



Using H₂ in Industry and SMEs: Barriers & Best Practices

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Barriers: Renewable Hydrogen in Industry and SME

	Barriers & Obstacles
Production Capacity	<ul style="list-style-type: none"> - Only 5% of the targeted 4 GW electrolysis capacity for 2030 is under construction in Netherland, ~ 15 % of targeted 10 GW in Germany - Investment decisions are delayed due to uncertainty about demand and costs → available amounts of hydrogen still low
Demand Creation	<ul style="list-style-type: none"> - Future demand is uncertain, especially due to the competitive position of industries. - Weak incentives for transitioning from grey to green hydrogen. - Technological uncertainties: direct electrification vs. green hydrogen (options, energy savings, ...)
Infrastructure	<ul style="list-style-type: none"> - Delay in the construction of the national hydrogen network and Delta Rhine Corridor. - No direct connections between storage locations and industrial clusters. - German Hydrogen Core-Network only slightly delayed, but connection towards non-industrial demand sites (distribution grids) challenging (no regulatory basis, high invests for single-site connections)
Costs Operation	<ul style="list-style-type: none"> - Green hydrogen production costs are 5 to 6 times higher than grey/blue hydrogen. - Rising investment and network costs increase uncertainty.
Costs Invest	<ul style="list-style-type: none"> - Fuel switch requires large investments in on-side infrastructure, components etc. - Large investments for connections to transport infrastucture
Import & International competition	<ul style="list-style-type: none"> - Import contracts lag behind ambitions; only one major project confirmed. - Delays in Pipelines from e.g. Spain & Africa
Legislation & Regulation	<ul style="list-style-type: none"> - Uncertainty about future European hydrogen obligations. - No uniform certification for green hydrogen imports

Hydrogen for Industry and SMEs: Demand creation

Source Study Deloitte Mobilising consumer demand for green hydrogen based products 2025

Policy measures & regulations

- Mandatory Blending
- CO2 pricing
- Certification & Standards

Financing

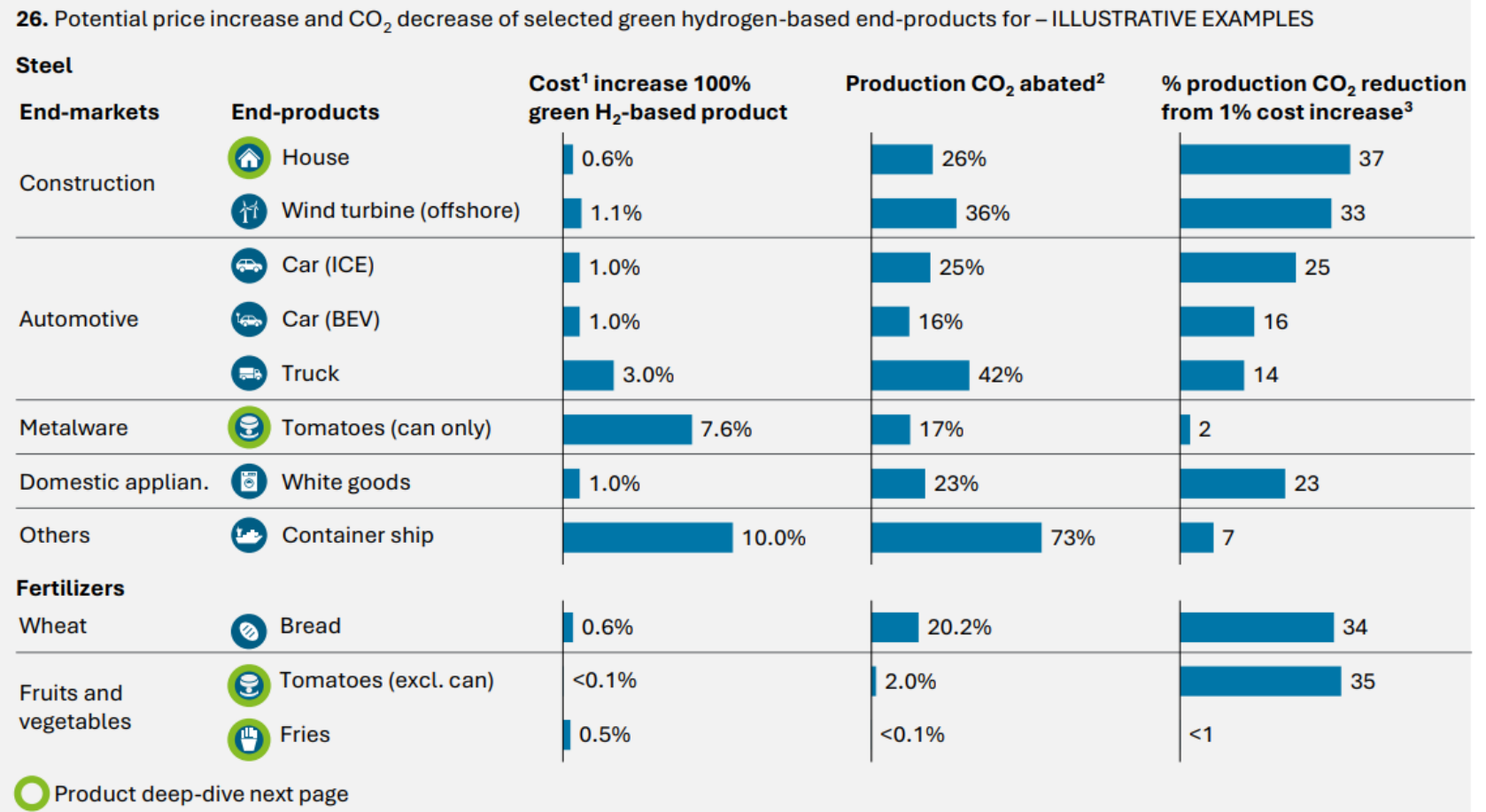
- Expanding SDE++
- EU subsidy utilisation
- Investing in Infrastructure

