

Sunamp



Andrew Bissell, CEO

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Presented at iHeat 2012, Cambridge, UK

www.cir-strategy.com/events

Andrew Bissell

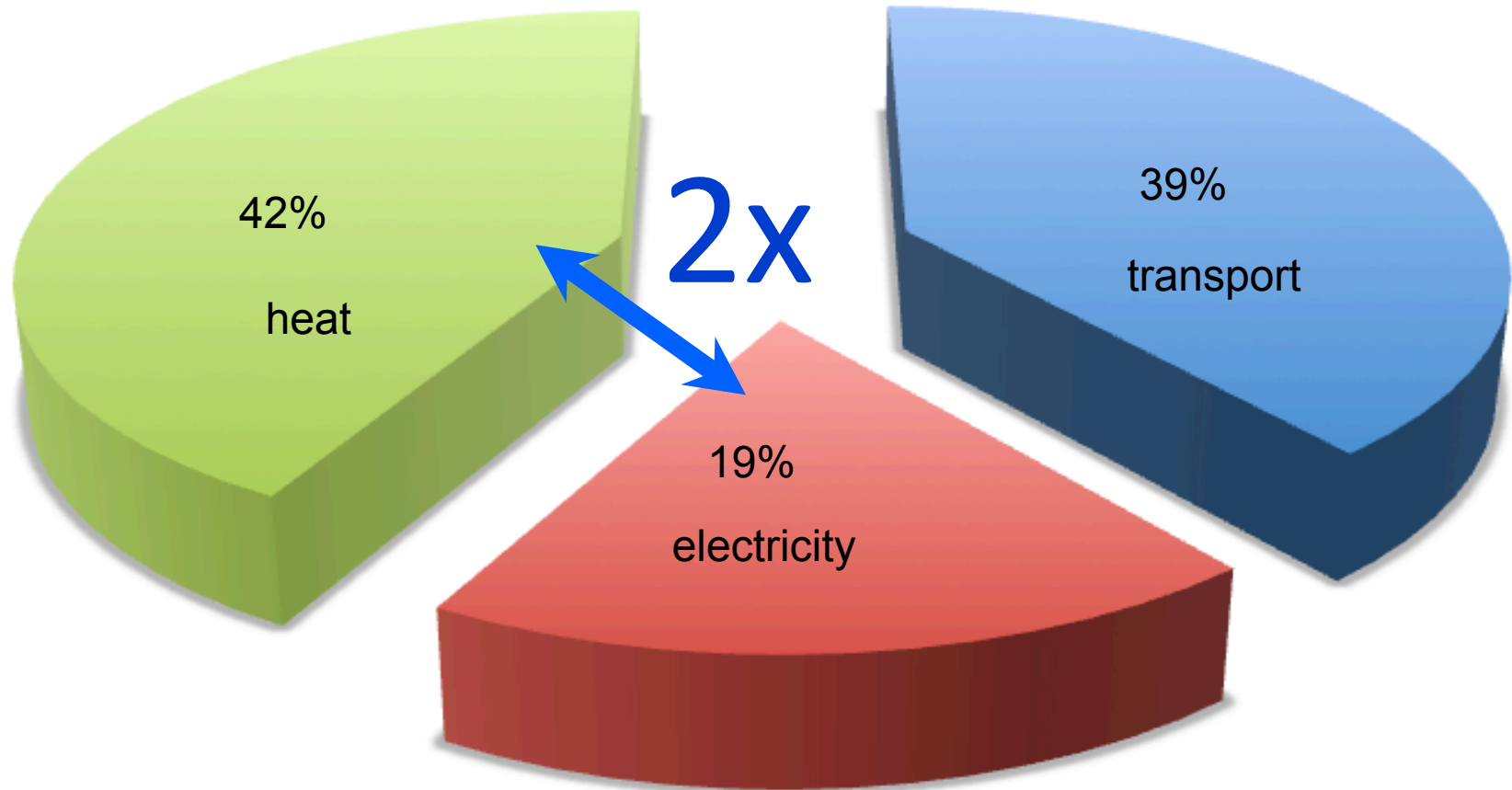
- 1991-2004: **Founder CEO of Voxar Ltd**
 - Medical Imaging Software leader
 - Pioneered and dominated new segment globally
- 2004: **Led sale of Voxar to Barco for €39M**
 - Acquired from Barco by Toshiba in 2008



- 2006-2012: **Founder CEO of Sunamp Ltd**
 - Innovating in a new field: heat storage
- 2013: **Market Entry**
 - Raising over £2M to accelerate



Why Heat?



