

Q P I N C H
BREAKTHROUGH ENERGY EFFICIENCY:
QPINCH INDUSTRIAL CHEMICAL HEAT
TRANSFORMER

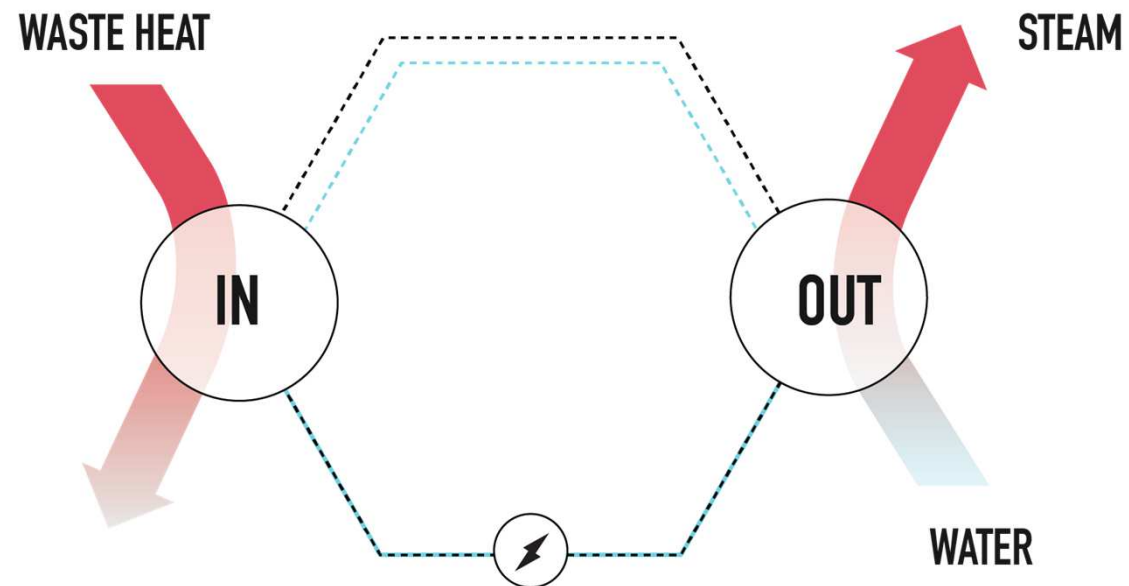
12TH IEA HEAT PUMP CONFERENCE 2017
ROTTERDAM

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WOUTER.DUCHEYNE@QPINCH.COM
CEO & CO-FOUNDER

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RECOVER WASTE HEAT WITH A HEAT TRANSFORMER



CHALLENGES TO RECOVER WASTE HEAT WITH A HEAT TRANSFO



HIGH TEMPERATURES
& HIGH TEMPERATURE LIFTS



WORKING SOLUTION WITH LOW CP: 1.6 KJ/KGK
REFRIGERANT HIGH CONDENSATION HEAT: >2 000 KJ/KG
CHEMICAL POLYM. REACTOON -> HIGH VAP. PRESSURES



