

bGen™ E2S

# Thermal Storage based Steam Generator

**BRENMILLER ENERGY**  
THERMAL ENERGY STORAGE

Decarbonization of Heat



**BRENMILLER ENERGY**

## De-carbonizing heat

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bGen™ E2S (Electricity to Steam) is a high-temperature thermal energy storage unit, charged from renewable electricity which converts to heat at 750°C using embedded electrical heaters. The inherent steam generator produces steam, according to demand.

### Key Advantages:

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Enabler for renewable energy- Utilization of intermittent renewable electricity sources for a steady industrial heat delivery with reduced CO2 emissions.



Economical- Utilizing low tariff or curtailed renewable energy to provide green steam.



Efficient- Decoupling between charging time of the electricity sources and the delivery time of the steam to increase efficiency.



Long lifespan- Tens of thousands of charge/discharge cycles lifespan of 30 years.



Modular- Multiple storage modules can be used to produce the required capacity.



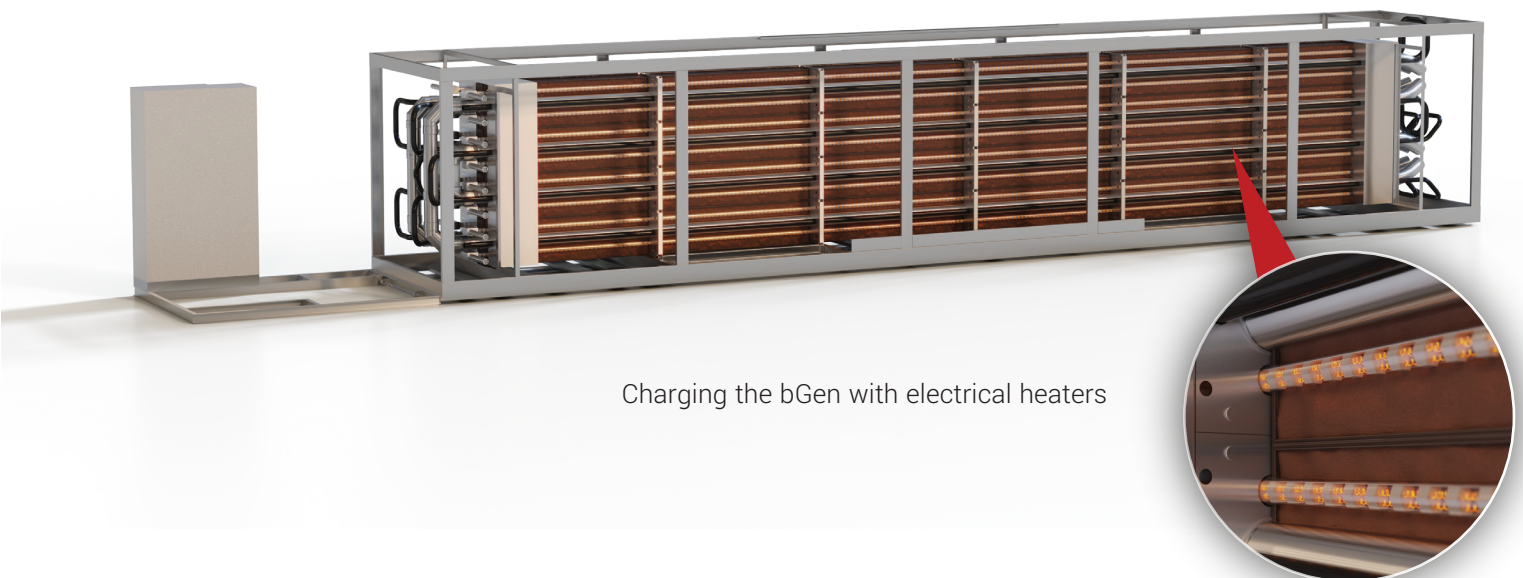
Sustainable- The system is built from green only materials with no hazardous to the environment.

### Product Functionality:

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Electricity from renewable energy sources such as PV, Wind Turbine or directly from a grid, when electricity tariffs are low, are being used to charge the bGen™ E2S.