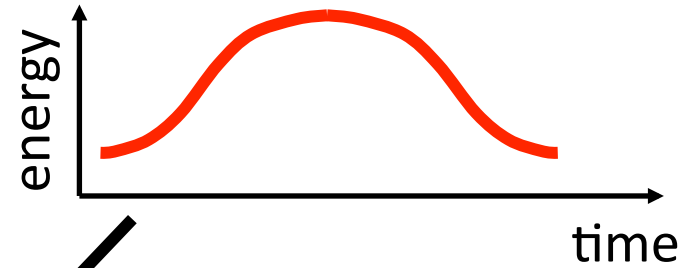
UK Final Energy Consumption

Twice as much heat is consumed as electricity

Why Heat Storage?

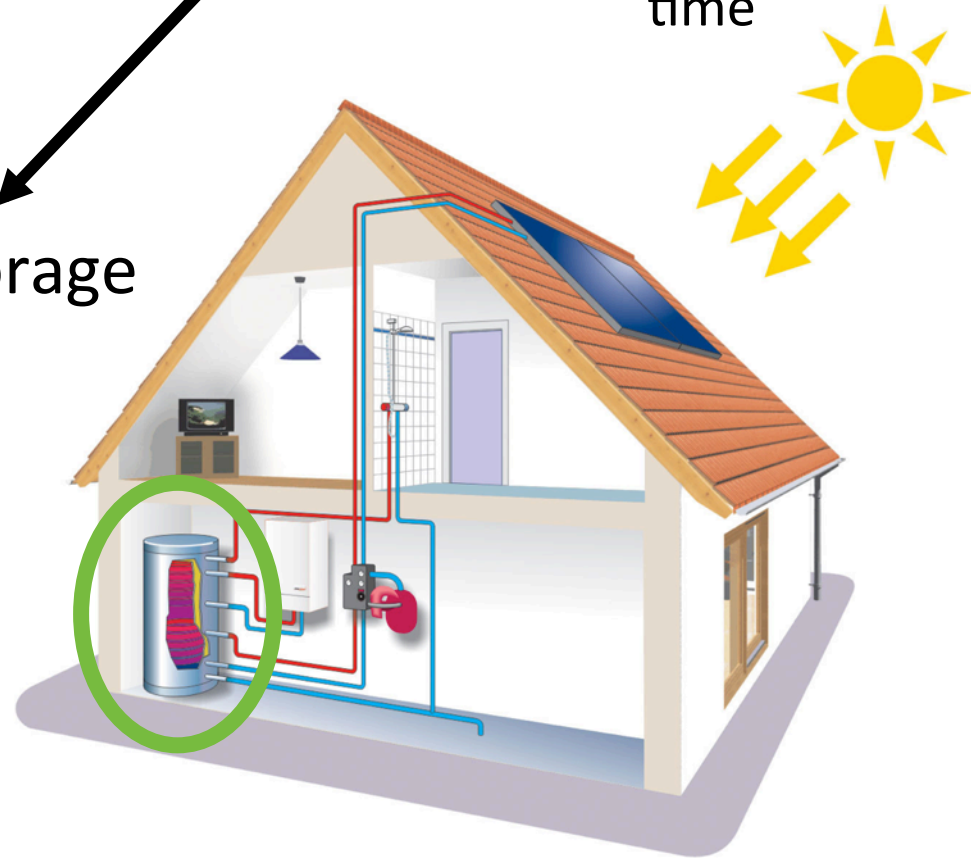
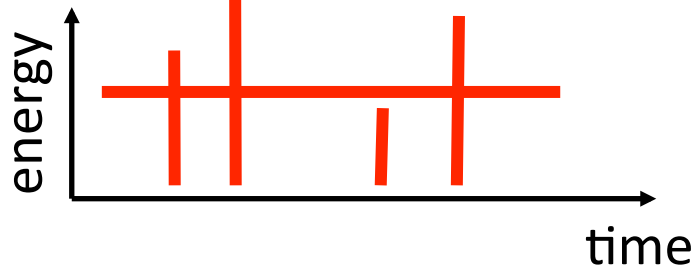
CHP
Solar Thermal
Heat Pumps
Biomass
Waste Heat
.....

