



# e-Fuels and e-Gases

A European approach to overcome dependencies on fossil oil and gas

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Nils Aldag / Managing Director & Founder



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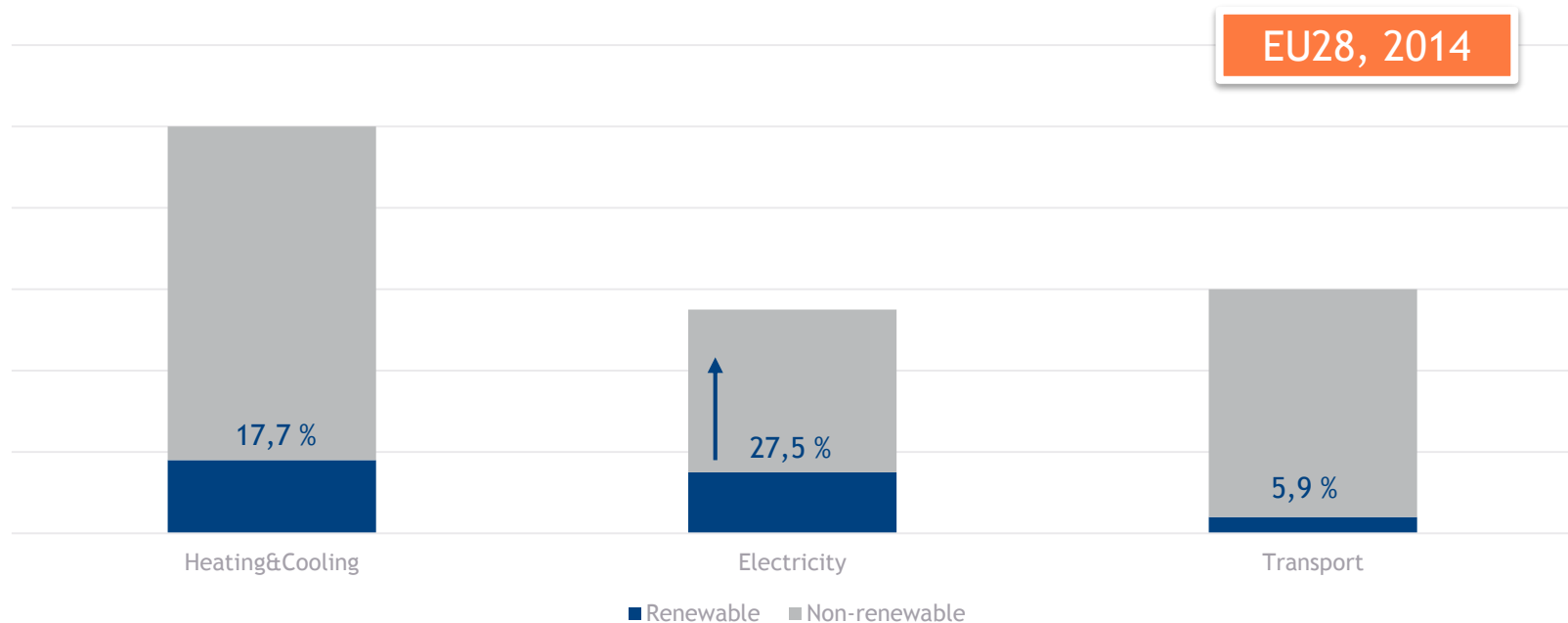
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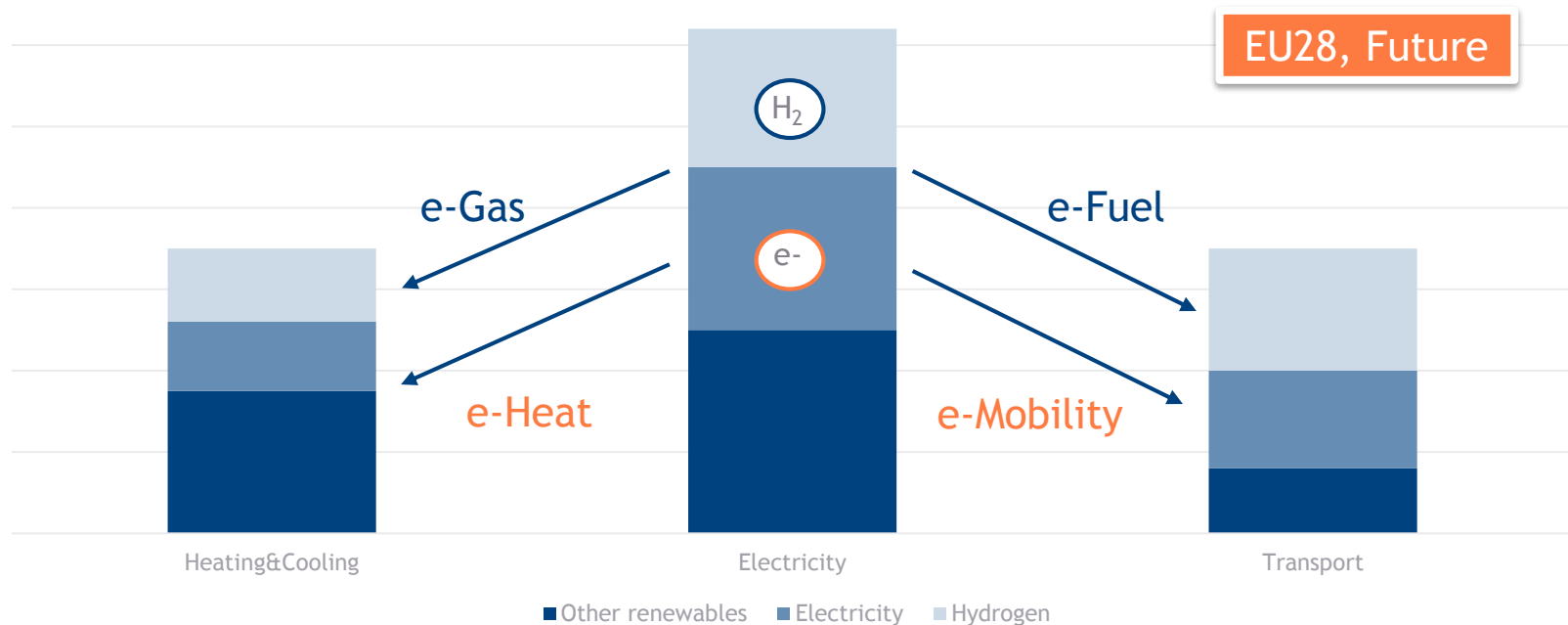


