



# Fast-track Energy Reduction through $\geq 95\%$ Fired Heater Efficiency

Sulzer 95+™ Heater Technology

An abstract, flowing graphic in the lower half of the slide, composed of overlapping, translucent shapes in shades of blue, purple, pink, and yellow, creating a sense of movement and energy.

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Sulzer Chemtech

**TNChE, June 9-11, 2026**

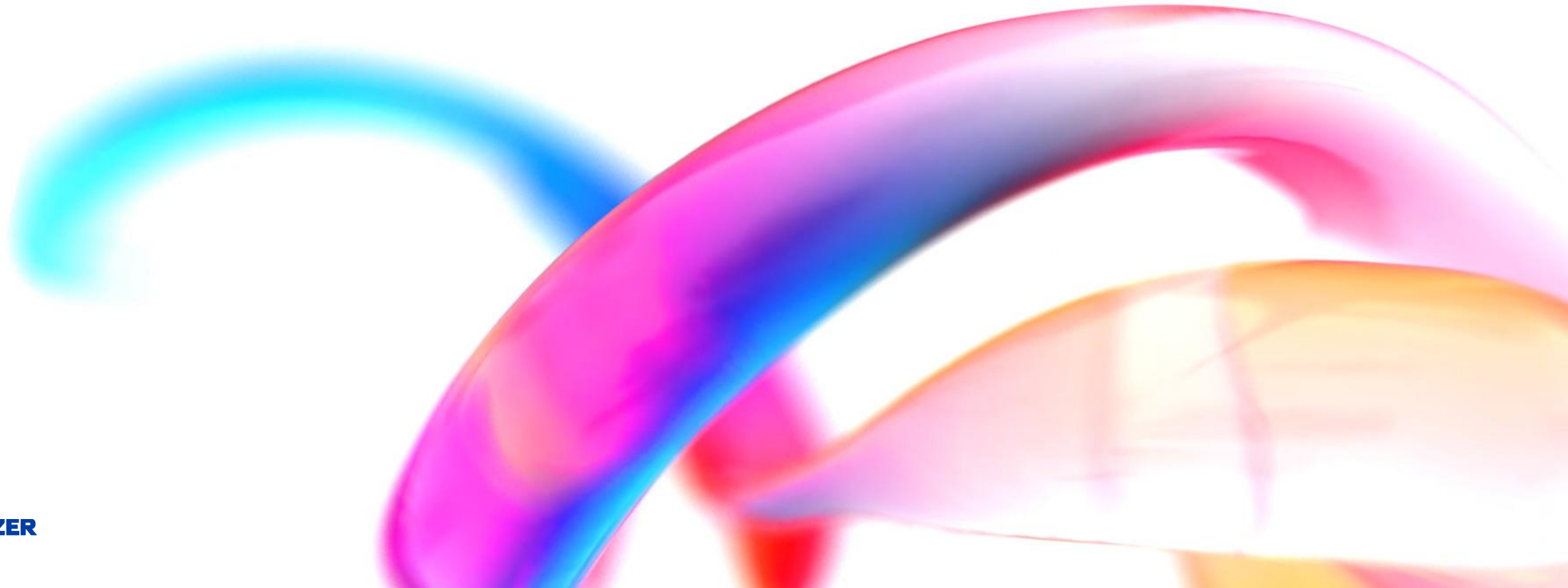
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# Global and agile