Intermittent input



Heat storage

Controlled output





Renewable Heat

Got
room?

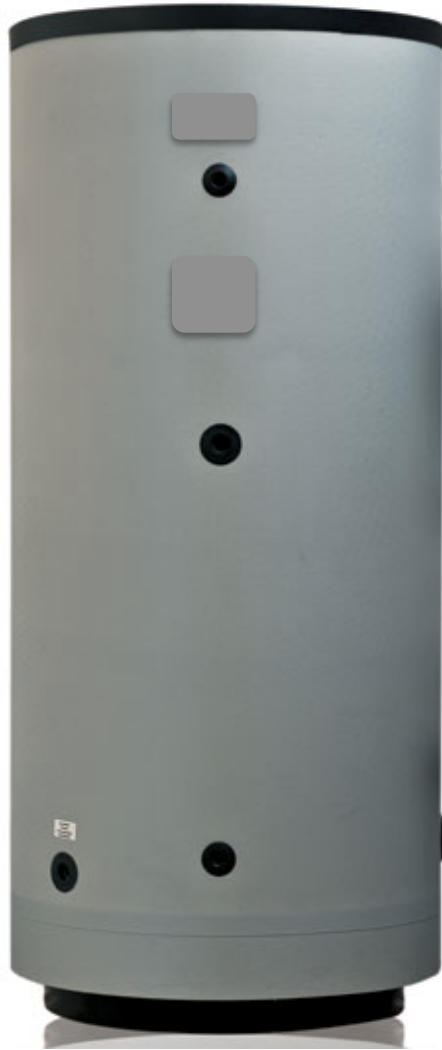


3000 litre stratified
hot water tank

High Capacity Heat Storage

Compact, Flexible,
High Performance

