

H₂ in the Green Transformation of Saarland Steel Industry

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Part 1

Power4Steel



Overview Stahl-Holding-Saar: SHS is one of the largest German steel producers and the most important employer in the Saarland

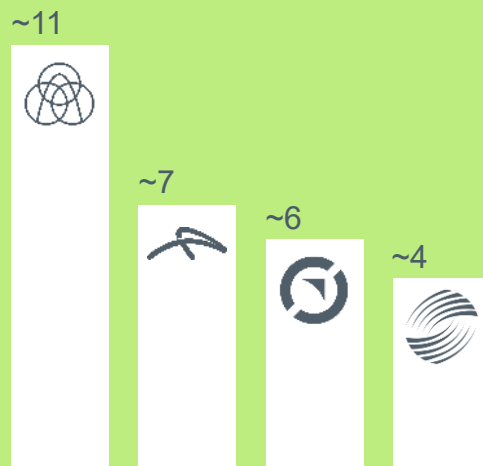
**Largest employer
in Saarland**

~ 5 bn €
Revenue per year

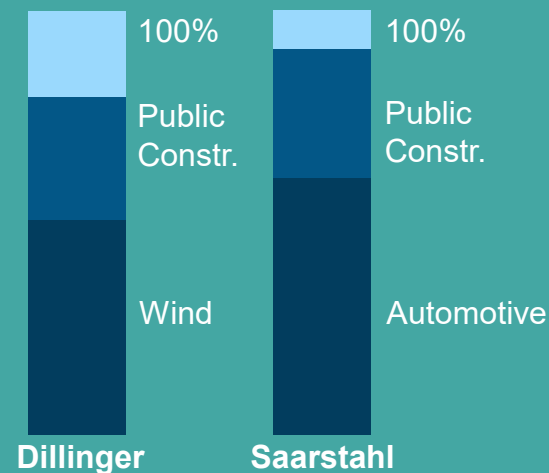
~ 4 Mio. t
Shipments per year

~ 13.000
Permanent employees

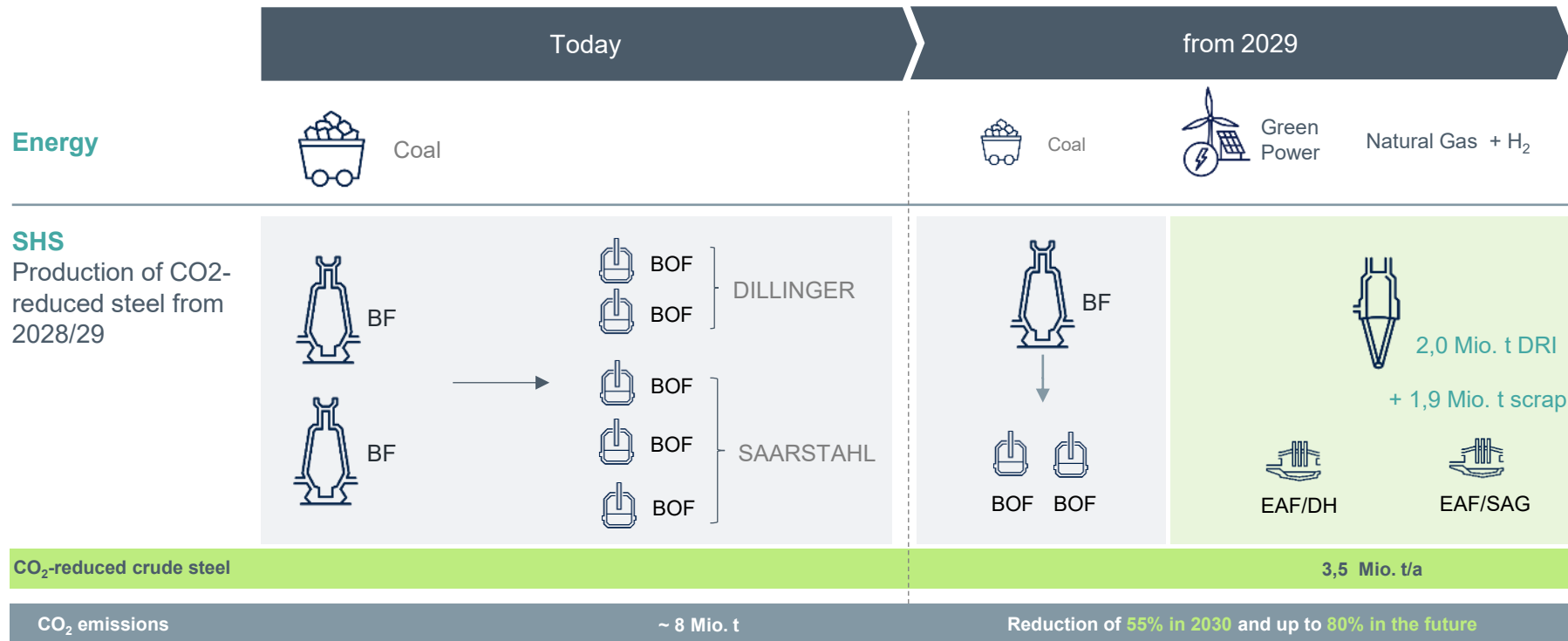
**Fourth largest
steel producer
in Germany, Mio. t**



