boostHEAT,
A global player
for energy transition

boostHEAT

PIONEER OF A NEW WORLD OF ENERGY

BOOSTHEAT MANUFACTURES THE WORLD'S MOST ENERGY-EFFICIENT BOILER.
THANKS TO BIOGAS THIS BOILER IS 100% GREEN TODAY.

The innovative combination of a standard condensing heating unit with a CO2 heat pump cycle driven by **thermal compression** instead of mechanical work sums up to a condensing heating unit supplying 20kW heat at 65°C and a seasonal gas utilization (SGUE) of up to 200%.

This heating system hence comes with up to 50% renewable ambient thermal energy available all year round.

The heat pump cycle is driven by external combustion heat. It can be operated with what ever type of gas: natural, liquid, biogas, fluegas or even hydrogen.

The development was started in the year 2004 and supported by strong partners holding stakes in the gas sector. The market entry will take place in mid 2018.

A brief history of boostHEAT

2004
Starting Research and Development

2009
Thermal compressor concept validation

2011
boostHEAT incorporation - 1st patent

2013
1st compressor prototype

2015
1st boiler prototype

2017
Vénissieux (Lyon FR) Industrialization

2018
Boiler launch for residential market

2019
Boiler launch for commercial & tertiary market

boostHEAT fundamentals

14 years of Research & Development

7 FAMILIES OF **PATENTS**

OWNER of its technology

Shareholding

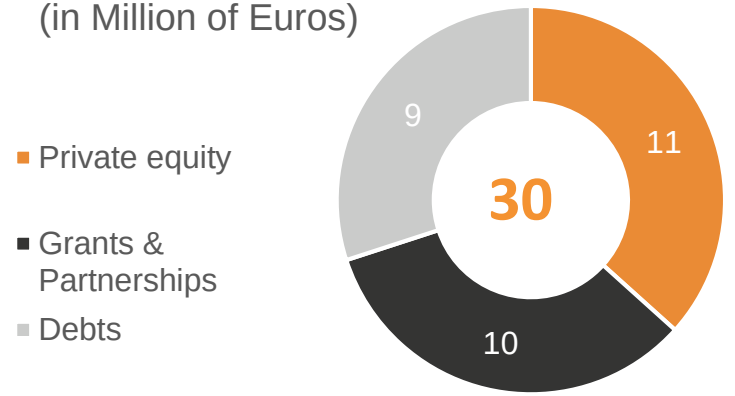
2 co-founders, Fluxys, Holdigaz and 3 family officies focused on energy representing more than 70% of the shareholding.

Key partners

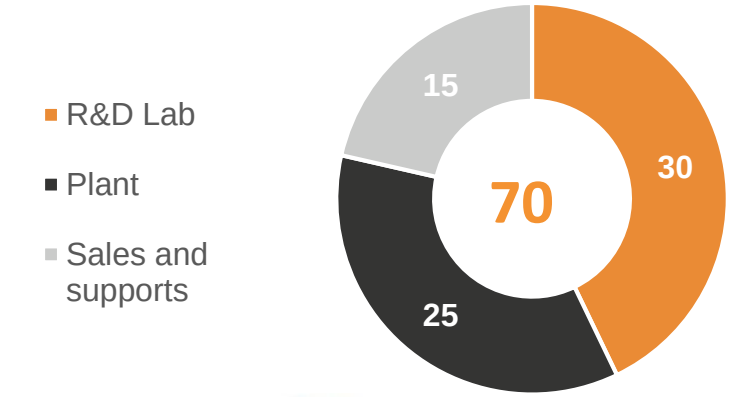
Supported by famous partners

Financial supports

Financial summary
(in Million of Euros)



Human Resources as of today
(employees)



2018 : START OF SALES

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Innovation

A thermal compressor at the service of the heat pump

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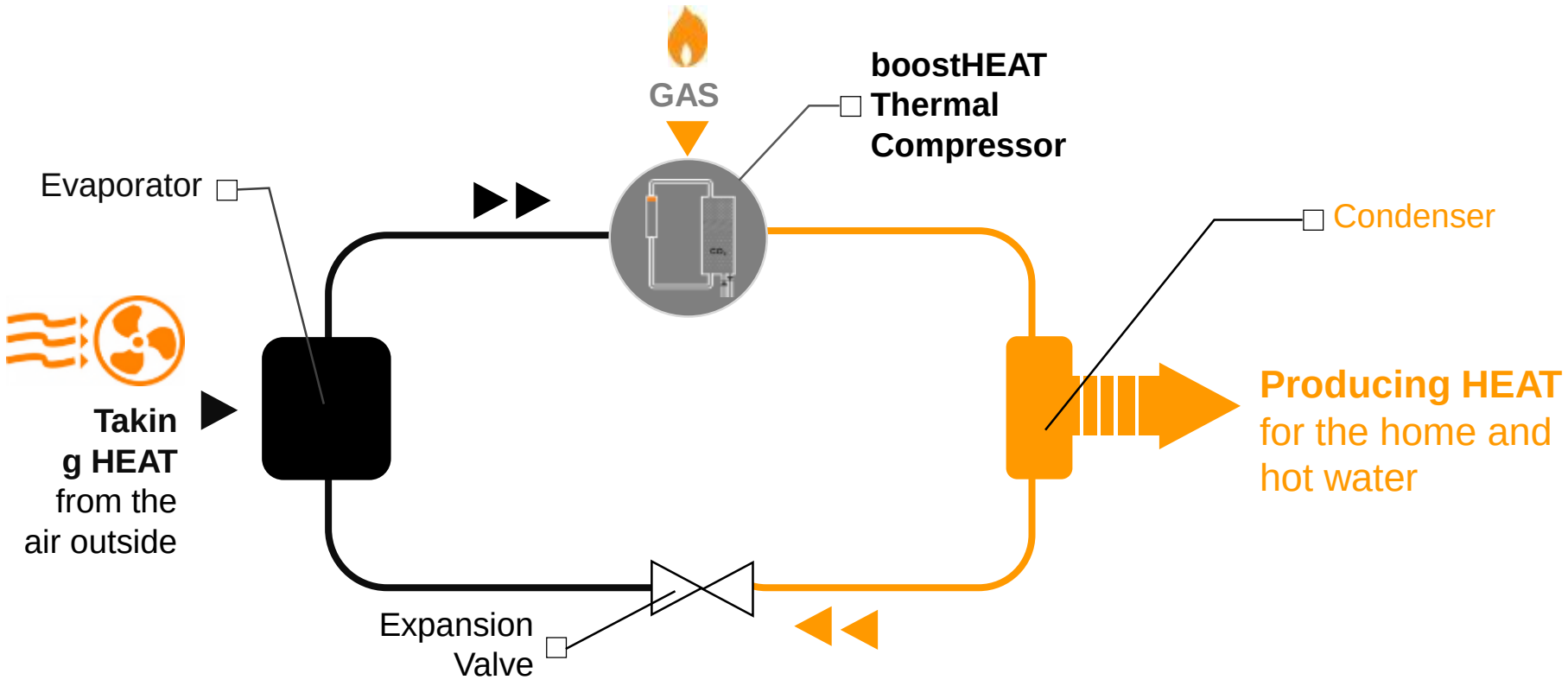
A design using the boostHEAT thermal compressor to activate the heat pump cycle