Shrunk 4 times smaller



Efficient

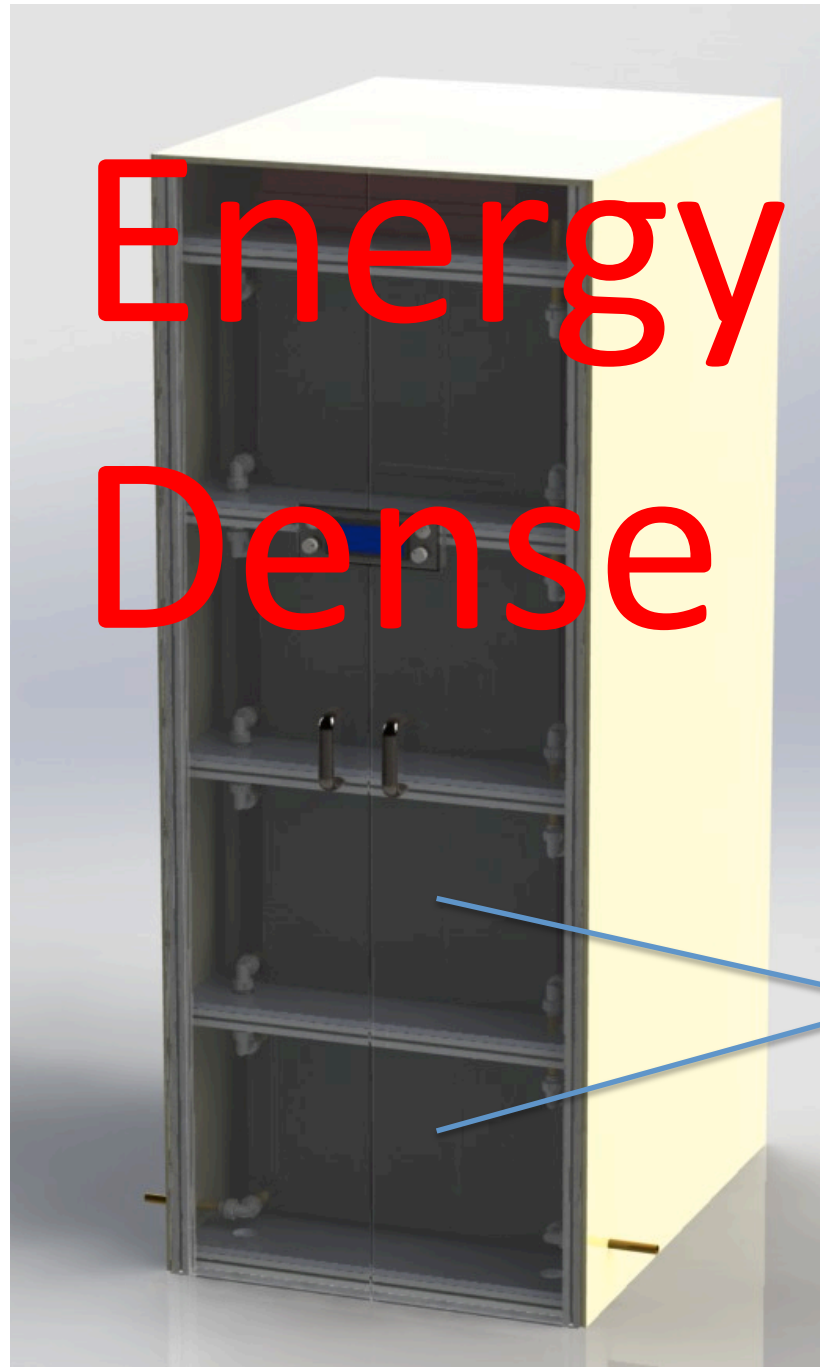
High
Performance

Compact

Flexible

Low CO₂

Energy
Dense



Heat
Batteries



1 - 1.5 KWH

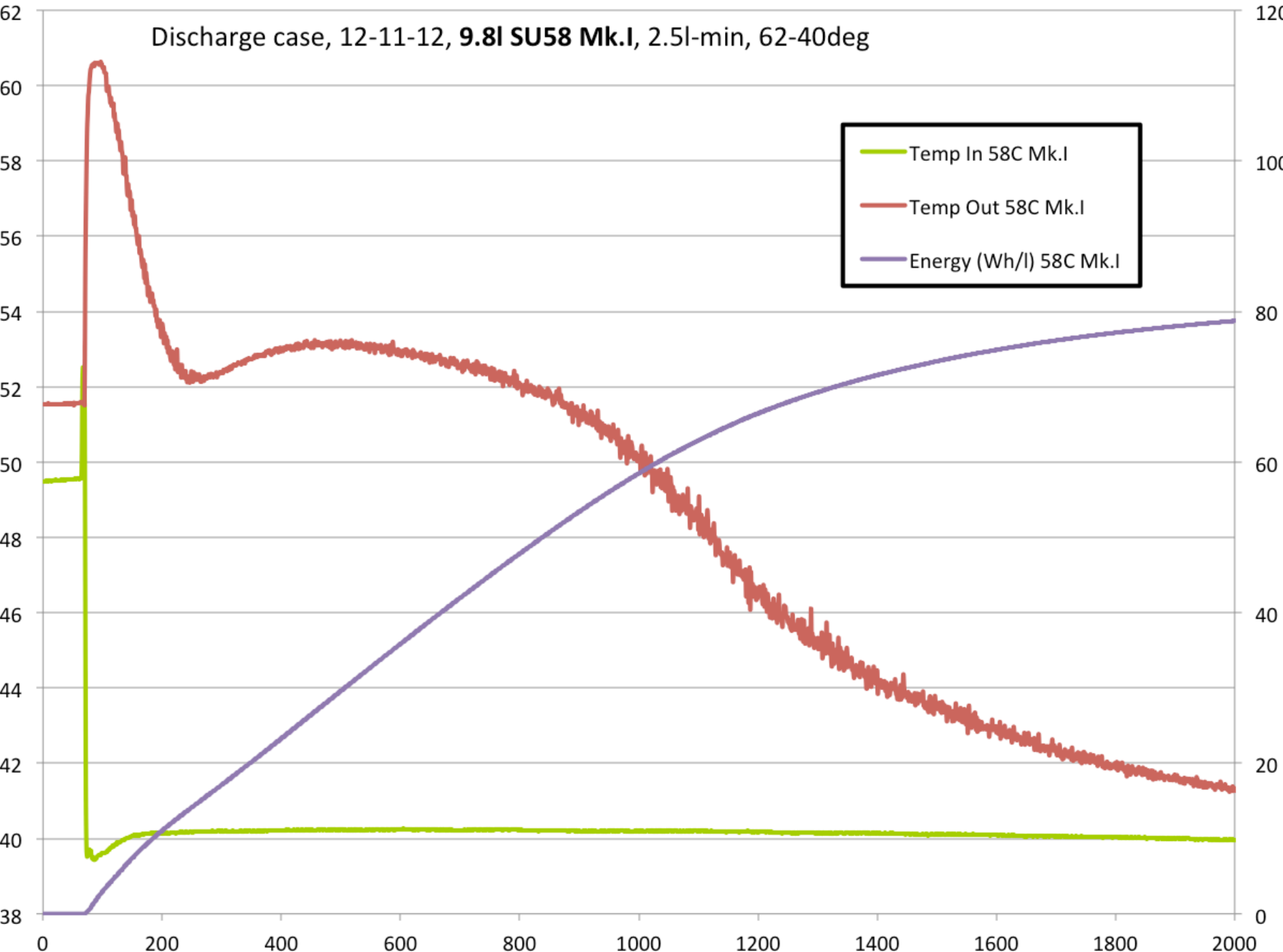
What's in a Heat Battery?