**Customers in green
end-markets**
Sales mix



Power4Steel is pursuing an ambitious goal: SHS on the way to the “Fit for 55” climate target



Transformation - Milestones Timeline



**October
2024**

Signing of the
contracts

**July
2025**

Banks' financing
approval



**Q3
2028**

Commissioning
of the EAF
plant in
Völklingen



**Q2
2029**

Commissioning
of the EAF
plant in
Dillingen



**December
2023**

Governmental funding
approval for 2.6 billion
Euros



**February
2025**

BlmSch
permits



**September
2025**

Signing of hydrogen
supply contract



**Q3
2029**

Comm. of
the DRI
plant in
Dillingen



Investment measures of EUR 4.6 billion are progressing

2.6 billion euros funding approval received

future



Works are running - what has been accomplished so far

Project

- ✓ Financing secured
- ✓ All permits obtained (incl. BImSch approval)
- ✓ ~ 70% of engineering completed
- ✓ ~ 60% of equipment procurement completed
- ✓ Concept development and preliminary studies completed



Construction

- ✓ Site preparation completed
- ✓ Civil works in progress
- ✓ OEMs scheduled to be on-site from 2027 onwards

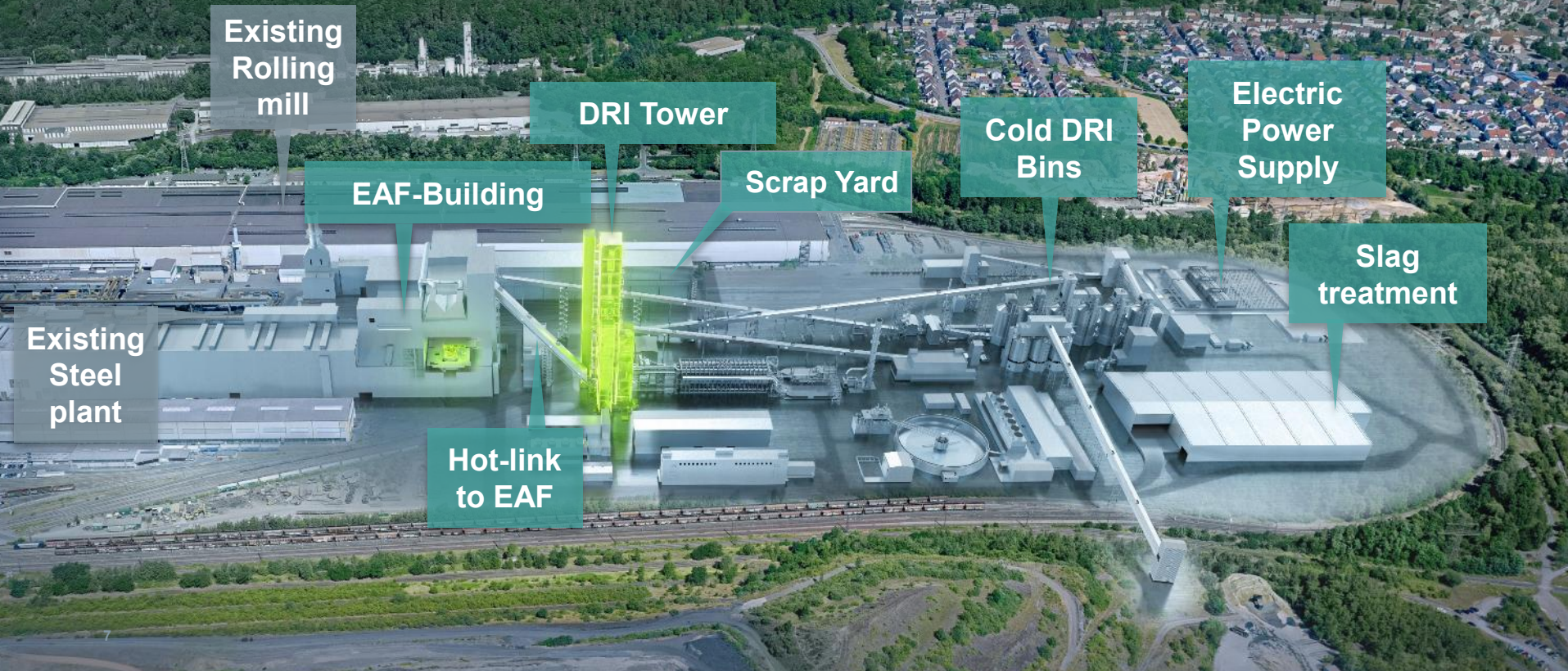


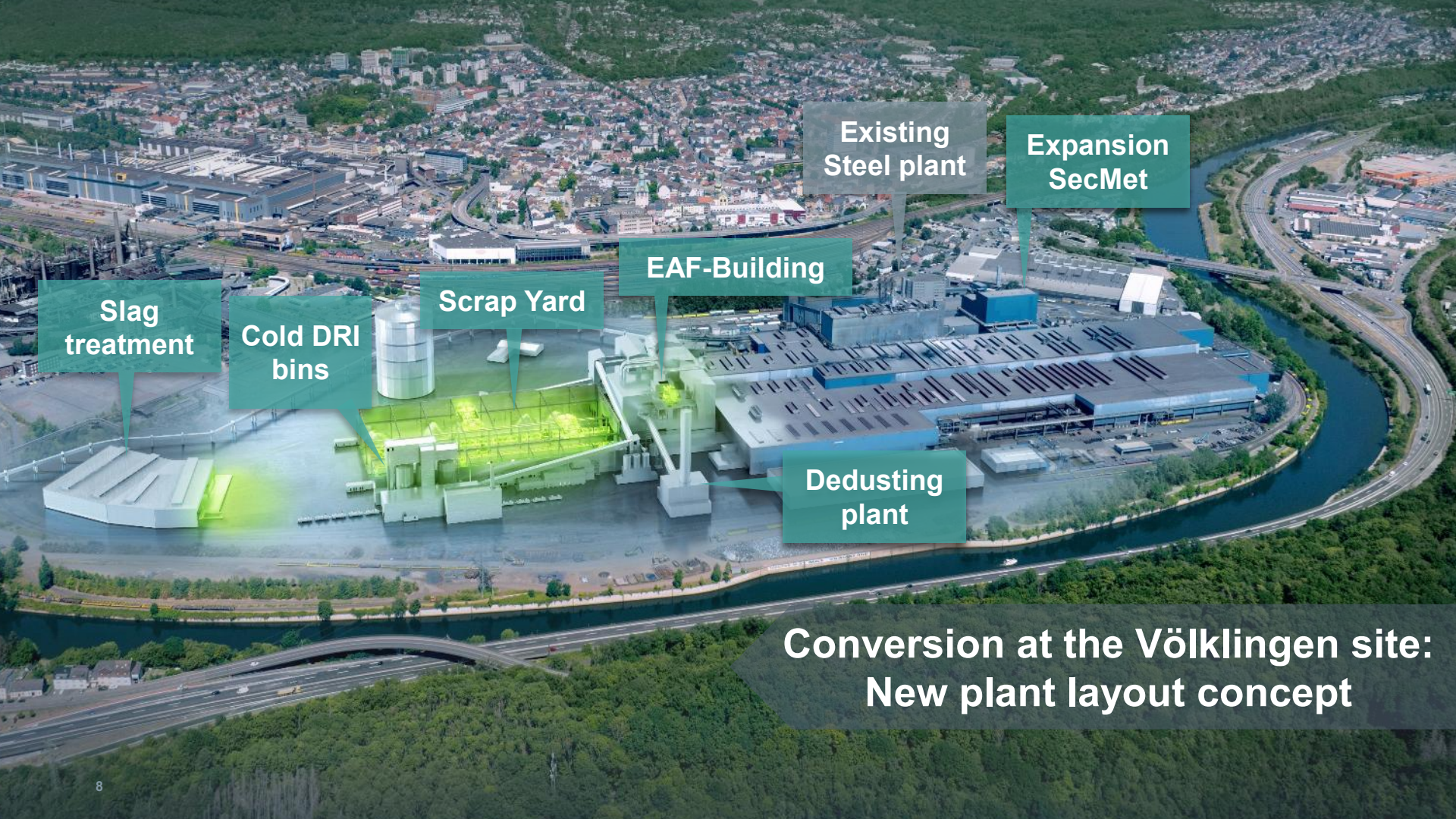
Key challenge

keeping the project on schedule and within budget



Conversion at the Dillingen site: New plant layout concept





Existing
Steel plant

Expansion
SecMet

EAF-Building

Scrap Yard

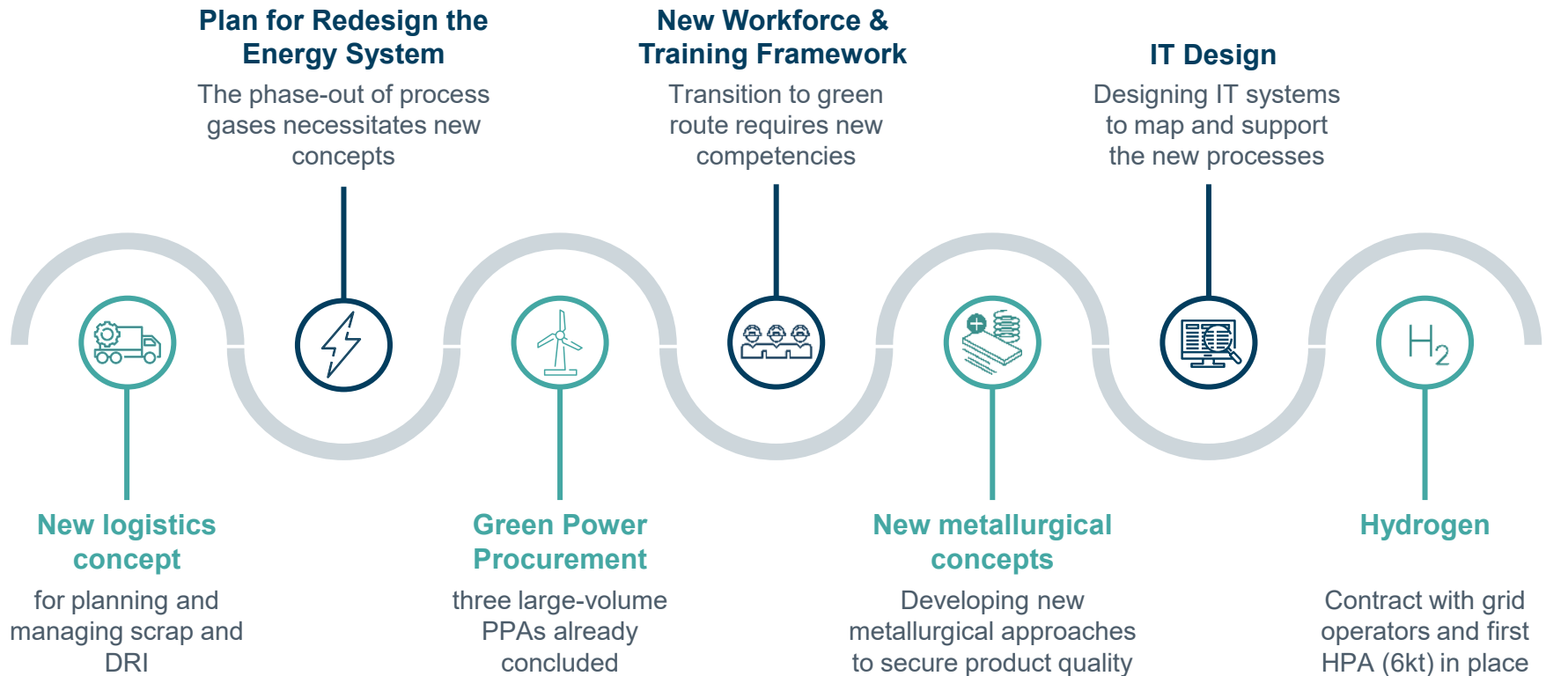
Cold DRI
bins

Slag
treatment

Dedusting
plant

**Conversion at the Völklingen site:
New plant layout concept**

Power4Steel is more than a mega construction project – value creation and innovation are crucial to survive