The boostHEAT heat pump boiler principle

General architecture : an association of technologies

Performance
Up to
200%*

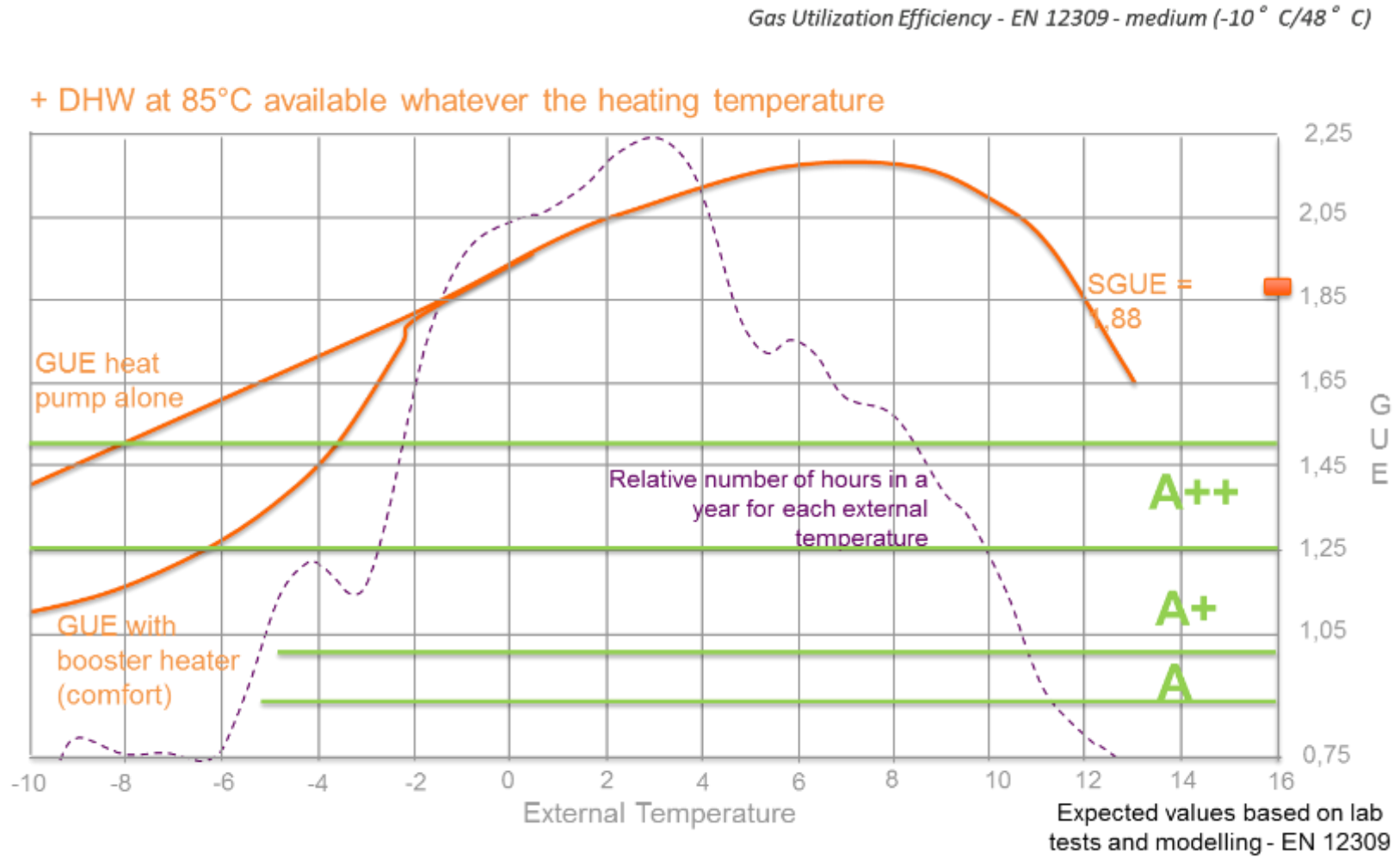
3 MODULES
made separately and interconnected by the installer at the end customer :

- INDOOR UNIT brings comfort
- The THERMODYNAMIC CHARIOT brings energy efficiency
- OUTDOOR UNIT for renewable energy capture.