Demand Creation:

- Support industry clusters
- Government as Launching customer
- Long-term Hydrogen contracts (PPA)

Promoting Hydrogen in Transport & Mobility

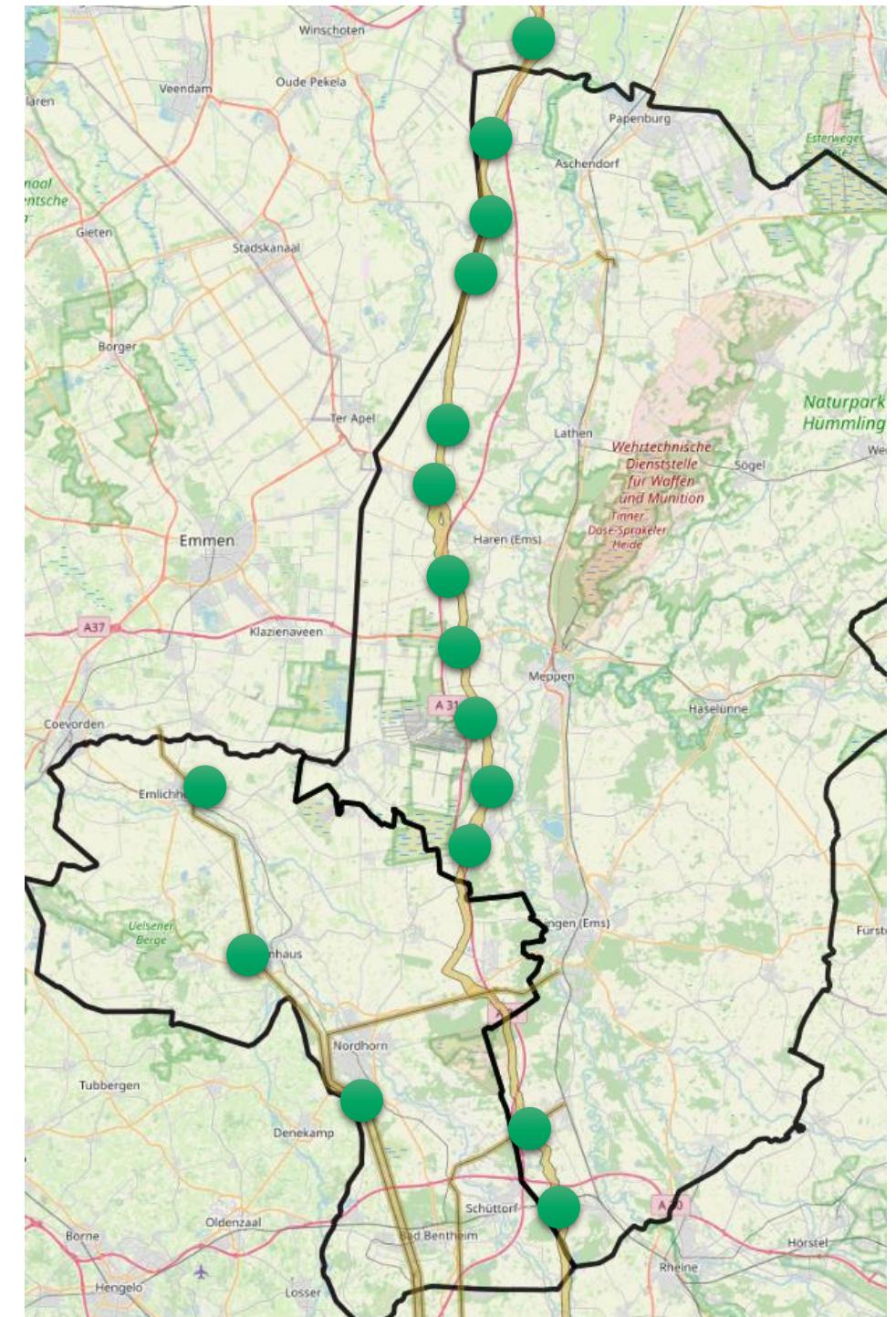
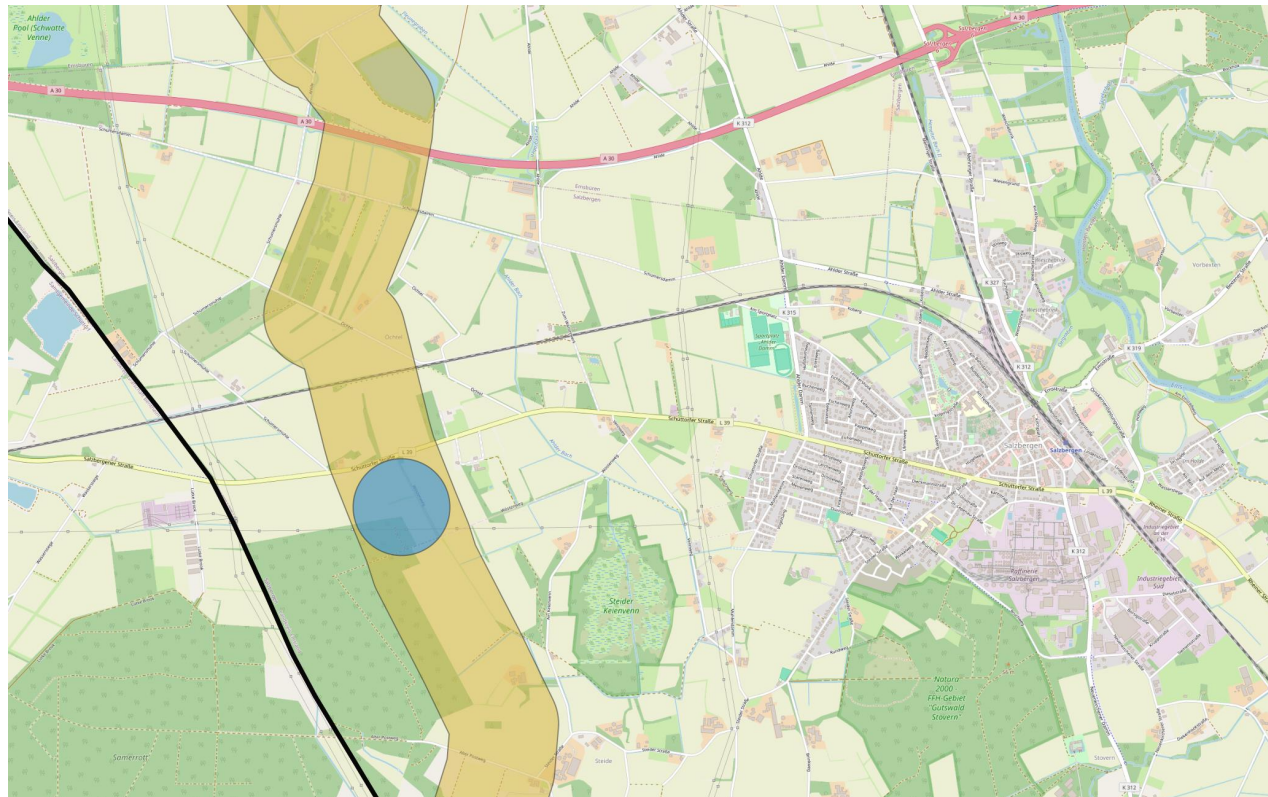
- HRF expansion
- Synthetic fuels for shipping & aviation
- Hydrogen in heavy transport



