

bGen™ - Energy when you need it

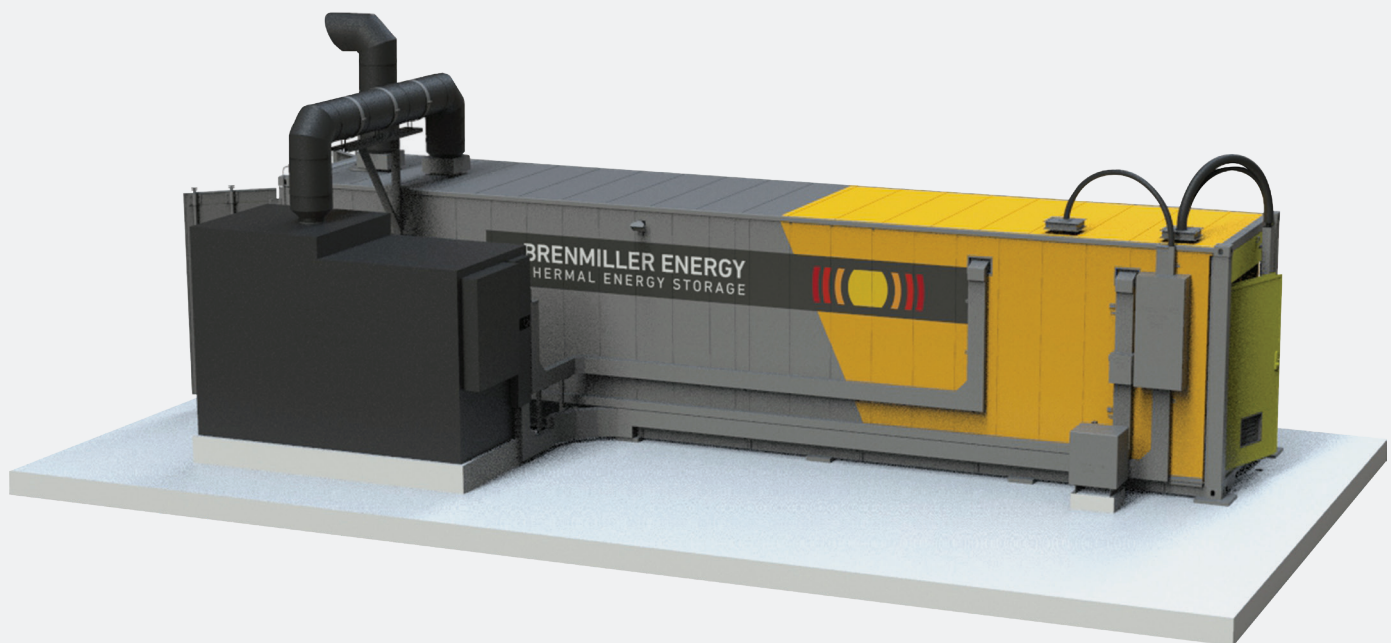
Storage Based Heat Recovery for On-Demand supply