* Compared to the best current boilers

Performance curve – seasonal performances

AUDIT BY GDF SUEZ JUNE 2013



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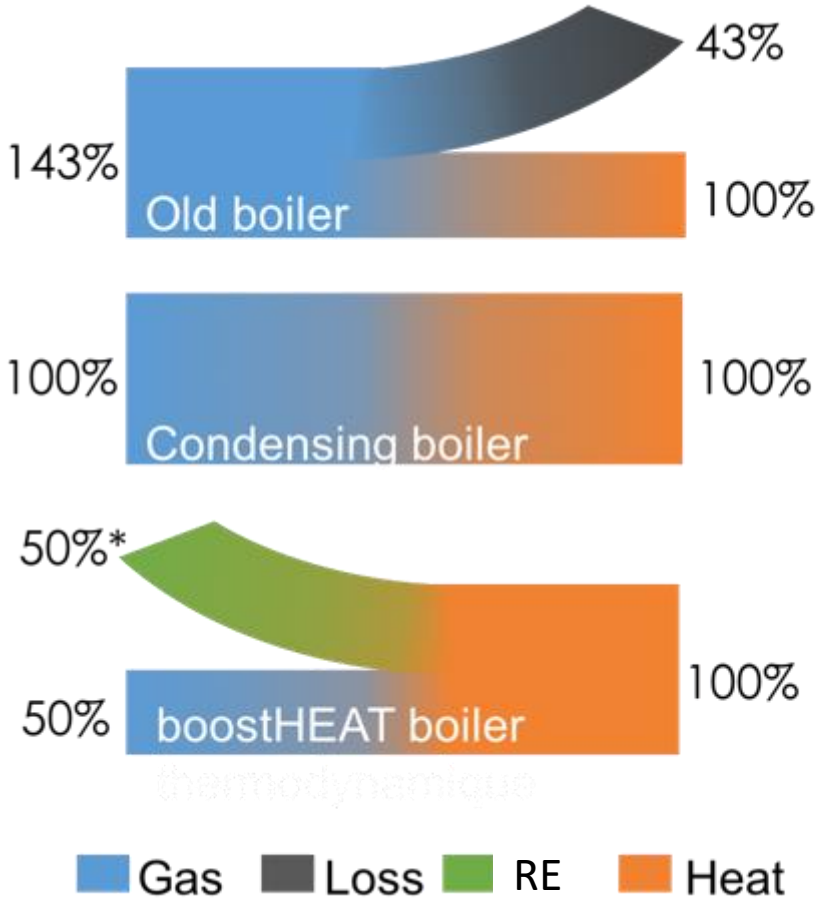
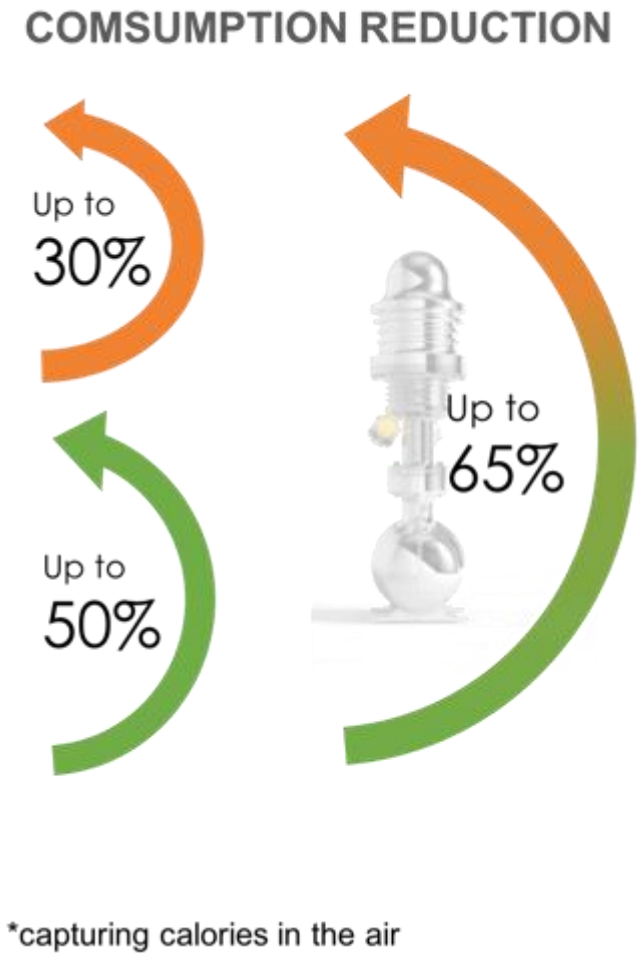
boostHEAT, a disruptive innovation contribution

- **Divide by 2 energy consumption** compared to the condensing boiler, **divide by 3** compared to the old boiler
- We provide **up to 50% of renewable energy**
- **Perfomance up to 200%** VS primary energy





*capturing calories in the air

Industrialization

A production plant in Vénissieux (LYON) FRANCE

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An industrial site of excellence in Lyon

- An industrial site **in the heart of a city** with industrial sensitivity
- **An exceptional site** for its transport **access**, for its **highways** and its **logistical interests**
- Very fast access to our **ecosystem of suppliers**
- **35% of the HVAC industry** is made in Lyon
- At the heart of an industrial campus of 11 ha