At your service since 1834

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3.6

Billion revenue  
(CHF) 2025

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13'500

Employees

---

30

Production  
locations

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130

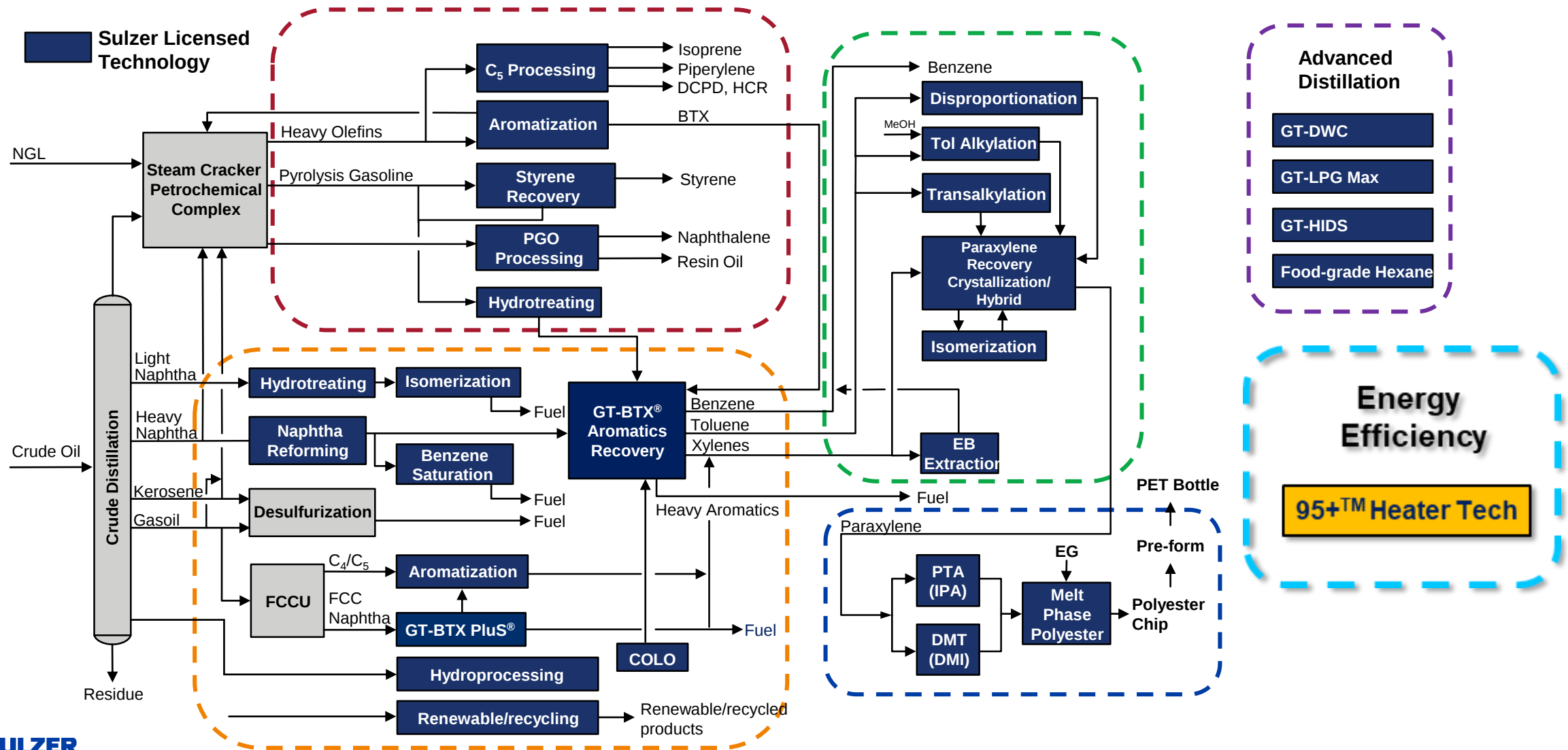
Service centers

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45

Countries with  
Sulzer presence

# Partial technology map



# Why 95+™ Heater Technology is Important?

*Energy and CO2 reduction is an ever-lasting requirement in the industry  
but*

