

BOOSTHERM®

Heat Recovery Systems



Free hot water by total recovery of the heat rejected by the cooling units

Award winning clean technology



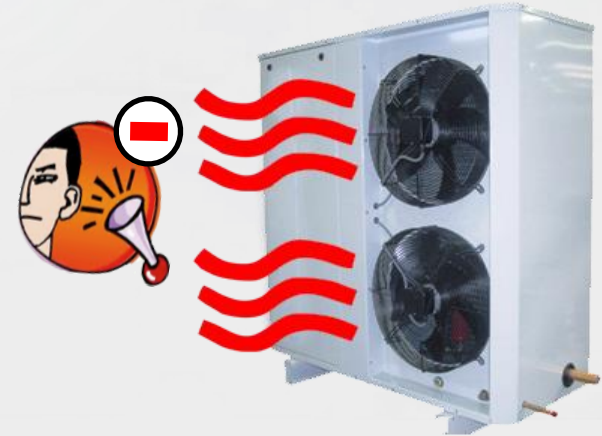
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Technology **Fast 500**
2016 EMEA **WINNER**



Why Boostherm ?

Cooling units produce large amounts of heat; this heat is lost, rejected in the ambient air by the fans often causing nuisances.



The water-heaters energy consumption represent an important part of the total energy bill.



Energy prices rising and carbon footprint awareness are challenges that current technological advances are able to take up in a sustainable and profitable way.



Why Boosttherm ?

Few examples of potential savings:

- **Walk-in chiller**– cooling unit 1 1/8 hp (CAJ9513 / 1 638 W) :
 - **700 litres** hot water daily
 - **10 500 kWh** annual savings (1 260 £)
- **Walk-in freezer**– cooling unit 3 hp (TFH2511 / 1 817 W) :
 - **950 litres** hot water daily
 - **14 250 kWh** annual savings (1 710 £)
- **Walk-in chiller**– cooling unit 10 hp (ZB75 / 15 900 W) :
 - **6 500 litres** hot water daily
 - **97 500 kWh** annual savings (11 700 £)

Calculation bases:

Hot water production based on 15 hours a day cooling unit operation.

Annual savings based on six working days per week x 50 weeks.

Energy price: 0,12 £ per kWh

Boostherm : for Whom ?

The system is intended to any small, medium-sized and larger companies who have on one hand a need for cooling (ex: cold rooms, refrigerated display, chillers) and on the other hand a need for heating (hot water production, low temperature heating).