- Phase Change Material - PCM
- PCMs store heat and cool as latent heat
 - absorbed when melting
 - released when freezing
- Example: 10 litres of water ice



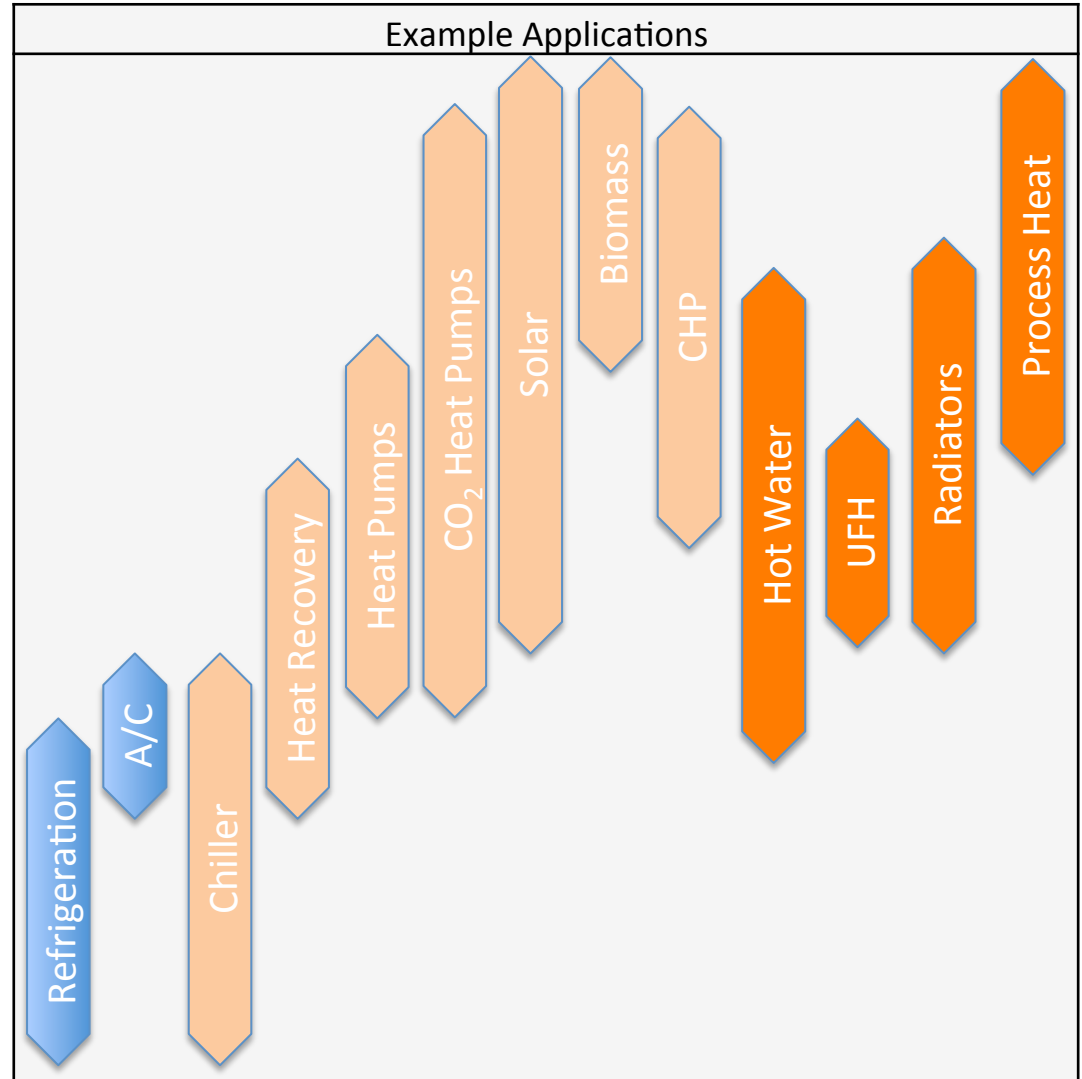
Temp Range:	-5 to +5°C	+5 to +15°C
	Ice melting	Water warming
Energy:	1 kWh	0.1 kWh
Specific Energy:	100 Wh/l	10 Wh/l
PCM advantage:	10 times	