*Is decarbonization project profitable ???*

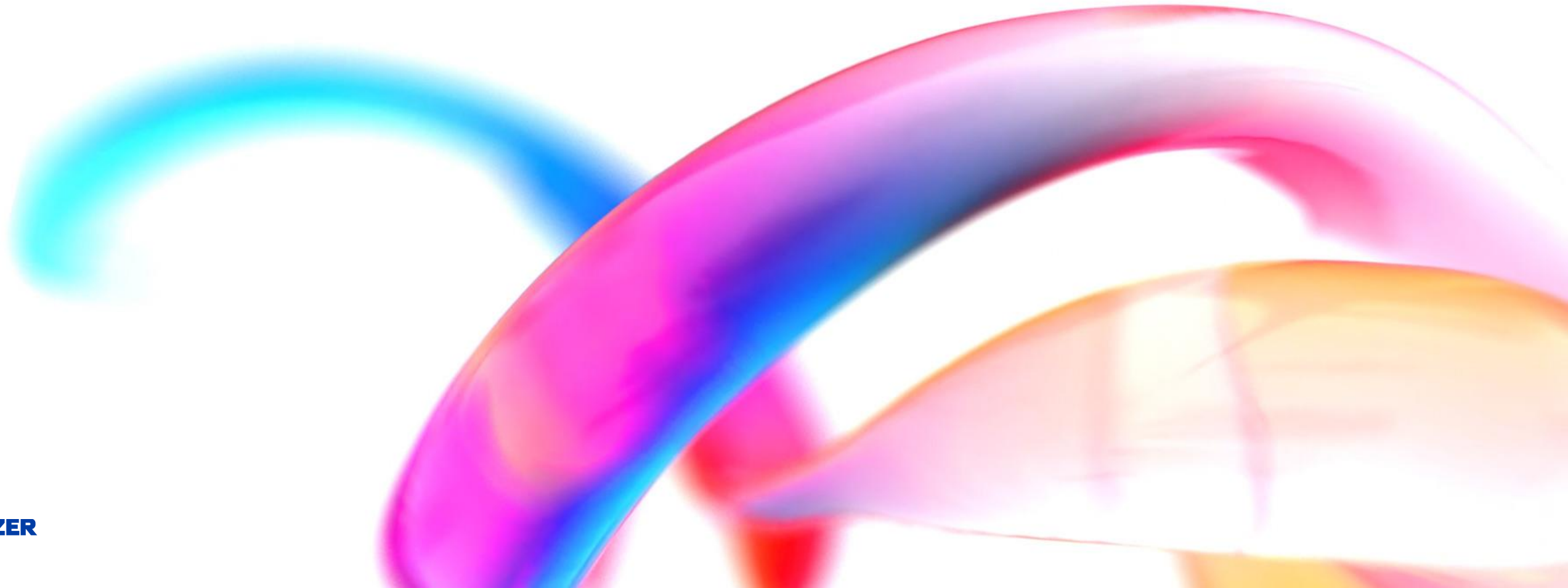
**95+ Heater Technology is a decarbonization project with  
excellent economical return**

# 95+ Technology Applied on Fired Heaters / Furnaces to Achieve –

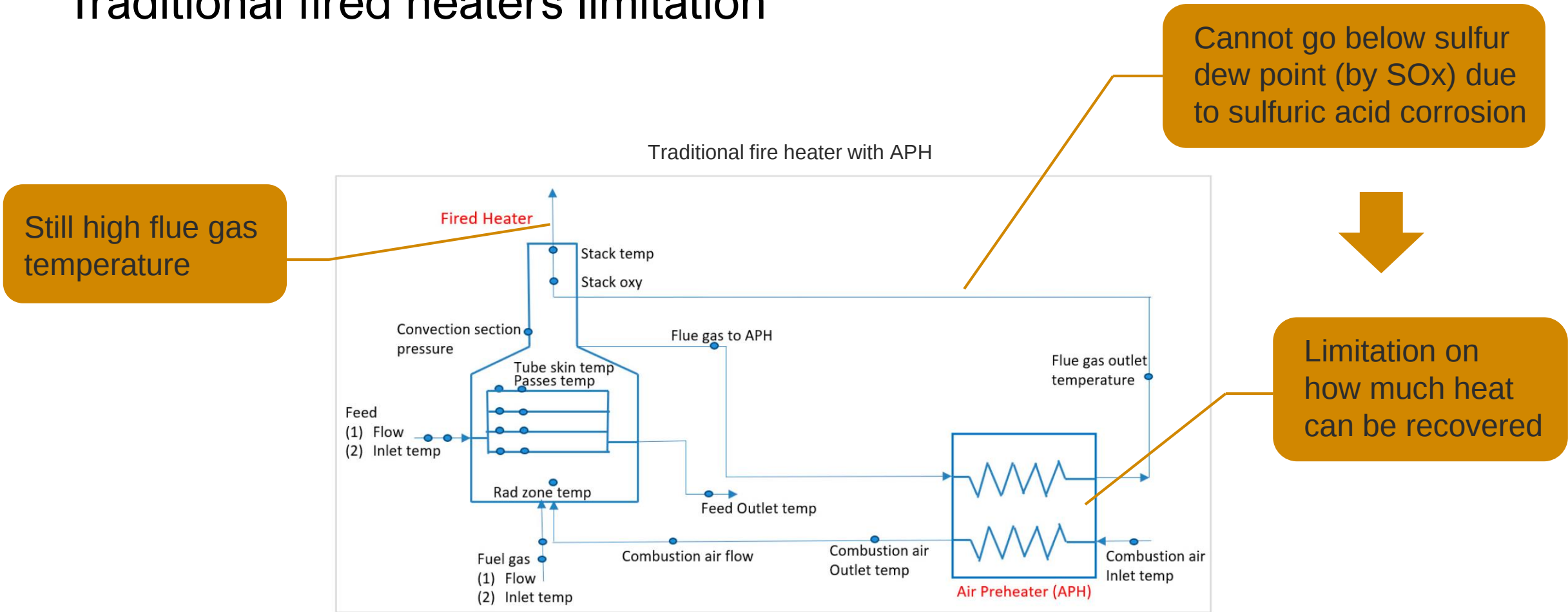
- Unbeatable thermal efficiency of 95% or higher
- Reducing energy (i.e. fuel) consumption, therefore reducing OPEX and increasing profitability
- Reducing CO<sub>2</sub> emission to achieve intermediate decarbonization goal
- Reducing SO<sub>x</sub> and NO<sub>x</sub> emission for the tightest environmental regulation