Demand obligations most effective as far down the value chain

Hydrogen for Industry and SMEs: Infrastructure

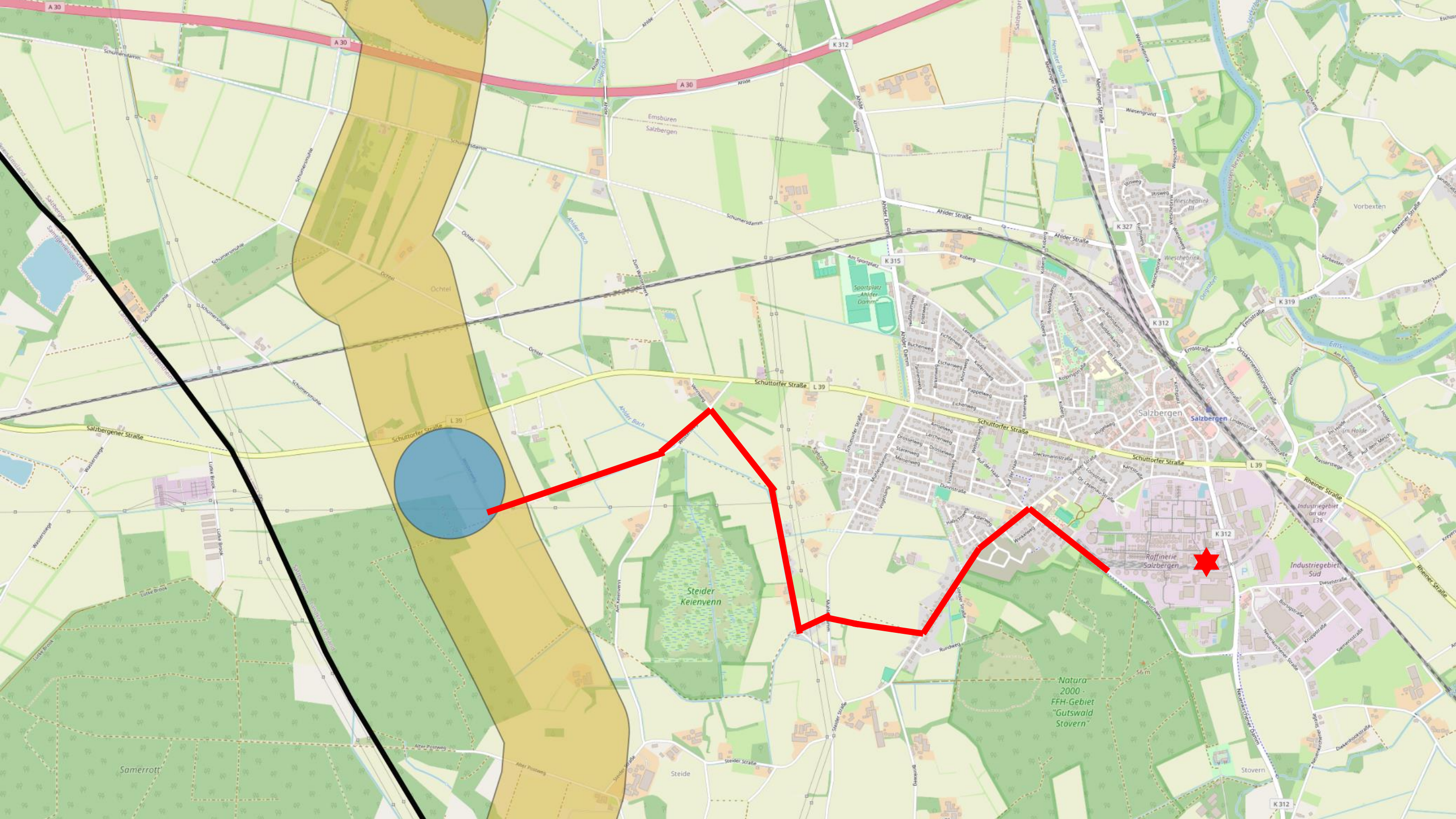
- From Core to Company: Only large industries are currently in focus!
- SMEs and (smaller) demand sites have to invest in own infrastructure!