MARGINAL OPEX
HIGH OPERATIONAL SAVINGS



LOW FLOW, HIGH DENSITY OF SOLUTION: 1.7 KG/L
LOW ELECTRICAL CONSUMPTION: 3% OF OUTPUT



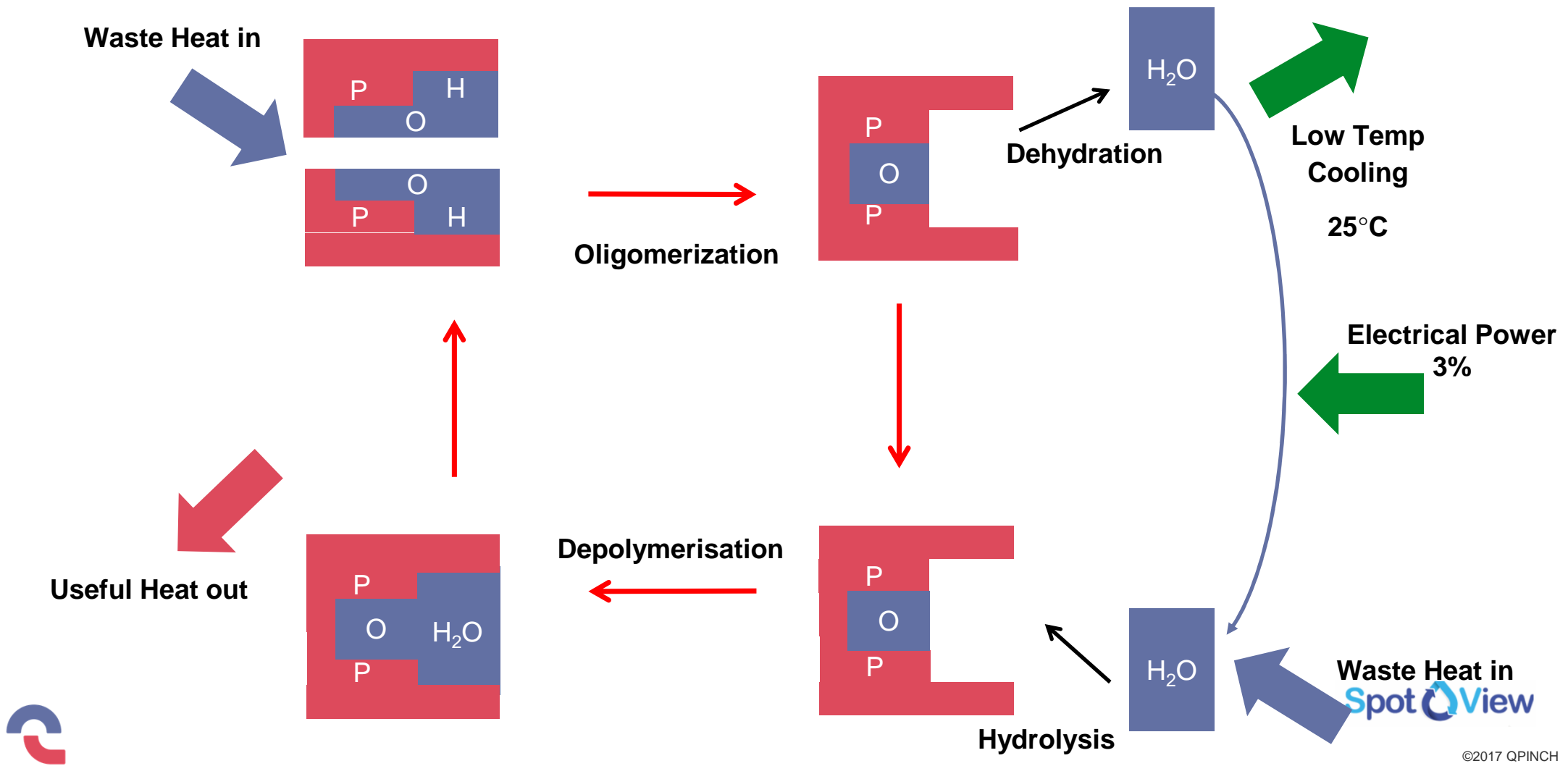
EASY TIE-IN
SCALEABLE
NO DECOMPOSITION
NO CORROSION



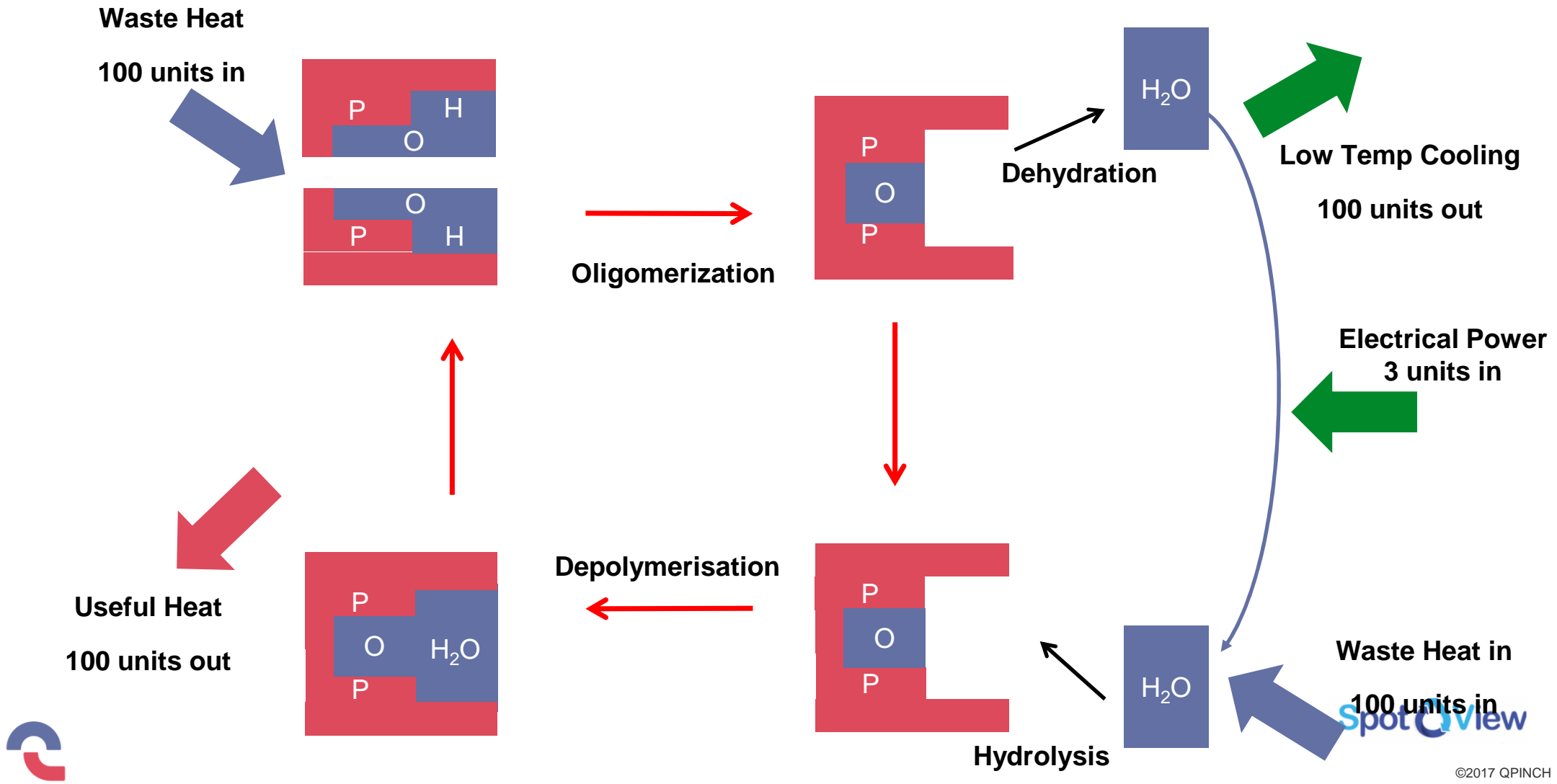
