Bloomenergy®

CASE STUDY

Parent organization
United Microelectronics Corporation

Headquarters
Taoyuan, Taiwan

Industry
Semiconductor

Founded
January 25th, 1990

President
TJ Tseng

Website
https://www.unimicron.com/en/

Bloom installation
600kW – 10MW (Coming Soon: carbon capture & grid independent)

Objective

Unimicron was on the hunt for an energy provider committed to power security. With Taiwan's constrained power grid and the intermittency of solar, finding an affordable, sustainable, and compact energy solution would help them significantly reduce their emissions and their power dependency on the grid while providing access to continuous power during grid outages.

600kW deployment over a parking space at the site

2023	2025	2026	2027	2028
600kW	3MW	5MW	8MW* (3MW CCUS)	10MW*

Unimicron expansion plan over the next 5 years (cumulative)

Key Project Values

Reliable Power: 24x7x365 operation, even through earthquakes and typhoons, due to the robustness of a natural gas pipeline

Clean: Local air pollution reduced local air pollution by >150 kg of CO_2/MWh (1360 kg/year), negligible NOx, Sox and Particulate Matter (PM)

Compact & Scalable: 125x less space than solar. Scaling from 650kW to 10MW within the site over a 5-year period as the power requirements grow.

Price Predictable: Consistent price over a 5-year period. Utility peak hour premiums of the order of 1.5x can be avoided.

> The installation of Bloom Energy's solid oxide fuel cell power generation system went very smoothly. The spirit of the contract has been 100% achieved in terms of project management, power generation efficiency, equipment availability, and safety. We are very satisfied, and in fact, we have begun the installation of two larger-capacity Bloom fuel cell systems at other Unimicron plants. I believe these systems will be completed before the end of this year, which aligns with Unimicron's consistent commitment to the social responsibility of energy conservation and emissions reduction.
>
> **Dave Yang**
> Senior Vice President, Unimicron Technology

Unimicron Meets Energy Goals with Bloom.

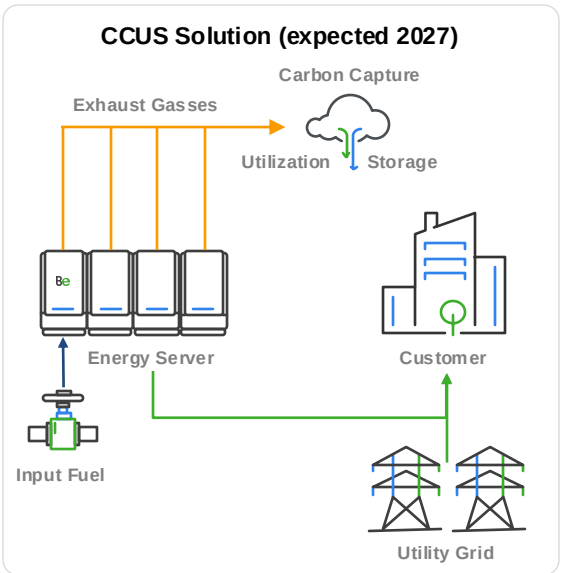
Unimicron is committed to the target of using 100% renewable electricity, recognizing the mission towards zero carbon grids at scale.

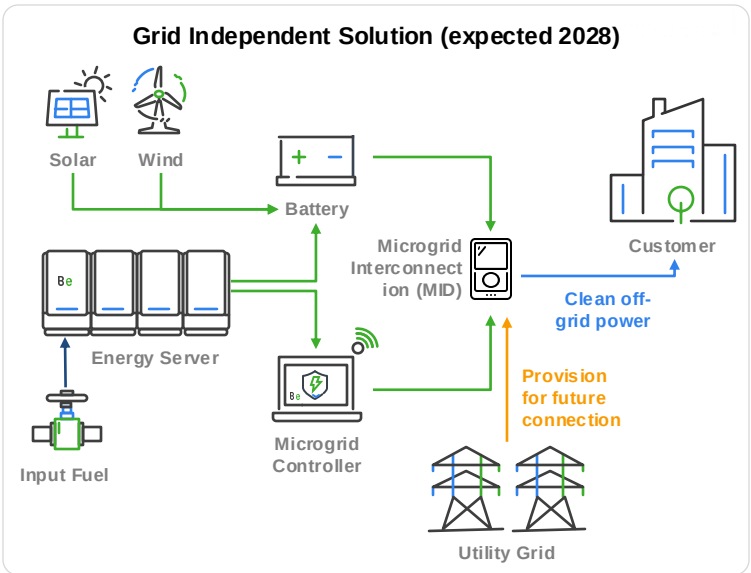
As centralized coal and nuclear power facilities are phased out, the industry faces challenges such as unpredictable power outages, voltage drops, space constraints, and the increasing need to operate critical infrastructure—like chillers and clean room processes—continuously. Consequently, there is an escalating demand for on-site power generation solutions that are both clean and dependable.

Currently, Taiwan depends on centralized power plants, with 10,000+ feeder lines over 410,000km, 1.55 million switches, 1.48 million transformers, and 3.2 million electric poles[1]. Any encounters with an external force or malfunctions lead to feeder tripping, causing regional or substation outages.

Unplanned outages affect business as usual and cost millions of dollars in loss of production and backup sources. Though the number of outages is on a downward trend thanks to government efforts, there is still a gap (over 6000 outages in 2023[2]) that needs to be addressed immediately.

Unimicron turned to Bloom for their energy needs for on-site, clean, and dependable power.





Implementation

Bloom completed the first 600kW installation, operating in parallel to the Utility, at the Unimicron facility in Taoyuan in August 2023. The space-saving Energy Server was delivered five months after placing the order and commissioned three weeks later.

Bloom's modularity makes it nearly effortless to expand and Unimicron can take advantage of this as they continue to expand until 2027.

