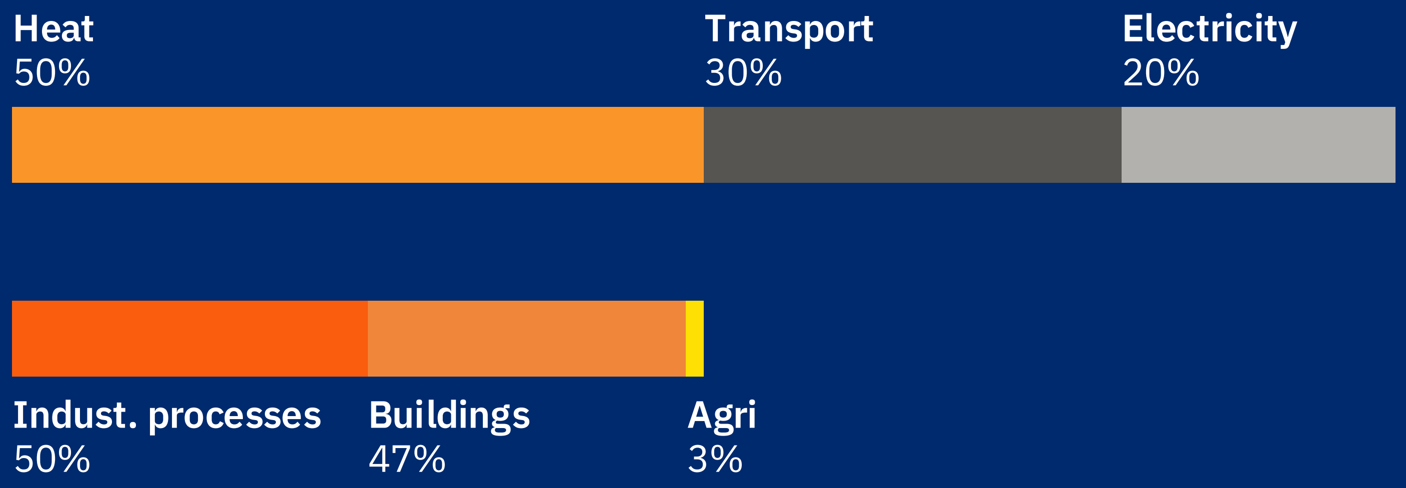
Technological breakthroughs in thermal storage

Tim de Haas
Chief Commercial Officer
Kyoto Group

Heat accounts for half of global energy consumption

Global energy demand



89%

of heat produced by fossil and non-renewable fuel sources make up

40%

of global CO_2 emissions

https://iea.org/reports/renewables-2020/renewable-heat

Thermal energy storage: the missing link between clean power and industrial heat

Key recommendations from the Transatlantic Initiative on Sustainable Trade, as a part of the EU-US dialogue, a roundtable with innovators in Washington D.C.

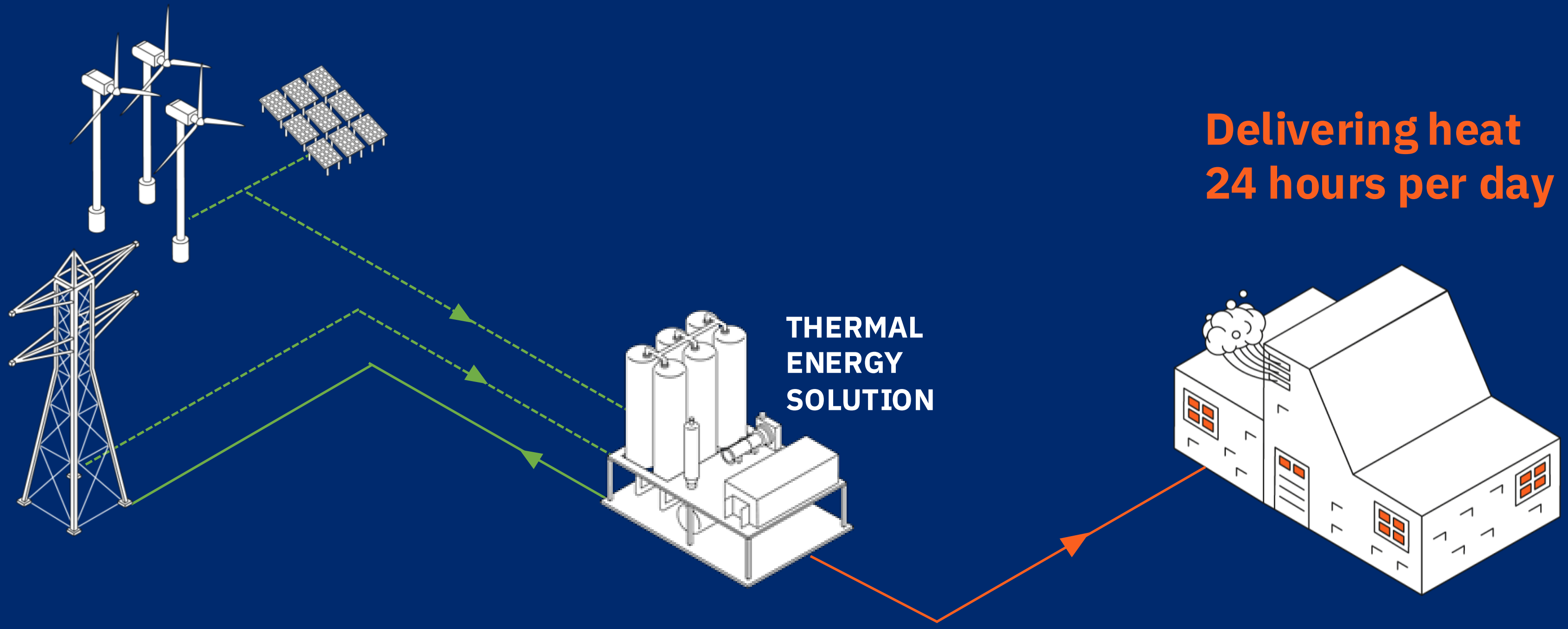
Thermal Energy Storage (TES) is gaining momentum as a solution for providing wider flexibility for the energy system to better integrate intermittent renewable energy and for decarbonizing industrial heat. Currently, TES has not yet been widely adopted, but its deployment has reached a turning point and is gearing up for an exponential trajectory. Installed TES capacity is expected to more than triple globally by 2030 (IRENA, page 12) to 800 GWh. There are tremendous opportunities for the US and EU economies to cooperate to create larger markets for these technologies, accelerating the decarbonization of the energy system.