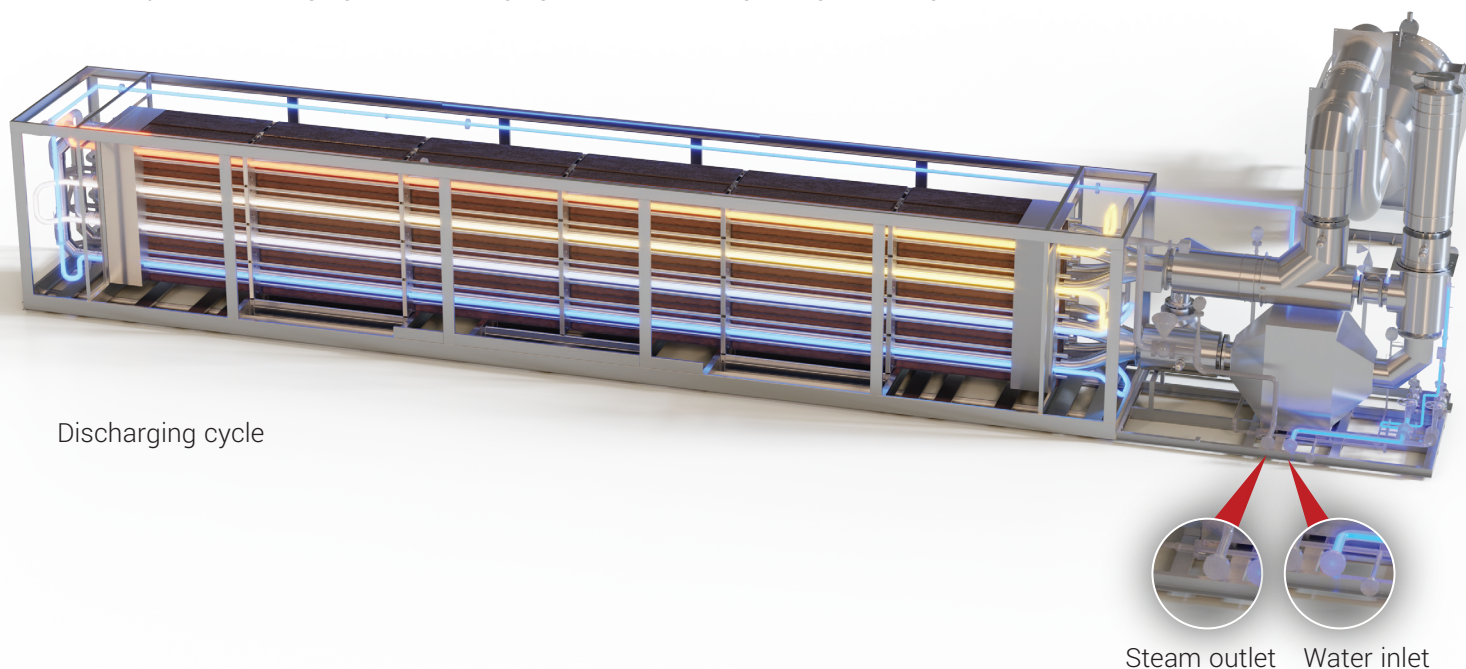
The electrical input is converted to high temperature heat using embedded electrical heaters in the storage modules. No gases or emissions are produced in this process.



Charging the bGen with electrical heaters



Either Simultaneously or in different times, water is flowing through the separated discharging piping cycle, and industrial steam is delivered to the customer on demand. The system is designed to maintain constant steam conditions through the discharge phase. Having two independent cycles inside the unit enables full control and flexibility for the charging and discharging conditions in regarding to timing, flow, and temperatures.



Discharging cycle

Steam outlet Water inlet

## Technical data & Performance - Process steam up to 200 C°

Steam flow	Ton/h	1	3	5	10	20
Capacity	MWh	6.2	18.5	30.9	61.7	123.4
Electricity charging	MW	0.8	2.3	3.9	7.7	15.4
Energy hourly losses (%)	MW	0.21%	0.21%	0.21%	0.21%	0.21%
Dimension- Height	meter	3.5	5	4.5	6.5	5.5
Dimension- Width	meter	3.5	4	6	6.5	16
Dimension- Depth	meter	16	16	16	16	16
Weight	Ton	76	228	380	760	1520

