Bloomenergy®

SK Eternix | Bloom Energy

Project Developer
SK Eternix

Project Location
Chilgok, Korea

Industry
Utility

Bloom installation
19.8 MW Primary Power solution with 600 kW CCHP application

Objective
Integrating fuel cells with CCHP (Combined Cooling, Heat, and Power) to increase energy efficiency and reduce carbon emissions

THE WORLD'S FIRST ALL-IN-ONE ABSORPTION COOLING SYSTEM UTILIZING SOFC TECHNOLOGY

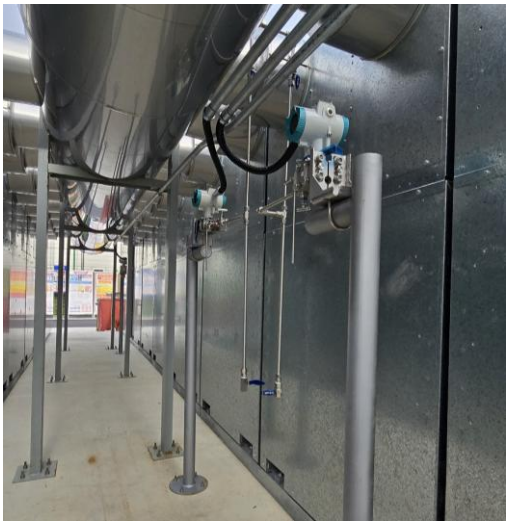
Key Values

Resilience: Clean, reliable, uninterrupted power, ensuring constant power output 24/7/365.

Cost-saving efficiency: Bloom generates clean electricity with industry-leading efficiency. The seamless integration of Combined Cooling, Heat, and Power (CCHP) using an Absorption Chiller enhances the system's functionality, eliminating the need for electrical chillers and reducing the site's overall energy consumption.

Sustainability: The Energy Server® fuel cell system generates combustion-free electricity, significantly reducing air pollutants such as NOx and SOx. With the Absorption Chiller, the additional >30% efficiency equates to less fuel being used to produce each unit of energy. The Energy Server system with an Absorption Chiller supplies eco-friendly electricity and cooling simultaneously, preventing hundreds of tons of CO_2 emissions annually.

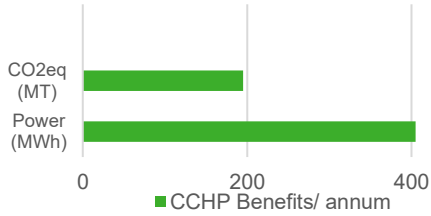
CCHP Solution at Chilgok Eco Park



Chilgok Eco Park is powered by a 19.8 MW Bloom Energy Server fuel cell system installation. It was installed and commissioned in 2024 as a Distributed Energy Resource (DER) to feed clean, reliable power into the Utility. The plant is projected to produce 165 GWh of electricity annually—enough to power approximately 45,000 households (considering a family of four). This facility is contributing to the Korean government's hydrogen economy and distributed energy initiatives while enhancing energy self-sufficiency in Chilgok County.

As part of an integrated power and cooling solution, the customer is utilizing the heat from the fuel cell system to operate an absorption chiller, which generates chilled water and cools an electrical server room that requires 72 tons of refrigeration.

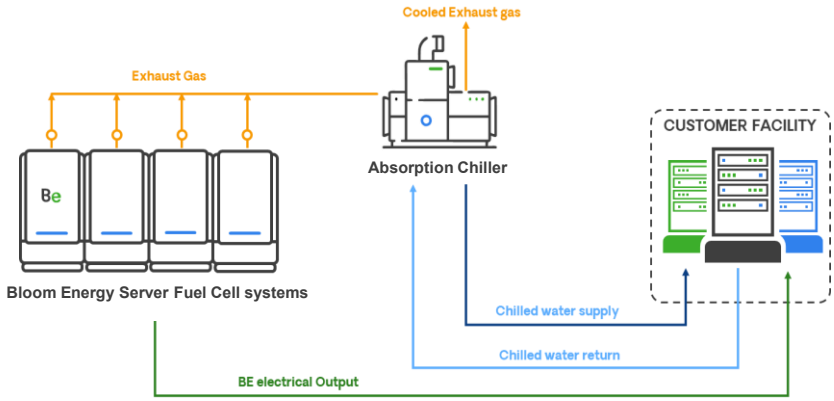
Instead of powering an independent electrical cooling system, which would add ~46 kW (assuming an electric chiller CoP of 5.5) of input power from an electric chiller, the heat from a portion of the fuel cell system is converted for cooling. This ability to convert heat to cooling saves the customer 405 MWh/year in cooling expenses and provides an annual carbon reduction (CO2eq) of 195 MT/year.



System Architecture and Performance

Operating in parallel with existing utility infrastructure, Bloom's solution has boosted the utility's dispatchable capacity and contributed to improving the grid's overall emissions by significantly reducing criteria pollutants such as NOx, SOx, and CO. This installation is the first of three phases, and owing to its modular architecture, expanding power at the site is simple and seamless.

In the figure below, the high-temperature exhaust heat from the Energy Server system is aggregated into a main duct and recovered via a direct-fired Absorption Chiller to generate chilled water. The chilled water is then circulated inside the electrical room, absorbing the heat from the electrical equipment and recirculating back to the absorption chiller. For more information, visit bloomenergy.com.



For more information:

CHP Brochure

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Power you can count on, at any scale.