***Hotels, restaurants,
bakeries, fast foods,
catering industries,
large kitchens,
supermarkets, food
processing...***

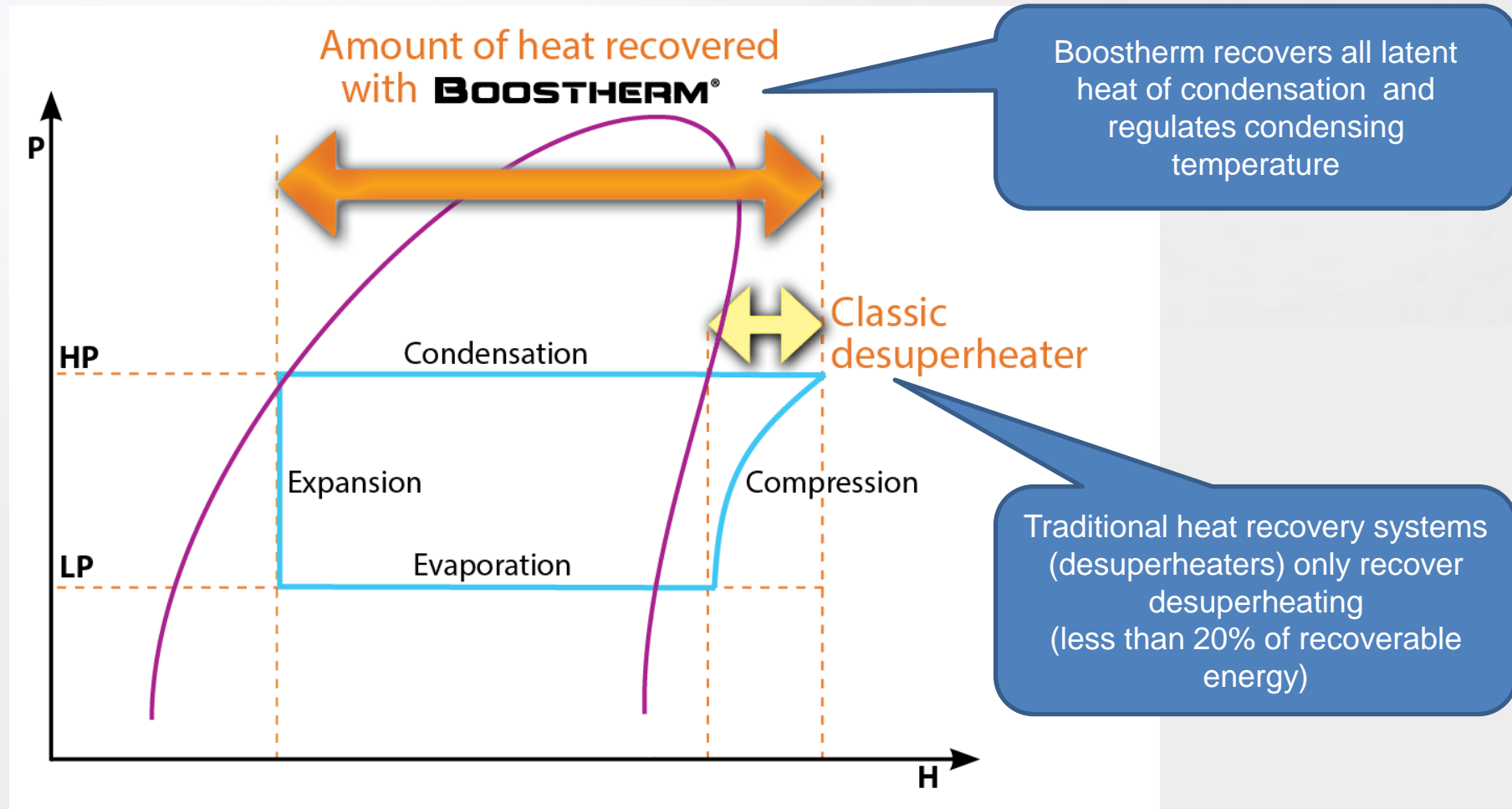


Application scope

	OK	OK
Refrigerant	HCFC, HFC, HFO, HC : R22, R404a, R134a, R407(a-c-f), R410a, R448a, R449a, R450a, R513a, R600, R290...	NH ₃ CO ₂ (except cascade systems if CO ₂ in on the low temperature level)
Condensing capacity	1 à 100 kW (and hundreds of kW with desuperheating)	MW
Applications	Refrigeration : Cold room, display, liquid chiller, cold storage. Dehumidification Air conditioning (Chillers)	Air conditioning with direct expansion, reversible systems Heat pumps
Systems	Condensing units Compressor racks Liquid chillers	Reversible air conditioners DRV, VRV...

Functioning :

Introduction : The condensation



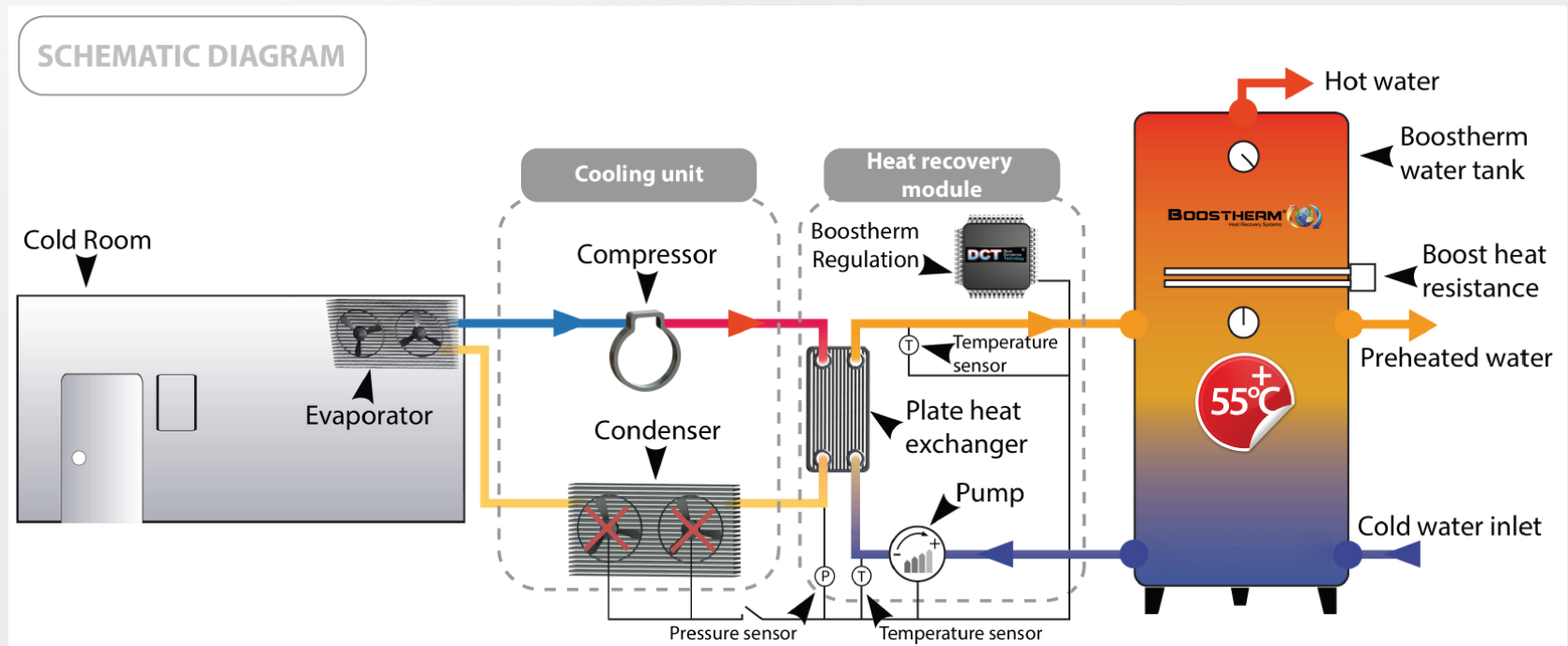
✓ Boostherm can heat up to 7 times more water than a desuperheater.

