

Clean Refinery Hydrogen for Europe

Fact Sheet

Project Information

REFHYNE

Grant agreement ID: 779579

[Project website](#) 

DOI

[10.3030/779579](https://doi.org/10.3030/779579) 

Project closed

EC signature date

12 December 2017

Start date

1 January 2018

End date

30 June 2024

Funded under

SOCIETAL CHALLENGES - Secure, clean and efficient energy

Total cost

€ 19 758 743,71

EU contribution

€ 9 998 043,50

Coordinated by

SINTEF AS

 Norway

Objective

The REFHYNE project will install and operate a 10MW electrolyser from ITM Power at a large refinery in Rhineland, Germany, which is operated by Shell Deutschland Oils. The electrolyser will provide bulk quantities of hydrogen to the refinery's hydrogen pipeline system (currently supplied by two steam methane reformers). The electrolyser will be operated in a highly responsive mode, helping to balance the refinery's internal electricity grid and also selling Primary Control Reserve service to the German Transmission System Operators.

The combination of hydrogen sales to the refinery and balancing payments create a business case which justifies this installation. This business case will be evaluated in

detail, in a 2 year campaign of techno-economic and environmental analysis. The REFHYNE business model is replicable in markets with a similar regulatory structure to Germany. However, to expand this market to a GW scale, new business models will be needed. These will include valuing green hydrogen as an input to industrial processes (to meet carbon policy targets) and also on sales to H2 mobility markets. The REFHYNE project will gather real world data on these models and will use this to simulate the bulk electrolyser model in a range of market conditions. This will be used to produce reports on the conditions under which the electrolyser business models become viable, in order to provide the evidence base required to justify changes in existing policies. A campaign of targeted dissemination will ensure the results of these studies reach decision makers in large industrial sites, financiers, utilities and policy makers.

The REFHYNE electrolyser will be the largest in the world and has been designed as the building block for future electrolysers up to 100MW and beyond. REFHYNE includes a design study into the options for a 100MW electrolyser at the Rhineland refinery, which will help prepare the market for deployments at this scale.

Fields of science (EuroSciVoc)

[social sciences](#) > [economics and business](#) > [business and management](#) > **[business models](#)**

[natural sciences](#) > [chemical sciences](#) > [organic chemistry](#) > **[aliphatic compounds](#)**



Keywords

Large scale electrolyser

Programme(s)

[H2020-EU.3.3. - SOCIETAL CHALLENGES - Secure, clean and efficient energy](#)

MAIN PROGRAMME

[H2020-EU.3.3.8.2. - Increase the energy efficiency of production of hydrogen mainly from water electrolysis and renewable sources while reducing operating and capital costs, so that the combined system of the hydrogen production and the conversion using the fuel cell system can compete with the alternatives for electricity production available on the market](#)

[H2020-EU.3.3.8.3. - Demonstrate on a large scale the feasibility of using hydrogen to support integration of renewable energy sources into the energy systems, including through its use as a competitive energy storage medium for electricity produced from renewable energy sources](#)

Topic(s)

[FCH-02-5-2017 - Demonstration of large electrolyzers for bulk renewable hydrogen production](#)

Call for proposal

[H2020-JTI-FCH-2017-1](#)

[See other projects for this call](#)

Funding Scheme

[IA - Innovation action](#)

Coordinator



SINTEF AS

Net EU contribution

€ 875 061,87

Total cost

€ 875 062,50

Address

STRINDVEGEN 4

7034 Trondheim

 **Norway** 

Activity type

Research Organisations

Links

[Contact the organisation](#)  [Website](#) 

[Participation in EU R&I programmes](#) 

[HORIZON collaboration network](#) 

Participants (9)



SHELL ENERGY EUROPE LIMITED

 United Kingdom

Net EU contribution

€ 118 705,00

Address

SHELL CENTRE

SE1 7NA London 

Region

London > Inner London — East > Lambeth

Activity type

Private for-profit entities (excluding Higher or Secondary Education Establishments)

