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# Welded heat exchangers

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Welded Heat Exchangers

# Definition – welded heat exchangers

**Welded Heat Exchangers (WHE):** Compact heat exchangers of plate and frame design where the platepack is welded together.

**WHE's** are a subgroup within **compact heat exchangers** which is the general expression used in Alfa Laval press releases.

# Growth drivers

- \* Increasing demand for energy

- \* Increasing demand for energy efficiency

➔ Drives the market for efficient heat transfer in energy applications

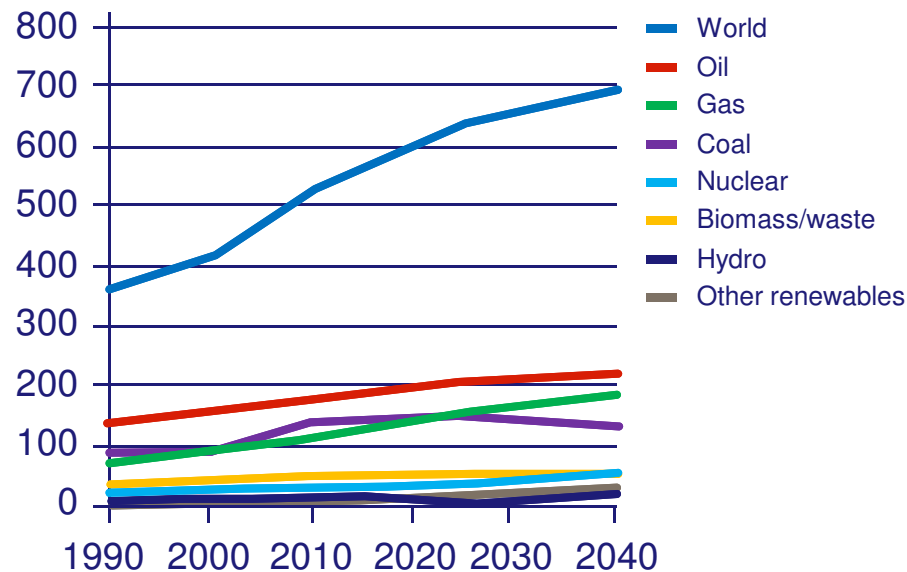




# The Welded heat exchanger market

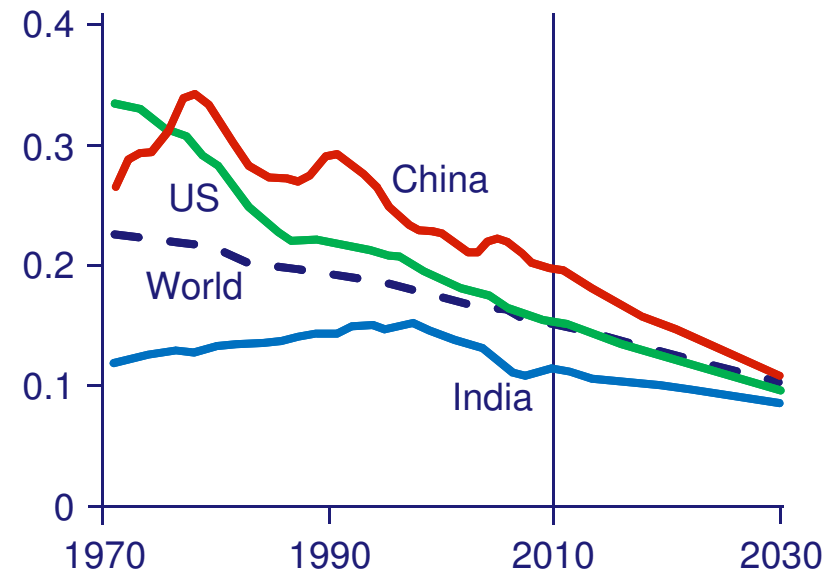
– The market for efficient heat transfer in energy applications

Energy demand (quadrillions of BTU)



