



Carbon Neutral Industrial Energy from Waste Heat

Workshop warmtepompen
Ijmuiden, 2018-10-02



ABOUT QPINCH

QPINCH

COMMERCIALISATION OF AN INNOVATIVE HEAT TRANSFORMER

2012

*founding by Wouter Ducheyne

2015

*start of 0.1 MW prototype system

2016

*TRL 7 attained
*start of commercialisation

2017

*detailed engineering of first >1 MW installation

2018

*multiple engineering projects, multiple clients

2019

*commissioning of first >1 MW installations

2016 team



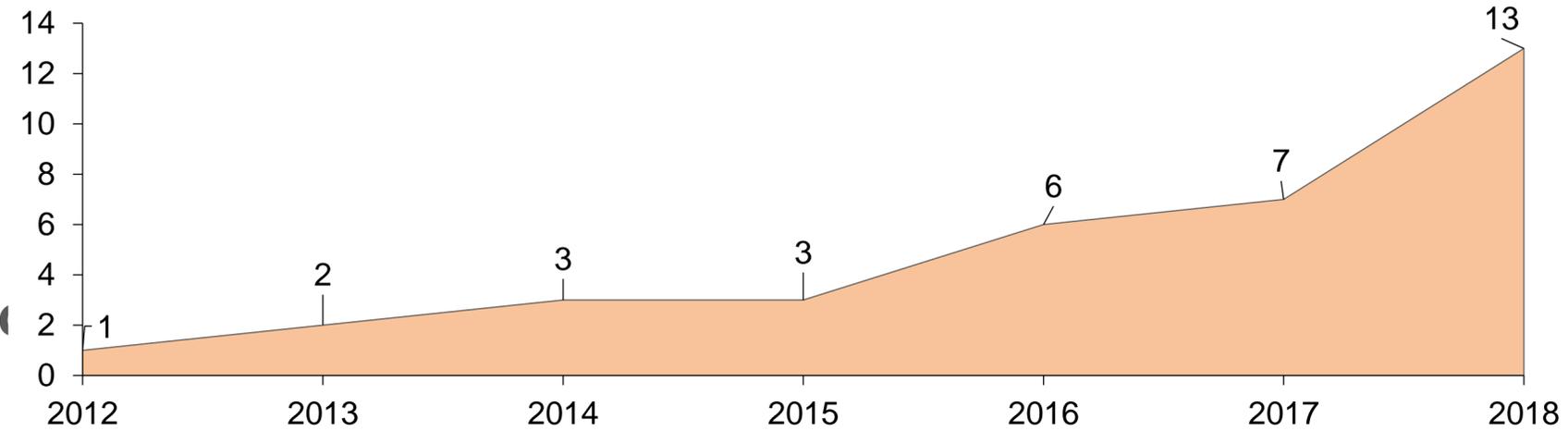
QPINCH

CURRENT TEAM

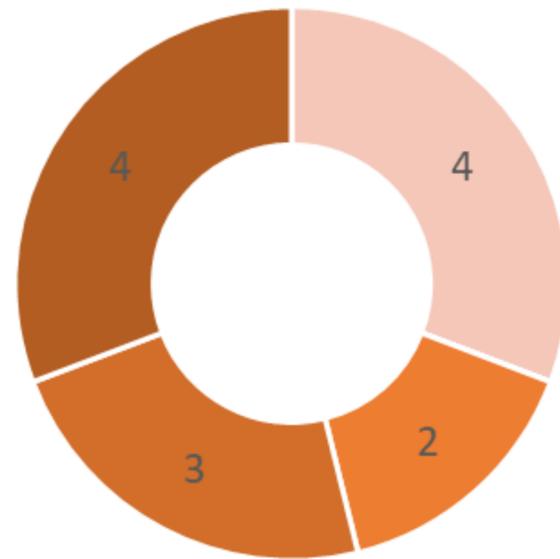
DIVERSITY

- 11 belgian, 1 italian, 1 dutch
- 11 male, 2 female
- 8 engineers, 2 lawyers, 1 finance, 1 sales, 1 support