bGen™ - HS-7014

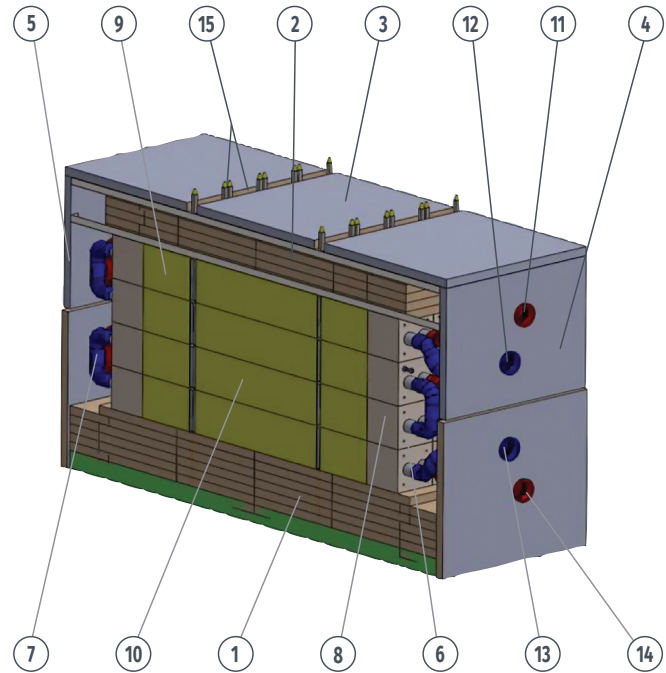
Storage Based Steam Generator

Charge with High Temp Flue Gas, Deliver Heat on Demand



Product Functionality

The HS-7014 is a high temperature Energy Storage unit, charged with flue gasses, exhausted from prime movers or production floor cycles. The patented technology utilizes inherently a steam generator, a heat exchanger and the storage media. The charged energy is delivered as steam, hot water or hot air. Delivery takes place only when demanded by the customer. Residual gasses can be used to charge the unit at intervals or continuously for 24 hours while the HS-7014 can deliver its stored heat at totally different time slots. Charging and discharging can take place in parallel or in serial with no dependency between the cycles. This unit will highly increase the efficiency of Co-generation or CHP cycles.



Key Advantages

CHP Enabler – The unit enables installations of Co-generation systems where the efficiency of standard CHP systems is below an economical threshold, through the decoupling of the heat collection time and its utilization period.

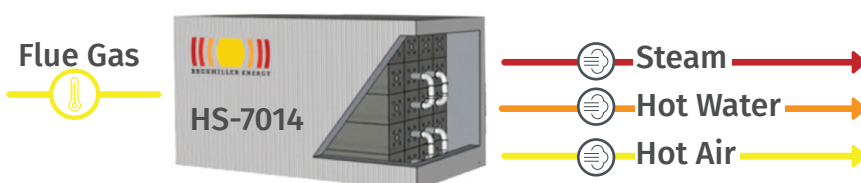
Flexibility – The HS-7014 can accept a wide range of charging inputs, from 300°C and above

Lifetime – The used storage media enables tens of thousands of charge/discharge cycles with no performance degradation for a 30 years lifetime

Modularity – Multiple units can be utilized to form a size which matches the customer need

Non Hazardous – The system is built from green only materials with no hazardous to the environment or special chemicals inside.

- 1 Bottom Insulation
- 2 Top Insulation
- 3 Sealed Housing
- 4 Front Housing
- 5 Back Housing
- 6 Internal Interconnecting Piping
- 7 Back Interconnecting Piping
- 8 Front Insulation
- 9 Back Insulation
- 10 Storage Media Cubes
- 11 Inlet Biomass Gasses
- 12 Outlet Fluid Supply
- 13 Biomass Returned Gasses
- 14 Returned Supply Fluid
- 15 Unit Handling Points