ExxonMobil 2012 Outlook for Energy

Toe (tons of oil equivalent) pr thousands \$ GDP



BP Energy Outlook 2030/Jan 2012

# What drives our customers?

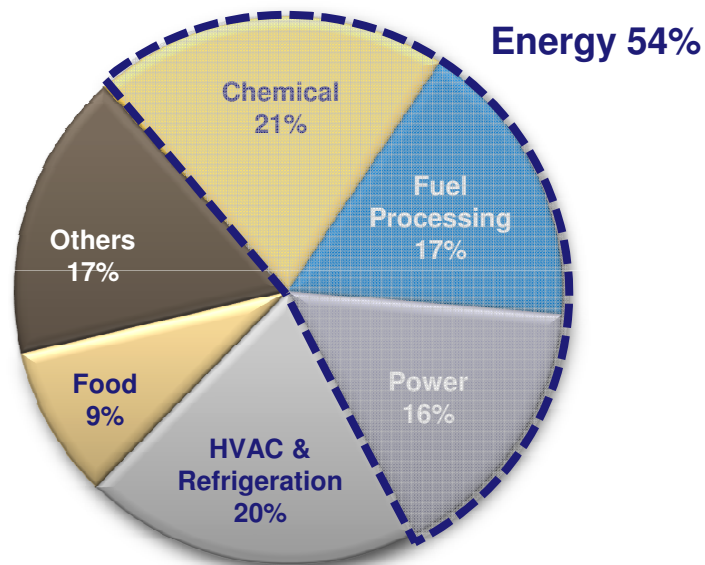
- \* Industrialization of fast growing regions (Latin America, Asia, Middle East & Eastern Europe)
- \* Growing demand in the whole energy production chain
- \* Structural changes in the composition of world energy production - **Gas**
- \* Optimization/reduction of energy use in processes and recovery of energy
- \* Environmental responsibility/concern/focus



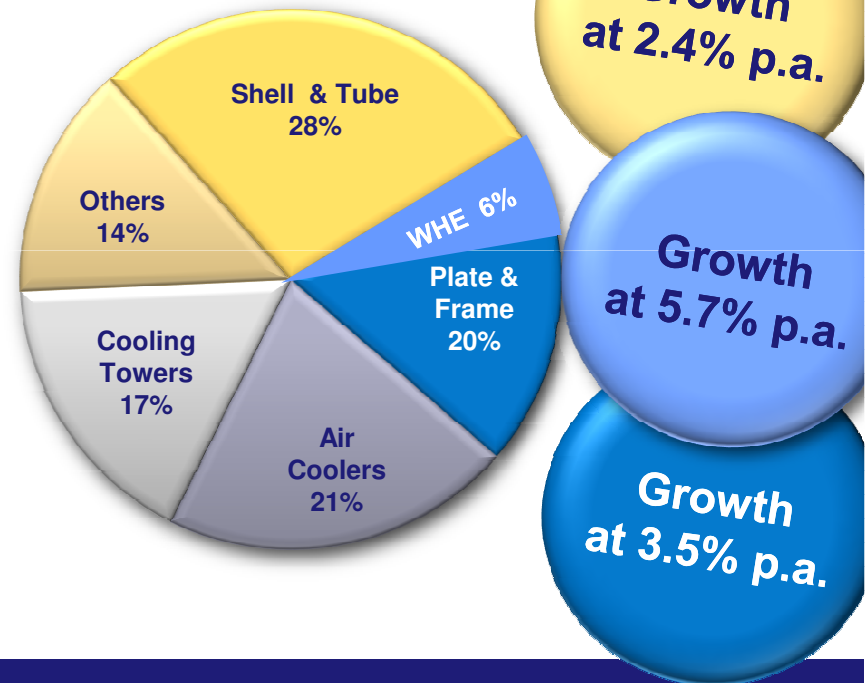
# Applications and product 'mix'