# How the 95+™ Heater Technology Works?



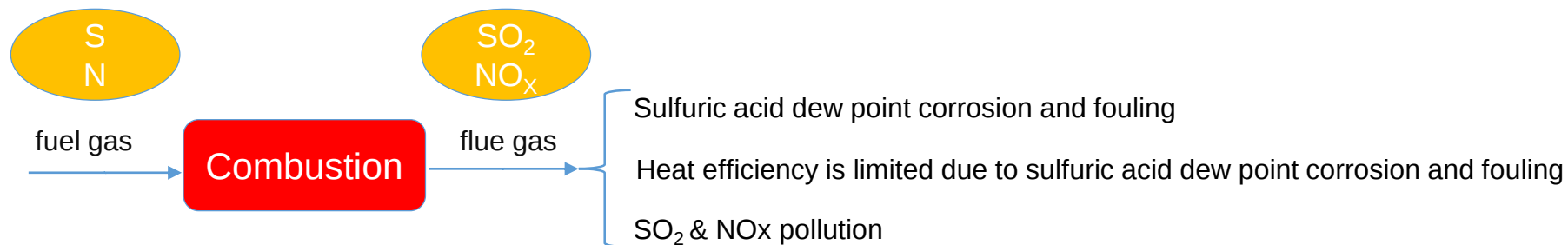
# Traditional fired heaters limitation



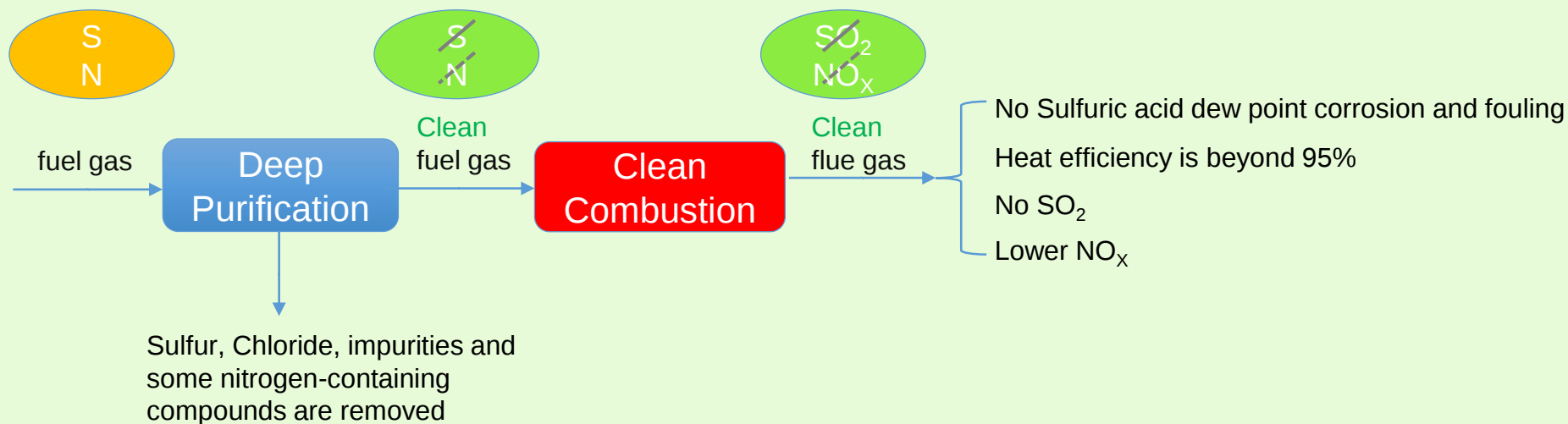
Heating efficiency is capped at max. 89%-92% even with APH or steam generation