PEOPLE EMPLOYED



PROFESSIONAL EXPERIENCE



■ 0 to 3 ■ 3 to 5 ■ 5 to 10 ■ 10 to 20 ■ >20

ENGINEERING

- 3 process engineers
- 1 mechanical engineer
- 2 project managers
- 1 E&I engineer
- 1 process expert



QPINCH

BERND VAN DEN BOSSCHE

PROFESSIONAL EXPERIENCE

2018-now Process engineer



Q P I N C H

2017-2018 Sales engineer water treatment



EDUCATION

2011-2017 Bio-engineer



2015 Environmental engineer

Technical University of Denmark



TECHNOLOGY INTRODUCTION

PRIMARY ENERGY SUPPLY IN INDUSTRY

EVOLUTION



<1850

biofuels, peat, wind

1900

Coal

<1980

Oil

NOW

Gas

FUTURE

Mix

~0 g CO2/kWh th

350 g CO2/kWh th

250 g CO2/kWh th

200 g CO2/kWh th

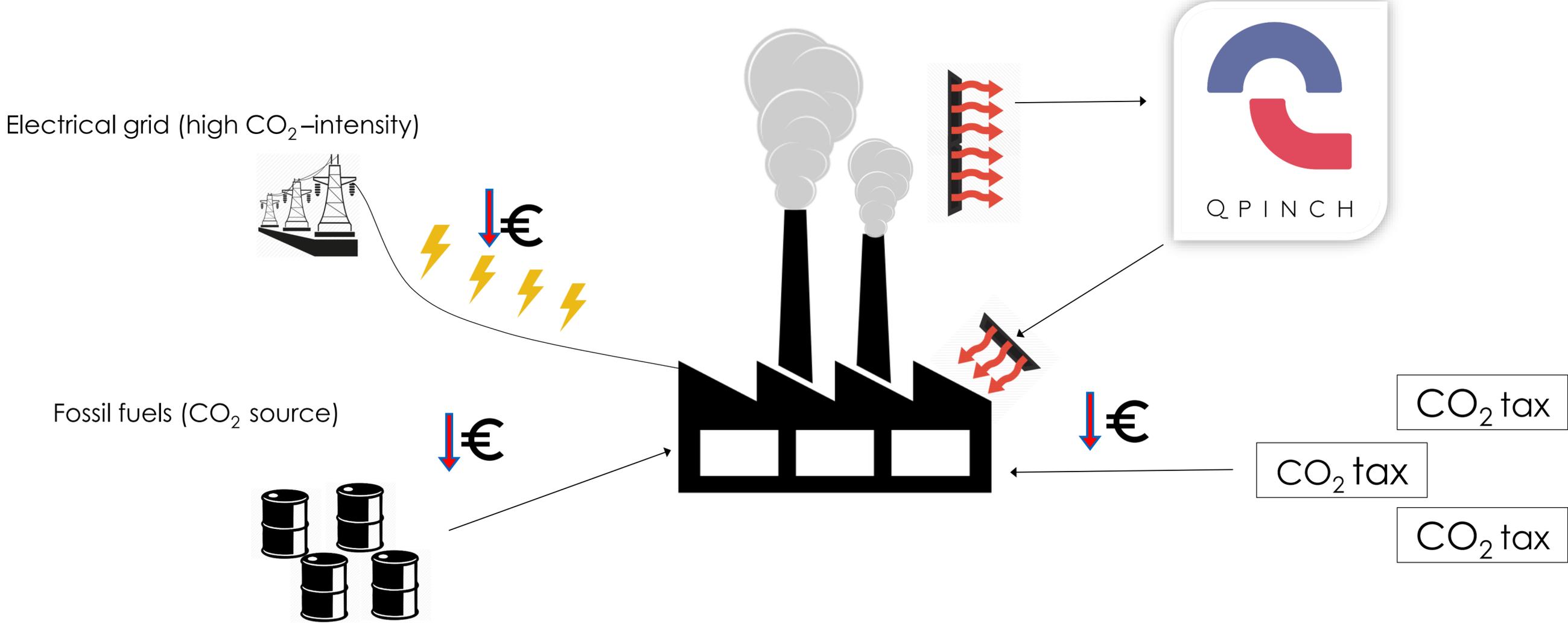
~0 g CO2/kWh th ?