– The technology shift

World HEX Applications 2011



World HEX Products 2011



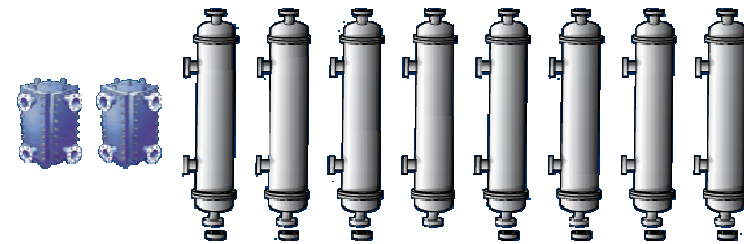
Source: GIA Market report 2011

# The technology shift

– Rate WHE versus Shell & Tube in energy applications

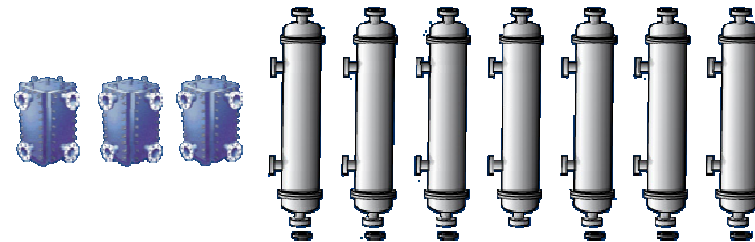
2012

2 to 8



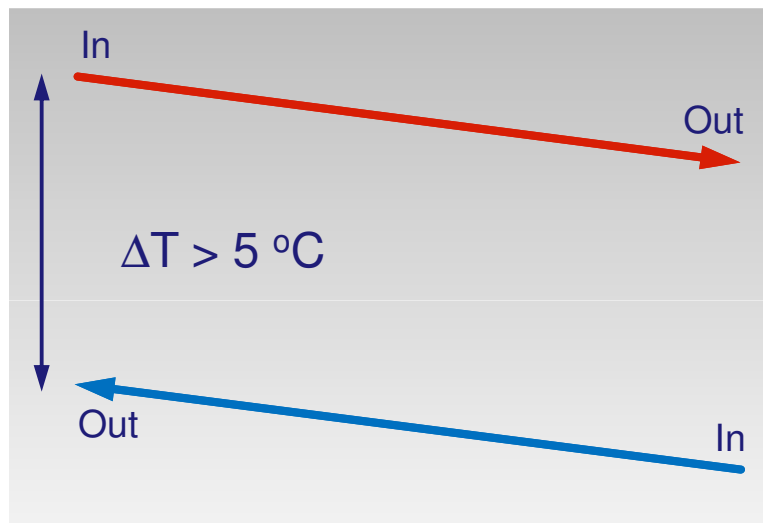
~ 2025

min. 3 to 7

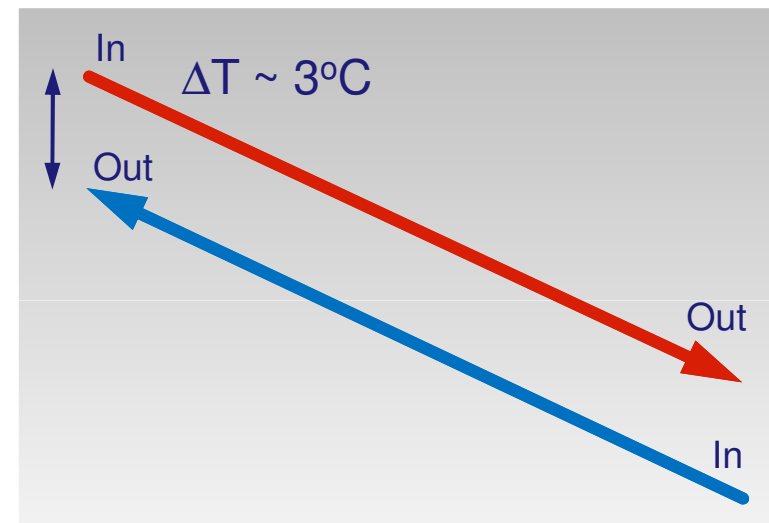