# Solution by 95+ Heater Technology

## Traditional:

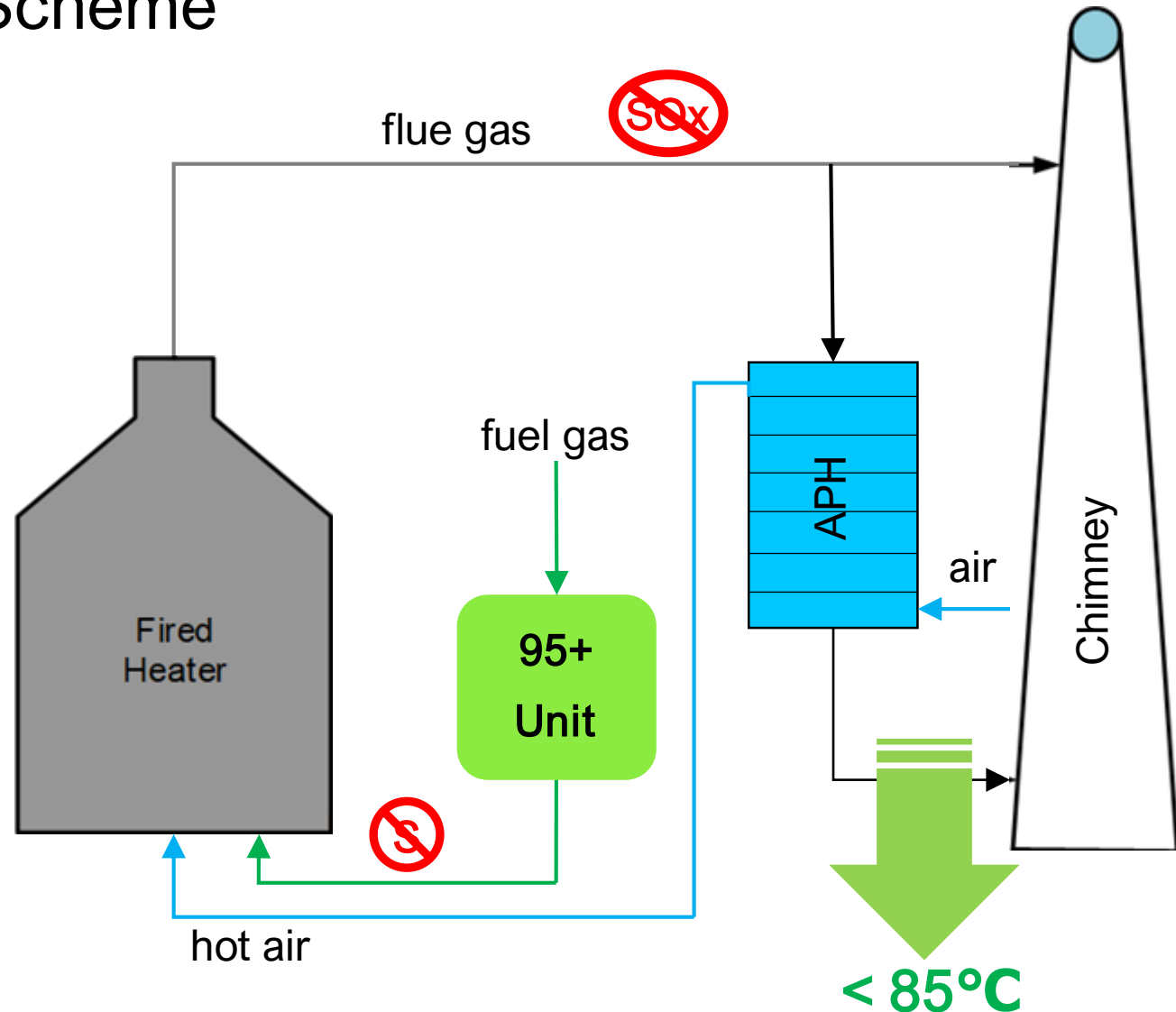


## 95+ Technology:



# 95+ Heater Technology Scheme

- 95% thermal efficiency (85°C) or even better
- Patented process
- Drop-in solution to any fired heater / furnace that burns fuel gas
- Guaranteed efficiency
- No special material
- No risk for any corrosion or fouling