Functioning: Water condenser mode



Boosthorm uses Dual Condense Technology (Patent pending) :

1- The heat recovery module totally condenses the refrigerant gas by using the cold water in the bottom part of the tank. All the heat rejected by the cooling unit is recovered to heat up water at 55°C in one pass whatever the ambient temperature. Cooling unit fans are stopped.

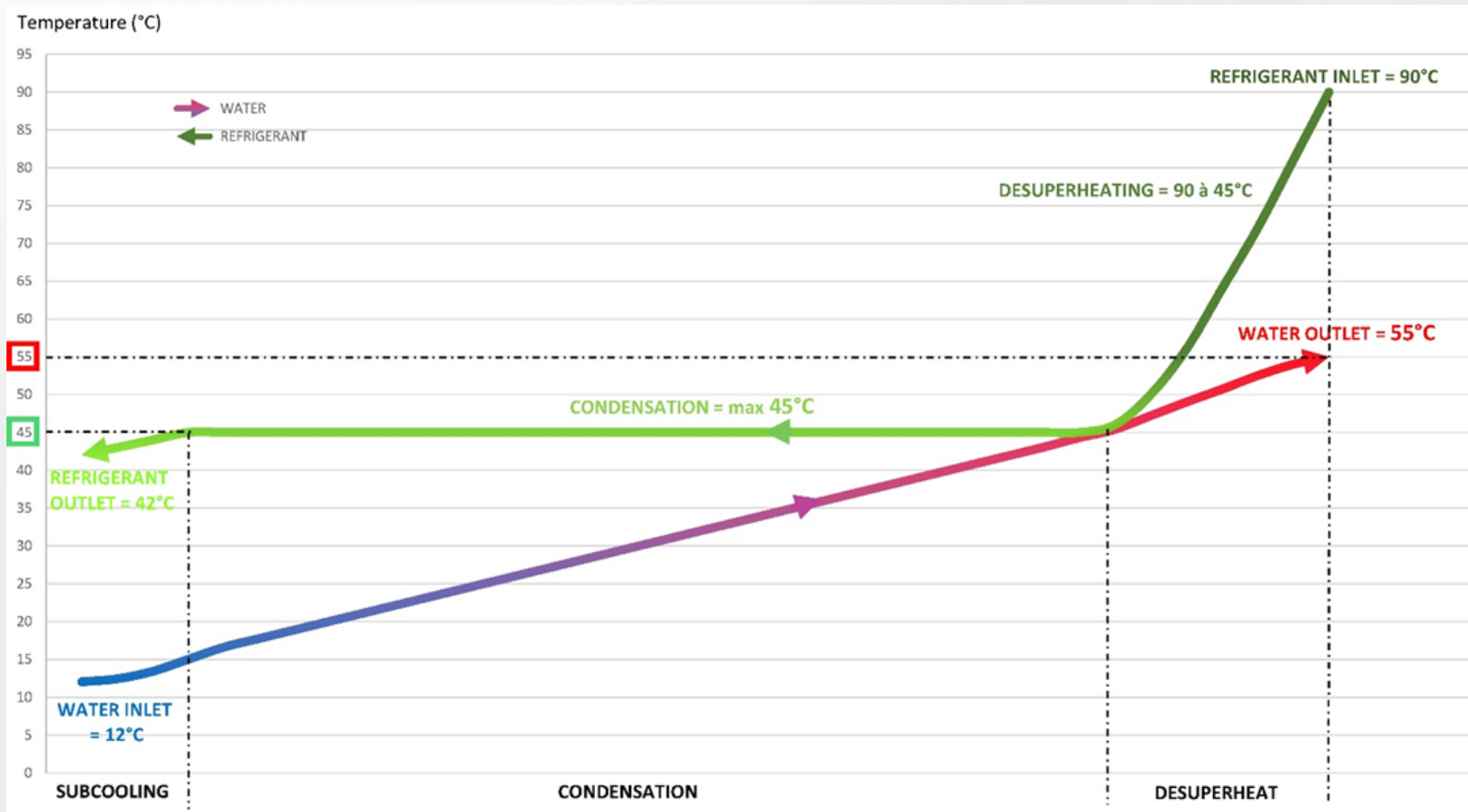


The electronic board monitors the pump speed to maintain 55°C at the heat exchanger's outlet.

Functioning: Water condenser mode



Heat exchange in a low temperature cooling system running with R404a:

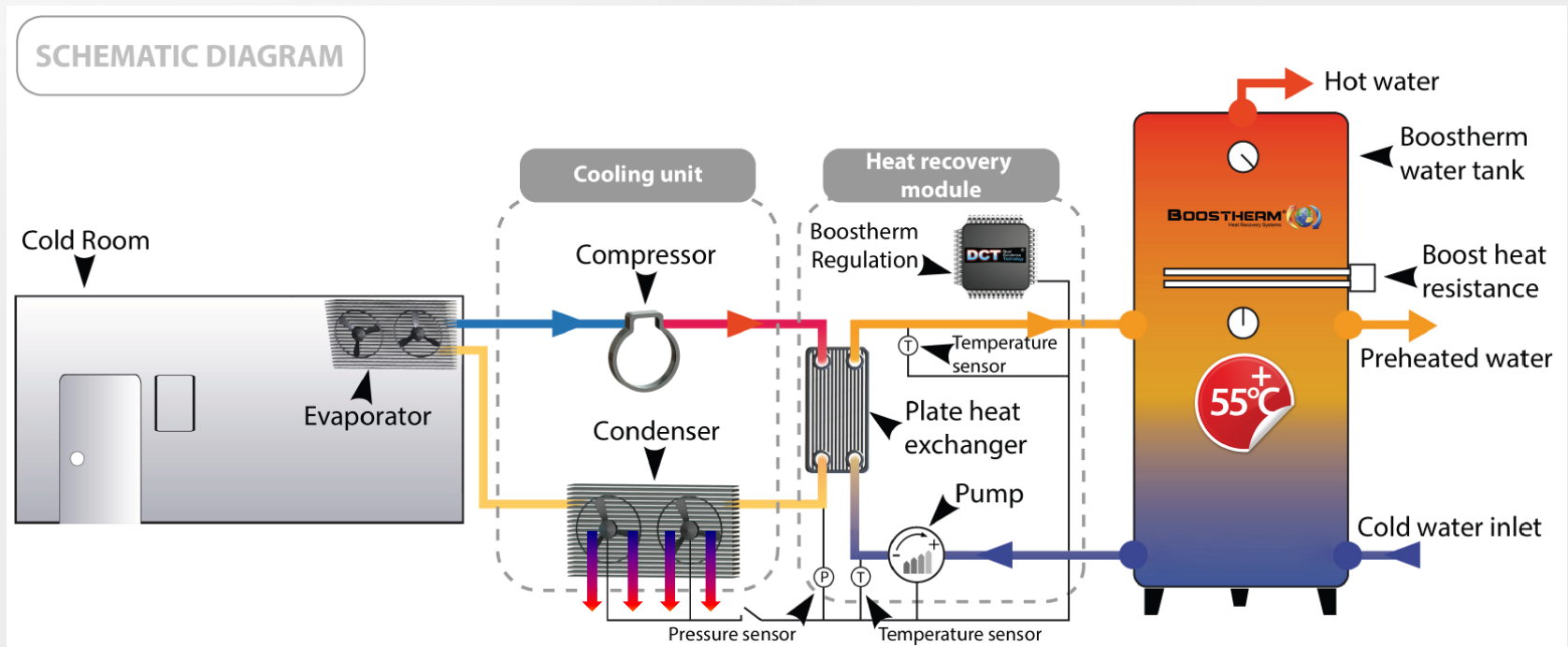


✓ Water is heated at a higher temperature than the condensing temperature.