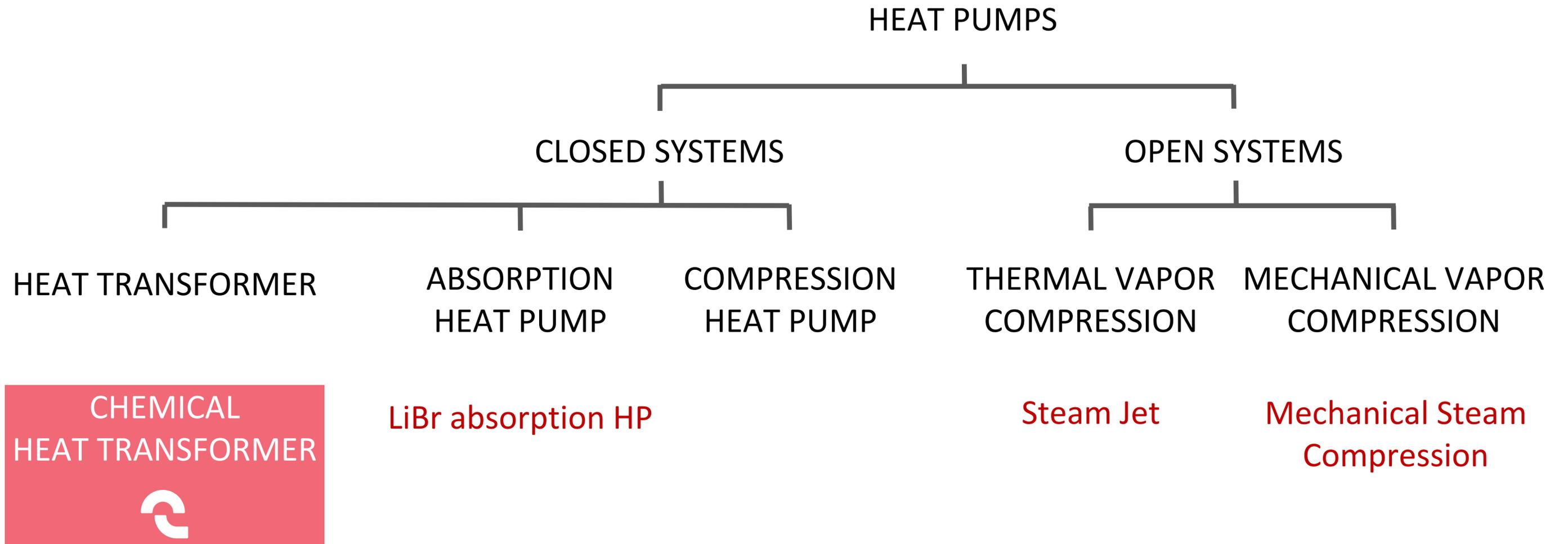
**WE GENERATE PROCESS HEAT
FROM WASTE HEAT**