Key dates

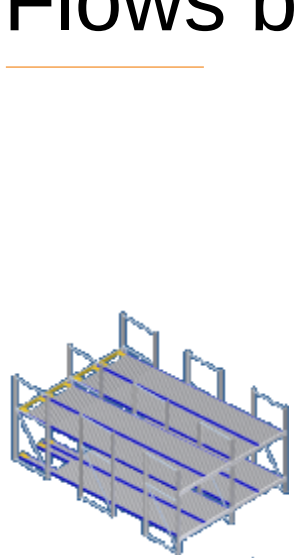
2016
BOSCH REVITALIZATION AGREEMENT

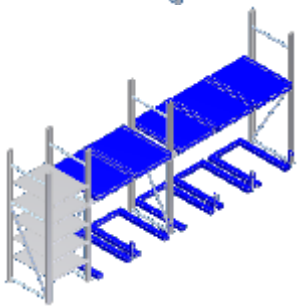
SEPTEMBER 2016 :
INSTALLATION

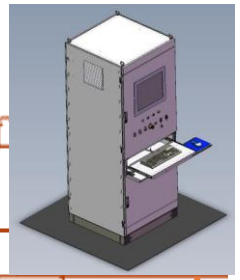
SPRING 2017 :
PIAVE & BANKS INDUSTRIALIZATION FINANCING

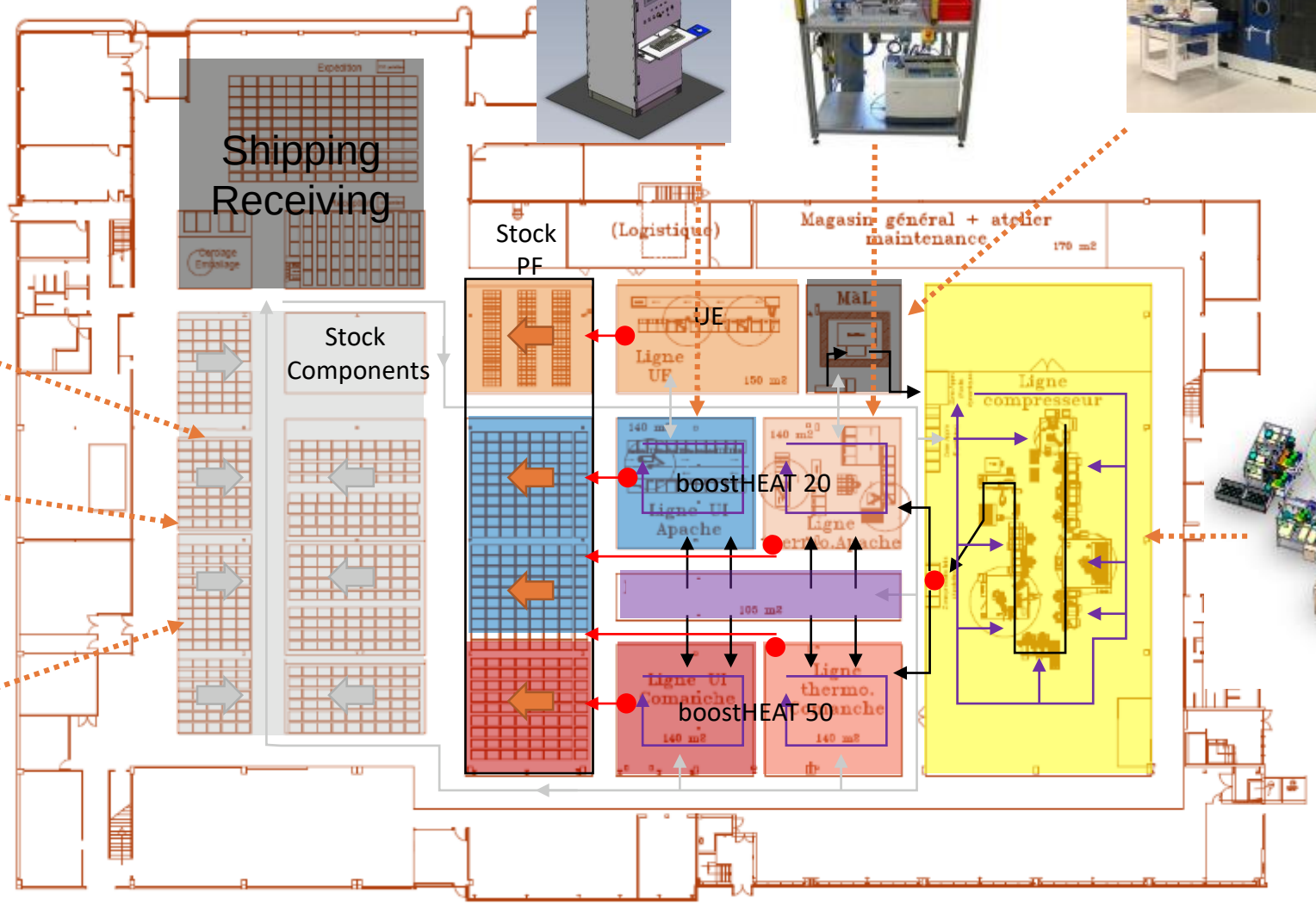
JUNE 2017
COMPRESSOR PRODUCTION LINE ORDER

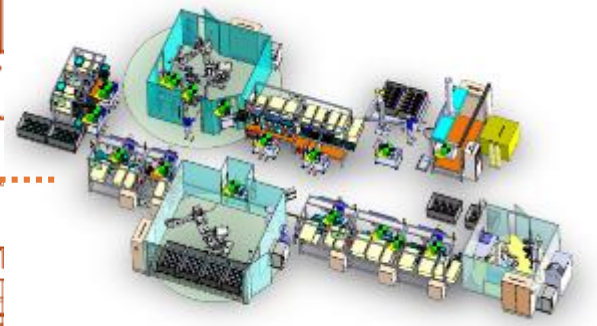
Flows blue print











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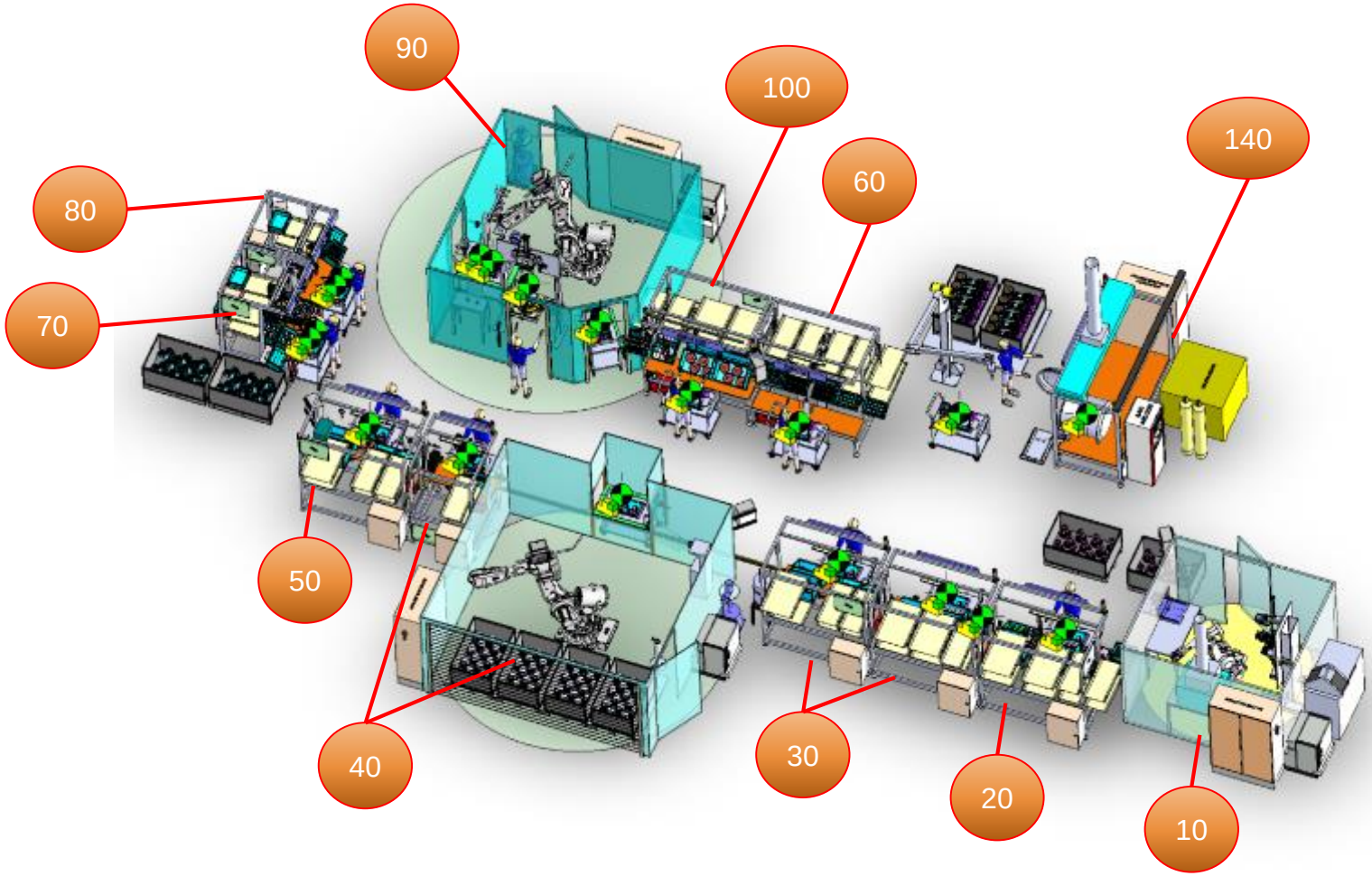
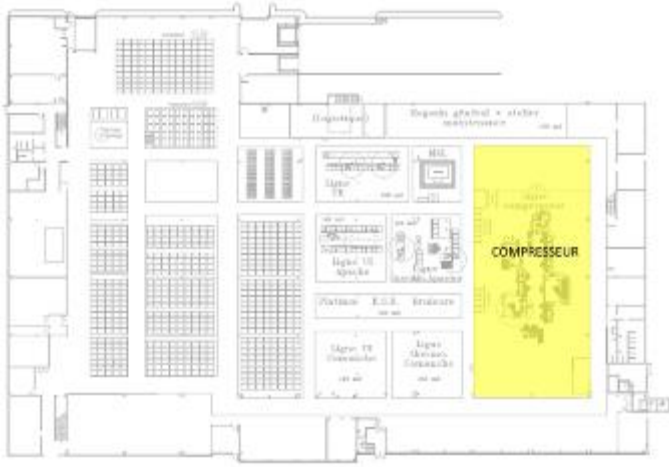
Compressor production line