# Technologies – comparison

Shell & Tube HX's

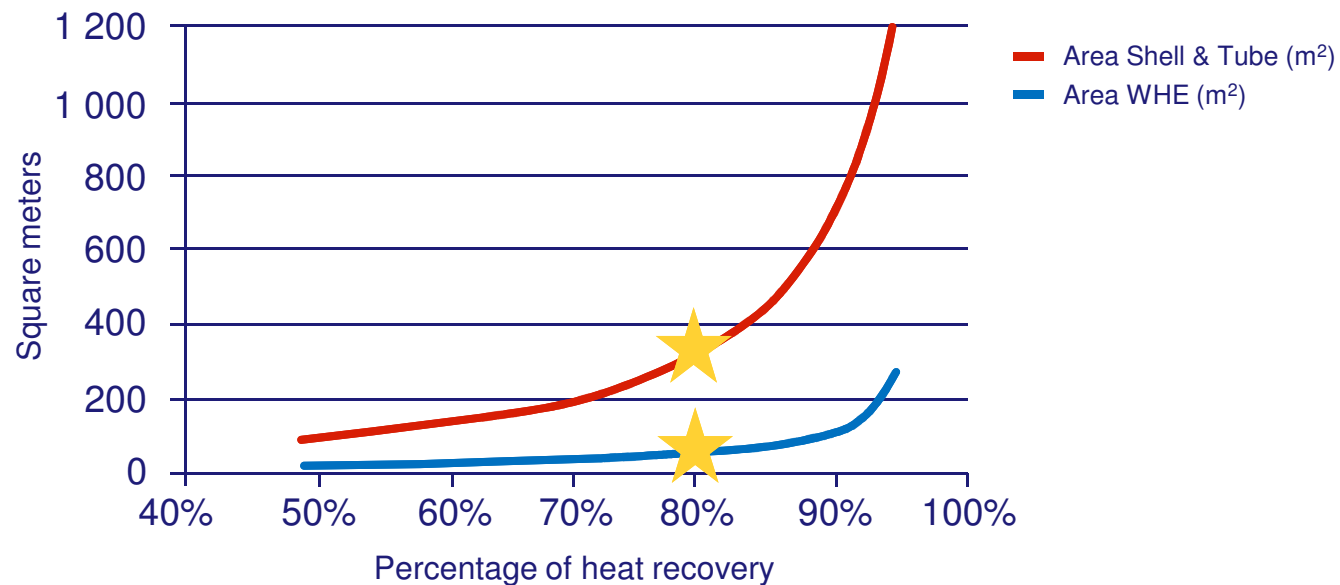


Welded plate HX's

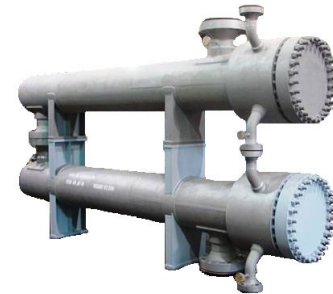


The difference in  $\Delta T$  is directly proportional to the **extra** heat recovery possible

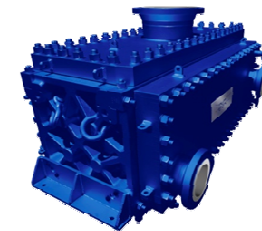
# Technologies – comparison



At heat recovery 80% – WHE need 5 times less heat transfer area than traditional Shell & Tube.



