

NEW WAY



OLD WAY



# Lime Production in Transition

From traditional shaft kilns to  
CO<sub>2</sub> capture with Maerz EcoKilns®

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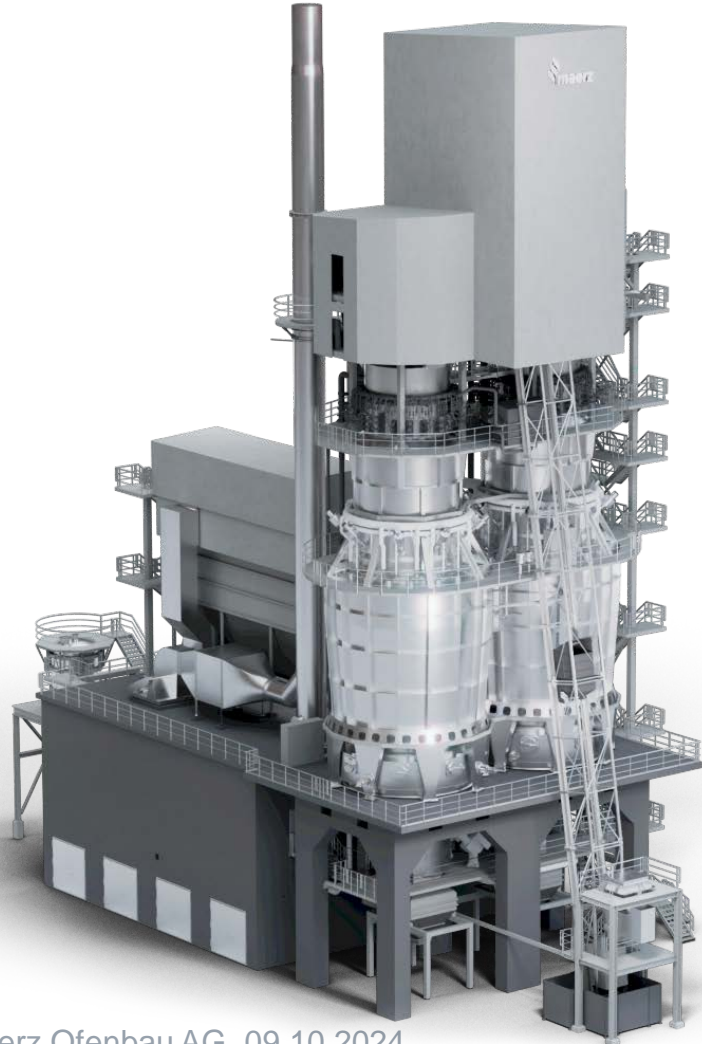




**10'000 households**



# ... consume as much natural gas as a conventional 600 t/d PFR kiln



- » Thermal heat consumption  
1'010 kWh/t lime
- » CO<sub>2</sub> mass flow in the off-gas  
590 t/d

A low-angle photograph of a large industrial plant, likely a refinery or chemical processing facility. The image shows several tall, cylindrical towers and a complex network of white pipes and blue metal scaffolding. The sky is bright blue with scattered white clouds. A prominent red banner with white text is overlaid across the middle of the image.

**Is amine scrubbing a good solution?**





**add another**

**10'000 households**



**... as these have the same natural gas consumption as an amine scrubbing plant**



» Thermal heat consumption  
990 kWh/t CO<sub>2</sub>

# Status quo Maerz PFR kiln



## Kiln

- » thermal 1010 kWh/t lime
- » electrical 40 kWh/t lime
- » CO<sub>2</sub> concentration 22.5 vol-% (dry)
- » CO<sub>2</sub> loss 0 %

## Carbon capture - amine wash<sup>1)</sup> & CPU

- » thermal 990 kWh/t CO<sub>2</sub>
- » electrical 210 kWh/t CO<sub>2</sub>
- » CO<sub>2</sub> loss 5 %



