

# *Ai-MicroCloud™ for Utilities*

## **Energy Consumption, Active Power Losses Forecasting, Building Energy Optimization, Data Center HVAC Failure Prediction**

From Electricity generation to storage, transport, distribution, and consumption, the energy industry value chain is extremely volatile and is being rapidly transformed by global market trends such as deregulation, renewable energy, carbon footprint reduction, energy exchanges and smart meter/grid technologies. Modeling for energy industry supports key decision making that can affect short-term supply and demand planning, energy efficiency, spot market futures, energy production, and long-term capacity management.

### **Zeblok's Ai-MicroCloud™**

Zeblok's Ai-MicroCloud™ is the most straightforward way to efficiently pipeline data, including the critical data comprehension step, and then quickly & affordably to develop, train and deploy pragmatic AI into mission-critical enterprise processes. Data scientists can start an AI/ML model in minutes, leverage open-source frameworks, a growing library of curated algorithms and accelerated data handling technology, scale seamlessly to high-performance computing (HPC) and deploy completed APIs in production.

Zeblok's Ai-MicroCloud™ provides a uniquely comprehensive AI/ML development environment:

- Portability – Deployed to data centers, public clouds and Edge locations
- Instant Usability – Start in minutes via a simple UI, with familiar frameworks
- Seamless Scalability – One click to scale to HPC
- The Right Algorithms – Proven, curated, easy to consume and share

**“AI will become a key enabler of the new, complex, and data-reliant energy system, offering a key tool to improving operational efficiency in an increasingly cut-throat environment.”**



“Think: Act,” Roland Berger GMBH report 2018

### **Build Domain-Specific Utilities Applications**

Ai-MicroCloud™ enables you to develop, deploy and manage bespoke real-time domain-specific AI applications in energy optimization, energy consumption and active power loss forecasting.

Ai-MicroCloud™ is a turnkey platform built on cloud native architecture for developers, data scientists, and researchers to create real-time, secure and scalable solutions. A simple user interface provides Jupyter notebooks, with access to all familiar open-source frameworks and popular data science language bindings such as R, Scala and Python.



## **Time Series Data Analytics**

- **Energy Consumption:** Accurate energy forecasting is a crucial factor underlying utility company financial performance. They need accurate energy forecasts since extreme wholesale price volatility requires hedging against volume and price risk. It is important to determine which input variable have the highest relevance in calculating forecast. Examples of explanatory data variables can be historical load data in different levels of aggregation, as well as real-time measurement, weather data, calendar information, day/night etc.
- **Active Power Losses Forecasting:** Electricity distribution is impacted by line resistance, outside temperature and switching states in the grid, potentially resulting in energy grid losses. Transmission system operators (TSO) must compensate for losses and manage them as it influences balance on the grid. Examples of explanatory variables include historical actual values for losses and technical information such as relevant points on the power grid, load and weather data.
- **Heat Consumption:** Domestic heat consumption for water heating (cooking, bathing) and space heating. Continuous monitoring and detection of anomalous values can indicate issues such as ruptured pipes, loss of system pressure, water diversion or issues with radiators or boilers.
- **Building Energy Optimization:** Buildings produce, store, and consume power, interacting with multiple suppliers – Stable (nuclear, hydro), controlled variables (coal, gas) and variable (Solar, wind). Building managers can harness AI to enable decision-making on power optimization alternatives, including drawing power, producing and uploading energy; producing and consuming energy; and producing and storing energy.
- **Data Center HVAC:** HVAC failures can lead to full shut down of critical infrastructure operations. Managers can leverage AI to forecast HVAC malfunctions, allowing for predictive maintenance interventions and to plan maintenance during off-peak hours allowing for better system balancing and saving costs.

## Platform Features Overview

AI Platform-as-a-Service delivered as Ai-MicroCloud™, including **Turnkey HPC Orchestration** and an **Intelligence Marketplace** for curated algorithms

- **Ai-WorkStation:** Customized and virtualized Jupyter notebook, with access to all familiar open-source frameworks, accelerated data lake and AI algorithms via a simple web interface
- **Ai-HPC-WorkStation:** Turnkey workload distribution to hundreds of GPUs for AI/ML model development, training and simulations
- **Accelerated Data Lake:** Enables a 10-15x reduction in search time
- **Intelligence Marketplace:** Growing library of carefully curated original AI algorithms, including exclusively in-licensed patent-pending software  
Easy to read, easy to use and easy to share  
Fast-track adoption of the best AI algorithms from academia and AI startups
- **Cloud Native:** Scalable architecture running in modern, dynamic environments using containers and declarative APIs
- **Ai-Rover™:** Analytics and data visualization notebook – domain-agnostic data discovery tool for large, multi-variate, high dimensional data analysis, using patent-pending explainable AI algorithm, exclusive to Zeblok  
Provides crucial data comprehension step as starting point for AI model development – patterns, correlations and causation
- **Ai-Rover™ for Time Series Data:** Automated predictive model-building that creates human readable explainable forecasts and anomaly detection models from historical time-series data.
- **Runtime Environment:** Finished model pipeline easily promoted to a runtime API, including inferences running at the Edge
- **Multi-Cloud from Core to Edge:** Deploy Ai-MicroCloud™ anywhere, including enterprise data centers, public clouds and Edge locations

## Partner Programs

- **Frontier:** CSPs and MSPs upsell Ai-MicroCloud™ to remain competitive; Specialized hardware manufacturers use Zeblok's orchestration to enable AI workloads on their hardware
- **Ingenuity:** Algorithm originators are able to develop their software more easily on our Ai-MicroCloud™ and we facilitate commercialization by including their algorithms in our Intelligence Marketplace
- **Insight:** Data providers benefit from our accelerated search capabilities
- **Build Intelligence Services:** Broad network of AI solutions firms help integrate AI into enterprises' mission-critical process

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