# 95+ Heater Technology vs. Special-material (polymer/glass) APH

|                                 | Special-material APH                                       | 95+ Technology                   |
|---------------------------------|------------------------------------------------------------|----------------------------------|
| SOx in flue gas                 | No reduction                                               | Eliminated                       |
| Sulfur dew point                | Still exist, same dew point                                | No longer exist                  |
| Heat transfer efficiency        | Affected by polymer                                        | Not affected                     |
| Equipment integrity requirement | Very high                                                  | Standard                         |
| Acidic wastewater               | Yes, need to be neutralized and treated by wastewater unit | No need for wastewater treatment |
| Potential fouling by sulfur     | Yes                                                        | No                               |

# 95+ Heater Technology Improvement over Traditional Heater

| Item                                       | Traditional Heater                                                                                                 | 95+ Heater                                                                                                                                                   | Note                            |
|--------------------------------------------|--------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|
| Heat efficiency                            | < 89%-92%                                                                                                          | ≥ 95%                                                                                                                                                        |                                 |
| Flue gas temperature                       | >> 120°C ( > 180°C )                                                                                               | ≤ 85°C                                                                                                                                                       |                                 |
| Flue gas emission                          | NO <sub>x</sub> : 40~80 mg/m <sup>3</sup><br>SO <sub>2</sub> : 10~50 mg/m <sup>3</sup>                             | NO <sub>x</sub> : 30~50 mg/m <sup>3</sup><br>SO <sub>2</sub> : Near zero emission                                                                            |                                 |
| Corrosion and Fouling<br>Long Term Running | Unable to avoid sulfuric acid dew point corrosion and fouling, causing inability to run for a long period of time. | No sulfuric acid dew point corrosion, no fouling, no special material<br>Can run for a long period of time with deep energy recovery and 80-85°C of flue gas | With Waste Heat Recovery System |
| Maintenances                               | Need a lot maintenances for air preheaters, draft fan and duct (replacement) due to corrosion and fouling.         | Almost no maintenance because the whole system is operated under no corrosion and fouling.                                                                   |                                 |

\* Project implementation duration from design to start-up could be as short as one year.

# 95+™ Heater Technology is Proven by Many Commercial References

Refinery & Petrochemical Plant

# 95+ Heater Technology Applications

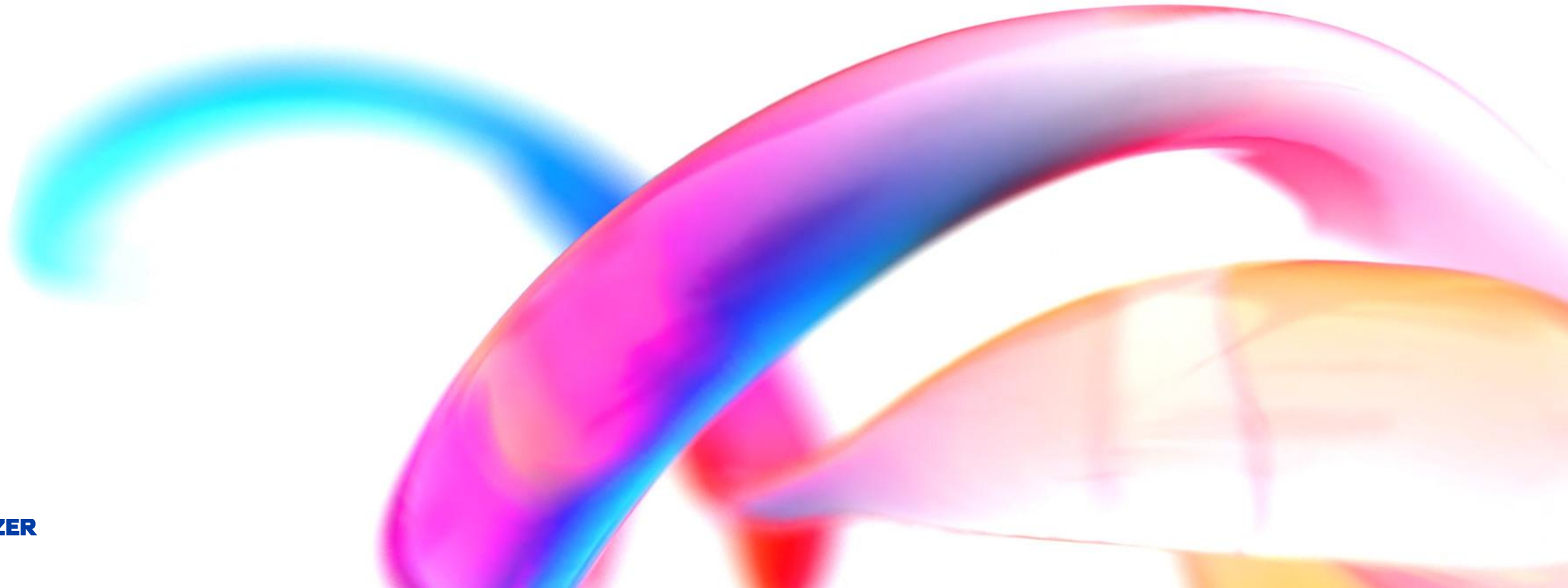
Applicable to all types of fuel gas fired heaters to improve heating efficiency to  $\geq 95\%$ .