## Energy transition with e-Fuels and e-Gas is required



- + Low growth of renewable solutions for heating/cooling and transport
- + Significant share of aviation, navigation and heavy duty sector not addressable by batteries

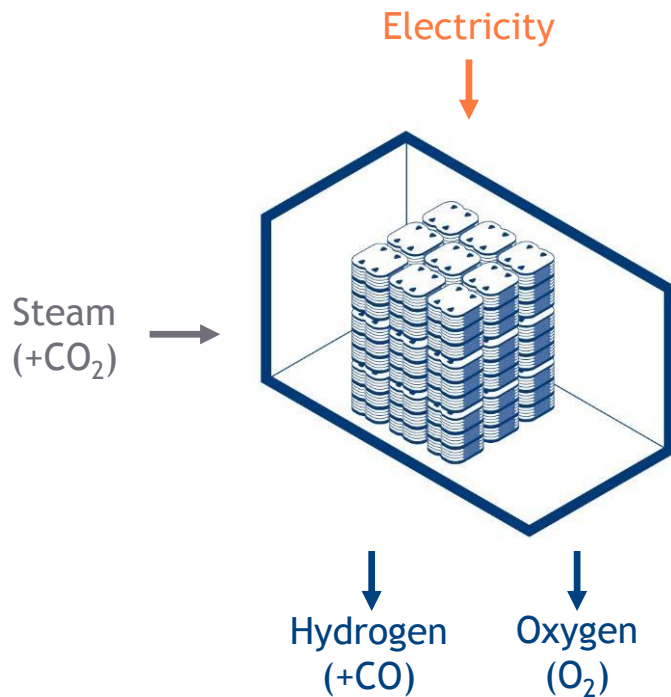
## How does energy transition with e-Fuels and e-Gas work



- + e-Fuels and e-Gases connect the power sector with the heating & cooling and the transport sectors (→ **sector integration**)
- + CO<sub>2</sub>-neutral fuels upscaling urgently required now