Functioning: Desuperheater mode



2- When all the water has been preheated, the fans turn on. The heat recovery module continues to heat up water (gas desuperheating); water can reach a temperature of 65/70°C depending on ambient temperature.

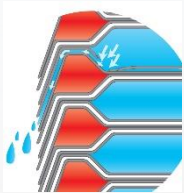


The water outlet temperature setpoint is mobile and incremented depending on water inlet temperature.

Safety:



Priority is given to refrigeration: The system runs within the operating envelope of the compressors (pressure and temperature);



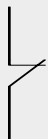
Double wall plate heat exchangers: 2 separation plates between refrigerant and water:
- Compatible with Domestic Hot Water
- Functional safety



High pressure safety: A pressure sensor switches the fans(s) on in case of excessive pressure in the cooling circuit.



Leak detection: In case of refrigerant leakage, a too low condensation pressure is detected by the module and an alarm is activated before the cooling unit low pressure switch stops refrigeration.



“Normally closed” relay: Cooling is ensured in case of electrical default on the heat recovery module.



Self-learning: No adjustment required on start up thanks to the auto-tune function on the electronic regulation.

User & Environmental benefits:



- Significant **energy bill reduction**: quick return on investment & **reduced CO2 emissions**.

- **Reduces wasted water** on water cooled condensers and even faster ROI.

- Refrigerant **leak detection** for improved equipment safety and reduced wasted food & CO2 emissions.



- **Reduces** air cooled condensers **nuisances** (fan noise and dust, heat rejected) and improves compressor efficiency in summer.



- Recycles wasted thermal energy to produce **Free hot water in large quantities at high temperature**.

BREEAM[®] points available for heat recovery

(Building Research Establishment Environmental Assessment Method)



Boostherm Modules

Module	Dimensions in cm (HxLxP)	Litres / hour max. (12 to 55°C) *
5 kW	47 x 33 x 19	81
10 kW		165
20 kW	58 x 38 x 25	342
45 kW		810
70 kW		1330
100 kW	76 x 48 x 25	1900
> 100 kW	Assembly in parallel or custom made system or desuperheaters if desuperheat is enough	



* With heat loss coefficient

Assembly in parallel



- 2 x 70 kW modules in parallel
- 2 x 2000 litres buffer tanks in series + 1500 litres electric boiler.

Desuperheater kits:

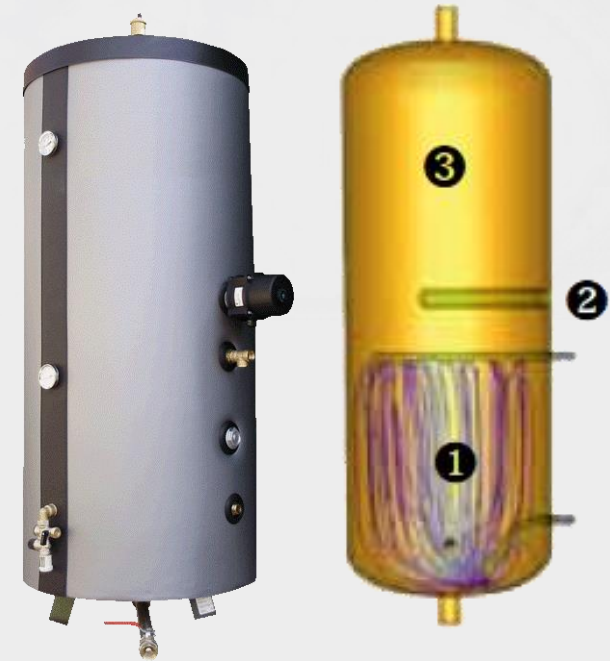
- Recover desuperheat only (+/- 20%)
- Available in 2 ranges:
 - For sanitary hot water with double wall heat exchanger
 - For heating applications with single wall PHE
- Insulating shell and wall / floor fixing support
- Electronic control box
- Variable speed pump
- Hydraulic fittings

THR	Double Wall part #	Single Wall part #
150 kW	853010	854010
300 kW	853020	854020
450 kW	853030	854030
600 kW	853040	854040



Boostherm Water tanks:

- One tank only for preheated water and hot water
- 2 thermometers
- Temperature up to 80°C
- Industrial Manufacturing
- 5 year warranty
- Quick-drain valve to remove deposits
- Anti-legionella conception
- Preheated water diffuser for optimal stratification
- Range :
300/500/750/1000/1500/2000/3000/5000 litres



