



BLUWAVE-AI GRID ENERGY OPTIMIZATION PLATFORM PROVEN FOR MILLION PERSON SMART CITY

Following successful performance tests at Summerside Electric, BluWave-ai conducted this project using CENG's infrastructure and CANARIE's Digital Accelerator for Innovation and Research (DAIR) cloud to test a simulated smart grid for a city with a population of one million people.

BluWave-ai is an Ottawa-based company committed to accelerating the adoption and use of renewable energy. The company's grid energy optimization platform resolves the intermittency challenge of renewable energy sources like wind and solar, so that communities, enterprises, and utilities can increase their reliance on renewables. This lets these organizations save up to 20% on energy costs, make the most of renewables hardware and/or Power Purchase Agreements (PPAs), right-size energy storage requirements, and reduce greenhouse gas (GHG) emissions. BluWave-ai is pleased to count Hydro Ottawa, Tugliq, and India's Tata Power as lead customers, among others.

KEEPING A BALANCED ELECTRICAL GRID

Many grid operators have difficulty managing the constant fluctuations in energy supply, user load, and energy pricing. Organizations need to be able to accurately predict the supply of different energy sources – renewable and non-renewable – to meet user demand in real-time. When energy supply and demand are unbalanced the result is often very costly. Demand in excess of supply means importing energy on short notice with an associated price premium (ex. importing energy from another utility) and an oversupply means overpaying for the amount of energy actually required. As well, if there is insufficient energy storage to absorb the oversupply, operators are forced to sell it at a loss and/or lose the energy altogether.

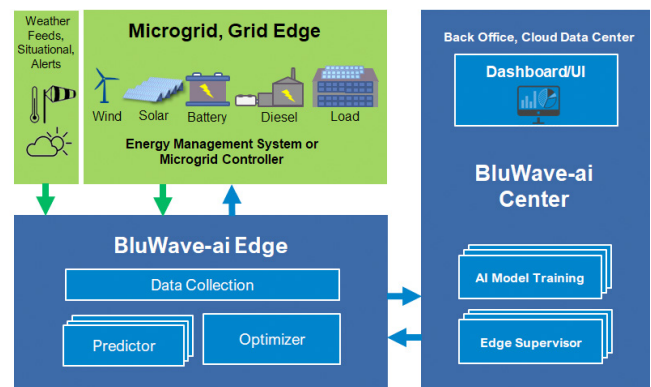
Weather fluctuation is one of the primary reasons that organizations have difficulty predicting the available supply of renewable energy. This has created a strong demand for an energy optimization platform that municipalities and other grid operators can use to make renewable energy more reliable. BluWave-ai has the solution.

BLUWAVE-AI EDGE AND CENTER

BluWave-ai operates at the intersection of power systems engineering, machine learning, control and optimization to deliver an advanced SaaS-based platform for modern power and energy systems.

The company's grid energy optimization platform, which consists of BluWave-ai Edge and BluWave-ai Center, operates in either the public or private cloud.

BluWave-ai Edge connects to IoT sensors and meters, using historical and real-time data to provide artificial intelligence (AI) assisted optimization of local energy generation and storage. BluWave-ai Center manages multiple BluWave-ai Edge locations, applying machine learning with new data to continuously adapt and improve the AI models used by BluWave-ai Edge to predict, optimize, and dispatch control. This lets grid operators optimize their energy decisions for increased sustainability, reliability, and affordability.



BluWave-AI Smart Grid

SCALING FOR LARGE SMART CITY DEPLOYMENTS

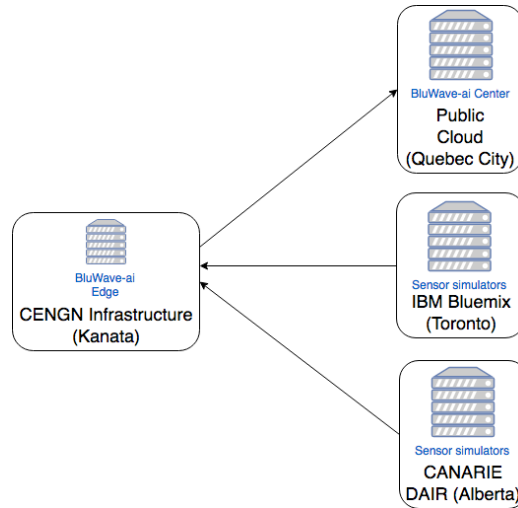
BluWave-ai has been in operation for close to two years and the company has been getting significant traction. To date, they have completed pilots with several utilities and government labs and have raised over \$3.4M in funding. The primary goal of the CENG project was to simulate a smart grid for a city with a population of one million people by testing the deployment of numerous BluWave-ai Edge servers, each connected to 1000 sensors. As well, CENG's testing infrastructure which includes a diversity of hardware from a multitude of vendors, enabled BluWave-ai to further define client recommendations for best server platforms.

CENG MEMBERS



INFRASTRUCTURE SETUP

IoT sensor data was sent from IBM Bluemix in Toronto and CANARIE DAIR in Alberta, replicating data that would be collected from the electrical grids of BluWave-ai customers. This data was sent to CENGH HQ, located in Kanata, where multiple BluWave-ai Edge servers were deployed. The BluWave-ai Edge servers intelligently forwarded interesting data to the BluWave-ai Center hosted in the Public Cloud, located in Canada, where continuous AI training occurred.



RESULTS AND CONCLUSION

BluWave-ai was able to successfully test the company's largest deployment to date, further validating the ability of their platform to optimize energy decisions for a one million person smart city including increased sustainability, reliability, and affordability. This is a huge accomplishment for the cleantech startup. In addition to reaching this technology performance milestone, BluWave-ai gathered several insights during the project as to how to further improve data traffic flow and increase overall platform scalability.

Beyond infrastructure resources, CENGH provided impactful technical support to the BluWave-ai team. CENGH guided BluWave-ai through the implementation of a monitoring tool that provided the company with insight into how their solution operates and how to identify and resolve deployment issues immediately. In the end, this CENGH project provided BluWave-ai with significant insight into how their solution performs including validation of their technology in a large-scale setting, opening the door to expand to much larger global megacities deploying renewable energy to create distributed Virtual Power Plants (VPP's) that significantly reduce their reliance on fossil fuels.

ARE YOU INTERESTED IN COMPLETING A CENGH PROJECT?

BluWave-ai accessed the services at CENGH through the Next Generation Network Program (NGNP). The NGNP is a Government of Ontario program offered through a partnership between CENGH and the Ontario Centres of Excellence (OCE) that is providing small and medium-sized businesses across Ontario access to the CENGH Testbed. CENGH's digital infrastructure is connecting growing tech businesses like BluWave-ai to state-of-the-art equipment and network services, which will allow these companies to test and validate their solutions.