



# Molten Salt-based Thermal Battery to Decarbonize Process Heat

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<b>COMPANY NAME</b> XXX	<b>TECHNOLOGY</b> -	<b>TYPE OF OWNERSHIP</b> Public company
<b>YEAR FOUNDED</b> 2016	<b>HEADQUARTERS</b> Lysaker, Norway	<b>KEY MARKETS</b> Europe
<b>INVESTMENT STAGE</b> Equity Finance	<b>TOTAL FUNDING</b> \$23.8 M (€22.1 M)	<b>TOTAL REVENUE</b> -
<b>EMPLOYEES</b> 11-50		

**ABOUT THE COMPANY**  
 XXX is a Norwegian clean energy technology company that develops industrial decarbonization solutions. The company has developed a molten salt-based thermal energy storage (TES) solution specifically for energy-intensive industries.

<b>KEY CONTACT</b>	 <b>NAME</b> -	 <b>PHONE</b> -	 <b>EMAIL</b> -	 <b>URL</b> -
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**Technology Snapshot**

The company has developed the ABC, a thermal energy-storing battery that uses proprietary ternary molten salt as heat storage medium. This energy storage has a capacity of 16–96 megawatt hours and a charging capacity of 10–30 megawatts and can provide steam between temperatures of 170 and 400 degrees Celsius.

**What Problem does the Technology solve?**

Energy-intensive industries require huge amounts of process heat in manufacturing, which is provided by burning fossil fuels. As per International Energy Agency estimates, industries account for nearly 50% of global heat demand. Excessive use of fossil fuels in heat generation results in carbon dioxide emissions and the release of other harmful gases that contribute to climate change. The company’s thermal battery provides a solution to this problem.

**Attributes**

**High Heat Conversion Efficiency and Reduced Emissions**  
 The product has a high electricity-to-heat conversion efficiency of > 90%. The ABC also eliminates CO2 emissions from process heat generation by replacing fossil fuels as the energy source.

**Low Storage Footprint and Heat Loss**  
 The ABC has a low storage footprint of 250 kilowatt-hours/m2, enabling more energy generation without the need for high footprint. The product has a low heat loss rate of <1% per day, providing long storage durations for thermal energy.

**Long Operating Life**  
 The molten salt-based thermal battery has a long operating life of more than 25 years.

Source: Frost & Sullivan

# XXX - Value Proposition

## Technology Assessment

The ABC is a plug-and-play design and includes a series of tanks that heats the molten salt via renewable energy. The key advantage provided by the system is, during high renewable generation & low prices, thermal battery is charged i.e., Electricity is converted to heat and stored. Whenever the industry needs heat or during hours with high electricity prices, stored heat can be used for steam production for process heat or electricity generation. The company has 2 business models. With the Heat-as-a-Service model, the company enters into heat purchase agreements with customers and ABC is operated by XXX or its designated partners. With the Heat-as-a-Product model, the company sells the ABC directly to the customers while providing services and support for the product.

## Key Competitors

- XXX
- XXX
- XXX
- XXX

## Strategic Analysis

**S**  
Strengths

- The plug-and-play design makes connecting with the heat generation network easier.
- Minimal moving parts result in lower losses.
- It can be charged whenever low-cost renewable energy is available.

**W**  
Weaknesses

- The ABC technology does not have any significant weakness because it can provide high-quality steam as well as high efficiency heat conversion.

## IP/ Patent Activity

The company has filed for 3 patents pertaining to its thermal energy storage, circulation of molten salts and melting of ternary salts.

**O**  
Opportunities

- The industrial sector is increasingly focusing on reducing carbon emissions and enhancing sustainability, which will provide ample opportunities for technology deployment.

**T**  
Threats

- A strong decline in fossil fuel prices and improvements in point source emission reduction technologies may act as a threat.

## Future Focus Areas

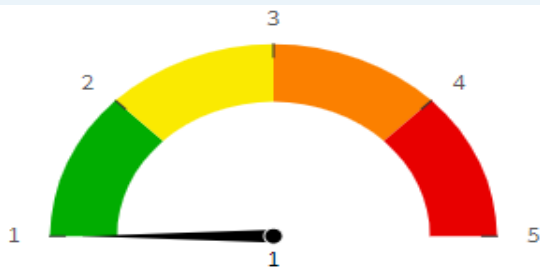
In April 2023, the company signed memorandum of understanding (MoU) with one of the leading European renewable energy provider for industrial heat decarbonization.

In January 2023, XXX and XYZ signed a letter of intent for the supply of its thermal battery technology. The ABC will replace nearly 40% of fossil fuel at XYZ production sites.

In January 2023, the company signed a letter of intent with XYZ for the R&D of heat exchangers for molten salt-based thermal energy storage technologies. The company also signed a letter of intent with XYZ to finance its ABC commercial projects.