1. Heat recovery area
2. Boost resistance (option)
3. Hot water stock area



An industrial water tank specially developed for heat recovery

Online Simulator

BOOSTHERM[®] SIMULATOR

Boostherm Savings Simulator

DHW Needs

Heating potential

Number of cooling systems

System 1

Cooling system name

Cooling system type

Refrigerant

Cold room setting temperature °C [-25, 15]

Average evaporating temperature °C

Max evaporating temperature °C

Minimum operating time h[0, 24]

Maximum operating time h[0, 24]

Average total cooling capacity W*

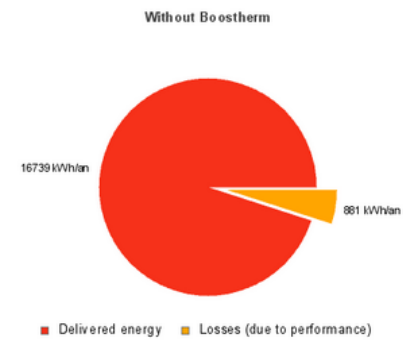
Pfroid à Tk=40°C, Te=-30°C, SR=0K, SH=10K

Estimated recoverable capacity W

Heating potential L/h (from network temperature to 55°C)

Selection

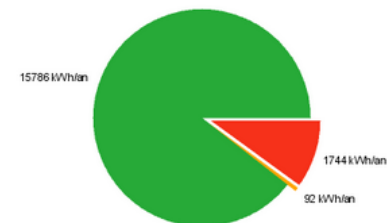
Validation



Annual energy bill: 2379 €/day

Unit 1 equipped with Boostherm ?