Links

[Contact the organisation](#) 

[Participation in EU R&I programmes](#) 

[HORIZON collaboration network](#) 

Total cost

€ 195 625,00



SHELL DEUTSCHLAND GMBH

 Germany

Net EU contribution

€ 2 414 401,00

Address

SUHRENKAMP 71-77

22335 Hamburg 

Region

Hamburg > Hamburg > Hamburg

Activity type

Private for-profit entities (excluding Higher or Secondary Education Establishments)

Links

[Contact the organisation](#) 

[Participation in EU R&I programmes](#) 

[HORIZON collaboration network](#) 

Total cost

€ 6 642 704,00



ITM POWER UK LIMITED

United Kingdom

Net EU contribution

€ 6 365 294,00

Address

2 BESSEMER PARK
S9 1DZ SHEFFIELD

SME

Yes

Activity type

Private for-profit entities (excluding Higher or Secondary Education Establishments)

Links

[Contact the organisation](#) [Website](#)

[Participation in EU R&I programmes](#)

[HORIZON collaboration network](#)

Total cost

€ 11 723 625,00



SPHERA SOLUTIONS GMBH

Germany

Net EU contribution

€ 99 706,00

Address

HAUPTSTRASSE 111-113
70771 Leinfelden-Echterdingen

SME

Yes

Region

Baden-Württemberg > Stuttgart > Esslingen

Activity type

Private for-profit entities (excluding Higher or Secondary Education Establishments)

Links

[Contact the organisation](#) [Website](#)

[Participation in EU R&I programmes](#)

Total cost

€ 142 437,50



ELEMENT ENERGY LIMITED

 United Kingdom

Net EU contribution

€ 85 866,11

Address

**SUITE 1 BISHOP BATEMAN COURT THOMPSON'S LANE
CB5 8AQ Cambridge** 

SME 

Yes

Region

East of England > East Anglia > Cambridgeshire CC

Activity type

Private for-profit entities (excluding Higher or Secondary Education Establishments)

Links

[Contact the organisation](#)  [Website](#) 

[Participation in EU R&I programmes](#) 

[HORIZON collaboration network](#) 

Total cost

€ 134 267,73



THIRD-PARTY 

ERM FRANCE

 France

Net EU contribution

€ 8 120,30

Address

**13 RUE FAIDHERBE
75011 Paris** 

Region

Ile-de-France > Ile-de-France > Paris

Activity type

Private for-profit entities (excluding Higher or Secondary Education Establishments)

Links

[Contact the organisation](#) 

[Participation in EU R&I programmes](#) 

[HORIZON collaboration network](#) 

Total cost

No data



STIFTELSEN SINTEF 

 Norway

Net EU contribution

€ 0,00

Address

STRINDVEIEN 4
7034 Trondheim 

Region

Norge > Trøndelag > Trøndelag

Activity type

Research Organisations

Links

[Contact the organisation](#)  [Website](#) 

[Participation in EU R&I programmes](#)

[HORIZON collaboration network](#) 

Total cost

No data



ENVIRONMENTAL RESOURCES MANAGEMENT LIMITED

 United Kingdom

Net EU contribution

€ 18 448,02

Address

SAINT MARY AXE 33 2ND FLOOR EXCHEQUER COURT
EC3A 8AA LONDON 

Activity type

Private for-profit entities (excluding Higher or Secondary Education Establishments)

Links

[Contact the organisation](#)  [Website](#) 

[Participation in EU R&I programmes](#) 

[HORIZON collaboration network](#) 

Total cost

€ 45 021,98

 **THIRD-PARTY** 

ERM FRANCE

 France

Net EU contribution

€ 12 441,20

Address

13 RUE FAIDHERBE

75011 Paris 

Region

Ile-de-France > Ile-de-France > Paris

Activity type

Private for-profit entities (excluding Higher or Secondary Education Establishments)

Links

[Contact the organisation](#) 

[Participation in EU R&I programmes](#) 

[HORIZON collaboration network](#) 

Total cost

No data

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