QPINCH AND YOUR PROFITABILITY

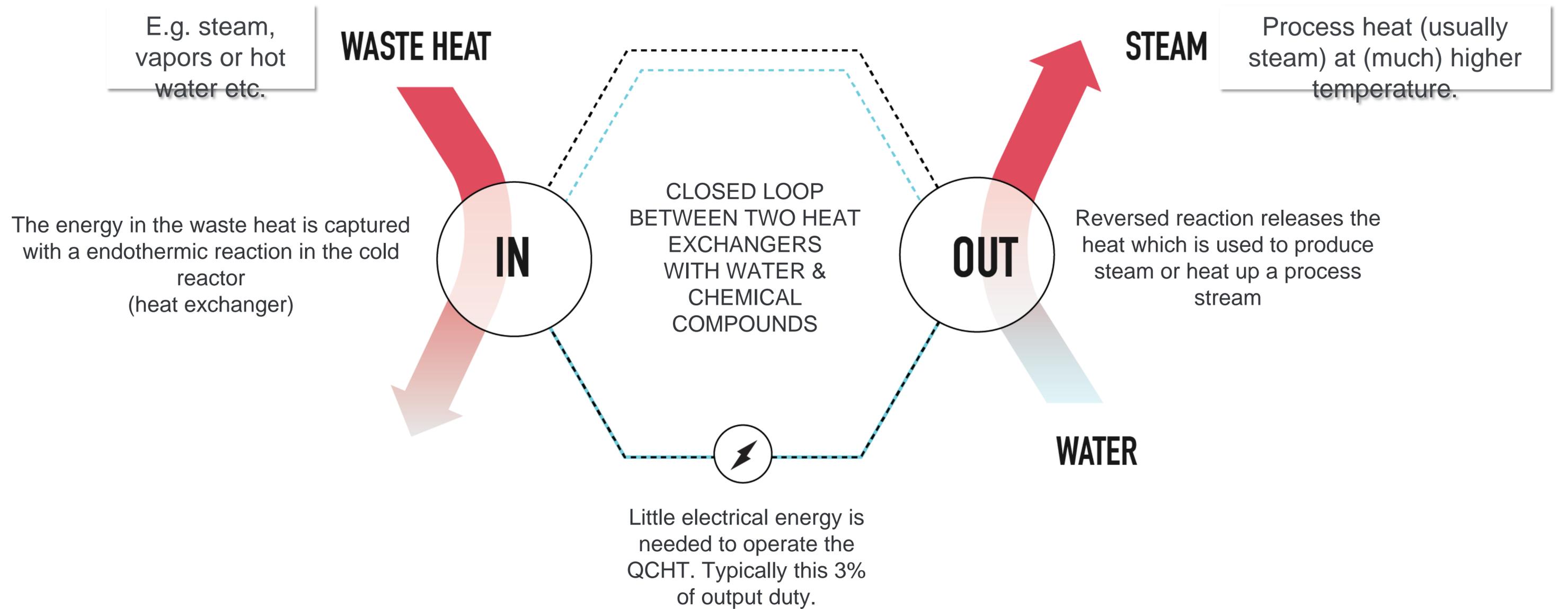


HEAT RECOVERY TECHNOLOGY LANDSCAPE



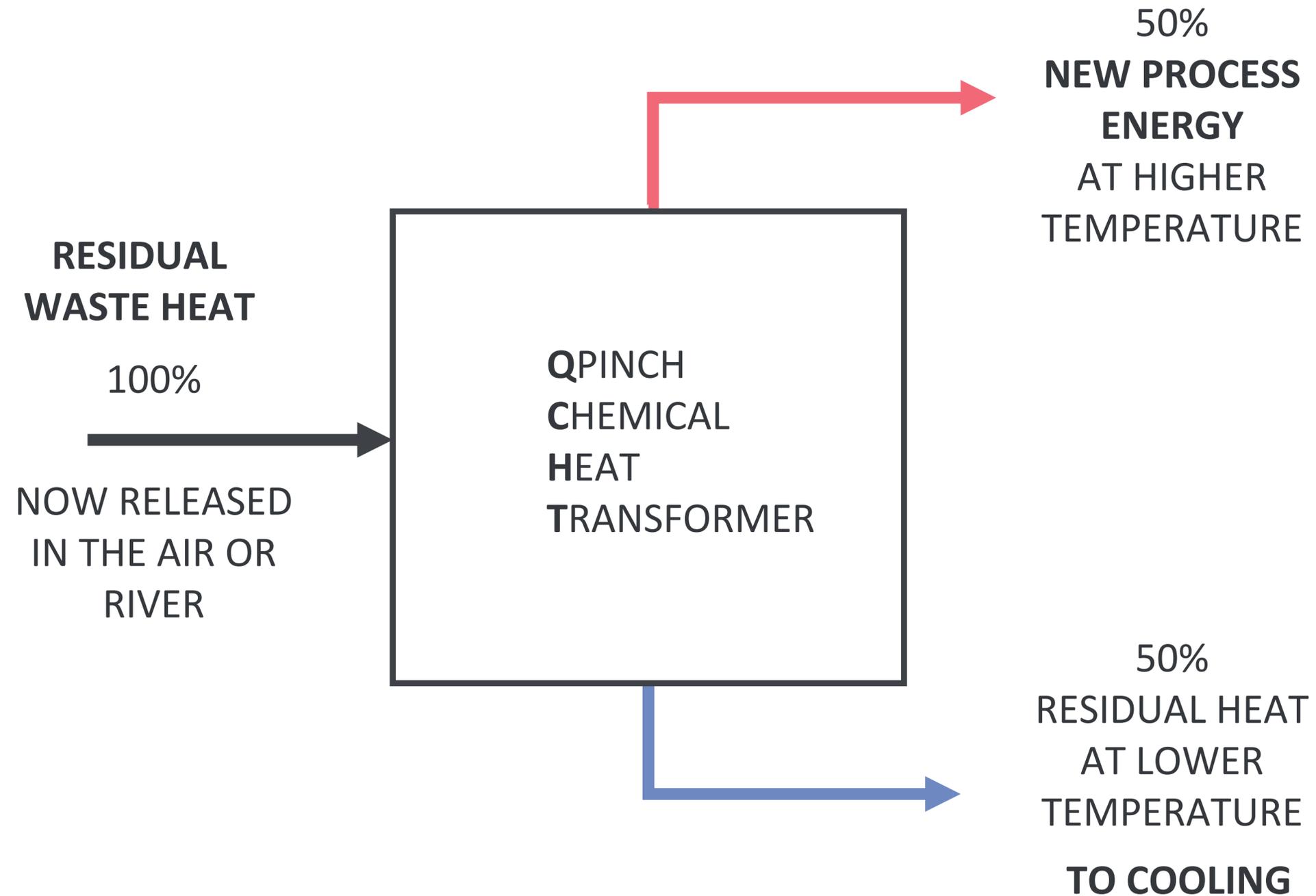
QPINCH CHEMICAL HEAT TRANSFORMER

HOW IT WORKS



QPINCH CHEMICAL HEAT TRANSFORMER