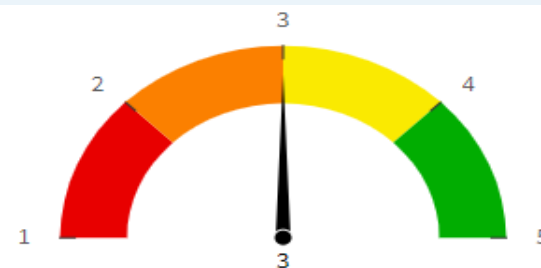
Source: Frost & Sullivan

## Risk Analysis



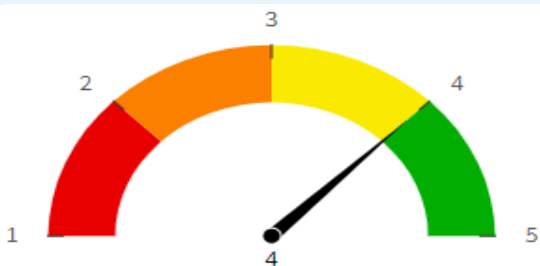
- The company has very strong project pipeline in various stages of completion. An 18 MWh storage capacity project is under construction while pipeline with 1000 MWh storage in assessment stage. Its total storage pipeline currently stands over 40 projects. Due to strong project pipeline, its risk related to future growth is low.

## Revenue Magnitude Potential



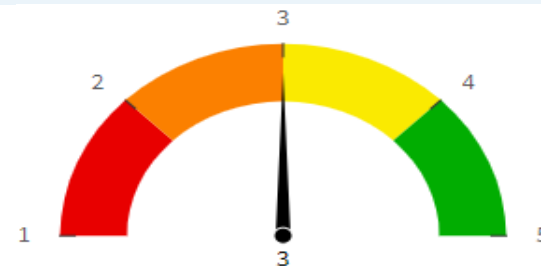
- The company is expected to achieve the EBITDA break-even by 2025. In addition, its strong project pipeline and well thought out funding strategy will significantly contribute towards company's revenue magnitude potential.

## Buzz Worthiness



- In April 2023 the company joined The United Nations Global Compact which aims to promote responsible business practices. XXX's solution also meets two of the Sustainable Development Goal agendas.

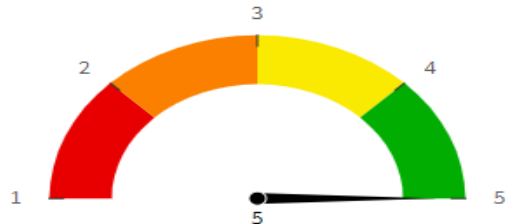
## Investor Lens



- In 2021, the company raised approximately \$17.1 million via new equity to fund its R&D and growth. The company has also received debt financing approval from Nefco. The total financing can go as high as \$4.4 million (EUR 4 million).
- The cumulative funding generated by the company as of 2023 is USD 23.8M (EUR 21.1M)

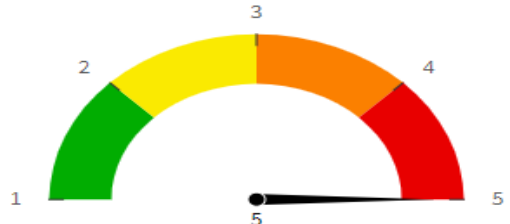
Source: Frost & Sullivan

## Commercialization Readiness Level



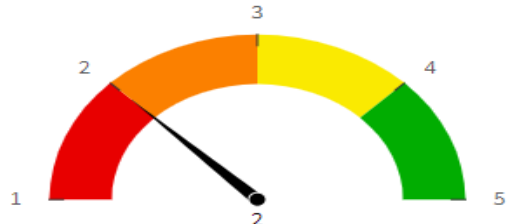
- XXX conducted its 1st pilot-scale demonstration of the product in 2020 and launched its 1st commercial ABC installation in 2022. The company launched the technology's 2nd generation in the last quarter of 2022 for commercial deployment. The ABC's commercialization readiness level is high.

## Technology Competition Level



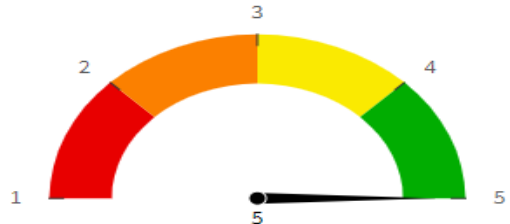
- The ABC will compete with other thermal energy storage solutions including solid state TES offered by other competitors. TES solution will also compete with Li-ion battery storage technologies.

## Regional Impact



- The company primarily operates in Europe

## Application Potential



- Reliable and low-cost heat for key industries such as iron & steel, food processing, pulp and paper, petrochemicals, CHP systems and metals & minerals production.

## Analyst's Insights

With the announcement of net-zero emission goals, the industrial sector is increasingly coming under scrutiny because of its high fossil fuel use, process-heat generation, and subsequent carbon emissions. As a result, consumer awareness and policies supporting industrial decarbonization are growing. The ABC's thermal battery can meet the industry's need for energy security and sustainability and can play a vital role in electrifying and decarbonizing process heat. It can also provide grid balancing services and minimize investment needs for Transmission System Operators (TSO) and Distribution System Operators (DSO). The company is also on track to achieve low CAPEX of \$44/kWh and levelized cost of storage of \$16.5/kWh by 2025.

Source: Frost & Sullivan