\*Assuming no returning water

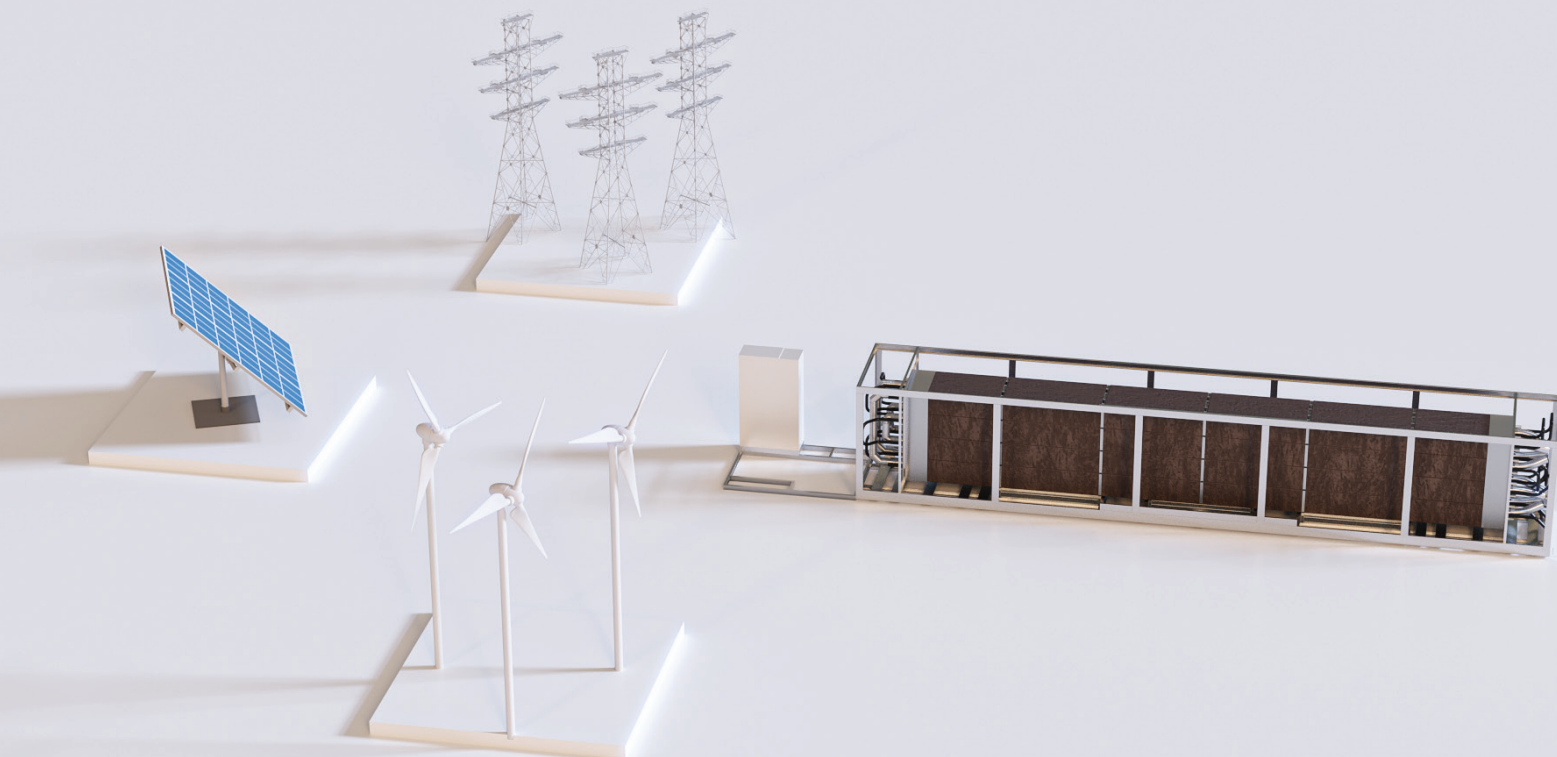
## Operations & Maintenance:

- The bGen™ E2S unit is fully automatic and operated through a software communication protocol.
- No special local operator is required for operating the system.
- Local customer maintenance or operating staff will go through a grade A O&M course which will enable them to give full support of the hardware and communication topics.
- Storage modules do not require any preventive or periodic maintenance. Auxiliary systems (pumps, valves, etc) require minimal ongoing maintenance.
- Brenmiller Staff will support the customer with any grade B topics which are not covered by the local maintenance or operating staff, upon demand.

## Safety and Standards:

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Standard	Description
ISO 9001	Quality management systems
ISO 14001	Environmental management systems
OHSAS 180014	Health and safety management systems
CE / UL	Directives for CE / UL listed
ASME 31.1	Power piping
Eurocode8, US ASCE 7-98	Building and foundations
TA-LUFT, BEMS	Gas emissions



## Company Profile:

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Brenmiller Energy provides sustainable thermal energy storage solutions. The company was founded by Avi Brenmiller, former CEO of Siemens CSP and Solel, and a team of experts in the field of renewable energy. Since 2012 the company has developed a patented thermal energy storage technology based on storing heat using crushed volcanic rocks. The company is traded on Tel-Aviv Stock Exchange and has raised over \$80m.

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