

Company name	Head-quarters	Year of foundation	Providing storage solutions to which sector	Level of commercialisation	Type of storage	Product name	Storage media	Heat Transfer fluid	Range of storage size	Max storage temperature	TRL level	Website
Alumina Energy	USA	2015	Industry sector and electricity sector	First demonstrator in operation in the USA (450 kWh)	Solid-particle storage	Particle Packed Bed Energy Storage (PB-TES)	Solid particles (recycled ceramics, ceramics, sand)	Air or CO ₂	100 kWh up to 10 GWh	up to 1,600 °C	TRL 4-5	https://www.aluminaenergy.com/
Antora Energy	USA	2018	Industrial sector	First demonstrator in operation in USA	Solid-state storage	Antora Thermal Battery	Solid carbon blocks	Energy is transferred via thermal radiation (light) to deliver process heat, or is converted into electricity via TPV cells	n/a	up to 2,400 °C	n/a	https://antoraenergy.com/
Brenmiller Energy	Israel	2012	Industry sector	Four commercial plants in operation in Italy (24 MWh), Brazil (1 MWh), USA (1 MWh) and Israel (1 MWh)	Solid-particle storage	bGen	Crushed vulcanic rocks	Air or steam	2 MWh to 10 GWh	up to 750 °C	TRL 9	https://www.bren-energy.com/
Build to zero	Spain	2022	Industry sector	First commercial project under construction	Molten salt storage	ThermalBox	Molten salt	Molten salt	Modular up to several MWhs	400 °C	TRL 8	https://buildtozero.es/
Carbon-Clean Technology	Germany	2008	Industrial sector and power plant sector	Demonstrator in operation (1 MWh)	Carnot Battery	Carnot Battery	Packed bed of ceramic balls	Air	100 MWh to several GWh	up to 1,200 °C	TRL 6-7	http://www.carbonclean.de/
E2S Power	Switzerland	2019	Power plant sector	Pilot plant in operation in India (0.25 MWh)	Solid-state storage	TWEST	Graphite blocks	Water / steam	Modular design storing 8+ hours	up to 540 °C	TRL 7	https://e2s-power.com/
Eco-Tech Ceram	France	2014	Industry sector and renewable sector	Three commercial plants in operation in France (total 9.3 MWh)	Solid-state storage	Eco-Stock	Ceramic in a fixed bed	Air	2.3 MWh per Eco-stock module	up to 600 °C	TRL 9	https://ecotechceram.com/en/
Electrified Thermal Solutions	USA	2021	Industry sector	No pilot plant yet	Solid-state storage	Joule Hive Thermal Battery	Electrically-conductive firebricks	Air	25 MWh up to multi GWh	up to 1,800 °C	TRL 6	https://electrifiedthermal.com/
Element16	USA	2016	Industry sector and power plant sector	First demonstrator under construction in USA (1.5 MWh)	Molten sulfur storage	Element 16	Molten sulfur	Thermal oil or hot air	10 MWh to GWh range	up to 350°C	TRL 7	https://element16.com/
Energyneest	Norway	2011	Industry sector and power plant sector	Two commercial projects in Belgium (5 MWh) and Norway (4 MWh)	Solid-state storage	ThermalBattery	Concrete tubes (Heatcrete)	Steam or thermal oil	Modular with 1 MWh units up to 1,000 MWh	up to 450 °C	TRL 9	https://energy-nest.com/

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Exergy3	Great Britain	2023	Industry Sector	First demonstrator in Scotland under construction (36 MWh)	Solid-state storage	Thermal Storage	N/a	Air	Minimum 8 MWh and what ever the client needs	Up to 1,200 °C	TRL 5	https://www.exergy3.com/
Heliac	Denmark	2014	Industry sector and district heating sector	Pilot plant operated for 24 weeks in Denmark (0.5 MWh)	Solid-state storage	Rockstore	Granite rocks in a large steel tank	Thermal oil	Tailor-made for each user	up to 300 °C	TRL 6-7	https://heliac.dk/solutions/rockstore/
Hyme Energy	Denmark	2021	Industry sector and power plant sector	No pilot plant yet	Molten salt storage	Not named	Molten salt	Hydroxide salt	100 MWh -> 2 GWh	700 °C	n/a	https://www.hyme.energy/
Kaaj Energy	Canada	2020	Industry sector (heat/electricity as a service)	No pilot plant yet	Solid-state storage	Thermal Energy Storage (TES)	Iron ore	Air	n/a	up to 1,000 °C	TRL 7	https://kaajenergy.com/
Kraftanlagen	Germany	1923	Industry sector	Two demonstration plants in Germany (2 MWh and 20 MWh)	Solid-state storage	Green Heat Module	Ceramic honeycomb bricks	Air	5 to 1000 MWh	around 1000 °C	TRL 8	https://www.kraftanlagen.com/en/solutions/energy/green-heat-module/
Kraftblock	Germany	2014	Industry sector and electricity sector	Pilot plants in operation (70 to 150 MWh)	Solid-particle storage	Kraftblock	Composite material / 85 % recycled granulate from steel slag	Air (alternatively flue gas, helium, CO2)	4 MWh to GWh scale	up to 1,300 °C	TRL 7-8 for waste heat recovery TRL 6-7 for power-to-heat	https://kraftblock.com/de/
Kyoto Group	Norway	2016	Industry sector and power plant heat	Commercial demonstrator in operation in Denmark (18 MWh)	Molten salt storage	Heatcube	Molten salt	Water / steam	up to 120 MWh	Up to 415 °C	TRL 8	https://www.kyotogroup.no/
Lumenion	Germany	2016	Industry Sector and electricity sector	Pilot project in operation in Germany (2.4 MWh). First demonstrator under construction in Germany (20 MWh)	Solid-state storage	TES (Thermal Energy Storage)	Steel rods	Nitrogen or pressureless air	5 to 500 MWh	up to 600 °C	TRL 9	https://lumenion.com/
Magaldi Green Energy	Italy	1929	Industry sector	First demonstrator under construction	Solid-partical storage	Magaldi Green Thermal Energy Storage - MGTES	Silica sand in a fluidised bed	Steam	from 5 MWh (single module) up to GWhs size	up to 620 °C	TRL 6-7	https://www.magaldigreenenergy.com/en
Malta Group	USA	2018	Electricity sector and industry sector	Demonstrator in operation in the USA	Molten salt storage with two tanks	Malta Pumped Heat Energy Storage (PHES)	Molten salt	Molten salt and air	10 to 100 hours of 100 MW electric discharge power	up to 565°C	TRL 6	https://www.maltainc.com/
MGA Thermal	Australia	2019	Electricity sector and industry sector	First Demonstrator (5 MWth) under construction	Phase change material storage	MGA Thermal Energy Storage (MGA Block)	Tiny metal alloy particles (made from PCMs C-Al or C-AL-SI) are dispersed through a matrix	Argon or nitrogen	5 MWh to 6 GWh	650 °C	TRL 7	https://www.mgathermal.com/

