Bloomenergy®

DATA SHEET

Energy Server® SOFC System with integrated Heat Capture

Power & Hot Water

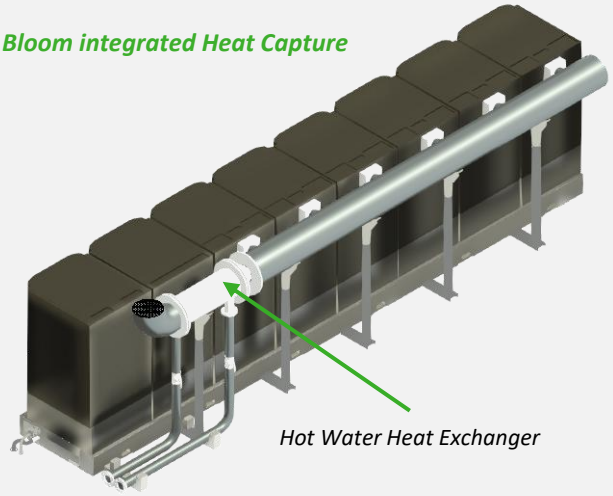
Bloom Energy is a world leader in fuel cell-based power generation. With a platform based on solid oxide fuel cell (SOFC) technology, the Energy Server SOFC system uses an electrochemical reaction to convert fuel to energy. The system runs on natural gas and is fuel-flexible, able to operate on biogas, hydrogen, or a blend of fuels.

The Energy Server system has one of the highest power-producing efficiencies in the market today and operates at greater than 800°C, making it a perfect companion for Cogeneration applications. With a high combined electrical-thermal efficiency, this Energy Server system with an integrated heat exchanger (HX) is the ideal solution to improve project economics and reduce emissions.

The integrated heat capture system is fully factory packaged and available in block sizes of 325kW and is scalable to hundreds of MW. The system can be mounted on the ground or stacked, providing the best-in-class power density and flexibility to customers to provide both power and hot water in as little as three months.

The emission reduction and efficiency increase achieved through the integrated HX are economical solutions for providing decentralized hot water and are essential in geographies where regulations require the adoption of cogeneration, like the EU directive for energy efficiency.

Bloom integrated Heat Capture



Clean: Our systems reduce criteria pollutants (NO_x, SO_x, and particulate matter) to near zero and has far lower carbon emissions than conventional technologies.

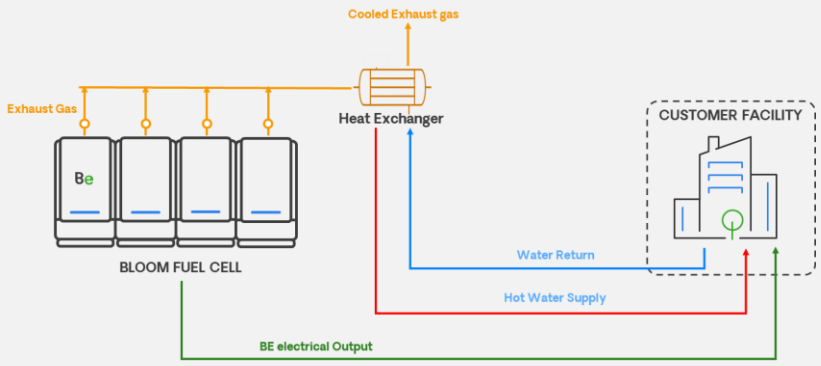
Energy Efficiency: Onsite electricity generation and reuse of waste heat boost total energy utilization and reduce dependency on inefficient grid-sourced electricity and natural gas-based hot water generators.

Cost Savings: Lower capital and operational expenses with a reduced total cost of ownership through lower utility and gas bills, and fewer backup systems.

Scalability and Flexibility: Modular factory packaged plug and play system allows for rapid deployment without the delays or constraints of grid interconnection, enabling agile growth as the customer plant expands.