STEAM, PROCESS VAPOR, PROCESS LIQUID
USE ONLY INDUSTRIAL PROVEN COMPONENTS
STABLE: INORGANIC OXOACIDS
ADEQUATE STAINLESS STEEL FOR CONTAINMENT



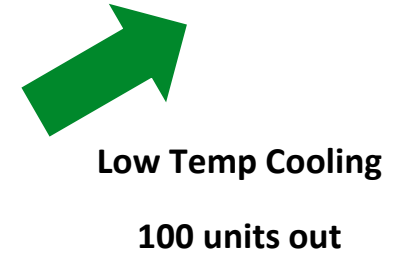
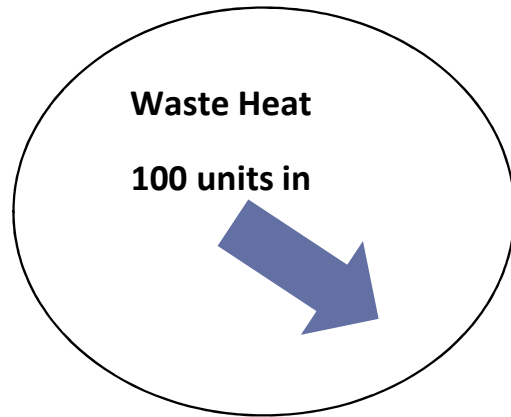
TECHNOLOGY WORKING PRINCIPLE