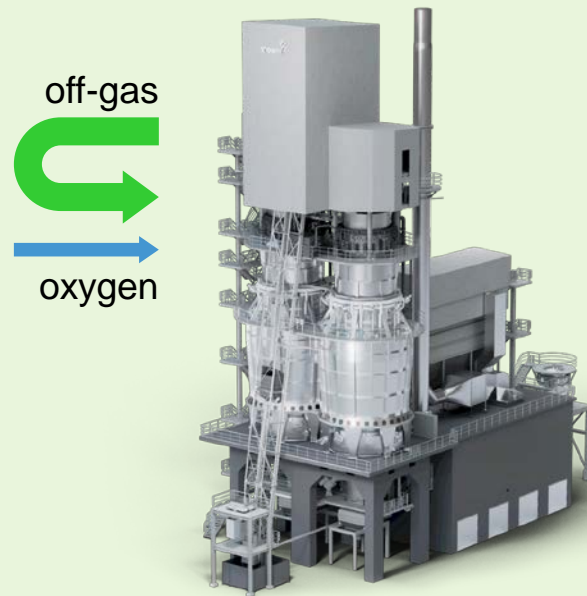


**Is there a better way?**



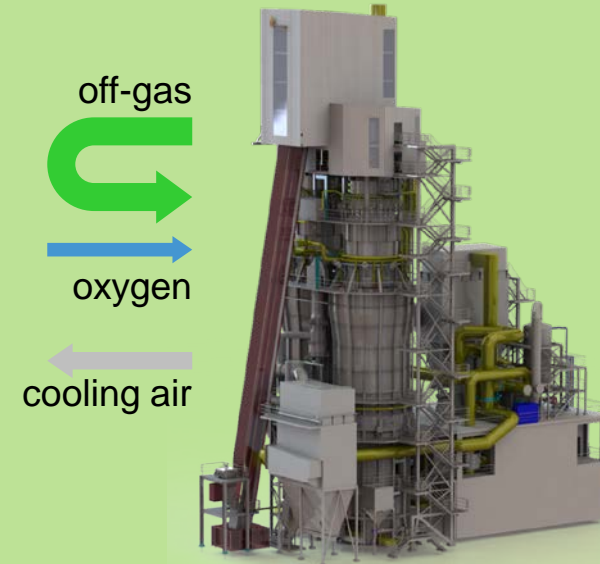
# ... absolutely – modern kilns offer high CO<sub>2</sub> concentrations in the off-gas