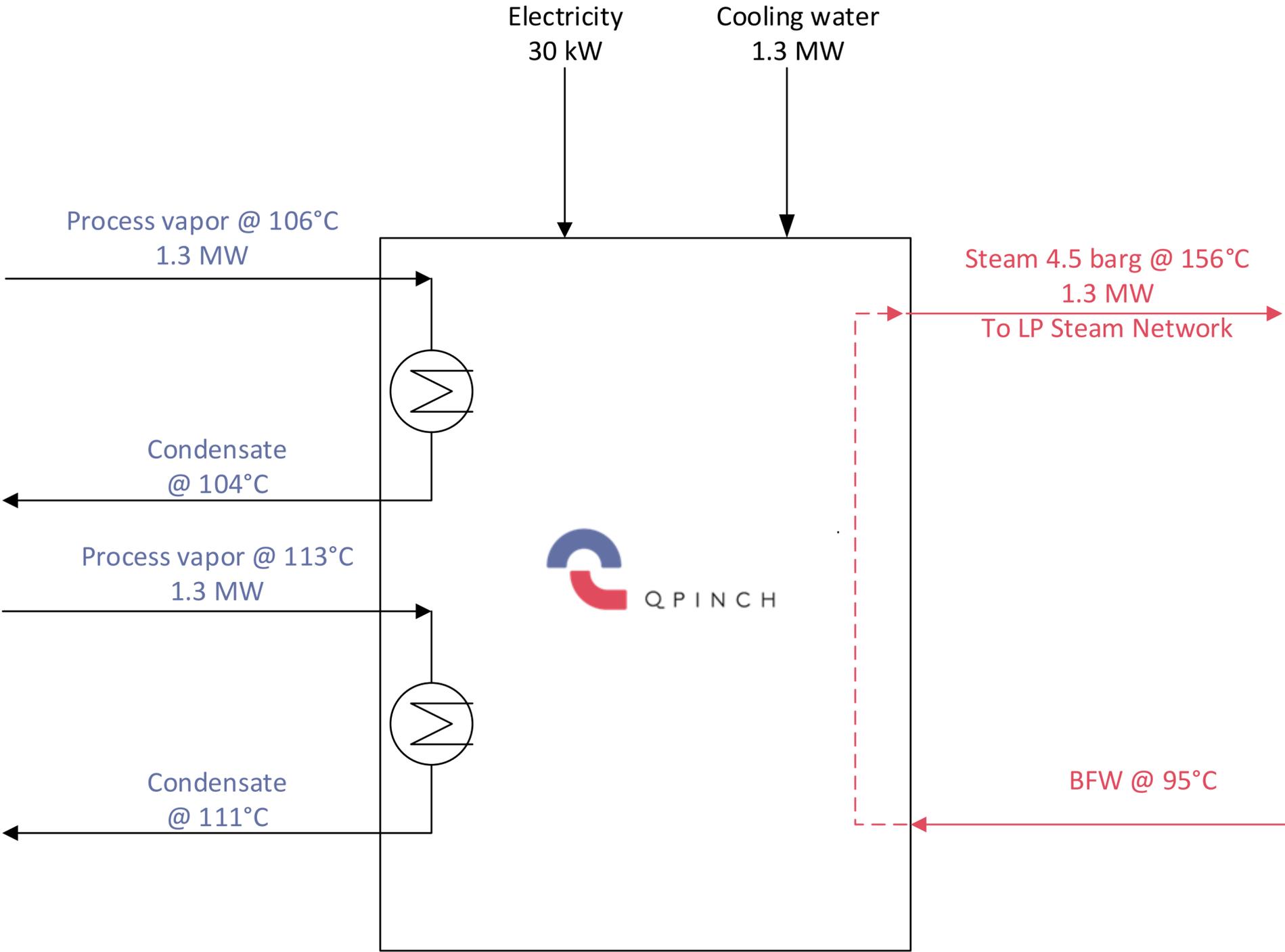
THERMODYNAMICS



BUSINESS CASE
COMPLETION BY Q4 2019

BUSINESS CASE

OVERVIEW



BUSINESS CASE

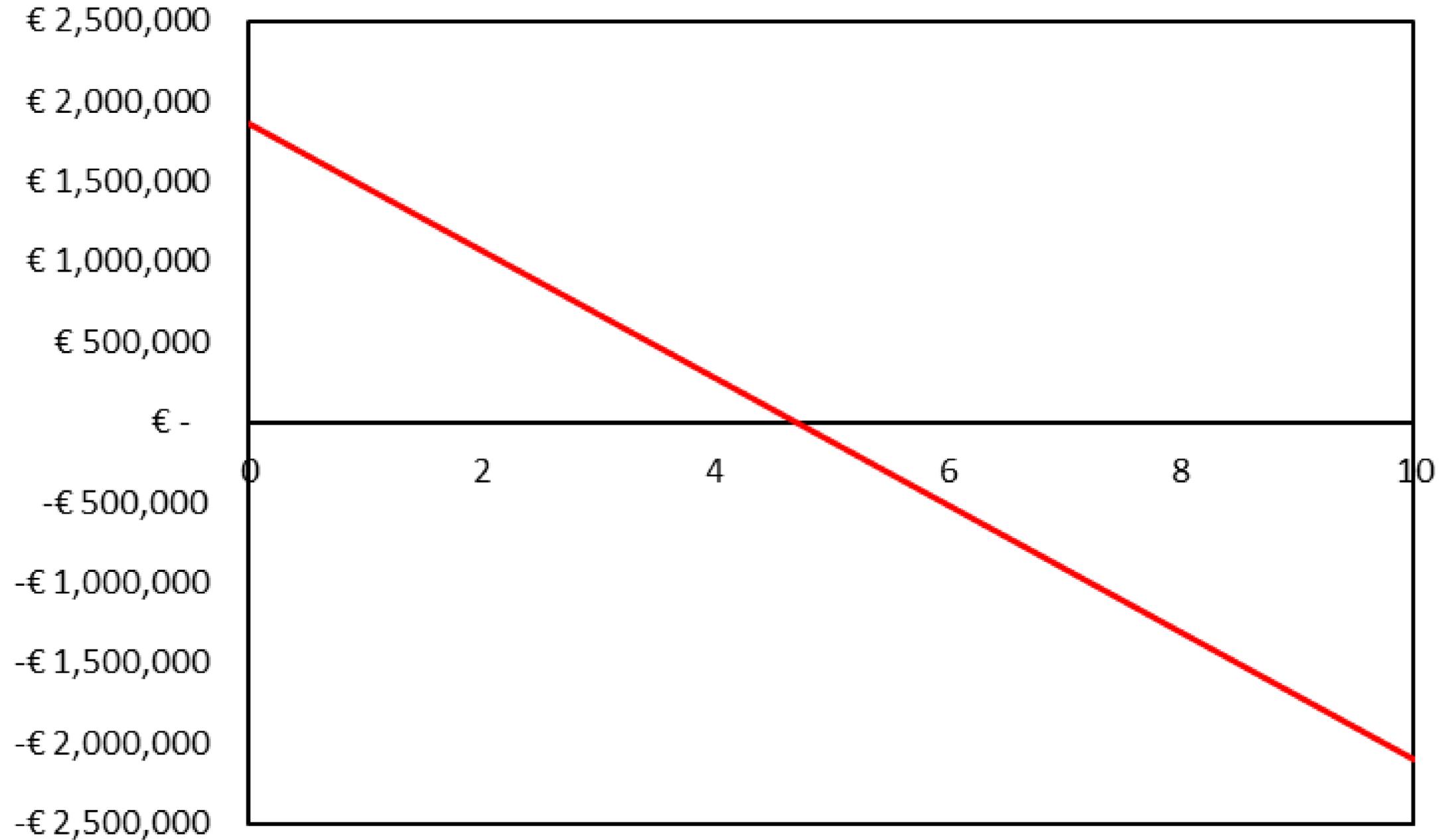
GAIN

- **GAIN:** 1.3 MW thermal energy or 2 ton/h steam at 156 °C
 - = 1.6 MW internal fuel consumption saved
(90% boiler eff. and 10 % flue gas cond. losses)
 - = 360 k€/y saved net
(8300 hr/y operation, €25/MWh thermal energy, €55/MWh electrical, €15/ton CO₂)
 - = 2600 tons CO₂/year saved compared to natural gas combustion
 - + Cooling duty reduced by 50 % !
- **OPEX:** 30 kW electrical energy (financial loss already included in 360 k€)



BUSINESS CASE

TOTAL COST OF OWNERSHIP



WHY DO THEY CHOOSE QPINCH ?