TECHNOLOGY EFFICIENCY



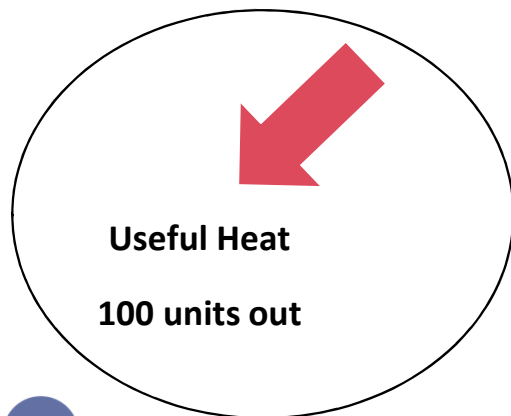
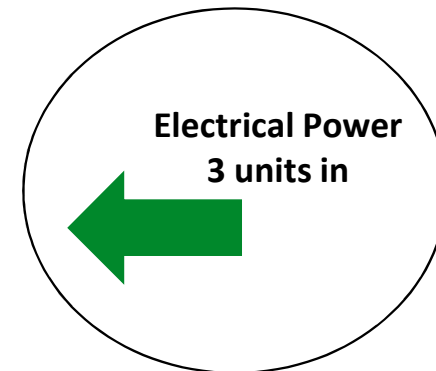
TECHNOLOGY WORKING PRINCIPLE