Discharge case, 12-11-12, 9.8l SU58 Mk.I, 2.5l-min, 62-40deg

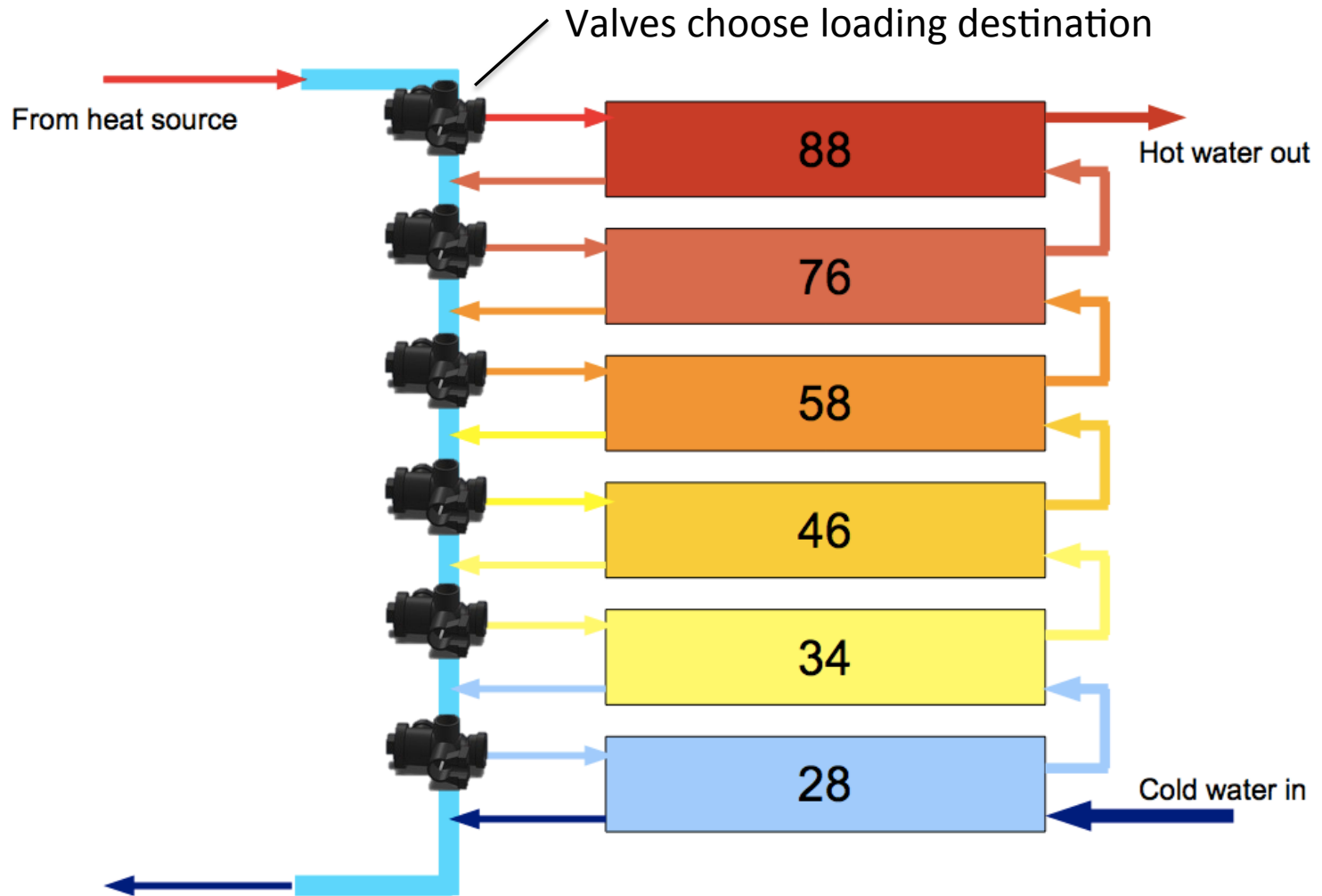


Sunamp PCM Temperatures

	Melting Point
>90°C	Future
80 - 90°C	↕ 88
70 - 80°C	↕ 76
50 - 60°C	↕ 58
40 - 50°C	↕ 46
30 - 40°C	34
20 - 30°C	28
10 - 20°C	15