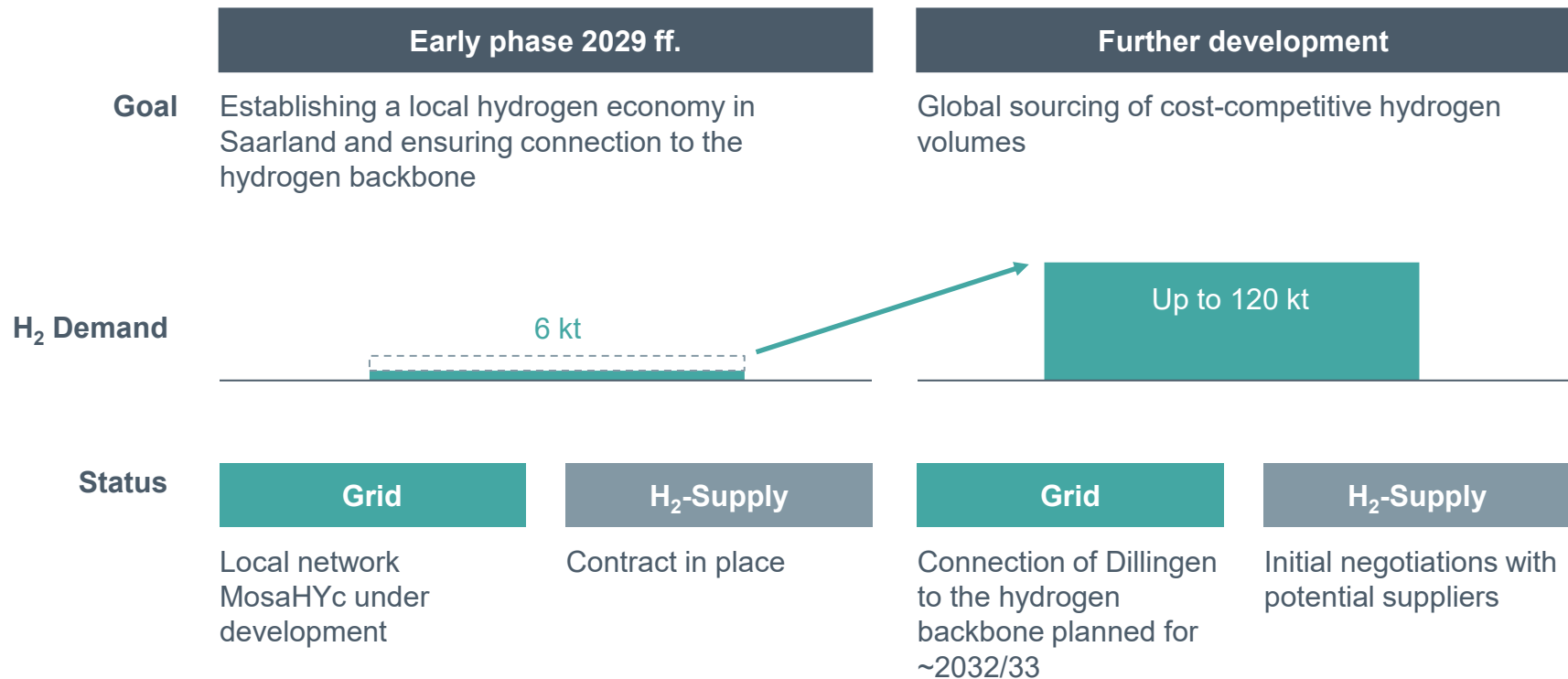


Part 2

Role of Hydrogen



Hydrogen becomes the central energy source for steel production

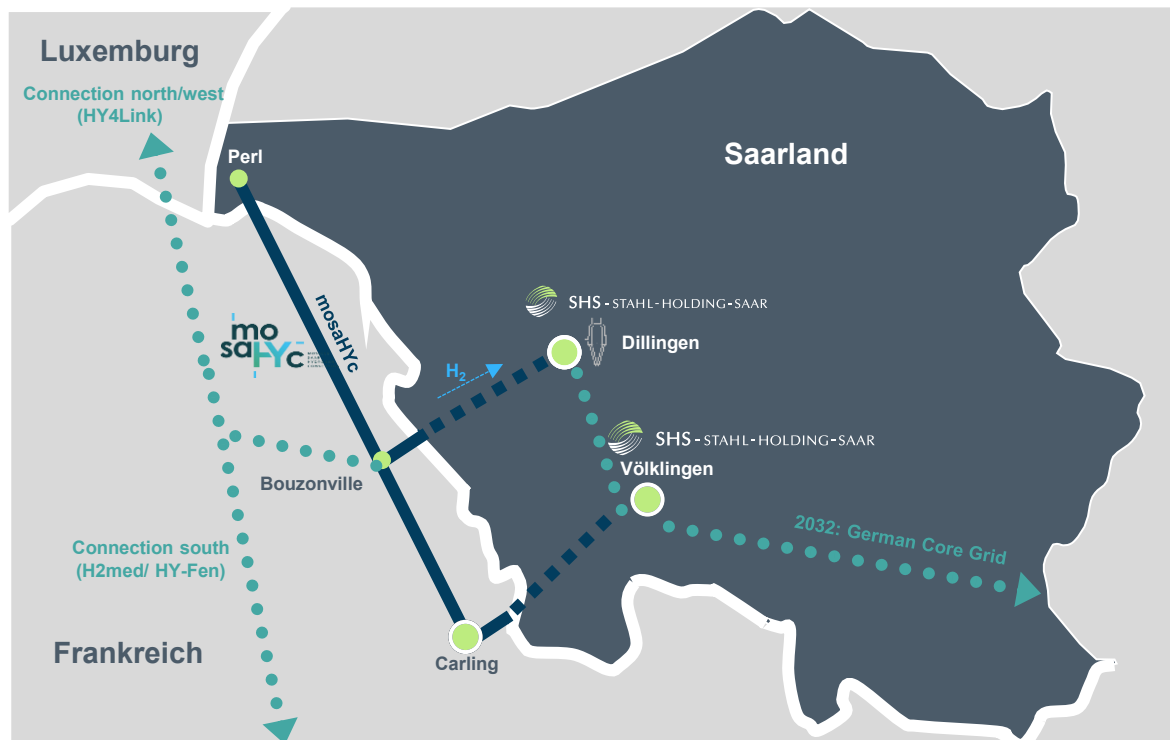


Local mosaHYc grid as basis for future backbone connection

MosaHYc at the center of Europe's future hydrogen backbone



Quelle: h2inframap.eu



Start of local hydrogen sourcing as the kick-off for hydrogen-based steel production in the Saar region

05. September 2025

The transformation takes another step forward: SHS Group and Verso Energy sign groundbreaking hydrogen contract