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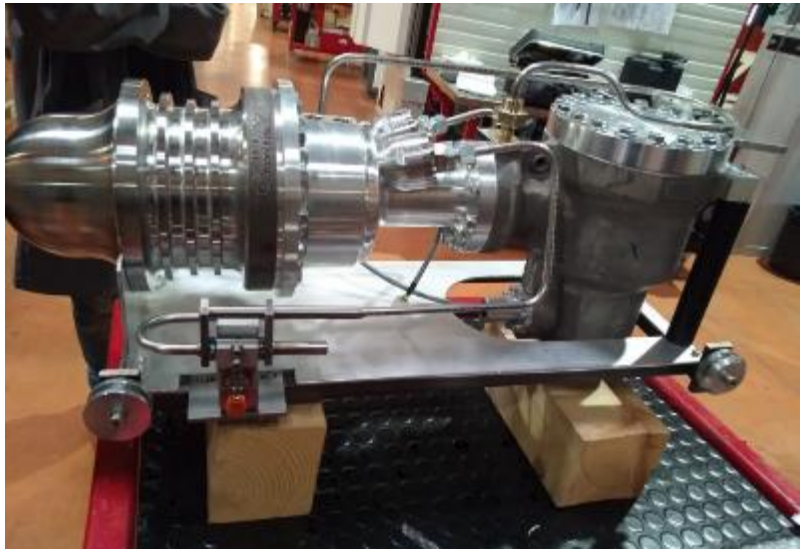
Pressure + Leak test bench



Product Marketing

Two products for two major market segments

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TWO PRODUCTS FOR TWO MAJOR MARKET SEGMENTS

1 technology : 2 products

boostHEAT
20 kW

START OF PRODUCTION :
Q4 2018

boostHEAT
50 - 250 kW

START OF PRODUCTION :
Q4 2019

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SALES AND MARKETING STRATEGY BOOSTHEAT 20KW

A disruptive approach

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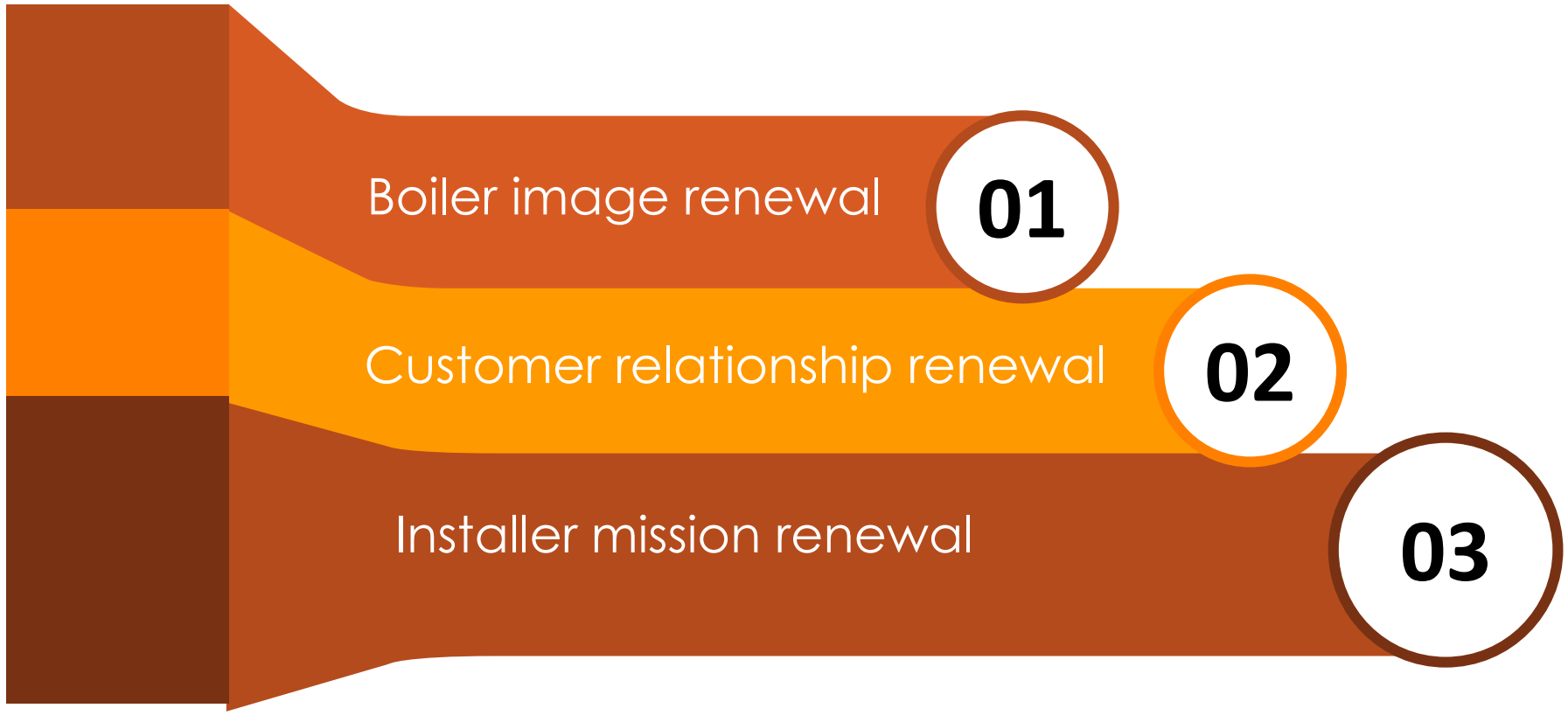
Breaking business strategy