<10°C	Future



Stratified by Design



Multiple international patents pending

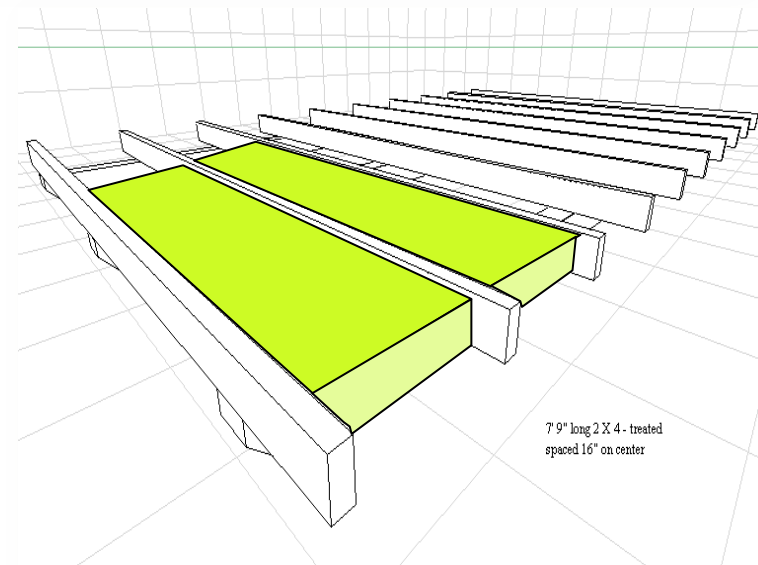
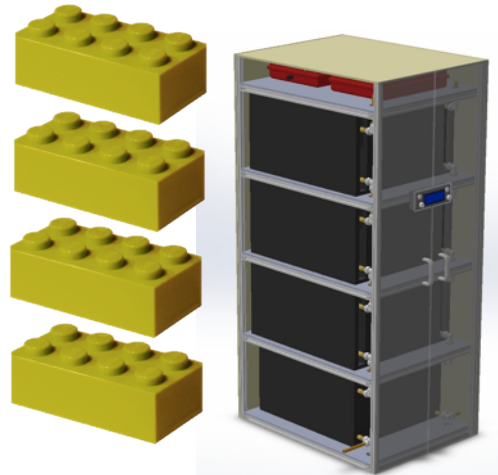
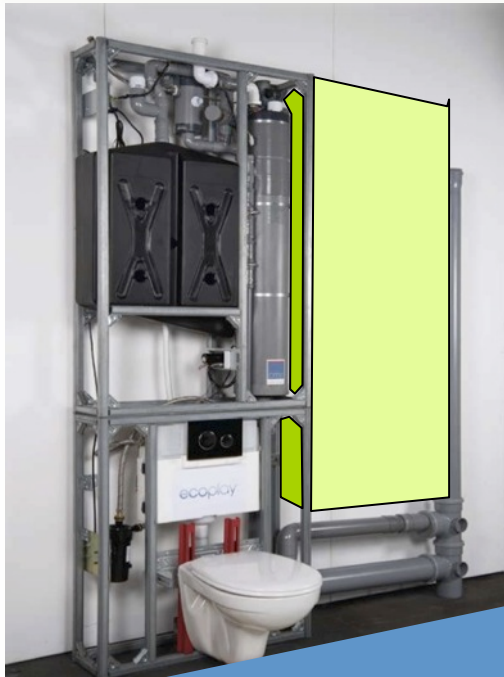
Configurable: Scalable, Flexible Shapes



