

ThermoCube

Storage Systems

Smart Solutions for the
Heat Transition



Heat storage systems compensate for the **time difference** between the **heat/cold produced** and its **demand**, thus enables the use of renewable energies

However, the **high costs** of **heat storages** are currently making the heat transition more expensive and **preventing desirable applications**, such as:

- **Solar-assisted heating**
- **Thermal batteries** (heating/cooling production only when electricity prices are low or when environment temperature is high)



Note: Our **Thermobattery** costs only **5%** compared to a **el. battery**

→ But it has identical effect in **el. grid stability** !

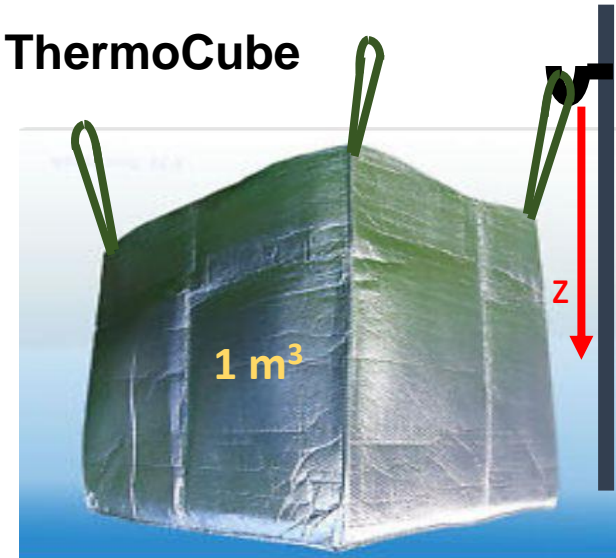
This is a heat storage !

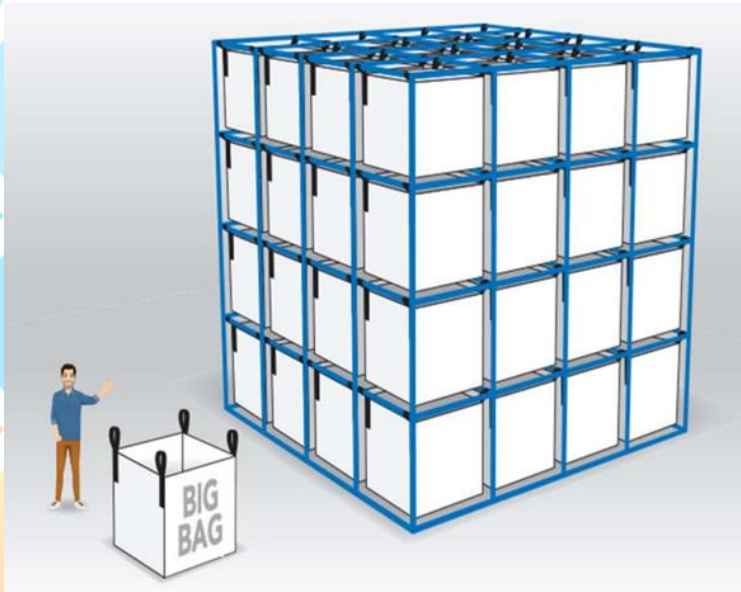


Idea: Cheaper
and bigger !



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Patented Idea (EU-Patent) :

- Division of the storage tank into small (almost) pressureless plastic cells
- The cells (big bags) are hung on simple metal carrier
- An empty cell for transfilling (full cube → empty cube)