BOOSTHEAT CONTROLS ITS ENTIRE VALUE CHAIN

Axes of renewal



boostHEAT20kW: OUR OFFER

A targeted offer for a calm decision

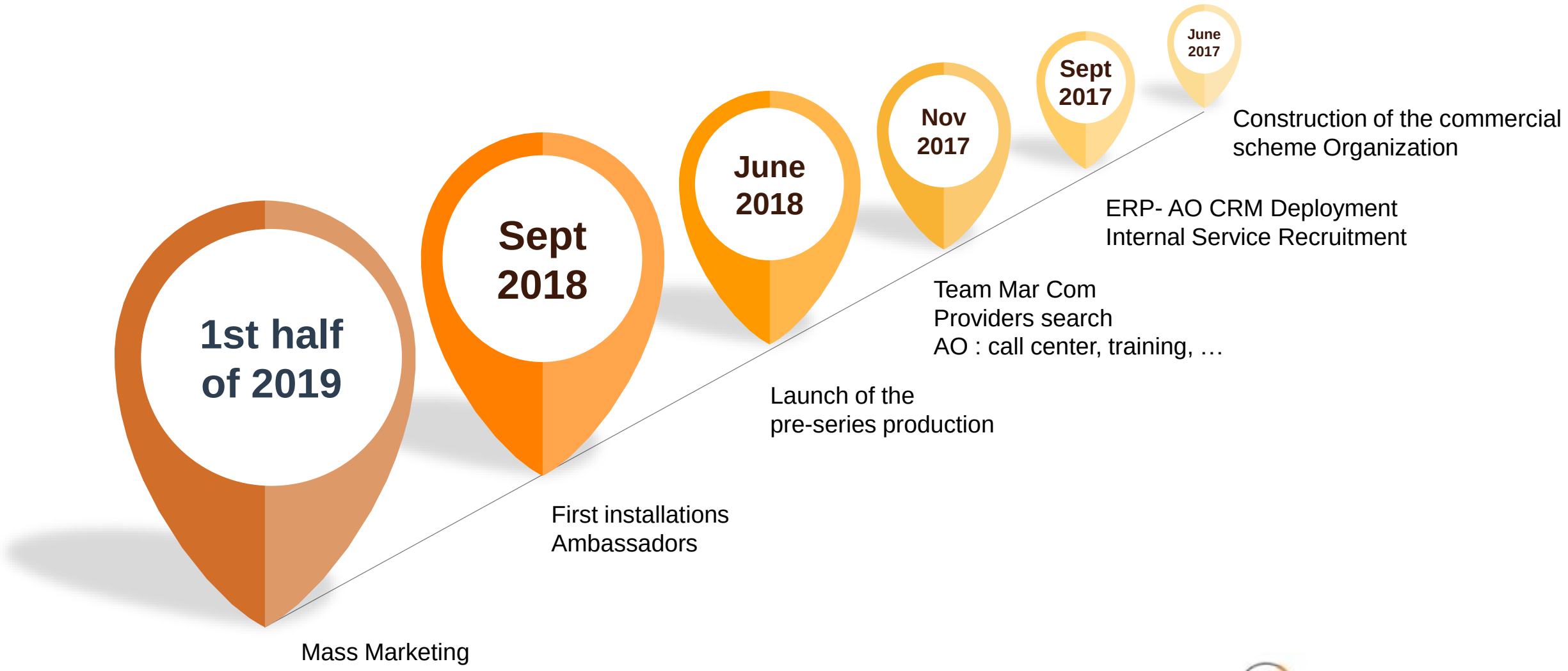
A turnkey heating solution, with :

- Financing with a boostHEAT partner
- The boostHEAT boiler supplied, installed
- A maintenance contract
- A warranty extension
- A green Gas supply option

- Easy to understand
- Easy to use
- Comfortable a single interlocutor : the manufacturer
- *Reassuring* : leading partners

A PRECISE, PERSONALIZED PROCESS, WITH SLOW MATURATION AND THOUGHTFUL DECISION

Objective & planning



The future
By boostHEAT

boostHEAT

boostHEAT: the biotech of the energy

Initial offer

Future developments

Reversible range with cooling system

Micro-cogeneration

Integration in **Smart-Grid** networks, remote control, free energy billing…

A 100% owned technology platform for multiple applications : industry, chemical, HVAC,…