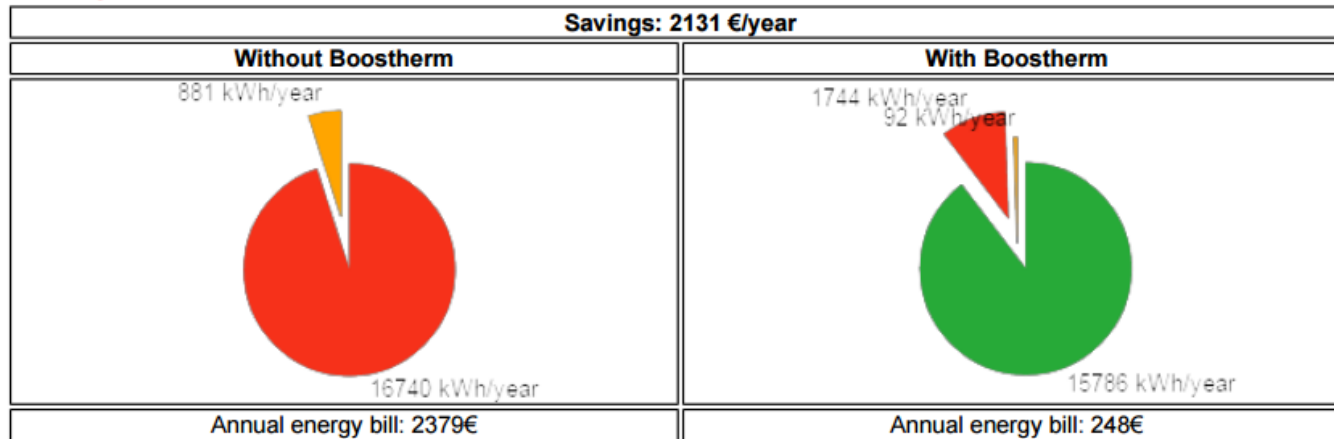
With Boostherm



 Simulate your savings in just a few click

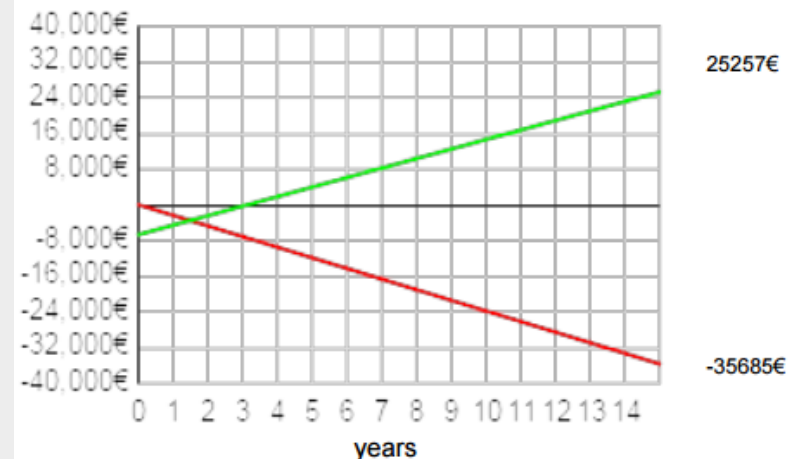
Online Simulator

A) Energetic balance

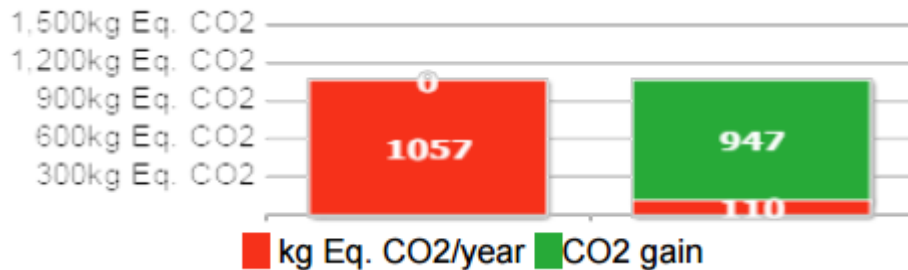


B) Financial balance

Accumulated cash flow ■ Without Boosttherm ■ With Boosttherm



C) Environmental balance



Edit a pdf file with the complete technico-economical study

Case studies

Fast food

- **20 m³ walk-in freezer** – Compressor TAG2525Z 3 kW