Maerz PFR kiln  
operating with oxyfuel



1

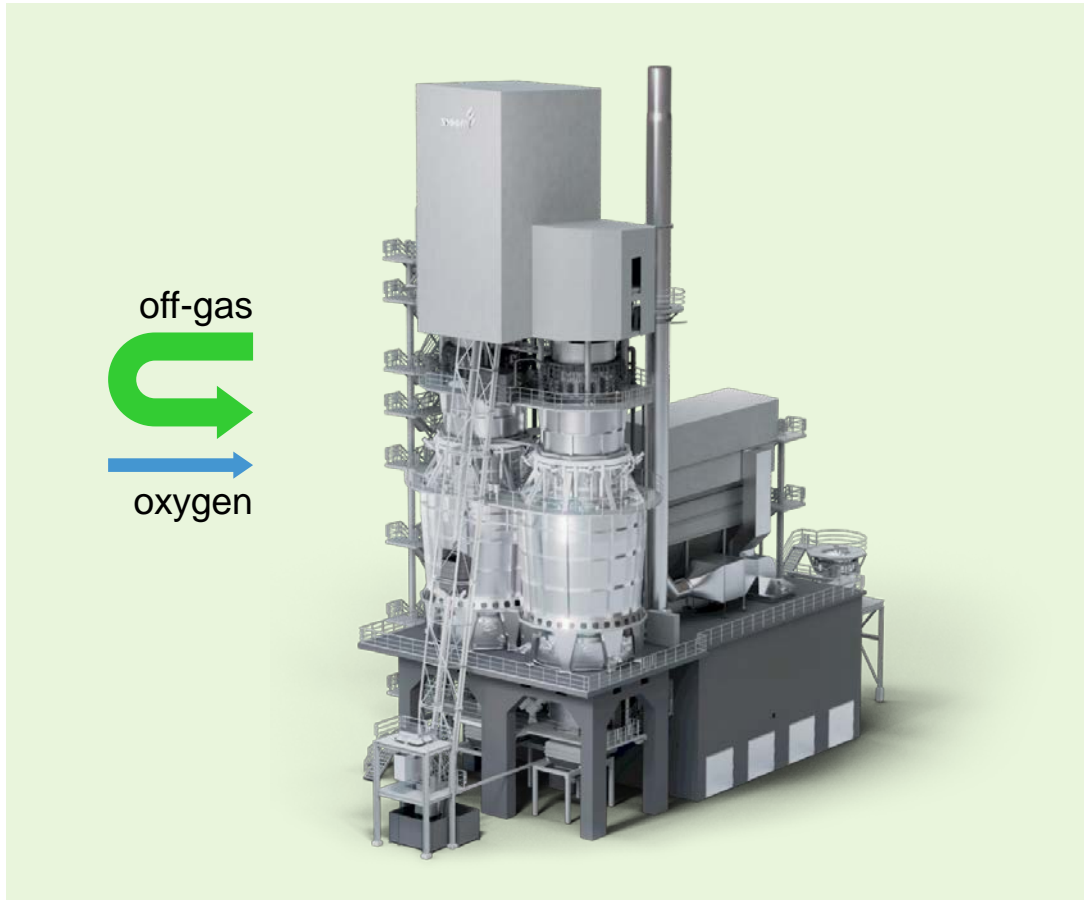
Maerz EcoKiln®  
full EcoKiln mode



2



# Case 1 Maerz PFR kiln operating with oxyfuel



## Kiln

- » thermal 990 kWh/t lime
- » CO<sub>2</sub> concentration 44 vol-% (dry)
- » CO<sub>2</sub> loss 7 %

