HYDROGEN HEATING FOR BUILDINGS

Scope

Complete **heating system replacement** from natural gas to integrated hydrogen production, storage, and heating at Port of Antwerp-Bruges' Nautical Operations Cluster building.

Goal

Validate hydrogen as viable alternative to natural gas heating, addressing technical feasibility and implementation challenges for port facilities.

Benefits

- **Environmental**: Clean heating alternative reducing greenhouse gas emissions
- **Technical**: On-site hydrogen production via electrolysis (32% green grid + 68% solar)
- **Innovation**: Comprehensive safety systems designed for hydrogen applications
- **Knowledge**: Practical insights for future hydrogen heating implementations

Port of Antwerp Bruges

Results

- ✅ Successfully installed integrated system (electrolyzer, compression, storage, heating)
- ✅ Completed all safety certifications (HAZID, HAZOP, ATEX, insurance approval)
- ✅ Achieved initial operational status with system validation
- ❌ Post-commissioning reliability issues prevented continuous seasonal operation

DISCOVER MORE

Upscaling

- **Technical**: Knowledge gained provides foundation for future implementation
- **Market**: Currently economically unviable - awaiting favorable market conditions
- **Strategic**: Positions port with readiness for hydrogen adoption when viable
- **Policy**: Demonstrates need for supportive frameworks to achieve commercial viability

Lessons Learned

- Comprehensive **safety assessment** (HAZID/HAZOP) essential and effective
- **Modular design** (containerized electrolyzer) facilitates installation/maintenance
- Current **hydrogen costs** make heating economically unviable vs. traditional alternatives
- **Extended timeline planning** needed for hydrogen technology demonstrations

PIONEERS

This project has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement 101037564.