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Pintail Power	USA	2014	Electricity sector	No pilot plant yet	Molten salt storage	Liquid Salt Combined Cycle (LSCC) or Liquid Air Combined Cycle (LACC)	liquid salt	Liquid salt	2000 MWh per tank pair	up to 427 °C	n/a	https://www.pintailpower.com/
Polar Night Energy	Finland	2018	Industry sector and district heating sector	First commercial plant in operation in Finland (8 MWh)	Solid-partical storage	Sand Battery	Sand or sand-like materials	Air	Two standard systems with 200 MWh and 1 GWh respectively	up to 500 or 600 °C	TRL 8-9	https://polarnightenergy.fi/
Rondo Energy	USA	2020	Industry sector (heat-as-a-service)	First commercial project in operation in USA (2 MWh)	Solid-state storage	Rondo Heat Battery: RHB100 and RHB300	Bricks	Air	100 MWh or 300 MWh storage capacity	> 1,000 °C	TRL 7	https://rondo.com/
Rpow	Spain	2019	Electricity sector and industry sector	No pilot plant yet	Molten salt storage	No Name, client-specific products	Molten salt	Water/steam or Air/waste heat	from 100 MWh	up to 565 °C	N/a	www.rpow.es
Solstor Energy	USA	2023	Electricity sector	No pilot plant yet	Molten salt storage	eTES	Molten salt	Molten salt	500 MWh and 1 GWh	up to 565 °C	N/a	www.solstor.energy
Storasol / enolcon	Germany	2013 (Storasol)	Electricity sector and industry sector	Pilot plants in operation	Solid-particals storage	Heat storage: HTTES Thermal Electricity storage: OPTES- and OPTES-GT Battery	Sand, gravel, rocks or stones in a fixed bed	Air or gas	Modular design from 100 kWh to 1000+ MWh	up to 1,050 °C	HTTES: TRL 8-9 OPTES: TRL 4-5	https://storasol.com/
Storworks Power	USA	2010	Industry sector and power plant sector	Demonstrator in operation	Solid-state storage	Storworks BolderBlocs	Concrete blocks	Air or steam	Modular design from 10 to 250+ MW and from 4 to 24+ hours of storage	up to 600°C	TRL 6	https://www.storworks.com/
Sunamp	Great Britain	2005	Industry sector	Pilot projects realised	Phase change material storage	Central Bank thermal batteries	Multiple phase change materials	Thermal oil	up to 6 MWh	up to 600 °C	TRL 7	https://sunamp.com/
Terrajoule Energy	USA	2022	Electricity sector	No pilot plant yet	Steel pressure vessel	Steam Accumulator Energy Storage (SAES) available as a component of the Dispatchable Solar	Pressurised hot water	water	n/a	n/a	n/a	https://www.terrajoule.energy/
1414 Degrees	Australia	2009	Industry sector	Demonstrator of SiBrick in operation in Australia (1 MWh)	Phase change material storage	SiBrick / SiBox	Silicon-based bricks	Air	Modular up to GWh	up to 1,414 °C	TRL 6	https://1414degrees.com.au/
247Solar Inc	USA	2015	Electricity sector and industry sector	Demonstrator under construction in USA (3.6 MWh)	Solid-particle storage	HeatStorE battery	Silica sand, small pieces of ceramical or iron slag	Air	Minimum 200 kWe with storage 9+ hours	up to 1,000 °C	TRL 6	https://247solar.com/

Overview of high-temperature storage solution providers - status March 2024, based on a market survey carried out by solrico (www.solrico.com) and financed by Natural Resources Canada Source: companies' information