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THE POSITIVE ENERGY

THANK YOU

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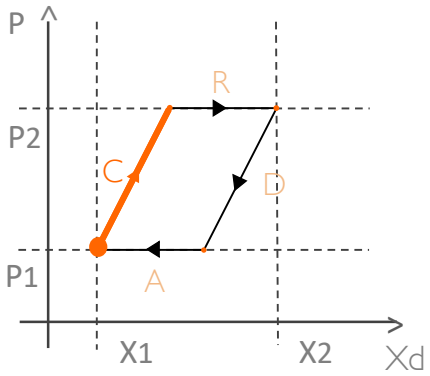
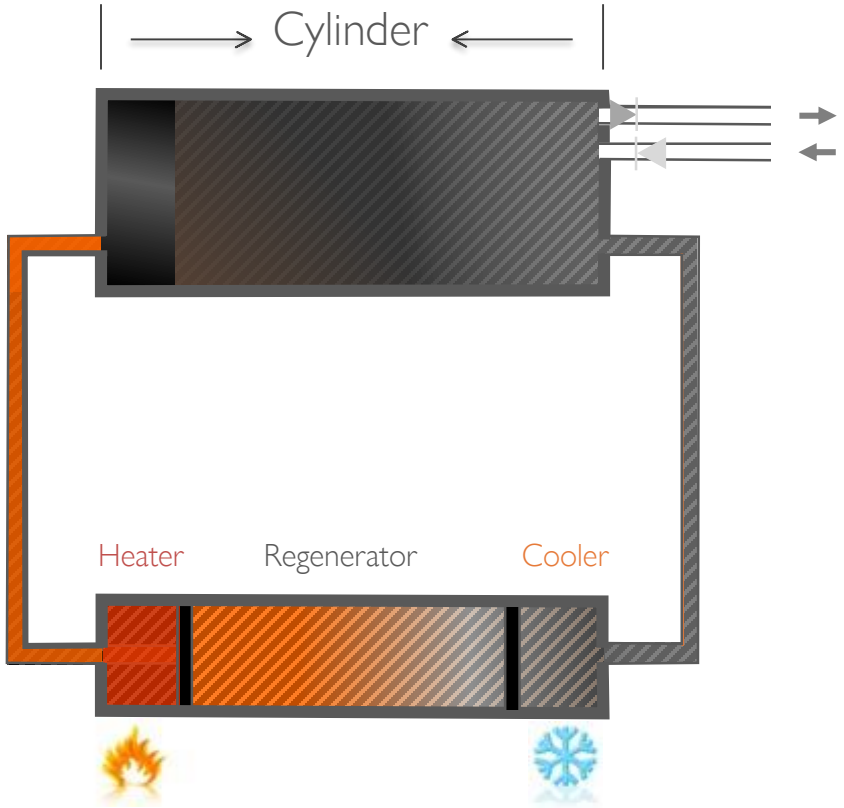
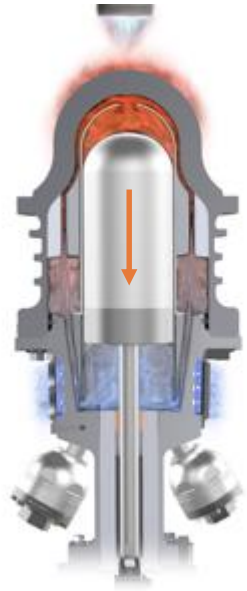
The regenerative thermal compressor

