Novel Insulation Concepts For Liquefied Hydrogen Storage Tanks



Liquefied Hydrogen (LH2) could enable CO2-neutral energy trading on a large scale. The storage of LH2 needs temperatures of -253°C. In order to maintain this condition for a long time with low losses, LH2 tanks require very good thermal insulation.







State of the Art



LH2 tanks have been approved as small and medium-scale storage facilities for several decades.

The State of the Art comes with several disadvantages which are exemplary:

- A long production time of more than 3 year based on the production chain,
- Difficult to scale & expensive,
- Low fault tolerance.





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The NICOLHy Approach

In NICOLHy novel thermal insulation concept for LH2 storages, that based on Vacuum Insulation Paneels (VIPs) will be researched and tested.

This approach increases the:

- Energetic and economic efficiency,
- Safety and fault tolerance,
- Scalability,
- Availability,

of tanks.

Gas-tight outer membrane





High porous core material with vacuum that ist incompressible



Application	Targeted tank size	KPI	2020	2030
Stationary offshore tank	200,000 m ³	LH2 tank capex offshore	100 €/kg	<20 €/kg
Ship	40,000 m ³	LH2 boil-off	0.3 %	<0.1 %



Co-funded by the European Union

NICOLHy project No. 101137629 is funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or Clean Hydrogen JU. Neither the European Union nor the granting authority can be held responsible for them