Reliability and Resilience: Consistent 24/7, local power supply and heating, integrated into a microgrid, these systems ensure uninterrupted operations during outages and enhance energy security.

SPECIFICATIONS



2,777 kg/hr of hot water per 325kWe of fuel cell

Electrical

Fuel	Natural gas[1]
Input fuel pressure	12 - 18 psig (15 psig nominal)
	0.82 - 1.24 barg (1 barg nominal)
Nameplate power output (net AC)	325 kW
Voltage	3-ph, 480, 415, 400, and 380 V
Frequency	50/60 Hz

Thermal

Water Flow	2,777 kg/Hr* (6122 lbs/hr)
Water Side Pressure Drop	0.0003 bar (0.0044 PSI)
Water Temperature (IN/OUT)#	50 °C /100 °C* (122 °F/212 °F)
Nominal/Max pressure	5 barg (72.5 PSI)/16 barg (232 PSI)
Water connection	2-inch NB #300 RF

 # Other water IN/OUT temperatures are available on customer request

Efficiency

Cumulative electrical efficiency	65 - 53% (LHV net AC)
Heat rate (HHV)	6,131 - 7,519 kJ/kWh
	(5,811 - 7,127 Btu/kWh)
Avg. thermal efficiency	28.5%* (exhaust heat available @ >350 °C)
Total efficiency	82.5%*

Emissions Power Generation[2]

NO_x	0.001 kg/MWh (0.003 lbs/MWh)
SO_x	Negligible
CO	0.005 kg/MWh (0.013 lbs/MWh)
VOCs	0.004 kg/MWh (0.01 lbs/MWh)
CO_2 @ stated efficiency	308 – 378 kg/MWh (679–833 lbs/MWh)

[1] Contact Bloom Energy for information on using biogas, blended hydrogen and hydrogen with the SOFC systems.
[2] NOx and CO measured per CARB Method 100, VOCs measured as hexane by SCAQMD Method 25.3.
[3] Country-specific codes and standards for the cogeneration equipment shall be followed.

*Fuel cell operating at ISO Conditions. 15°C and 0m elevation. and average project life performance.

Emissions Reduction (Cogeneration)

CO_2 avoided @ stated Cogen efficiency	100 kg/MWh (220 lbs/MWh)
SOFC + CHP CO_2 emission	205 -275 kg/MWh (452 -606 lbs/MWh)

Physical Attributes and Environment

Weight (w/skid)	15.8 mt (34,833 lbs)
Dimensions (w/skid)	9.0 m x 2.0 m x 2.5 m (29'2" x 6'7" x 8'2")
Temperature range	-20 °C to 45 °C (-4 °F to 113 °F)
Humidity	0%–100%
Seismic vibration	ASCE7 SDC (Seismic Design Category) D
Location	Outdoor
Noise	<65 dBA @ 10 ft (3 m)

Codes and Standards[3]

Safety	FC1, UL 1741, UL 1998, CE, KESCO,
EMC	EN 5501/KN11, EN 61000, KN32, KN35
Grid Interconnection	IEEE 1547 2018, UL 1741 SB, CA Rule 21, CEI 016, KEPCO, G99, C10/11, VDE
Heat Exchanger Design Standards	ASME, PED

Additional Benefits

Access to a secure website to monitor system performance & environmental benefits. Remotely managed and monitored by Bloom Energy. Capable of emergency stop based on input from the site.

Meets stringent CARB 2007 Distributed Generation emission standards.

An Energy Server SOFC system is a Stationary Fuel Cell Power System. It is Listed by UL Solutions (UL LLC) as a 'Stationary Fuel Cell Power System' to ANSI/CSA FC1-2014 under UL Category IRGZ and UL File Number MH45102.

Model number for Energy Server 6.5 with CHP follows the format:
ES6-XXXXXXXXXXX-XXXXXX

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Reliable. Cost-effective. Future Proof.

Power you can count on, at any scale.