> COMPRESSION

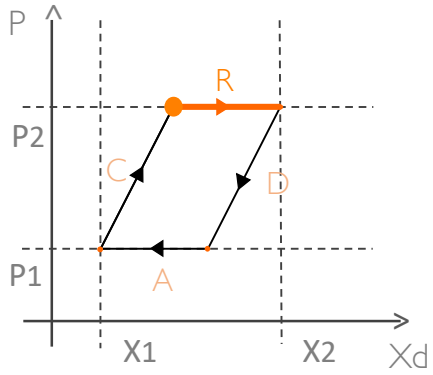


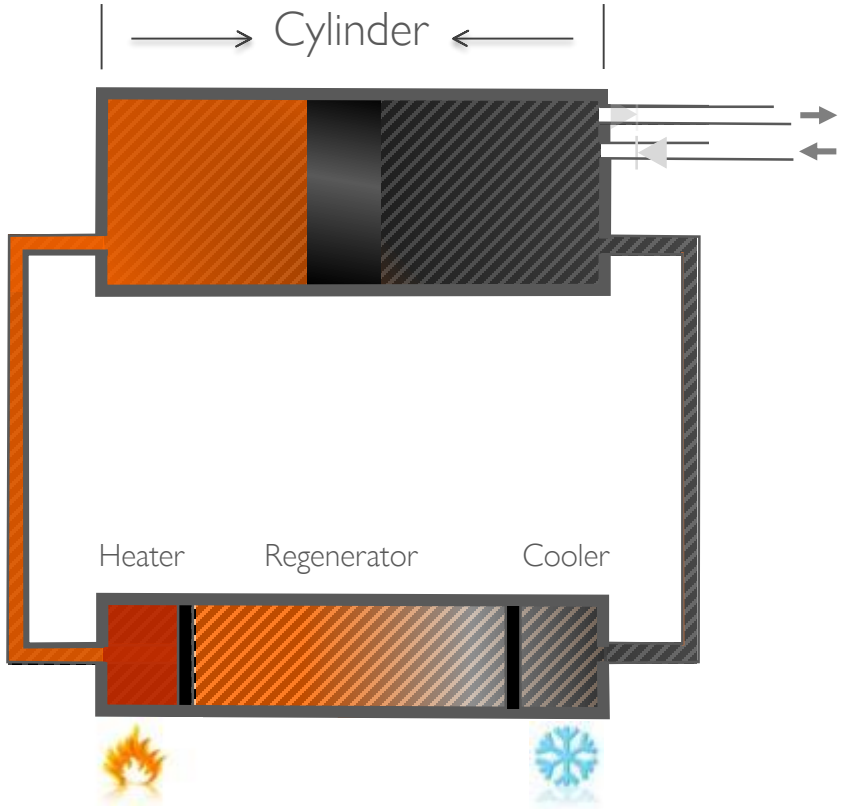


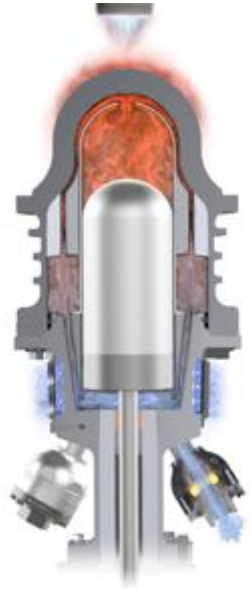


The regenerative thermal compressor

> **DISCHARGE**

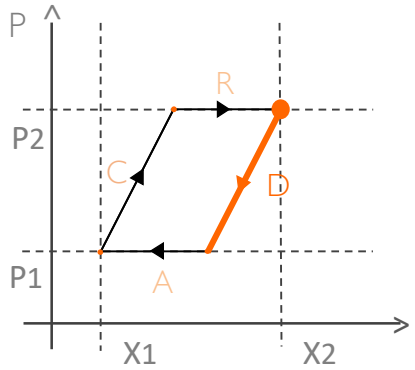


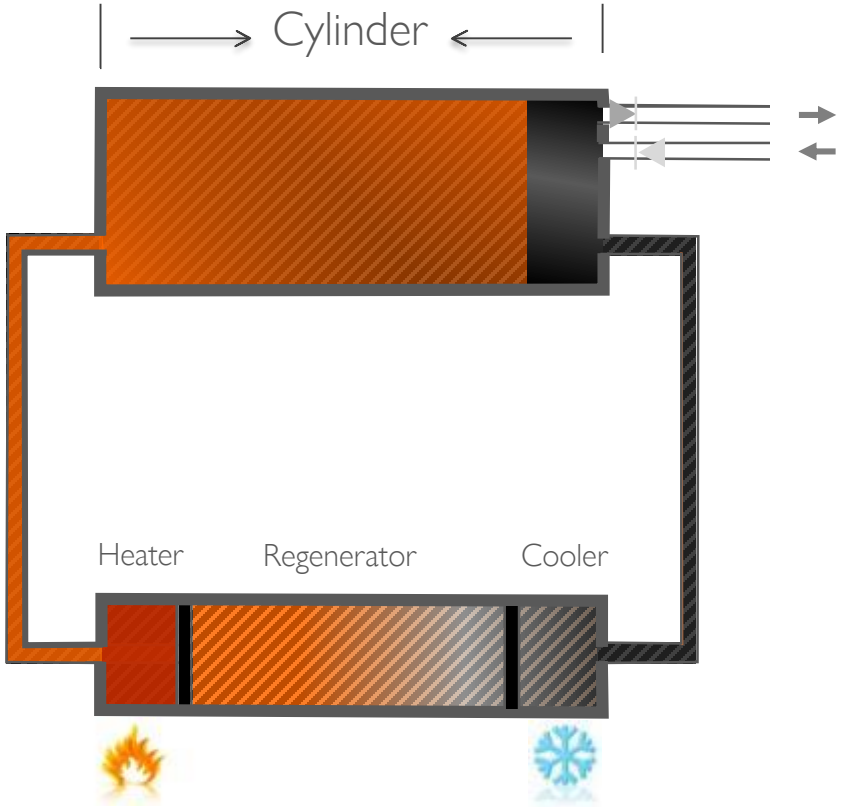


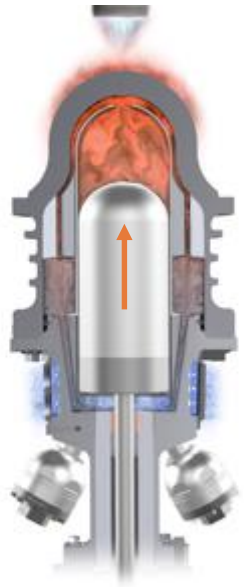


The regenerative thermal compressor

> EXPANSION

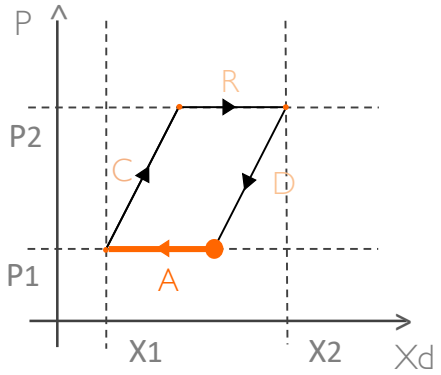


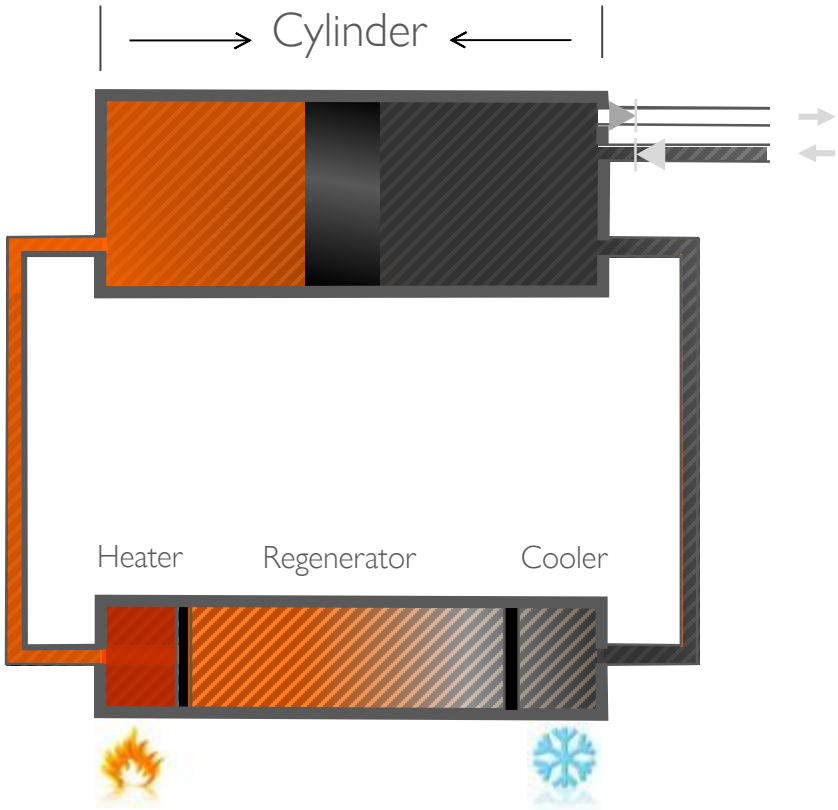


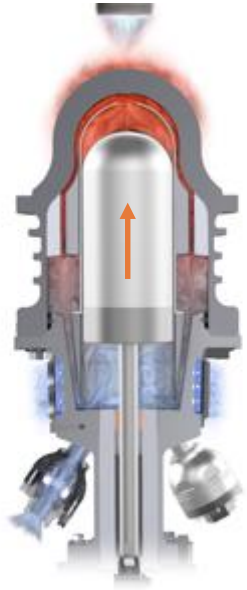


The regenerative thermal compressor

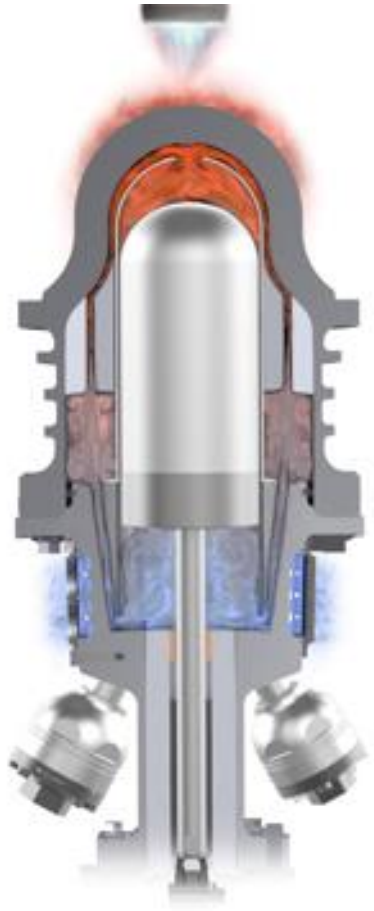
> INTAKE







The regenerative thermal compressor



No mechanical power

+

- Technology from engines and compressors
- Simplicity and reliability
- Lifetime greater than 50 000 hours without maintenance
- Economic (replace an engine and a compressor)
- Performance

A UNIQUE SOLUTION from 10 years of research