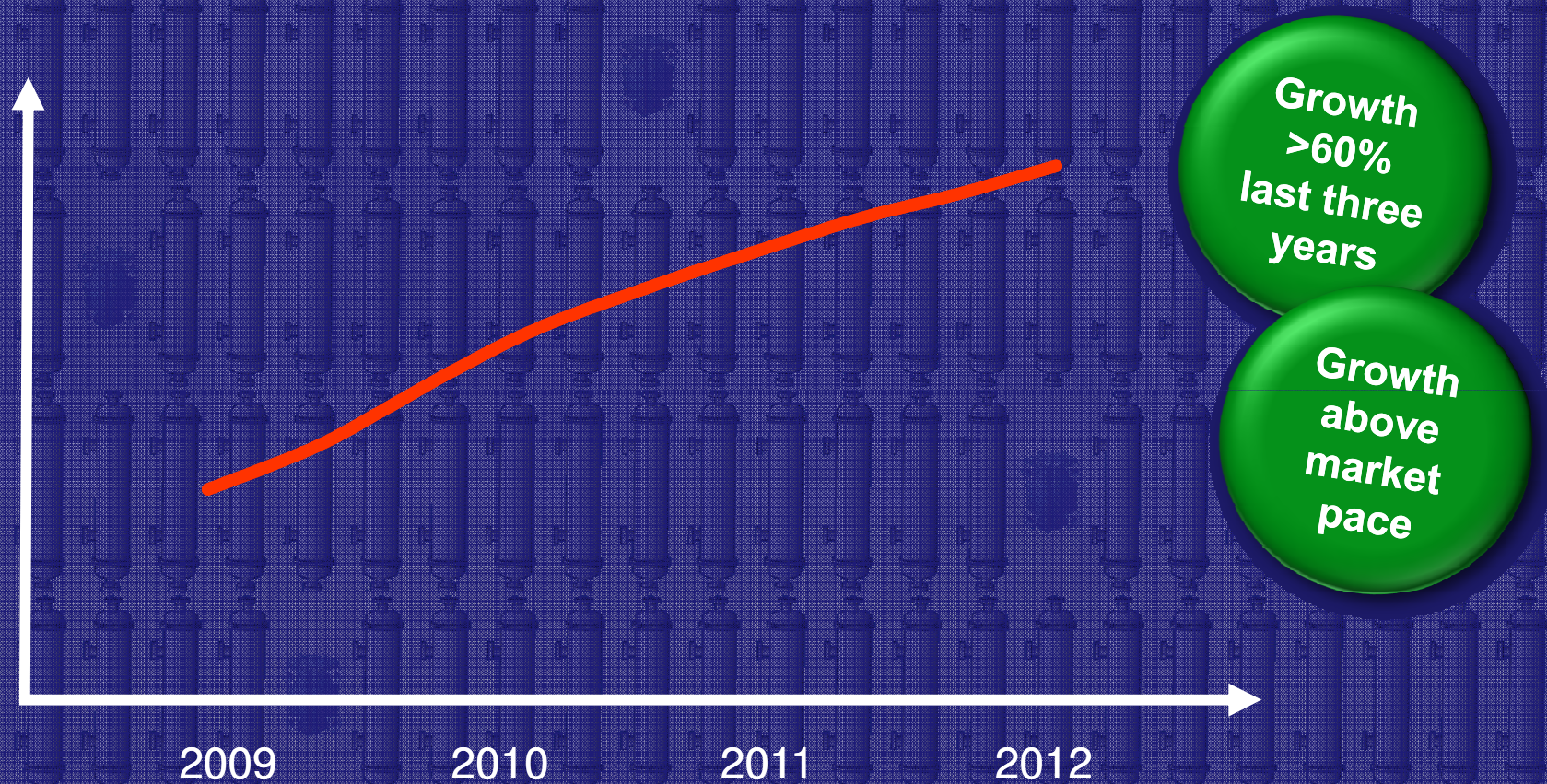
Shell & Tube



WHE



# WHE an increasing part of Alfa Laval



# Alfa Laval WHE direction

“every welded  
heat exchanger  
for every need”

➔ Superior product performance  
Superior product portfolio





# The Alfa Laval WHE portfolio

The market  
leading  
portfolio

Customer value / uniqueness



AlfaNova



AlfaDisc



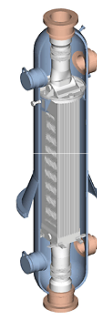
AlfaRex



Compabloc



Spiral



Packinox



OLMI

Production standardization

# The Alfa Laval WHE portfolio

2006



Oil & Gas



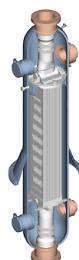
Refining



Chemical



Power



# The Alfa Laval WHE portfolio

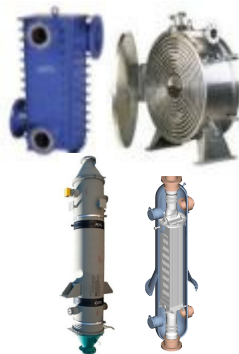
2012



Oil & Gas



Refining



Chemical



Power



# Growth of portfolio in the markets

- last three years



Oil & Gas



Refining



Chemical



Power



# Delivering customer value

– through a complete product portfolio

End Customers



Contractors



Licensors



A superior WHE portfolio from an experienced supplier is critical

# Welded solutions for the gas industry

– Case I: Leading EPC – LNG contractor





# Welded solutions for the gas industry

– Case I: Leading EPC – LNG contractor

- \* A leading EPC
- \* Have delivered a significant part of global LNG capacity
- \* 3 recent key projects in Australia and the US



# Welded solutions for the gas industry

– Case I: Leading EPC – LNG contractor

- \* Alfa Laval supplies the WHE's for each project
- \* EPC values 'trouble free' project execution
- \* Alfa Laval sole-sourced on latest projects