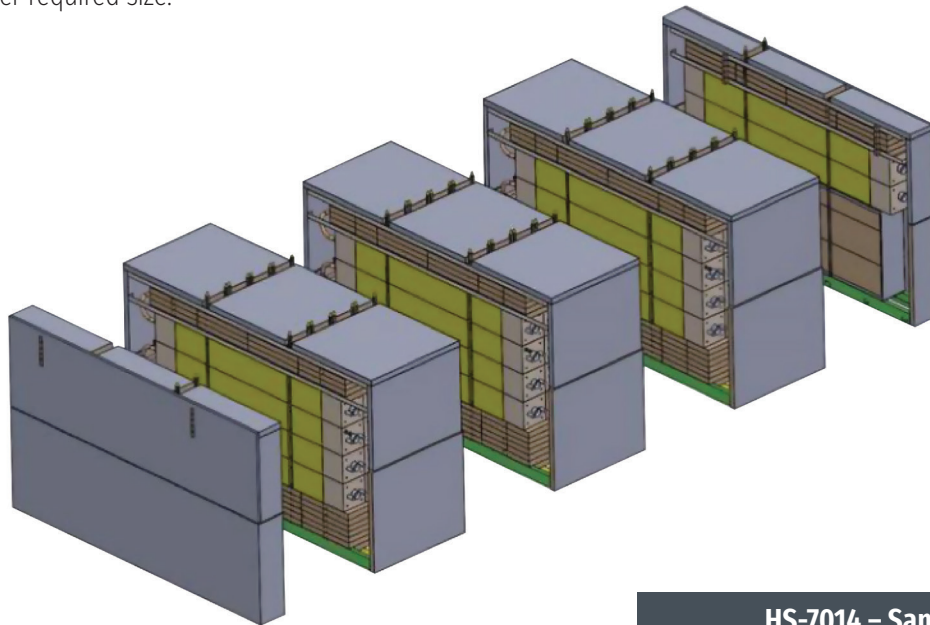
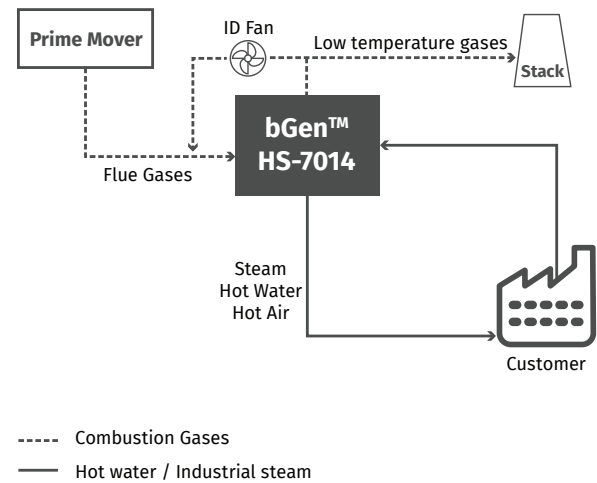


Residential / Commercial



Technical Details and Performance

Hot flue gasses, as exhausted from prime movers or production cycles are flowing to the HS-7014 input piping. These gasses are heating the internal storage media while flowing through the unit and leave as cooled gasses through the stack unit. In parallel or at a total different timing, cold water or air is flowing through the separate discharge piping system and deliver steam, hot water or air to the customer. Returned water goes back to the HS-7014 unit for a new cycle. The separate cycles inside the unit enable full control and flexibility for the charging and discharging conditions in regards to timing, flow and temperatures. Multiple such units can be Integrated to form a bigger storage based heat supply according the customer required size.



The HS-7014 can be activated at different working points. The following table specifies such sample points. One can use it to maximize power or to maximize capacity.



HS-7014 – Sample working points

Storage Power [kW]	Hot Water (Up to 90°C)		Industrial Steam (up to 180°C)	
	Storage Capacity [KWh]	Storage Capacity [Hour]	Storage Capacity [KWh]	Storage Capacity [Hour]
100	1333	13.3	1083	10.8
250	958	3.8	792	3.2
400	567	1.4	467	1.2
550	183	0.3	138	0.3

BS-7014 - General technical data

Efficiency	80%
External Dimensions (WxHxL)	3.0 x 3.0 x 6.5 m
Heat Losses	3% / 24 Hours
Response Time	60 Seconds

Construction

The HS-7014 is supplied and shipped as one and integrated unit. Once the ground preparations are performed, installation is short and focused on connections to the required interfaces. Specifications are supplied for the various interfaces according to the below topics. Installation and integration are completed when a full acceptance test has been performed.

- SW/Control Interface
- Piping Interface
- Ground preparations
- Water Requirements
- Installation Tools
- Acceptance Test



Safety and Standards

Standard	Description
ISO 9001	Quality management systems
ISO 14001	Environmental management systems
OHSAS 18001	Health and safety management system
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

Operations & Maintenance

The HS-7014 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. A special monitoring screen for control of the unit will be supplied. Hardware items of the system do not require any preventive or periodic 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.

Brenmiller Energy, Based on its unique storage technology provides sustainable energy solutions to the distributed generation market. The company was founded in 2012 by Avi Brenmiller, former CEO of Siemens CSP and Solel, and a team of experts in the field of renewable energy. Brenmiller Energy's knowledge and expertise are well grounded and based on years of field experience in designing, building and operating various energy plants in Spain and in the US.

