

# ***PIT THERMAL ENERGY STORAGES***

*for green heating and cooling*



**AALBORG CSP**  
- Changing Energy

# ***INTEGRATED PTES SYSTEMS***

*for green and stable heating and cooling*

Heating and cooling account for approximately half of the world's total energy consumption, and the need to decarbonize this sector is significant.

The Pit Thermal Energy Storage (PTES) technology is a key element in this transition. Well-integrated PTES systems enable efficient utilization of surplus energy from renewable sources and industry, as well as the delivery of stable and cost-effective heating and cooling on demand.

The storage allows for the decoupling of consumption and production, enabling the optimization of heating and cooling production, while ensuring that both base and peak loads are met through the stable and flexible discharge of the storage.

## **Benefits**

- Storage of renewable and surplus energy
- Cost-effective technology
- Increased efficiency and flexibility
- On-demand energy and peak load coverage
- Scalable Technology
- Good integration possibilities
- Can be used for both heating and cooling storage
- Supports sector coupling and electrification



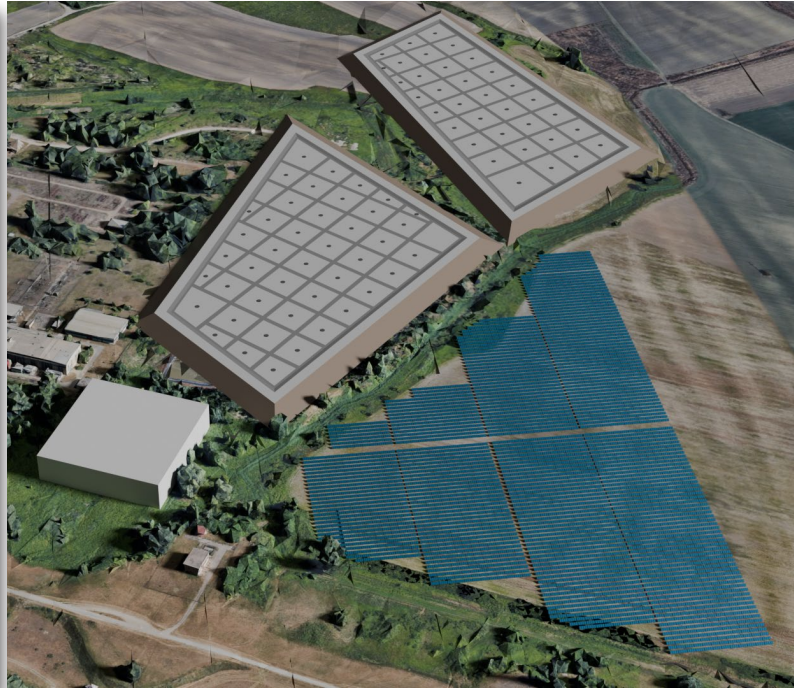
# ON-DEMAND GREEN ENERGY

*with intelligent PTES integration*

Integrated energy systems that utilize PTES systems in combination with renewable energy plants are a key component of future green energy systems. A PTES is ideal when combined with heat pumps and electric boilers, as well as solar thermal, PV, biomass, biogas, and power-to-x plants.

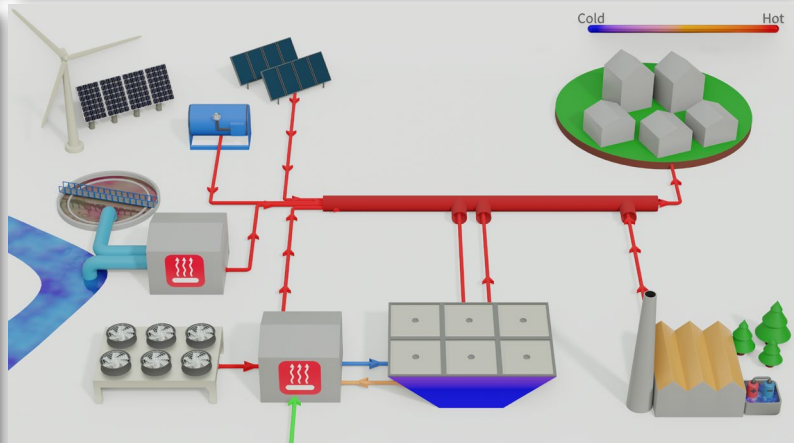
While the storage technology is often associated with seasonal storage, its profitability and value are much higher when used as hourly, daily, and weekly storage for peak shaving.