QPINCH CHEMICAL HEAT TRANSFORMER

UNIQUE SELLING POINTS

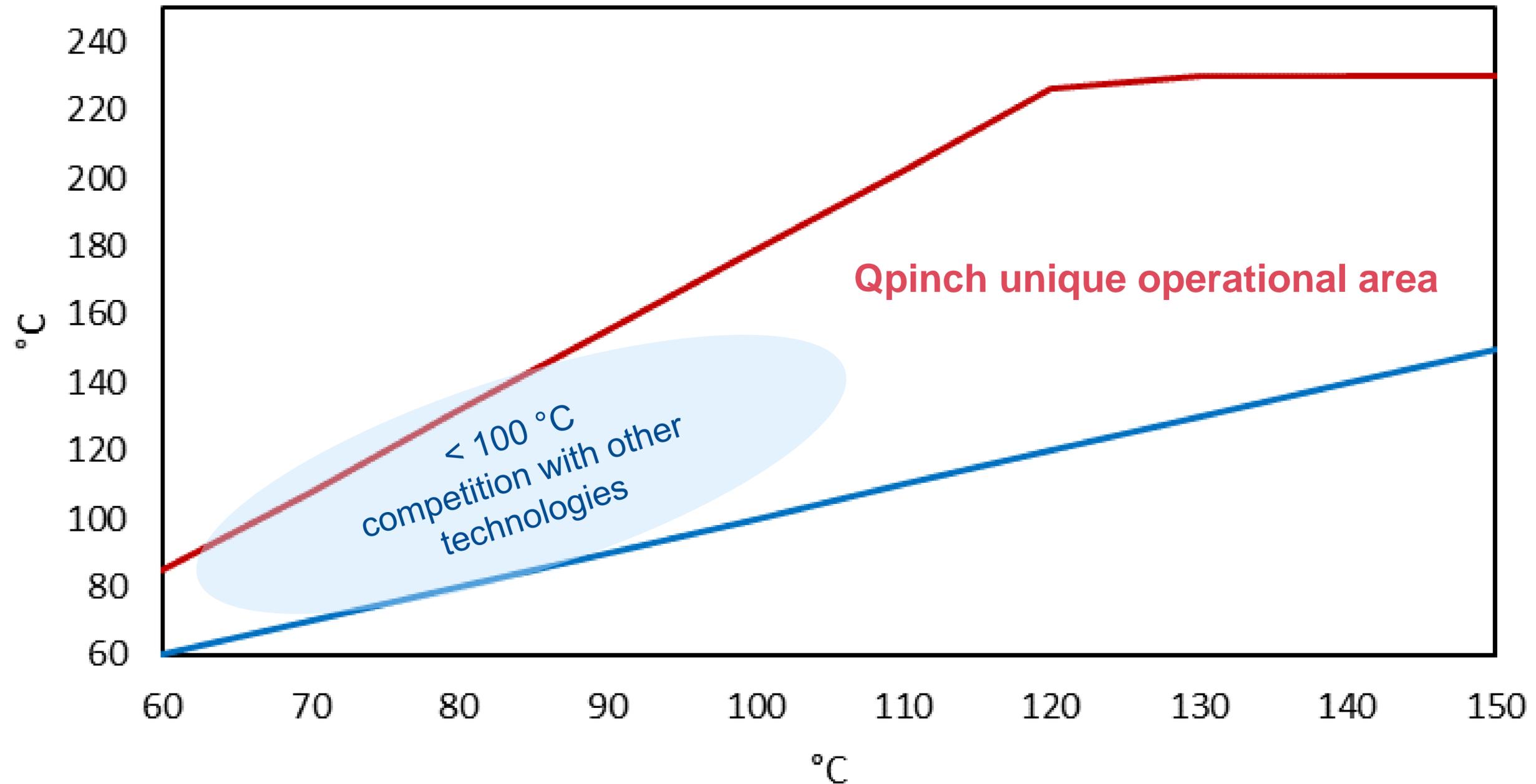
- **BIGGEST CO2 REDUCTION PER MW OUTPUT** of all commercially available tech
- **BIGGEST TEMPERATURE LIFT** between waste heat and output heat
- **LOWEST OPERATIONAL COST** of all commercially available tech
- **SCALABLE**
from 2 MW up to 100+ MW
- **FLEXIBLE WITH TURNDOWN RATES CLOSE TO 0 %**



QPINCH CHEMICAL HEAT TRANSFORMER

CURRENT STATE OF TECHNOLOGY

— heat sink temperature — waste heat temperature



QPINCH CHEMICAL HEAT TRANSFORMER

LIMITS

- **ECONOMICS REQUIRE A WASTE HEAT AVAILABILITY OF >4 MW, >7500 h/y**
- **TEMPERATURE LIFT SHOULD BE >10 °C**
- **CANNOT BE USED FOR COOLING, though yes for cooling demand reduction**
- **MAX. OUTPUT TEMPERATURE = 230 °C for the current generation**





Q P I N C H

redefining industrial carbon emission

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