, fueled by the integration of renewable energy sources, a growing fleet of electric vehicles, and the shift from fossil-fuel-based heating to electric heat pumps, is exerting tremendous pressure on today's electrical grids. This pressure is especially pronounced on low-voltage grids, which are at the forefront of the energy transition. The management and effective distribution of energy in the face of these challenges are becoming increasingly complex. This underscores the critical necessity of transitioning to a smarter, more efficient, and more reliable smart grid for tomorrow. At the heart of this transformation lies the growing digital revolution, where data assumes paramount importance and modern information and communication technology converges with operational technology. This integration is what will ultimately empower the smart grid to truly become smart.



# Introducing SYMBIOT Twinner

SYMBIOT Twinner, AI powered Grid Digitalization Platform, is a revolutionary solution developed in close collaboration with Distribution System Operators (DSOs) and AI experts. The SYMBIOT Twinner features a digital twin of the entire grid, driven by smart metering data. These digital replicas of the physical grid can be continuously trained in near real-time, assimilating a constantly increasing volume of data. They serve as invaluable decision-support tools for various departments within DSOs.

SYMBIOT Twinner excels at aggregating, visualizing, analyzing, and learning from data derived from diverse legacy systems, such as EAM, GIS, ERP, AMI, real-time sensors, and more. Notably, SYMBIOT Twinner is built upon a unique combination of graph and time-series database engine, allowing it to scale effortlessly to encompass millions of grid elements and billions of metering point measurements annually. This versatility positions SYMBIOT Twinner also as a robust data lake solution.



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# Benefits

SYMBIOT Twinner is not just a solution; it's a transformative leap toward a more sustainable, efficient, and resilient energy future. SYMBIOT Twinner empowers DSOs to efficiently operate, maintain and plan their grids. Here are some of the key benefits:

**Individualized Consumer Insights:** SYMBIOT Twinner utilizes state-of-the-art machine learning to predict and understand the consumption behavior of each consumer individually.

**Proactive Grid Management:** With its built-in power flow calculations, SYMBIOT Twinner can predict and alert grid operators about potential overloads and other critical grid issues.

**Advanced Grid Simulation:** The solution employs advanced simulation methods to evaluate grid reconfigurations, aiding in the planning of maintenance actions and anticipating their impacts on cable load, voltage, and more.

**Custom Load Simulation:** SYMBIOT Twinner supports grid planning activities by enabling the simulation of custom loads (like heat pumps and electric cars) at any point within the grid.

**Smart Decision-Making:** SYMBIOT Twinner can even suggest countermeasures to address grid issues and recommend the optimal timing for surrounding grid capacity adjustments.

**Data-inconsistency detection and identification:** Algorithm finds errors in the PoC phase and provides right and accurate information.





# Revolutionizing the Smart Grid for DSOs

In a world undergoing rapid digital transformation, Symbiot Twinner, an AI powered grid digitalization platform, enables Distribution System Operators (DSOs) to capitalize on the full potential of their networks. Symbiot Twinner profiles each asset individually based on the data they generate, addressing the critical challenges encountered by DSOs in the most effective way. This ensures **Data Cleaning and Consistency**, improved **Argumentation for Investments**, reduction of **Non-Technical Losses**, optimization of **Network Capacity**, streamline of the **Planning Process**, and enhancements of **Grid Observability**.



## **Data cleaning and consistency: The single source of truth**

In an era where data becomes more and more indispensable to the pilot of the energy transition occurring on the LV grid, having precise and comprehensive information is of the utmost importance. Symbiot Twinner meticulously detects and enables DSOs to rectify and complete information from GIS (Geographical Information System) and ERP/EAM (Enterprise Asset Management), including details from substations, cables, LV feeders, distribution cabinets and network topology. This singular source of truth facilitates the cohesive operation of the entire network, allowing DSOs to make informed decisions and strategically plan their operations.



## **Better arbitration of investments: A strategic approach**

As the demand for electricity grows, DSOs must wisely allocate funds to investments that generate the highest rewards. Symbiot Twinner aids in reallocating funds for investments, enabling DSOs to formulate rational investment proposals and pricing towards the energy regulator. This strategic approach ensures that investments are channeled towards areas that require immediate attention and will have the most significant impact.



## **Decreased non-technical losses: A smarter way to operate**

Minimizing non-technical losses improves operational efficiency and ensures access to electricity for all consumers. Today, electricity theft and metering inaccuracies present a significant challenge for DSOs. In this regard, Symbiot Twinner advanced algorithms facilitate the calculations and detection of non-metered energy, assisting DSOs to identify and address these losses.



## **Optimization of network capacity: Maximizing the potential**

The rising adoption of electric vehicles and renewable energy sources such as photovoltaic (PV) systems necessitate the optimization of network capacity. Symbiot Twinner aids grid operators in different calculations for power flow, voltage profiles, and hosting capacity, ensuring the network can accommodate the increasing demand. This optimization not only ensures a stable supply of electricity but also enables DSOs to effectively plan and implement the integration of renewable energy sources.



## **Streamlining the planning process: Accelerating connection approvals and enabling future-proof grid planning**

The integration of new connections, such as PV and e-charging stations, necessitates a thorough and expedited planning process. Symbiot Twinner facilitates fast connection studies and approvals, speeding up the integration of these essential services into the network. This streamlined process enables DSOs to meet the increasing demand for renewable energy and electric vehicle charging stations, contributing to a greener and more sustainable future.



## **Improved grid observability: A holistic view of the network**

Symbiot Twinner provides a comprehensive view of the network, including voltage profiles, power loads, cable, and transformer overloading (past, present, and future), load monitoring and forecasting, and rebalancing plans to mitigate voltage drops and technical losses. This holistic observability enables DSOs to proactively address issues before they escalate, ensuring the stability and reliability of the electricity supply.



# Accelerating energy transition through network digitalization and AI innovation



## Real-time grid insight

Experience AI powered grid digitalization platform.



## Streamlined connectivity

We're standardizing grid connection processes, simplifying your operations for seamless integration.



## Future-proof planning

Our solutions ensure that your grid planning remains sustainable, adapting to the constantly evolving energy landscape.



## Optimized operations

Make grid management more effective and adaptable to changing demand.



## Collaboration made easy

Facilitate precise cross-departmental collaboration, fostering synergy within your organization.



## Data-inconsistency detection and identification

Algorithm finds errors in the PoC phase and provide right and accurate information.



# Ready to supercharge your grid operations?

**Get in touch to explore how  
Symbiot Twinner can help you  
operate and plan your grid with  
unmatched efficacy.**







# Twinmer

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