An integrated energy system consisting of a PTES combined with one or several renewable energy plants can supply e.g., district heating networks with on-demand energy. The storage creates a temporal connection between the heat supply and demand. The flexibility of the storage also enables the constant use of the most cost-effective heat source.



## Can be integrated with

- Heat pumps
- Solar heat
- Biomass
- Biogas
- Power-to-X
- Etc.



# ***STABLE AND RELIABLE LID SOLUTION*** *for customized PTES systems*



## **Benefits**

- Certified by Lloyd's Register
- Minimal heat loss (<10%)
- Improved insulation capacity
- Cost-efficient
- Long durability
- Stable operation
- Scalable

PTES systems from Aalborg CSP use a patented and certified lid solution whose unique design features help increase the efficiency and reliability of the storage, thereby ensuring its long-term durability.

The lid is designed as a diffusion open construction, which prevents vapor from accumulating and condensing inside the insulation. By making the lid a diffusion open construction, the insulation capacity of the storage is greatly improved, and the heat loss is reduced.

Moreover, the lid is divided into sections for improved rainfall handling, enabling safe and efficient dewatering of the lid's surface with minimal maintenance required.

The lid design is certified with a Technology Qualification Certificate from Lloyd's Register, declaring that the lid technology meets all necessary requirements in terms of both design, functionality and sustainability.





# ***YOUR TURNKEY ENERGY SPECIALIST***

*from concept to reality*

We take on the role as turnkey energy contractor and support our customers through all project stages, from identification of needs and conceptual design development to supervision, and commissioning.

As a turnkey energy specialist, we offer a wide range of engineering services. We offer support and guidance in connection with e.g., component selection, dimensioning, assembly, system setup and integration.

- One-stop-shop for accelerating the green transition
- Customized energy solutions
- Optimized and customized plant design
- Efficient integration with existing energy systems
- Preliminary design, FEED, and concept development
- Flexible collaboration, open-book and value engineering
- Service-friendly design and system set up
- Intelligent system integration



# **CHANGING ENERGY** *worldwide*

Aalborg CSP A/S is a leading developer and supplier of innovative, renewable technologies with the vision Changing Energy aiming at changing the way energy is produced and stored today. We design and supply green solutions and integrated energy systems based on solar power, energy storage within power-to-X (PTXHEAT and PTXSALT), heat exchange and much more for industries and power plants worldwide.

Since 1988, Aalborg CSP has utilized its immense expertise within design and delivery of boilers, complex systems, renewable energy technologies and energy storage. Thereby, we have a deep understanding of individual energy needs, technology- and system integration as well as optimization with key competences such as performance modelling and system design.

Aalborg CSP A/S places strong focus on R&D activities and works both internally within the company and externally with Danish and international knowledge-based companies and institutions in continuously creating innovative and sustainable technologies.

Aalborg CSP offers a wide variety of renewable energy solutions including high- and low temperature energy storage, solar panels, heat pumps, boilers, integrated energy systems as well as customized Power-to-X solutions. We match individual energy needs with the right systems and technologies and integrates and combines solutions to achieve synergies between both sectors and technologies. We do so in order to create optimum value for our clients, while also optimizing the utilization of the world's energy sources aiming for a CO2 neutral future.

Headquartered in Aalborg (Denmark) and with a sales & service office in Spain, Aalborg CSP A/S has realized cost-effective green energy solutions worldwide.

**AALBORG CSP**  
*- Changing Energy*

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