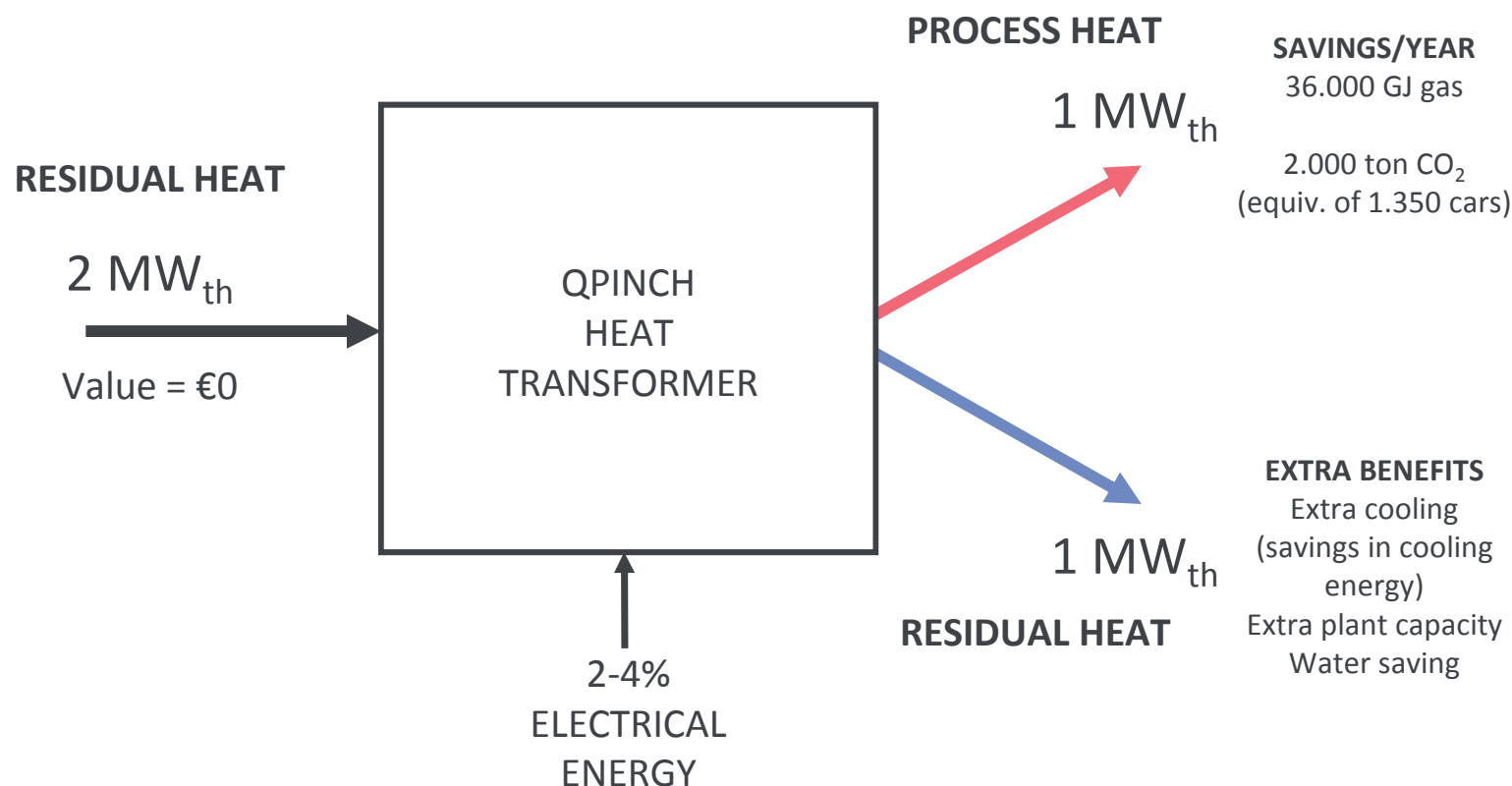
$$\text{Input} = 100 + 100 + 3$$

$$\text{Useful output} = 100$$

$$\text{Efficiency} = 100 / 203 \\ = +/- 50\%$$



FINANCIAL & OPERATIONAL BENEFITS

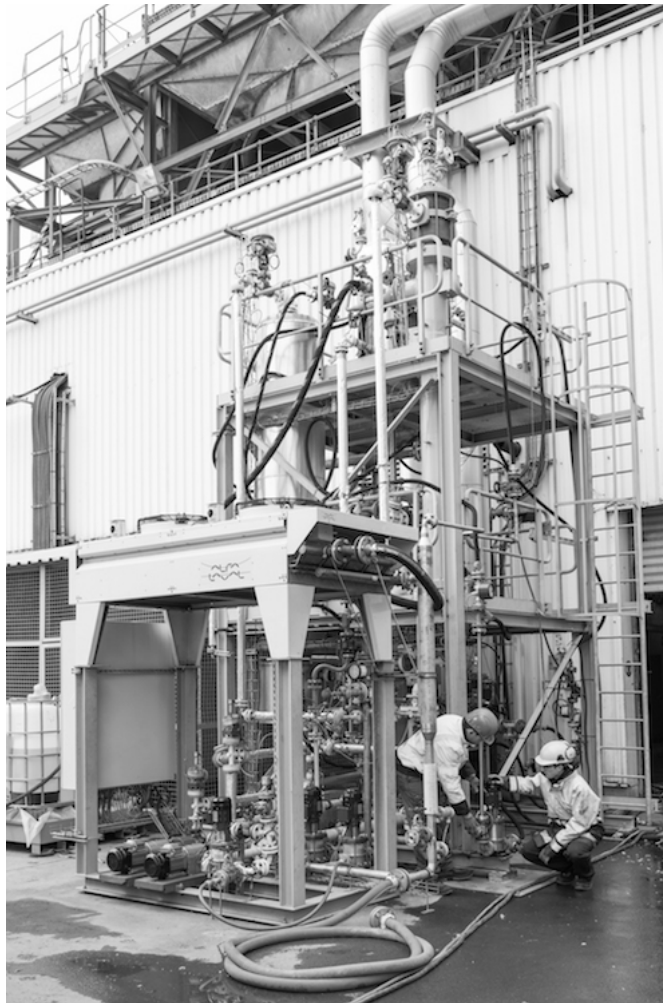


Operational SAVINGS
€200k – €350k / MW / YEAR

