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Solution Brief

Platform

Ensuring a trusted data strategy to support effective clean energy AI

It is widely recognized that the electric energy industry is an essential part of decarbonizing our economy. As the imperative to combat climate change grows even more urgent, the pressure on the energy industry to meet the exponential need for clean energy is increasing as well.

Implementing the infrastructure needed to meet the need for clean energy is not a simple task. The electric grid is already incredibly large and complicated. A clean electrified economy will increase the complexity of this system exponentially. For example, there will be even more reliance on intermittent renewable energy generation and a great increase in distributed energy resources on the grid. Because many of these will not be under the control of the utility, grid operators need to find and implement solutions for the incredibly complicated load balancing that will be required.

While many of the technologies used by the grid have a long history, energy companies today can greatly benefit from 21st century digital technologies such as AI (artificial intelligence). IT-based solutions are now an intrinsic part of grid infrastructure and AI is an indispensable tool to support a true clean grid. As noted in the figure below, a large number of use cases, such as load balancing and grid planning, will greatly benefit from AI-driven solutions. The computing challenge that clean energy grids represent is exhibited by the fact that organizations such as the U.S. National Renewable Energy Laboratory (NREL) are actively researching solutions leveraging AI and supercomputer technologies to support the future clean grid.

Figure 1.
Examples of energy use cases for AI

Renewables

- Planning and construction
- Optimizing wind and solar assets (design, failures, outages, maintenance)
- Supply/demand forecasting
- Integration into the power grid
- Hydrogen economy

Grid

- Enhance the capacity of existing transportation and distribution system
- Grid design and planning, operations and maintenance
- Grid performance
- Fill information gaps in distribution grids
- Lifetime extension, optimize allocation Opex and Capex

Electric vehicles

Data interoperability between DSOs and charging system operators to enable active load management

B2B/B2C Demand side flexibility

- Demand-side flexibility (aggregate and manipulate energy demand)
- Device management storage integration
- VPPs

Environmental data

- Wind
- Sun
- Clouds
- Major events (flooding, storm)
- Temperature
- Marine data

Supply and demand data

- Power generation forecasting (local/regional/national)
- Production asset availability & condition
- Micro-flexibility data (EVs, thermostats)

Financial data

- Power price predictions
- Marginal cost data
- Benchmarking data

Hardware and sensor data

- SCADA
- OT
- IT

Images and video

- Wind and solar assets
- Grid assets

Existing IT and data systems

- ERP systems
- Workforce systems
- Regulatory reporting

Figure 2.
Examples of datasets that are useful for energy-related AI

As energy companies plan for an AI supported future grid, they need to face one fact: AI by itself is useless. The journey to effective AI starts with data. For AI solutions to be truly useful, they need to be trained by and constantly updated with the appropriate data. Utilities and their partners need to identify, orchestrate, and collaborate over a huge number of datasets (see examples in figure 2) to get the most benefits from their AI systems. As utilities consider their data strategies, they should keep in mind that this is just the beginning; the number of datasets and the amount and speed of their data will continuously grow over time. Also, many datasets are likely to be under the control of partners.

Orchestrating this huge amount of diverse data is not a simple task. Issues to be considered include: maintaining data security and privacy, accessing distributed datasets that could be held in any number of cloud or on-premises repositories in different formats with little, if any, interoperability, controlling costs associated with data integration and cloud storage, and complying with applicable regulations and contractual obligations.

DigiKoo[1], a subsidiary of the European energy giant E.ON, is an innovative company focused on a foresight platform and data-driven Smart Grid applications and uses Interust Platform[2] for data orchestration. "The energy, mobility and heating transition will make extensive use of data and AI and Digikoo is at the forefront of this movement," said Martin Moeller and Benjamin Jambor, from Digikoo. "Utilities and their partners will use AI systems to ensure automation, orchestration and the affordability of these transitions. Together, Digikoo and Intertrust ensure that utilities can meet their time to AI goals."

Intertrust Platform is an ideal solution for utilities and their ecosystem partners to develop an effective data solution capable of supporting their AI initiatives. Designed specifically for trusted data orchestration and governance in multiparty data ecosystems, the Platform ensures consistent edge-to-cloud data security and governance, interoperability between connected devices and cloud providers, governs access of both human and third-party AI algorithms to data, reduces the operating costs associated with moving data to cloud repositories and supports public, on-premises, and hybrid cloud architectures.

As utilities and their partners develop the digital infrastructure to support the clean energy needs of the 21st century, Intertrust Platform can form the core data orchestration layer to ensure the trusted data flow needed to support the AI systems that will form its backbone.

1 Information about DigiKoo can be found at https://digikoo.de/

2 Detailed information on Intertrust Platform is at https://www.intertrust.com/platform/

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