# More welded solutions for the gas industry

## Case II

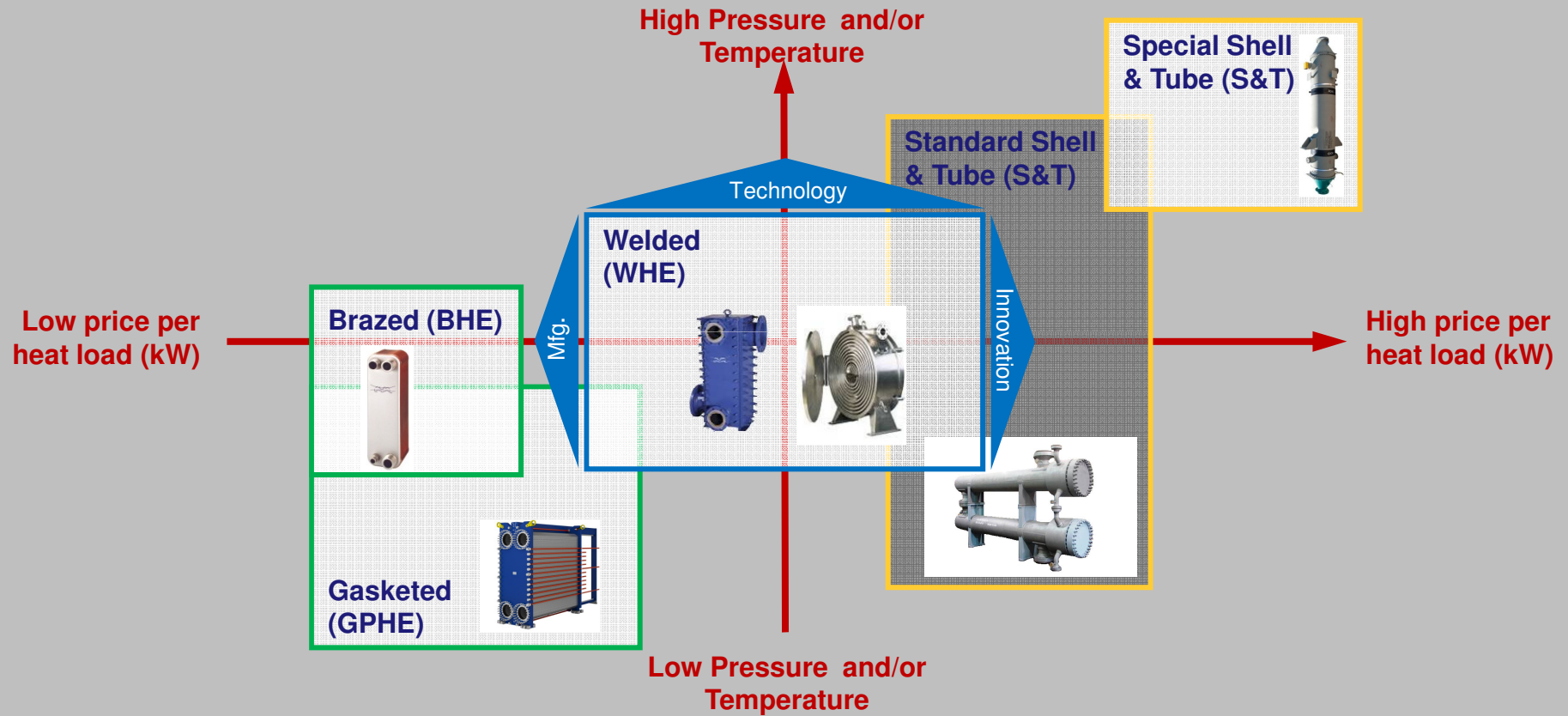
- \* GPP in UK
- \* Ordered: Compabloc & Spiral
- \* Technology conversion from Shell & Tube to Compabloc + Spirals
- \* Future projects with full WHE scope

## Case III

- \* GPP in Qatar
- \* Ordered: Compabloc & Spiral
- \* Successful experience with Compabloc . Latest addition Spirals
- \* Qatar – the world's leading LNG producer

**and more...**

# Focus on R&D





# Summary

## – welded heat exchangers

- \* High growth rate
- \* High barriers to entry
- \* The market leading portfolio





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