compact fits in every building

simple modular assembly

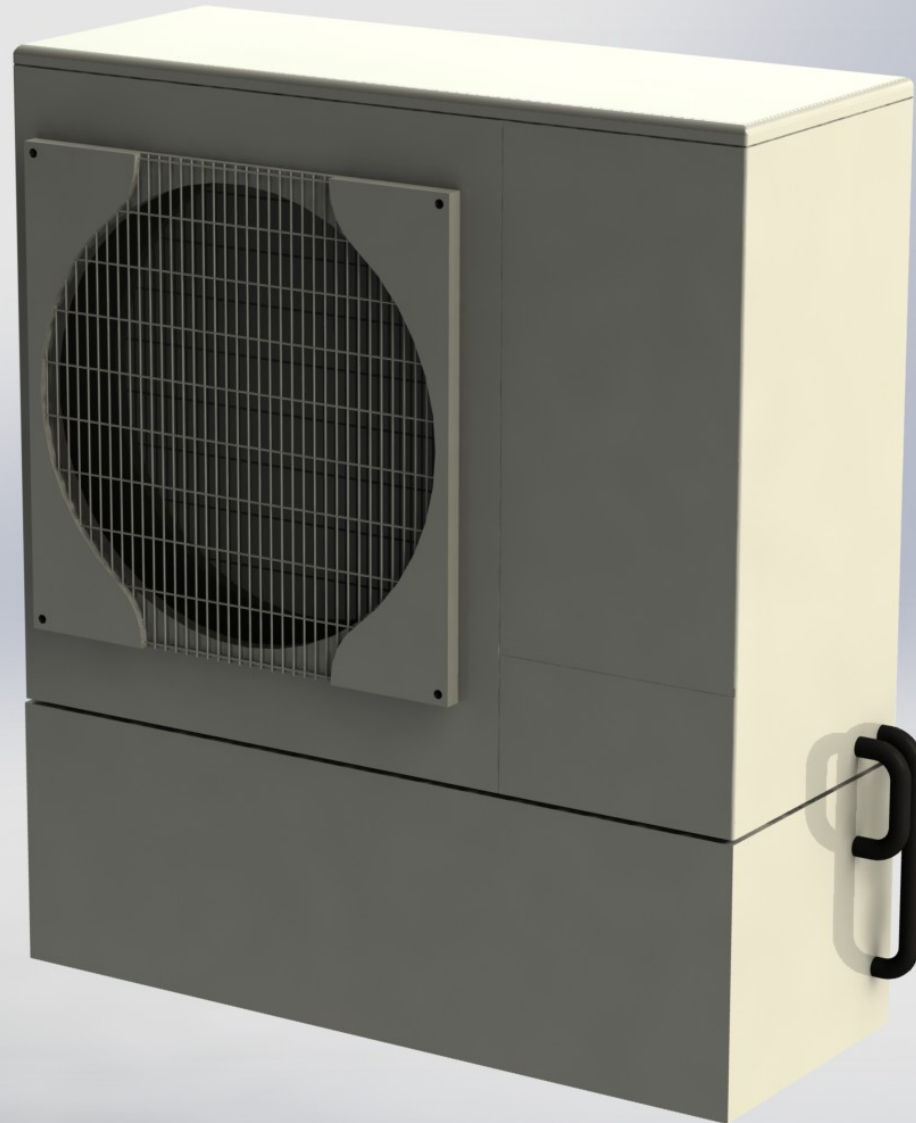
easy to install and to maintain



Key USPs

- Safe (not flammable)
- Energy dense (2x other PCMs; 2-10x water)
- High power
- Highly configurable
- Flexible range of temperatures
- Easy to integrate (2 circuits per heat battery)
- Fits in tight spaces
- Cuboids not cylinders
- Low heat loss (Vacuum Insulation Panel)

Heat Pump with HeatBase™



Optimal Applications

- Where space is the obstacle
 - allowing the introduction of more renewable heat
- Especially where the temperature range is narrow
 - e.g. heat pumps
- Where large heat capacity is required
 - e.g. biomass accumulators
 - e.g. heat pump time-shifting
- Talk to us about your application

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