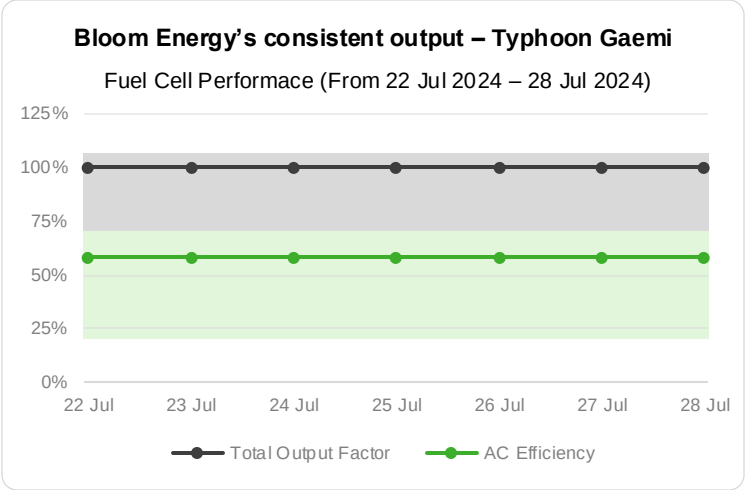
[1]Taipower News; [2] CNA Taiwan article;

Why Bloom?

Power security

On average, Typhoons occur about 13 times a year in Taiwan. Saola was the most severe typhoon to land in Taiwan in the past 12 months. It reached a wind speed of up to 248 km/h on August 29th and was 125 kilometers in diameter. This corresponded to a category 4 typhoon.

During Taiwan's recent category 4 Typhoon Gaemi, Bloom's Energy Server remained stable with an output factor of 100.3%, while Taipower had to shut down solar power equipment (inverters) due to explosion risks.



Power Quality

As part of its manufacturing ecosystem (advanced PCBs), Unimicron operates several critical and highly sensitive pieces of equipment. Each time this equipment is impacted by power fluctuations or power quality, there is a monetary impact due to interruptions in production and equipment failure, ultimately resulting in costly maintenance for the company.

Clean

The Bloom Energy Server generates electricity using the hydrogen stored in natural gas without combustion. Compared to the grid, carbon emissions are generally reduced by 30% using Bloom's fuel cell technology. Criteria pollutants such as nitrogen oxides (NOx), sulfur oxides (SOx), or particulate matter (PM) are negligible.

This installation reduced emissions by 424 tons (384,646kg) of CO2e after starting operations in the second half of 2023. The emissions will reduce further as Bloom's system expands over the years. Unimicron prioritizes carbon reduction in its operations and found Bloom's solid oxide fuel cell (SOFC) technology to not only be one of the cleanest solutions, but the most stable and efficient, meeting its continuous power needs for its critical loads.

Compact

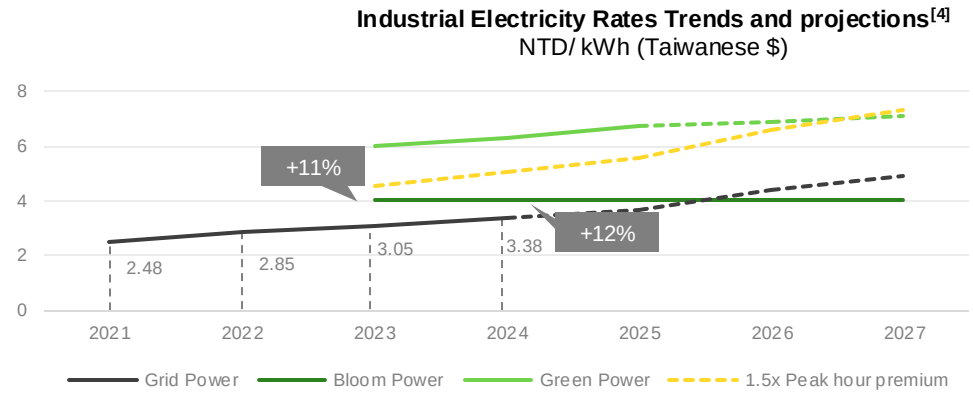
Energy density plays a very important role in Taiwan due to the limited availability of land. For example, a 1 MW Solar PV farm requires over 125x[3] more space than a Bloom Energy Server, whereas a 1 MW Bloom Energy Server occupies only ~330m2.

[3] 1MW Bloom Energy = 50m2; 1MW Solar PV = 6,250m^2;

Price Predictable

Traditional green electricity sources in Taiwan cost up to 30% more than the power from a Bloom Energy Server, which has the added benefit of providing stable electricity around the clock. Having made the choice, Unimicron's leadership described the Bloom Energy Server as "a golden hen that continuously lays golden eggs, compared to other green energy sources that are just expensive eggs."

Companies pay a peak-hour premium today for utilizing grid power, and the cost of grid power is projected to rise by double digits over the next few years. This means locking in a clean and more stable power source today was an easy decision.



Added economic benefits of using Bloom:

- Avoid the 1.5x peak hour premium levied by the grid
- Sell excess power from Bloom back to the grid

Bloom Energy's first deployment in Taiwan

Read about how Chairman TJ Tseng is committing billions of dollars to champion green manufacturing initiatives.

For More Information……

Energy Server Data Sheet

Energy Server Brochure

CHP Brochure

Sustainability Report

[4] Energy Bureau, Ministry of Economic Affairs of Taiwan (~2024), Bloom's estimation based on industrial articles and projections (2025~) Atlantic Council; BBC News_Asia; Energy imports to Taiwan from 2016 to 2022, by type.

Bloom Energy Headquarters
4353 North First Street
San Jose, CA 95134 USA
bloomenergy.com

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