-  Reforming heater
-  CDU/VDU heater
-  Naphtha Splitter and Xyl column heater
-  Coker heater
-  Hydrotreating heater
-  Some chemical heaters



**More than 25 successful operating references**

# Case Studies



# 95+ Heater Technology Selected Reference – 1 (grassroot)



Refinery H CDU Heater

| Heater          | CDU/VDU heater (5 MTA CDU) |
|-----------------|----------------------------|
| Heater load     | 56 MW                      |
| Heater type     | Box-type heater            |
| Heat efficiency | 95%                        |
| Start up        | Feb. 2016                  |

## 95+ Heater Technology Selected Reference – 2 (revamp)



Refinery C

| Heater           | Reforming heater (1.4 MTA CCR)     |
|------------------|------------------------------------|
| Heater load      | 134 MW                             |
| Heater type      | Box-type heater, side firing       |
| Heat efficiency  | Increased from 92% to 95%          |
| Start up         | Apr. 2019                          |
| Fuel gas saved   | 8,400 ton/year                     |
| Payback period   | < 2 years (by saving of fuel cost) |
| Carbon reduction | 11,500 ton/year                    |

# 95+ Heater Technology Selected Reference – 3 (revamp)



Refinery N

| Heater           | Reforming heater (3 MTA CCR)                 |
|------------------|----------------------------------------------|
| Heater load      | 220 MW                                       |
| Heater type      | Box-type heater, side firing                 |
| Heat efficiency  | Increased from 91.5% to 95%                  |
| Start up         | Apr. 2021                                    |
| Fuel gas saved   | 16,000*10 <sup>3</sup> Nm <sup>3</sup> /year |
| Payback period   | < 1.5 years (by saving of fuel cost)         |
| Carbon reduction | 30,000 ton/year                              |