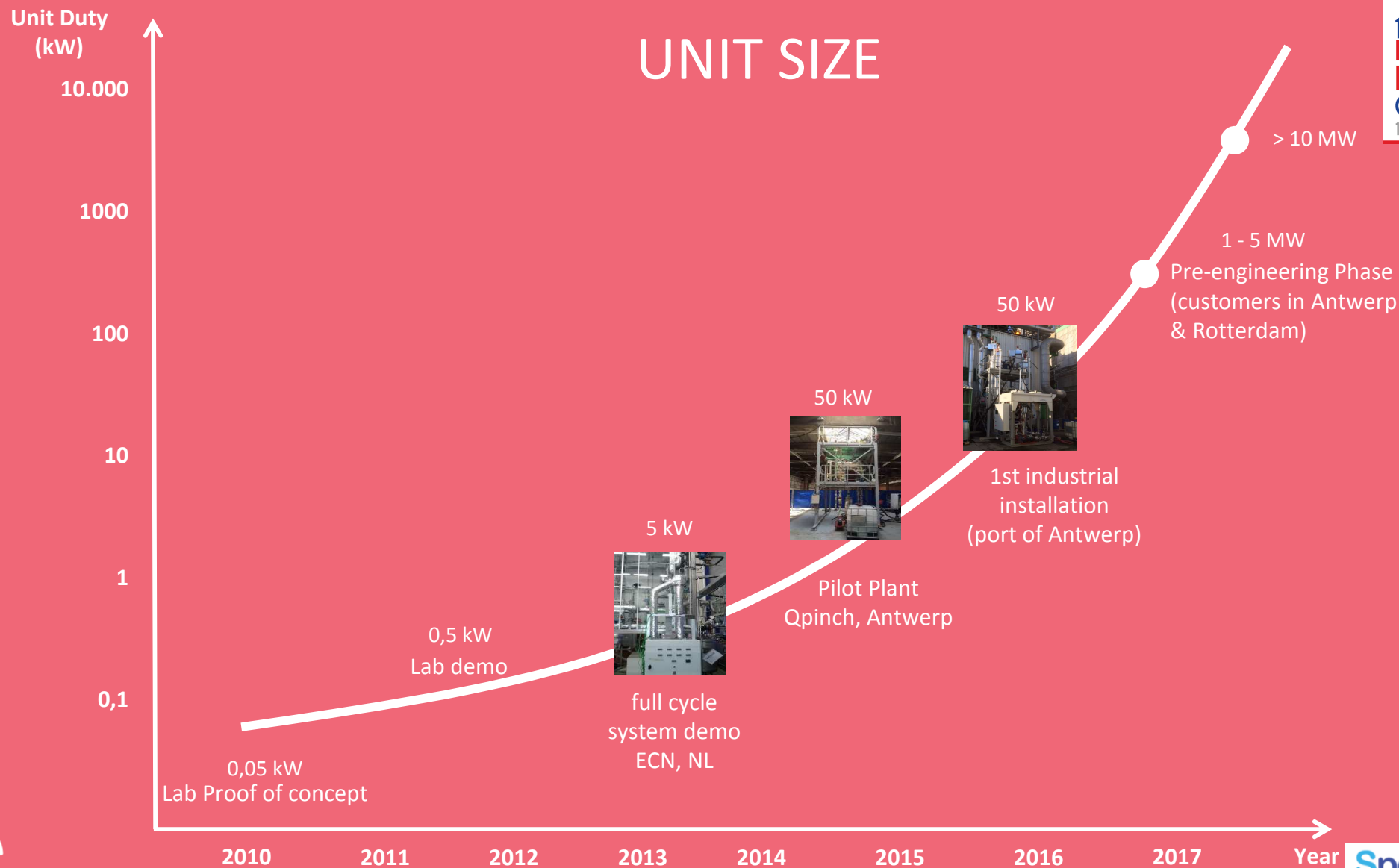


2016 1ST INDUSTRIAL HEAT TRANSFORMER – PORT OF ANTWERP

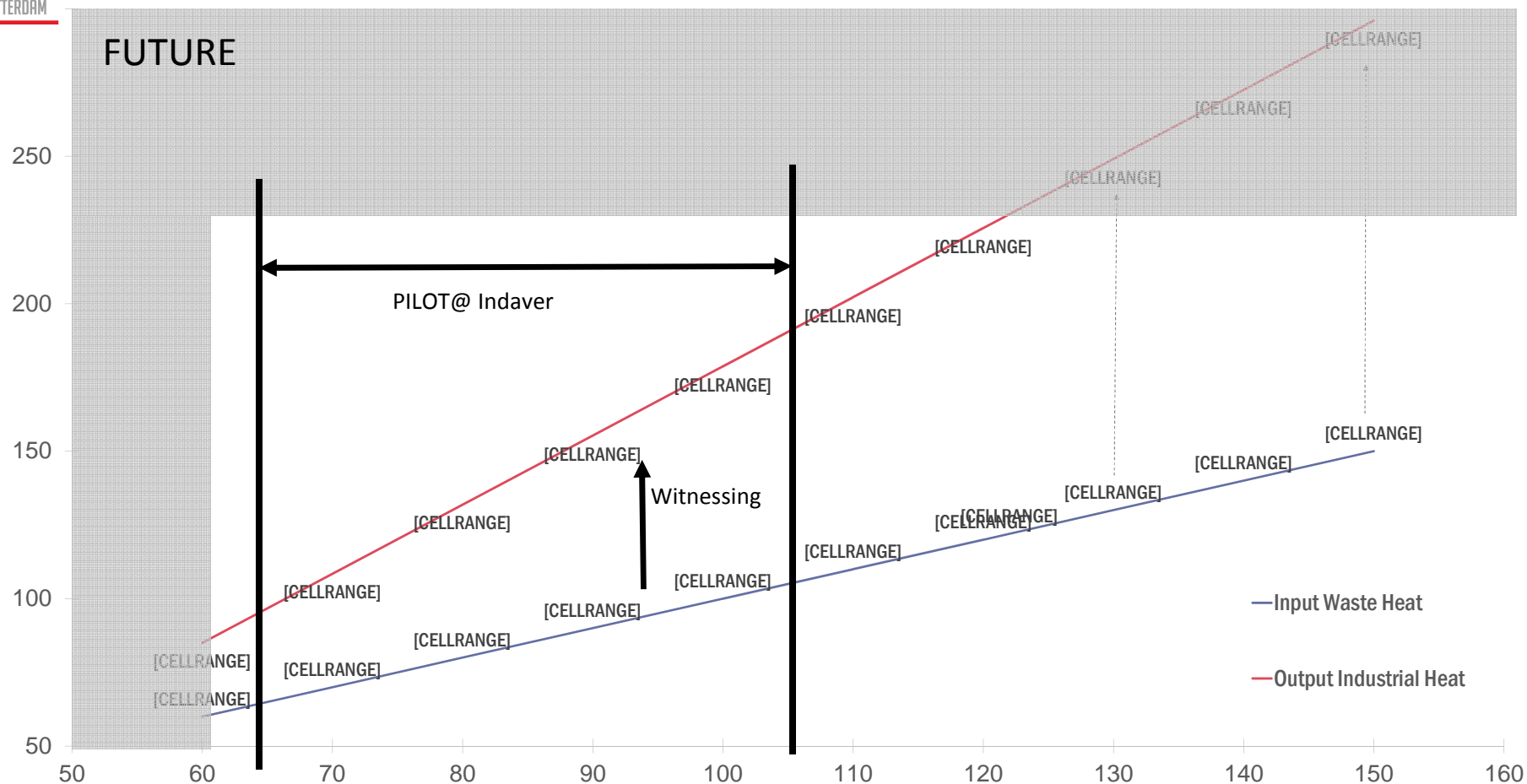
8



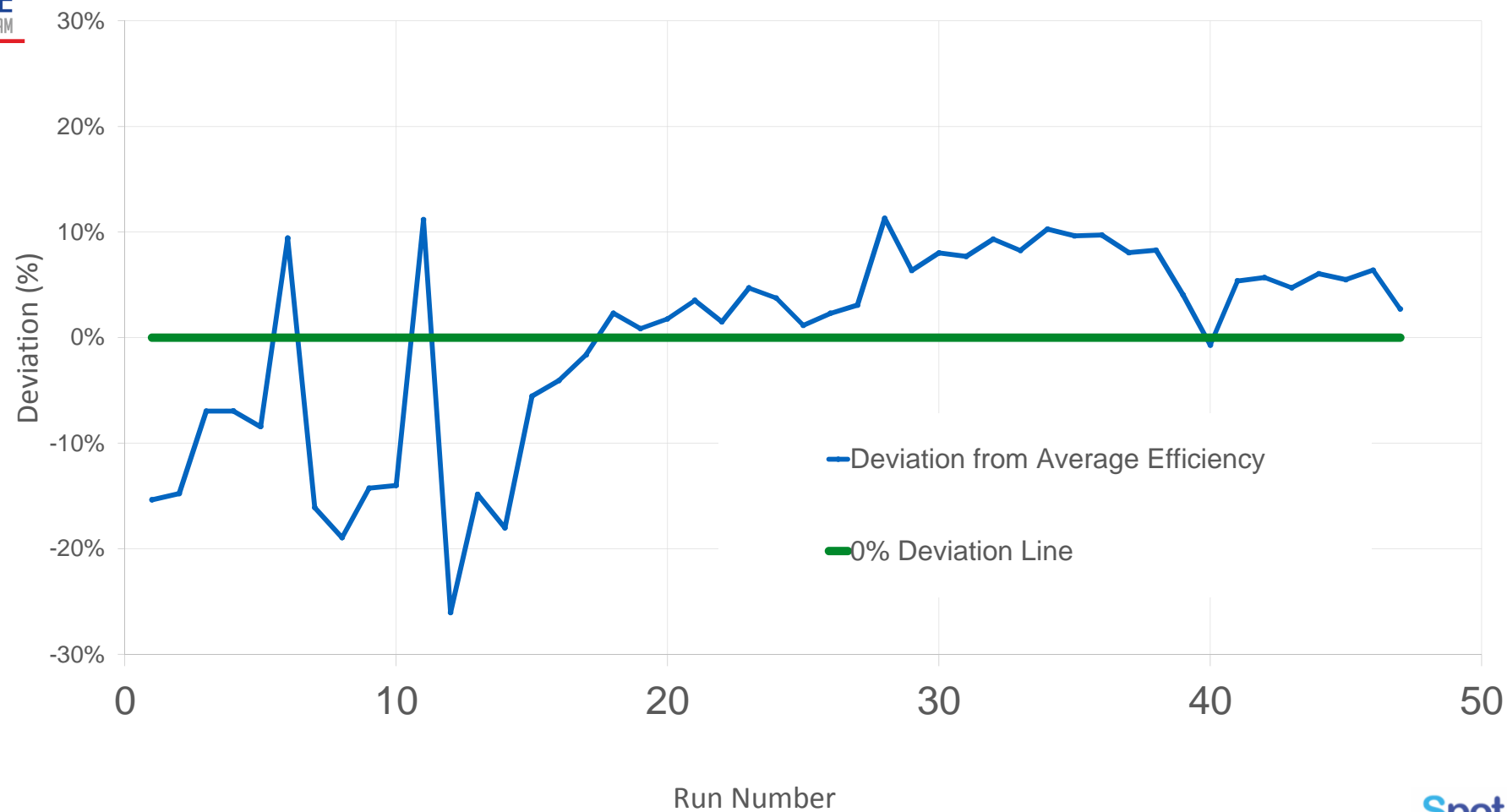
UNIT SIZE



TECHNOLOGY POTENTIAL – SINGLE EFFECT



EFFICIENCY



CHALLENGES

QPINCH



HIGH TEMPERATURES
& HIGH TEMPERATURE LIFTS

OUTPUT UP TO 230°
LIFTS OF 50 TO 100+ °C



MARGINAL OPEX
HIGH SAVINGS

ELECT. ENERGY INPUT / HEAT OUTPUT = 1/30
€200k – €300k/YEAR



EASY TIE-IN
SCALEABLE

SCALEABLE, VERSATILE &
LOW ELECTRICAL REQUIREMENTS



CONCLUSIONS

- Large temperature increases and high temperature range
- Marginal electrical energy consumption
- Breakthrough energy efficiency increases
- Built with standard components
- Highly scaleable → multiple MW range

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