HYDROGEN REFUELLING INFRASTRUCTURE

PSA ANTWERP

Air Liquide

Scope

Development of a 350 bar **hydrogen refuelling station** for heavy-duty port equipment, specifically targeting zero-emission straddle carriers fleet operations.

Goal

Validate **technical feasibility** and **business viability** of hydrogen as sustainable fuel in heavy-duty port logistics while demonstrating fixed infrastructure benefits.

Benefits

- **Innovation**: World's first hydrogen refuelling of dual-fuel straddle carrier (March 2023)
- **Technical**: Validated HRS design for straddle carrier fleet requirements
- **Knowledge**: Comprehensive insights into hydrogen infrastructure and implementation

Results

- ✅ Historic milestone: World's first hydrogen straddle carrier refuelling
- ✅ Technical concept validated through comprehensive engineering studies
- ✅ Successful testing with 200 bar mobile refuelling trailer
- ❌ Fixed HRS not completed due to economic and regulatory challenges

DISCOVER MORE

Upscaling

- **Technical**: HRS design and engineering knowledge ready for future implementation
- **Economic**: Requires supportive policy frameworks and favorable market conditions
- **Strategic**: Interest from other European ports demonstrates broader applicability
- **Policy**: Demonstrates need for coordinated support across technology development phases

Lessons Learned

- Large investments require comprehensive risk assessment, including energy price volatility
- Long-term offtake agreements essential for infrastructure investment justification
- Multi-stakeholder projects need clear commitment mechanisms and aligned incentives
- Early regulatory engagement and comprehensive permitting planning essential

PIONEERS

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