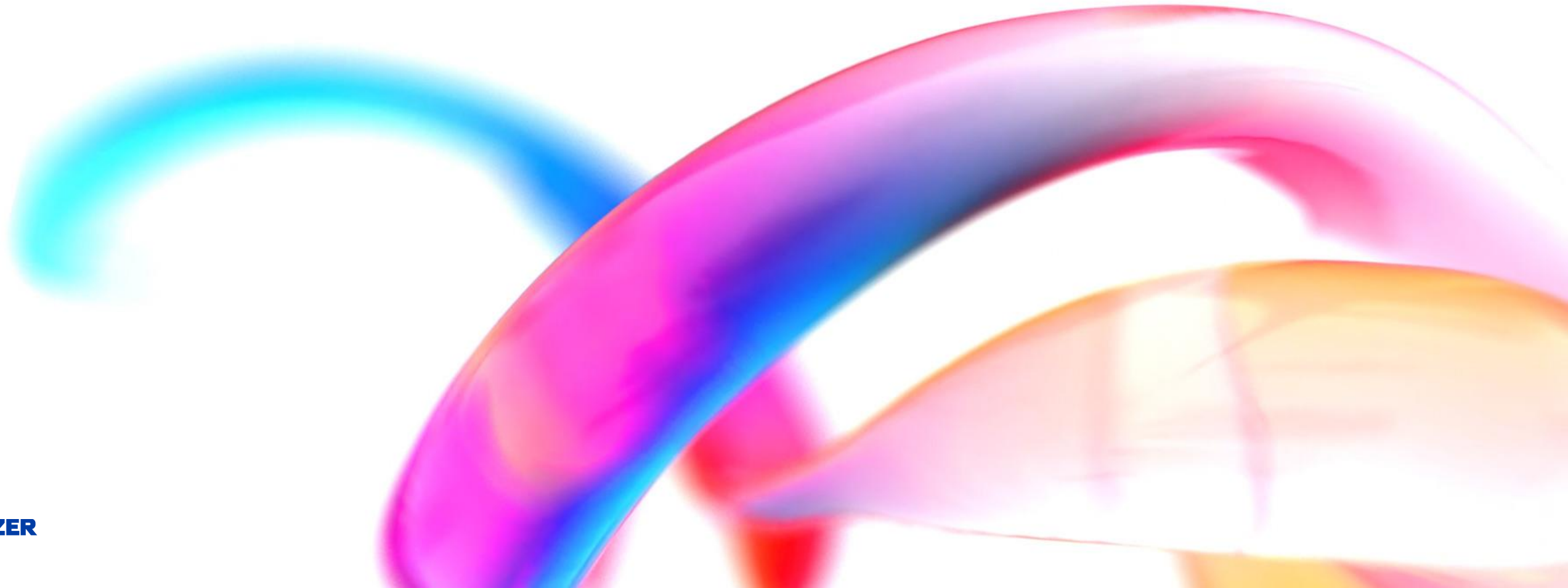
# 95+ Heater Technology Selected Reference – 4 (revamp)



Refinery P

| Heater           | CDU heater (3.7 MTA CDU)       |
|------------------|--------------------------------|
| Heater load      | 33 MW                          |
| Heater type      | Box-type heater, bottom firing |
| Heat efficiency  | Increased from 92% to 95%      |
| Start up         | Aug. 2022                      |
| Fuel gas saved   | 1,168 ton/year                 |
| Carbon reduction | 2,172 ton/year                 |

# Technology Recap



# 95+ Heater Technology

Advanced Heater Technology offered by Sulzer Chemtech to improve your heater efficiency to  $\geq 95\%$

## High Project Return

Fast return on investment simply by saving of the fuel cost

## Decarbonization

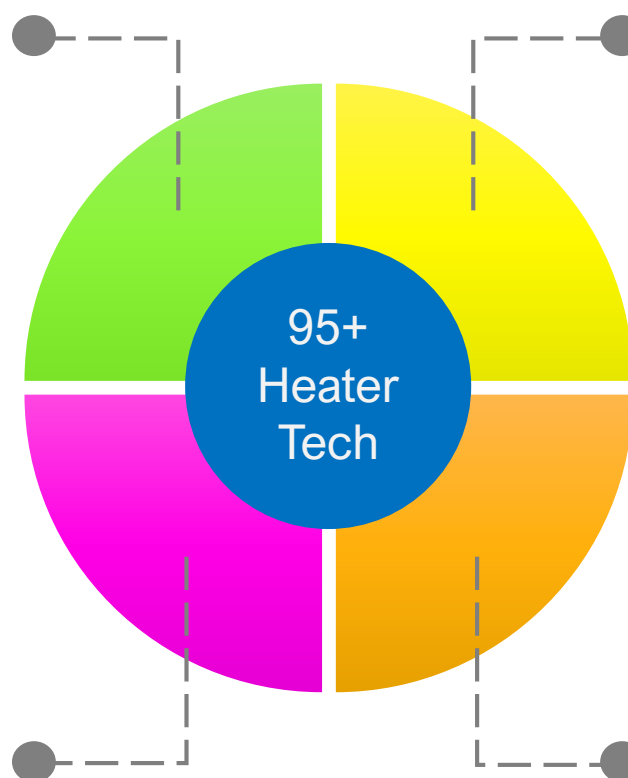
Fast & easy way to achieve decarbonization target

## Reliable Operation

No corrosion, no fouling, low maintenance

## High Quality

Reputable Sulzer products & services with numbers of successful references



Contact



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<https://www.sulzer.com/en/shared/products/sulzer-95-heater>

Thank You!

Q&A