Key Facts

- Tender Start March 2024
- Contract awarded to Verso Energy on September 5, 2025, for the supply of 6,000 t/a of RFNBO-compliant hydrogen
- Start of delivery in 2029
- Transportation via local grid „mosaHYc“

From 2032 onwards: further ramp-up of hydrogen volumes

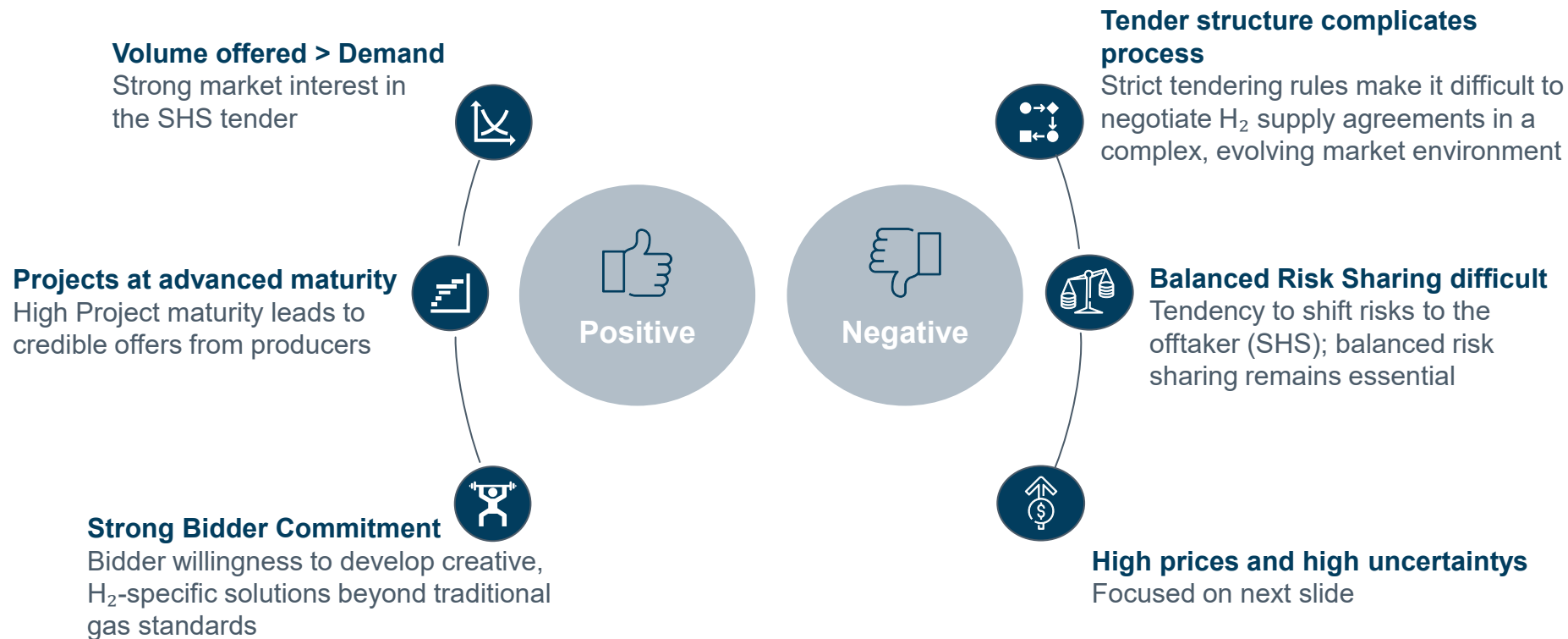
After connection to the European Hydrogen Backbone, SHS will ramp-up the H2 volume significantly



Hydrogen corridors to Germany

- A** South H2 – North Africa and Southern Europe
- B** Southwest Europe (and Africa)
- C** North Sea region
- D** Baltic Sea region
- E** East and South East Europe

First H₂ Tender – Highlights and Pain Points



How SHS managed key tender challenges – and what must change for large-scale ramp-up to 120.000t



High Prices

Regulation is a price driver

- Definition of RFNBO
- Expiring grid fee exemptions in Germany

Tender solution: French Producer (no additionality)