## Sunfire electrolyzers convert...

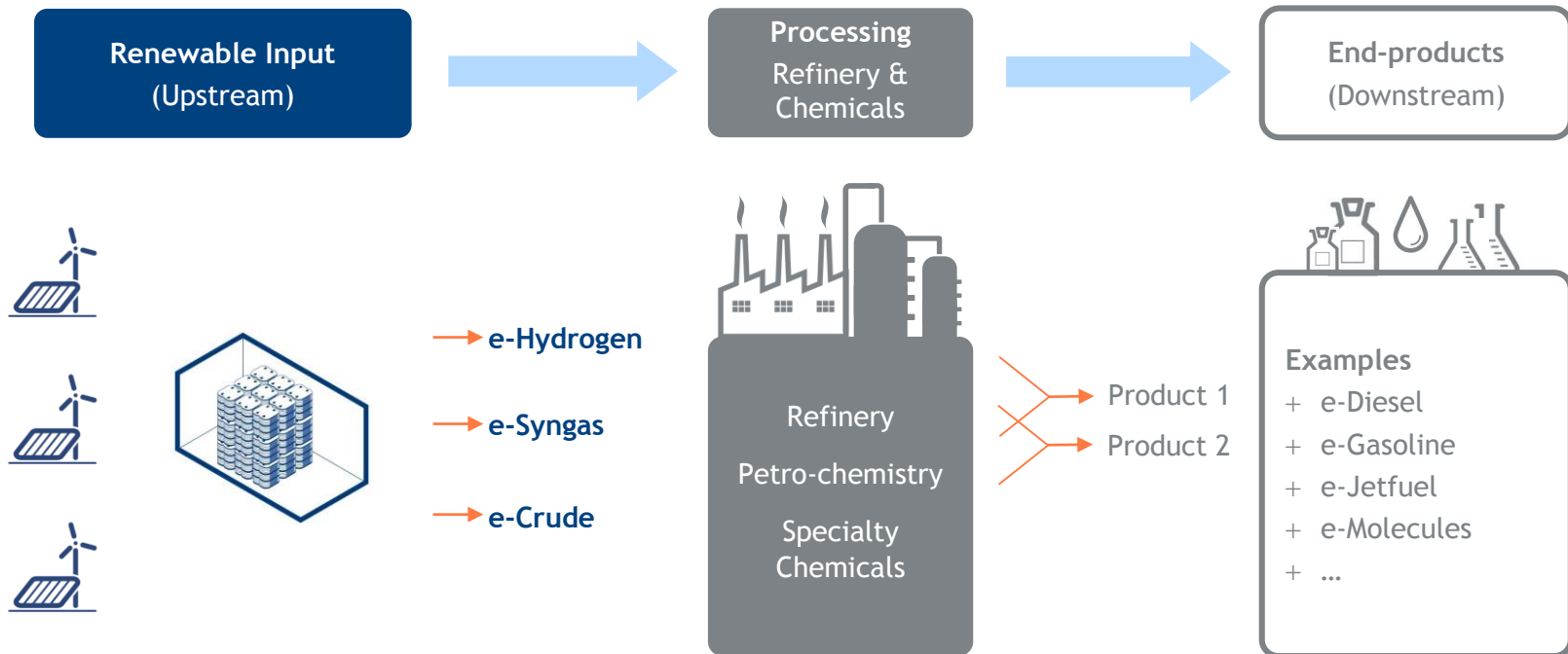
... electricity into hydrogen / syngas both feedstocks for e-Fuels and e-Gases