## Oxygen production - VPSA<sup>1)</sup>

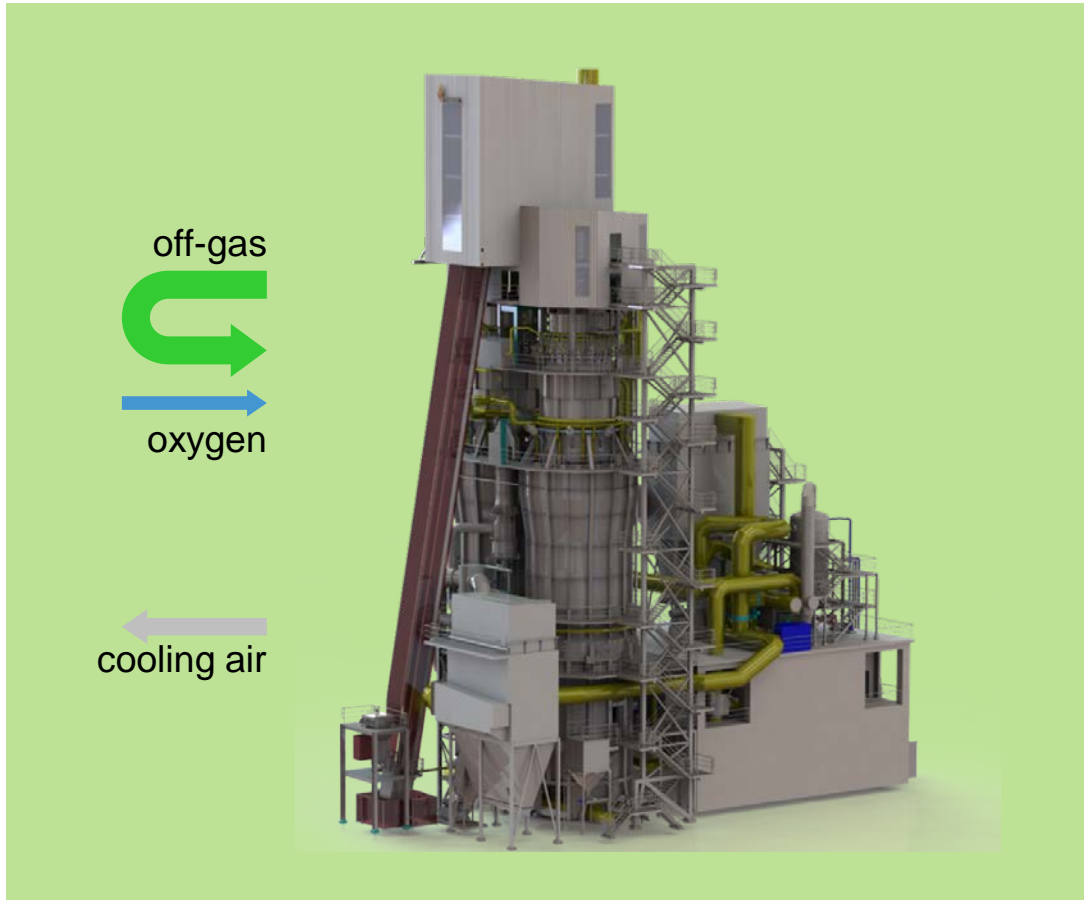
- » electrical 66 kWh/t CO<sub>2</sub>

## Carbon Capture – PSA<sup>2)</sup> & CPU

- » electrical 315 kWh/t CO<sub>2</sub>
- » CO<sub>2</sub> loss 2 %



# Case 2 Maerz EcoKiln<sup>®</sup> in full EcoKiln mode



## Kiln

- » thermal 1080 kWh/t lime
- » CO<sub>2</sub> concentration > 90 vol-% (dry)
- » CO<sub>2</sub> loss 4 %