Demand SHS

Relax RFNBO
criteria

Structuring delivery profile drives costs

- RFNBO smoothing requires costly storage and PPA over-contracting
- No local large-volume H₂ storage

Tender solution: as-produced (raises SHS technical risk)

Demand SHS

Adapt regulations
&
Diversify H₂
colours



High Risks

Infrastructure Risks

- Infrastructure availability key uncertainty at contract signing

Tender solution: Contract with grid operators & Risk sharing in HPA

Demand SHS

Additional support
schemes

High Uncertainty at Contract Signing

- Regulatory framework unclear or in discussion (H₂ definition, ETS, certification, network regulation etc.)

Tender solution: Maximise contractual flexibility

Demand SHS

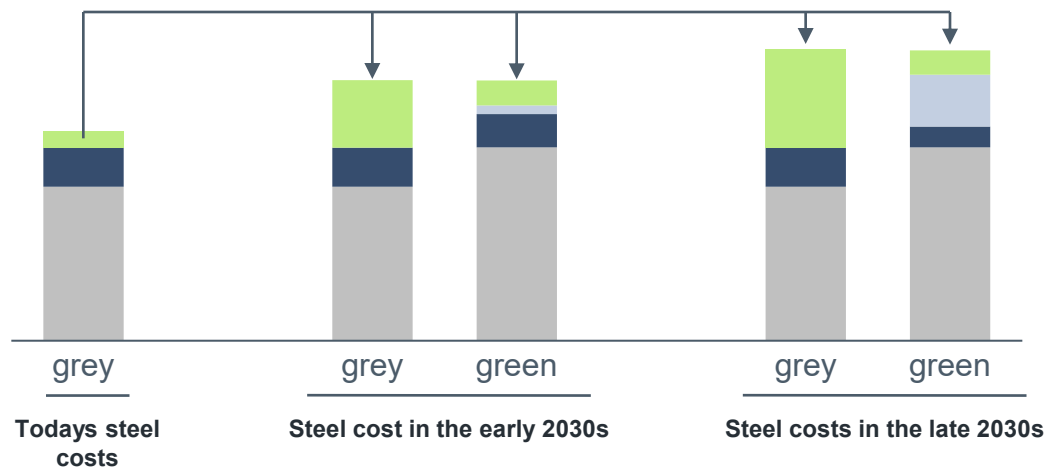
Clear and easy
regulatory
framework



Steel costs will increase substantially in the coming years, regardless of the production route | CO₂ and H₂ will remain the key cost drivers

Variable costs in €/t

CO₂ Hydrogen Coal, Natural Gas Others



- **Steel will become more expensive in Europe** – both via the conventional (grey) route and the green route. The grey route is becoming more expensive due to rising CO₂ costs, while the green route is primarily driven by the use of hydrogen.
- The actual cost difference, and thus the competitiveness of the green route, largely depends on the **development of CO₂ prices and hydrogen prices**

Grey = conventional steel production via the blast furnace route
Green = hydrogen-based DRI–electric steel route

Rising CO₂ prices are the essential condition for the steel industry to act as an anchor offtaker for the hydrogen ramp-up!



The success of decarbonization depends largely on a targeted and reliable regulatory framework

- **The economic viability of decarbonization - including Power4Steel - requires a stable ETS framework!**
 - Melting rates and existing ETS regulations must remain stable and consistent
 - Regulatory intervention weakens the CO₂ price signal and jeopardizes investments
- **Hydrogen must be available at competitive prices in the long term!**
 - This is the only way to achieve a break-even between the gray and green production routes
 - Key levers: Reduction of regulations (especially RED definition of RFNBO) & expansion of H2 infrastructure to enable access to low-cost imports
- **Green lead markets are crucial for creating binding demand!**
 - Binding demand, e.g., through public procurement and clear quota regulations, creates planning security and market volume
- **The current crisis is not related to decarbonization!**
 - The main drivers are weak demand and dumped imports
 - The energy cost disadvantages have less of an impact on the BF-route – risk for the period after Power4Steel

Thank you!

Power4
Steel

