



Integrated Design for Demonstration of Efficient Liquefaction of Hydrogen (IDEALHY)

Fuel Cells and Hydrogen Joint Undertaking (FCH JU)

Grant Agreement Number 278177

Title: Procedure for Achieving a Fully Engineered Package

Authors /
Project Partner: Christoph Haberstroh, Hans Quack, Ilka Seemann / Technische Universität Dresden
Lutz Decker / Linde Kryotechnik AG

Deliverable Number: 5.24

Date: 11 November 2013

Report Classification: Restricted (*here: Publishable Summary*)

Approvals	
WP Leader	✓
Coordinator	✓
FCH JU	pending
Contacts	
<p>christoph.haberstroh@tu-dresden.de</p> <p>info@idealhy.eu</p>	

Acknowledgements

The research leading to these results has received funding from the European Union's Seventh Framework Program (FP7/2007–2013) for the Fuel Cells and Hydrogen Joint Technology Initiative, under grant agreement number 278177.

Disclaimer

Despite the care that was taken while preparing this document the following disclaimer applies: The information in this document is provided as is and no guarantee or warranty is given that the information is fit for any particular purpose. The user thereof employs the information at his/her sole risk and liability.

The document reflects only the authors' views. The FCH JU and the European Union are not liable for any use that may be made of the information contained therein.

Publishable Summary

Within the IDEALHY project the partners have compared different hydrogen liquefaction options, including existing plants and proposed processes. A process has been identified which offers a high thermodynamic efficiency and simultaneously appears very cost effective.

When doing the prediction of the capital cost it turned out that there is relatively large amounts of uncertainty about the cost of realisation, both on the side of the component suppliers as well as on the side of the principal investor. It is therefore important to reduce the uncertainties on both sides during the time until the decision is actually taken to build such a plant. This requires a carefully planned transition from basic engineering to detailed engineering. The complication is that the fixation of the process and the freezing of the design parameters must go hand in hand with the development and design work needed on the component supplier side .

This report outlines the procedure which should be followed to achieve this.

Key Words

Process planning

Investment decision

Regulation

Permitting

Component development

Table of Contents

Acknowledgements	ii
Disclaimer	ii
Publishable Summary	iii
Key Words	iii
1 Introduction	1
1.1 IDEALHY Project Objectives	1
1.2 Work Package scope and objectives	1
1.3 Deliverable objective in relation to the WP	1
2 Procedures	2
2.1 Choice of planner by principal investor	2
2.2 Evaluation of different possible sites by the planner	2
2.3 Drafting of initial component specifications, discussions with the potential suppliers and coordination of development work	3
2.4 Freezing of the process and final technical component specification	3
2.5 Specification for general contracting and the tendering process	3
2.6 Final construction decisions	3
3 Conclusion	4