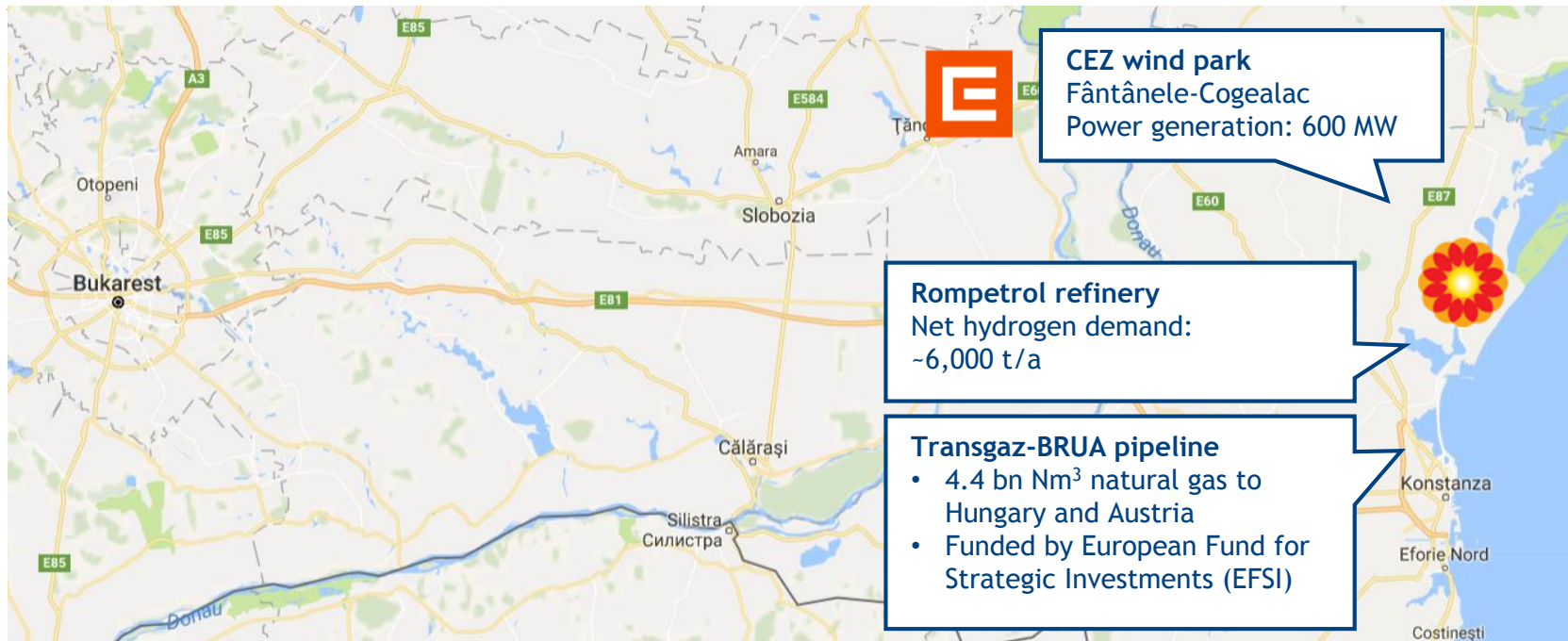


- + **Highest efficiency** in hydrogen production (82%<sub>LHV</sub> or 3.7 kWh/Nm<sup>3</sup>)
- + **Direct CO<sub>2</sub> reduction** via co-electrolysis of CO<sub>2</sub> and H<sub>2</sub>O
- + **Flexible** adjustment of output from part load to full load (30%-120%) in a short timeframe
- + **Low cost potential** due to use of non-critical materials and high automation potential

## Using the existing infrastructure

- + European transport consumes 3,000 TWh (250 Mt/a) of fossil fuel
- + e-Fuels production requires renewable power and O&G infrastructure





## A potential business model for Eastern Europe

- + Large un-utilized wind power potential
- + Close proximity to oil and gas infrastructure
- + Theoretical production volume with 20% power from CEZ:
  - 6.000 t H<sub>2</sub>/a = total H<sub>2</sub> demand at refinery or
  - 1% of the gas pipeline capacity
- + Can Eastern Europe become the energy hub for Europe?

## Key arguments

- + Technology is ready for deployment → **Immediate CO<sub>2</sub>-reduction** potential via re-use of refining and gas infrastructure and blend in **existing vehicle fleet**
- + **2.8 Gt CO<sub>2</sub>-reduction** in the EU from 2025-2050
- + **5,000 TWh** of electricity required
- + **No-regret measure** to use e-Fuels in passenger mobility first, as long-term mandatory for aviation, navigation, heavy duty and chemical industry
- + **Economically competitive** with clean solutions and long-term potential with today's fossil gasoline prices
- + **Renewable Energy Directive (2009/28/EC) or Passenger car CO<sub>2</sub> regulation** key to pave the way for large scale industrialization!



# THANK YOU!

E N E R G Y  
E V E R Y W H E R E

**Nils Aldag**  
Managing Director & Founder

**sunfire GmbH**  
Gasanstaltstraße 2  
01237 Dresden  
Germany

E: [nils.aldag@sunfire.de](mailto:nils.aldag@sunfire.de)

W: [www.sunfire.de](http://www.sunfire.de)