 - **100 litres** of hot water per hour heating capacity at 55°C
 - **1500 litres / day heating capacity** at 55°C
 - **2000 €** savings per year (at 0,1€ per kWh)

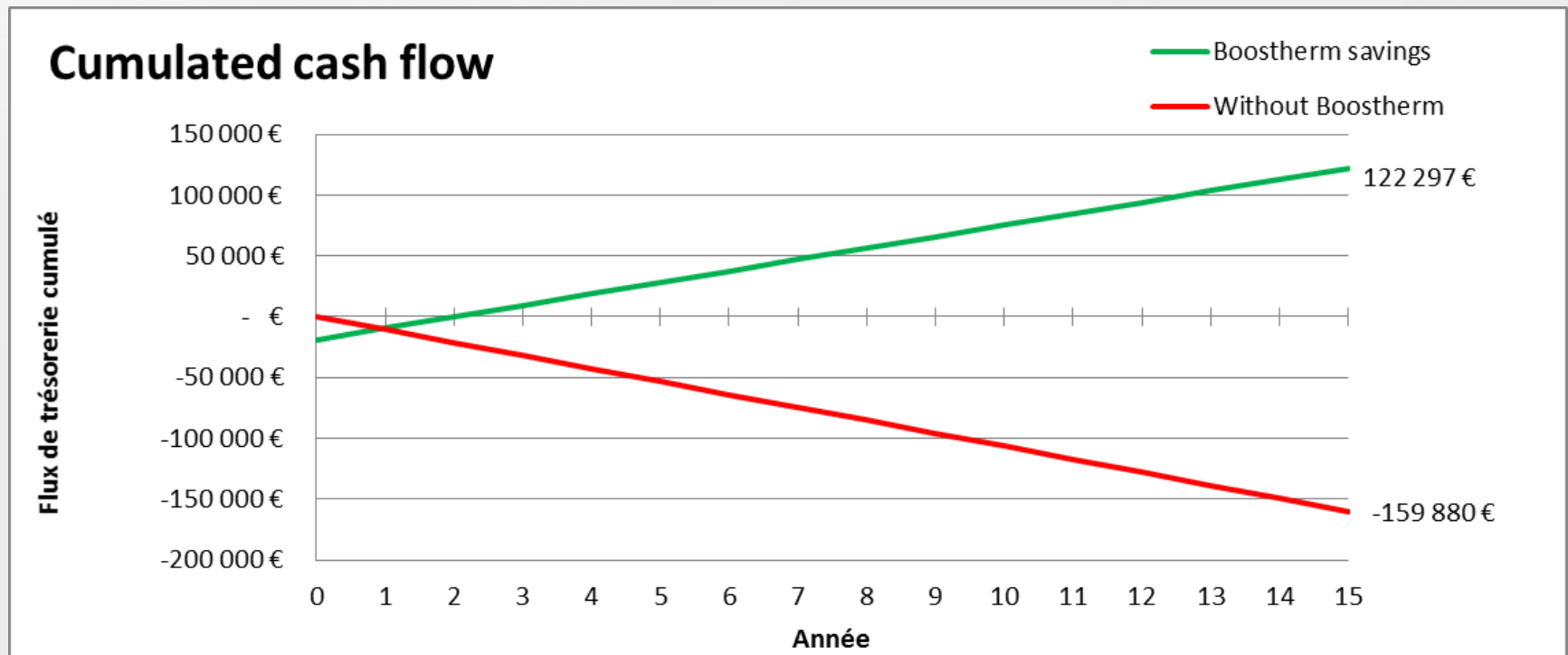
Brand	Mc Donalds	Mc Donalds	Mc Donalds	Burger King	Mc Donalds
Site	Fontaine les Dijon	Blois	Tavers	Neuilly	Saint Ouen l'Aumône
Installation	12/2013	02/2014	06/2014	01/2015	04/2015
Condensation	Air	Air	Air	water	Air
Litres / day	715	1876	1309	1486	1033
Savings / year	1 114 €	2 091 €	1 664 €	5 832 € *	1 372 €