Best Practice



 **H₂Cluster**
SALZBERGEN



Hydrogen for Industry and SMEs: Pricing

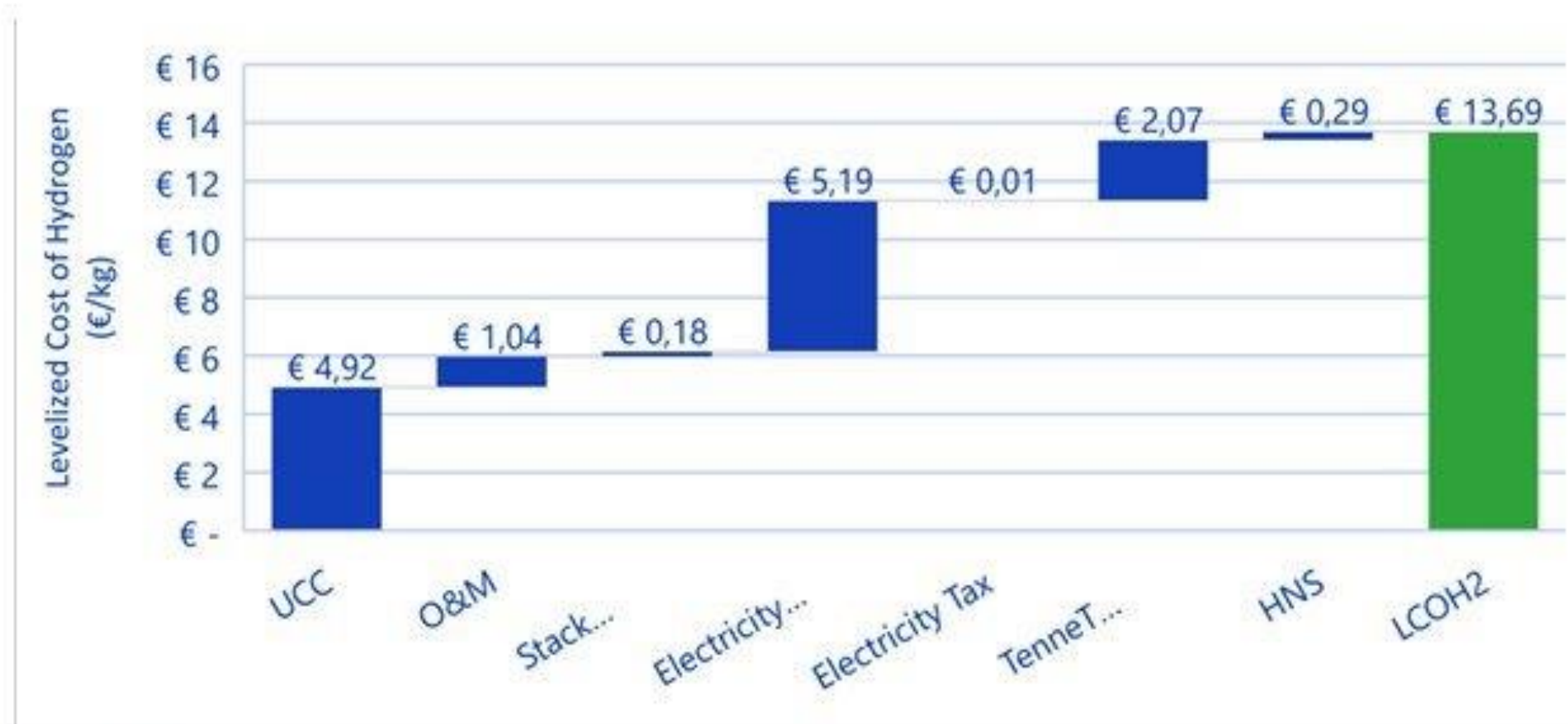
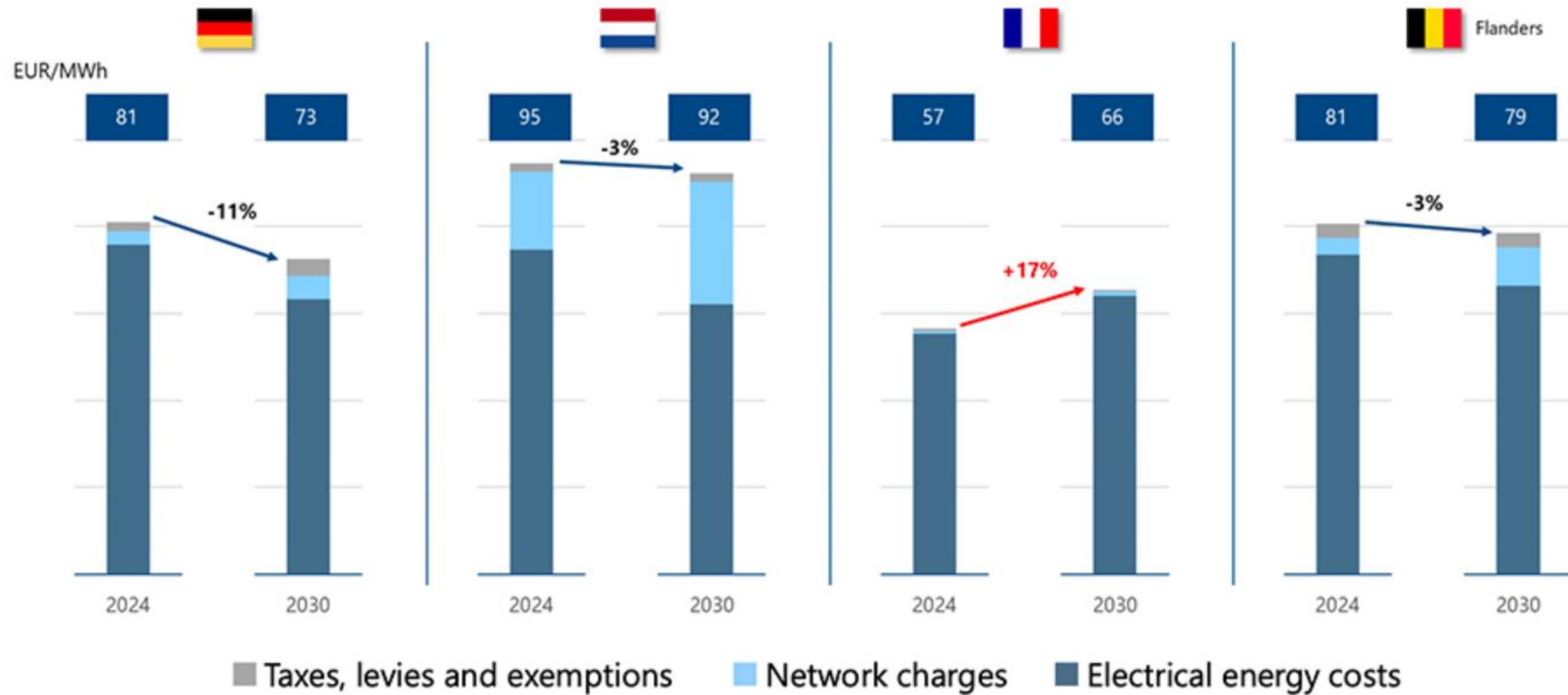


Figure 3.5: Nominal levelised cost of hydrogen production for the base case.

Hydrogen for Industry and SMEs: Electricity Pricing 2024 --> 2030



Bron: E-Bridge, Electricity cost assessment for large industry

Hydrogen for Industry and SMEs: Thinking out of the box!

Best Practice

Fire prevention via fuel cell

- Usage of O₂-depleted air from fuel cells to reduce amount of O₂ in e.g. storage centers
- FC triggered NOT by electricity or heat demand but by O₂-depletion demand!
- Production of electricity and heat on-site