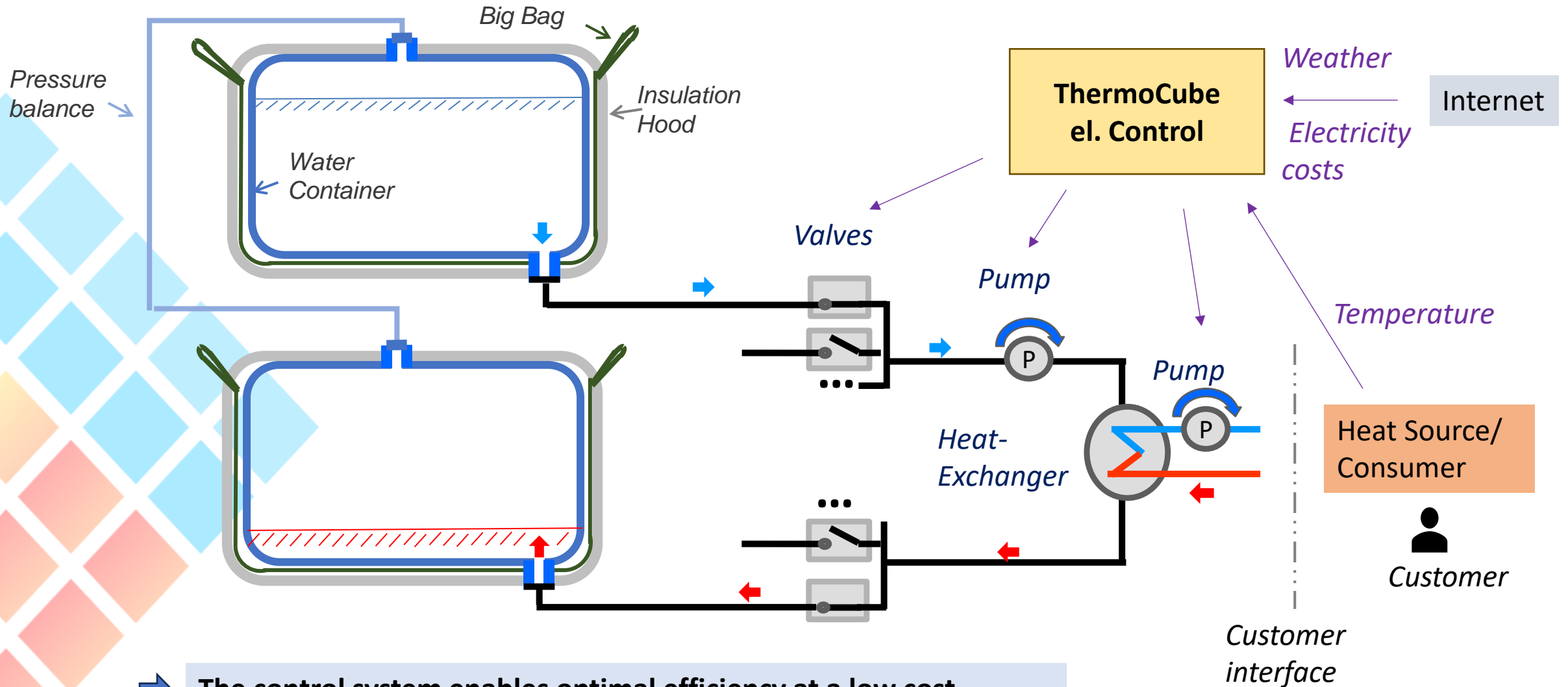
Thus, less than 5% of metal is needed in comparison with current tanks

→ Sales Price is < 50% of current tanks

Hydraulic and Control

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Low Cost Storage for Thermal Energy





- **Storage temperature = 5-60°C (GEN1) and 5-80°C (GEN2)**
- **Heat loss = 0.5 °C/ day**
- **Min. operation time = 15 years, app. 1000 charging cycles**
- **Medium = Water (possibly also salt water)**
- **Energy content per m3 = 70 kWh_th (GEN1) and 90 kWh_th (GEN2)**
- **Profit = €7/m3 or €9/m3 per filling**
- **Duration of complete filling/emptying = 4h**

Selling Points		Competitors	
Price (Material, Transport, Assembly)		👎	👍
Energy Losses	Temp. Mixture	👎	👍
	Heat-Radiation, -Conduction	👎	👍
	Surface Size	👎	👍
	Filling Inner → Outer Cubes	👎	👍
Longevity	Rust and Calc	👎	👍
	Temperature > 80°C	👍	👎
Filling Duration		👎	👍
Basement Assembly		👎	👍
Outdoor Tanks		👎	👍

Precondition:

Each individual storage component meets its requirements for the

- **Quality**



**Risk: Temperature resistance of
Plastic containers > 60/80°C**

1 m³

- **Profitability**



**Risk: Sum of component costs
higher than conventional storage**

1. Selection of robust plastic

Temperature resistance according to the manufacturer up to 70°C

2. Implementation of reduced life cycle tests (4. Q 24)

The average usage in 10 years =
Approx. 300 fillings

Stress test: 500 fillings (within one week)
with alternating filling 60°C and 10°C

→ Proof of longevity



[Video: Robustness of the water container](#)

- Prototype is entirely built of commercially available components!



→ Proof of functionality and profitability

- Material costs for prototype and for small series (redesign)

50 m3 Tank		Prototype Costs/m3	Small series costs/ m3
Components		1 Tank	100 Tank
Mech. Carrier			
Plastic Components			1 m ³
Valves			
Housing			
El. Control Unit			
Hydr. Components			
	Material Costs	545 € / m3	185 € / m3*

Storage Competitor prices > 1000...3000 € /m3

* Can be reduced to <140 € in high volume serial production

→ Sales price small series= 500..800 €/m3

- Thanks for your attention
- Contact us if you have any further questions
- Please visit our prototype
- We are currently looking for investors

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