FCA Future Cleantech Architects

Need for:

Flexible energy storage assets

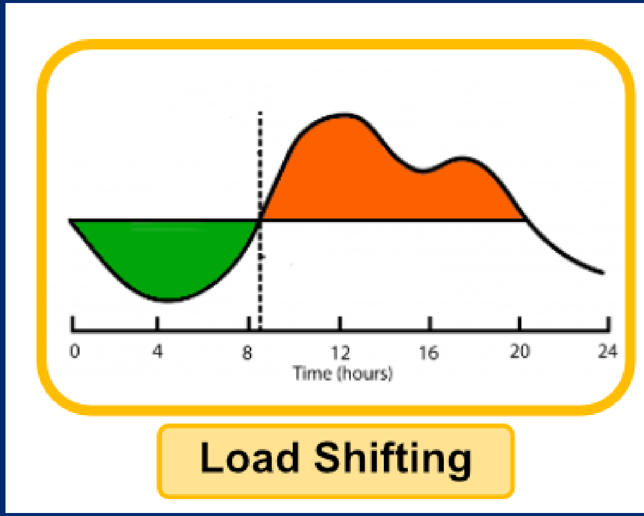
Thermal Energy Storage supplies reliable process heat to the industry while....



- **Sourcing electricity 6-10 hours per day**
- Providing ancillary services 16-24 hours per day

KYOTO

… providing additional services to energy and grid suppliers



Commercial installations – Proven and operational solution

Heatcubes are operational and being deployed

Aalborg Forsyning

Installations

Industry	**District Heating**
Charge	**5 MW**
Storage	**18 MWh**
Discharge	**4 MW**
Handover	**Q3 2023**

Demonstrated:

- ✓ **+93% RTE**
- ✓ **Ability** to capture down-regulation freq. **in less than 30 seconds**

KYOTO

Kyoto offering:
Heat-as-a-Service

- Kyoto Group offers a **low-risk, cost-effective solution** to decarbonize industrial process heat—without major capital investment or operational disruption.
- With Heat-as-a-Service (HaaS), you can purchase **green steam at a predicable, competitive price**:
  - ✅ No technology investment
  - ✅ No installation and maintenance
  - ✅ No operational and market risks

KYOTO

Benefits for Industry from Heatcube

- ✓ **Control costs** with stable, predictable steam pricing.
- ✓ **Retain existing customers and attract new ones** by offering a sustainable supply chain.
- ✓ **Eliminate gas dependency**, ensuring long-term energy security.
- ✓ **Shield your business** from CO_2 taxes and volatile energy prices.
- ✓ **Meet ESG targets to secure financing** and maintain customer trust.

Join us for our Thermal Energy Day (TED) and the inauguration of our latest Heatcube in Hungary

THANK YOU!

tim.de-haas@kyotogroup.no

www.kyotogroup.no/heatcube

7 AFFORDABLE AND CLEAN ENERGY

9 INDUSTRY, INNOVATION AND INFRASTRUCTURE

Follow us: YouTube LinkedIn

KYOTO