## Oxygen production - VPSA<sup>1)</sup>

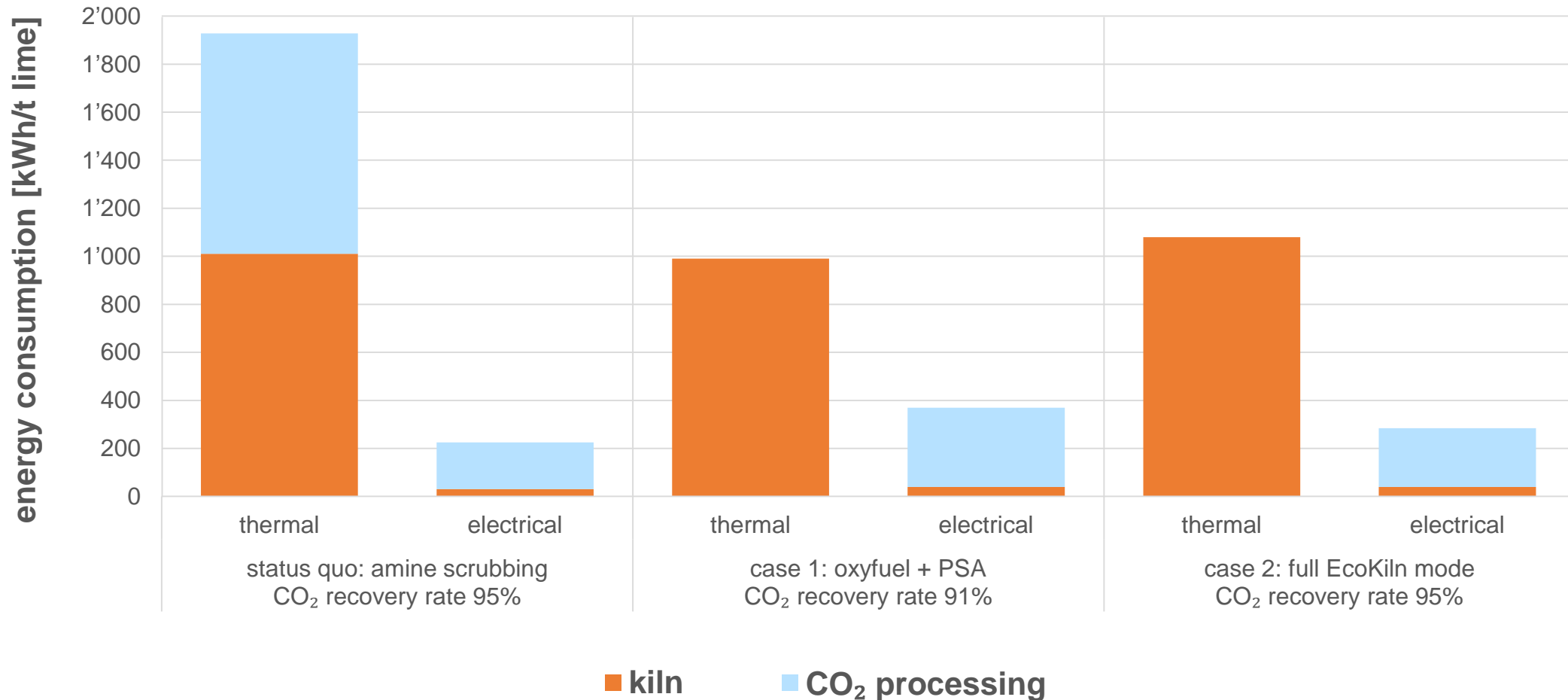
- » electrical 83 kWh/t CO<sub>2</sub>

## Carbon capture – CPU

- » electrical 175 kWh/t CO<sub>2</sub>
- » CO<sub>2</sub> loss 1 %

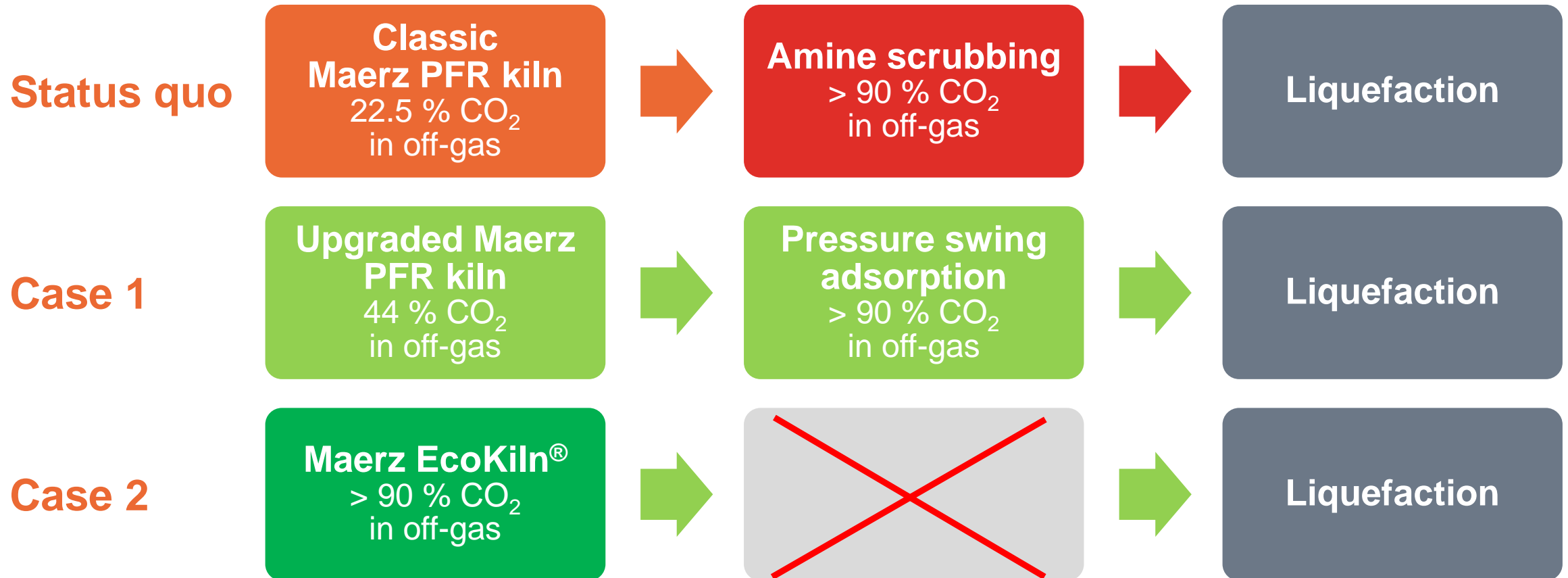


# OPEX: energy consumption and CO<sub>2</sub> recovery





# CO<sub>2</sub> process steps





# In the end, it comes down to a simple question

- >> Do we stick with conventional technology, or do we invest in a more sustainable future?
- >> Think about the 10'000 households...





**the choice is obvious**