* Including savings on condensing waste water : 1100 M³ / year – 3850€

Case study

Food processing

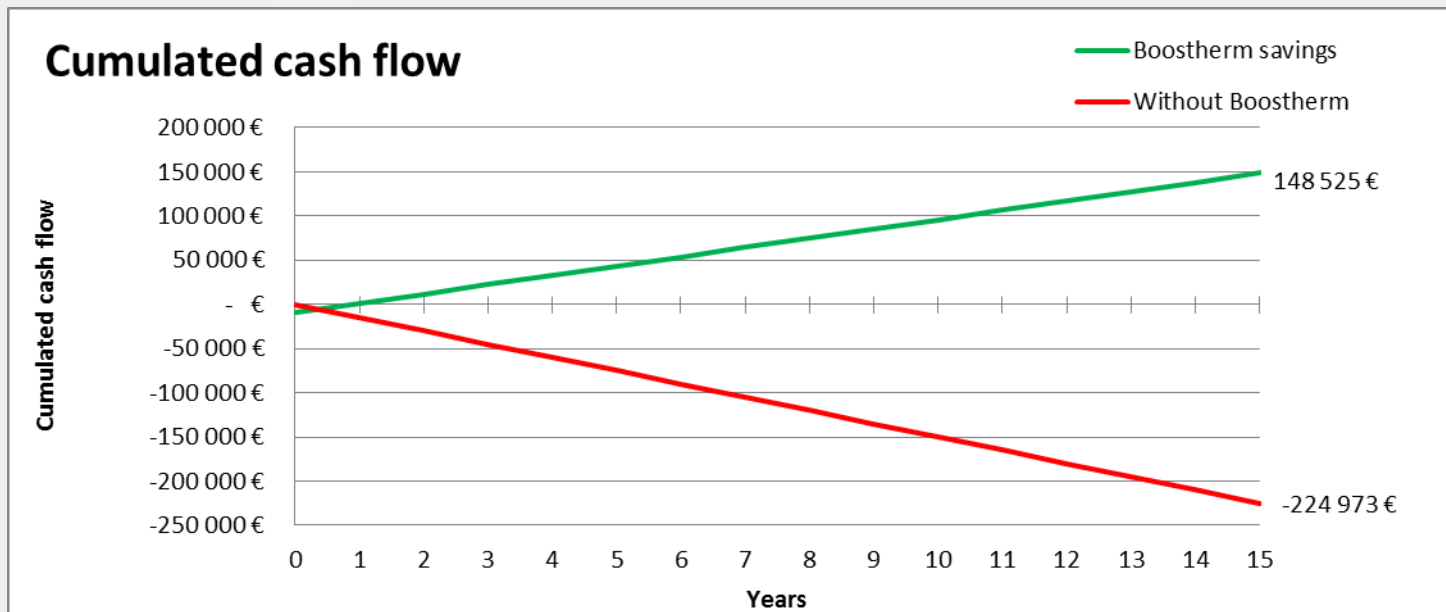
- **200 kW compressor rack** – 4 x 35 hp D6DH350X
 - **2500 litres** of hot water per hour heating capacity at 55°C
 - **8200 litres** of hot water used per day
 - **9400 €** savings per year (at 0,1€ per kWh)
 - Return on investment : 2 years



Case study

Warwick Hotel Geneva

- **24 kW medium temp compressor rack + 1,2 kW low temp condensing unit** (replacement of water cooled condensing units)
 - **3 000 litres** of hot water produced per day
 - 2 800€ savings per year on heating cost (at 0,05 € per kWh)
 - 7 700 € savings per year on saved water (at 3,5 € per M3)
 - **10 500 € total savings**
 - Return on investment: <1 year



References:

More than 2000 heat recovery systems installed



Watch the video :

