Celtic Hydrogen Cluster – Cork



Celtic Hydrogen Cluster - Linking Renewables & H2 Demand

A regional industry collaboration centered on Whitegate Refinery, Irving Oil, combining hydrogen production and demand with the potential to scale into renewable fuels and power.

WHAT IT IS

A full hydrogen value-chain proposition for East Cork

The cluster unites organisations spanning renewable power, electrolysis, refining, gas infrastructure, power generation and future hydrogen storage. It combines the key assets and capabilities needed to develop a fully integrated hydrogen value chain.

NEAR-TERM ANCHOR

20+ MW Whitegate Hydrogen Hub Project

Renewable hydrogen produced for immediate integration into existing refinery processes, enabling immediate decarbonisation

Bord Gáis Energy

IRVING

Gas Networks Ireland

ESB Energy for generations

WHY THE EAST CORK CLUSTER

1. Existing Hydrogen Demand & Route to market

Whitegate Refinery uses over 99% of Ireland's hydrogen, providing a ready-made market for green H2 without the need for new fuel cell applications, refuelling infrastructure, or changes in customer behaviour.

2. Credible partners

The partners have a strong track record in Irish energy infrastructure and are committed to delivering a large-scale project to advance hydrogen development in Ireland.

3. Location

Cork is uniquely positioned to be Ireland's hydrogen hub, with power generation, refinery and gas infrastructure providing the ideal platform for Ireland's largest electrolyser and a wider hydrogen ecosystem.

FOSSIL H_2 AND ELECTROLYSER RFNBO H_2 ENABLING LOW CARBON LIQUID FUELS

HYDROGEN AS AN INTERMEDIARY/REFINERY ROUTE

Celtic H_2 Cluster

FOSSIL H_2 (GREY H_2)

FROM CATALYTIC REFORMER



- Steam Methane Reforming
- PSA Purification
- Compressed H_2

RFNBO H_2 (GREEN H_2)

FROM ELECTROLYSER



- Renewable Electricity
- Water Electrolysis
- Compression

1 TON H_2 REQUIRED FOR:

300 TONS FOSSIL DIESEL

30 TONS RENEWABLE DIESEL

H_2 HYDROGEN SUPPLY

H_2 NETWORK

- Compression
- Distribution
- Flow Control
- Quality Monitoring

EXCESS H_2 USED AS FUEL IN REFINERY GAS MAIN

Provides low carbon fuel for heaters, boilers and other fuel users

DIESEL HYDROTREATER



- Hydrotreating
- H_2S & NH_3 removal
- Saturate olefins
- Metal deactivation

Operating Conditions: 300–380 °C, 50 bar

KEROSENE HYDROTREATER



- Hydrotreating
- H_2S & NH_3 removal
- Saturate olefins
- Metal deactivation

Operating Conditions: 250–320 °C, 25 bar

HEFA PLANT



- Hydrodeoxygenation
- Decarboxylation
- Isomerisation
- Hydrocracking

Operating Conditions: 280–350 °C, 30–50 bar

PRODUCTS

- **DIESEL (ULSD)**
- **CO-PROCESSED HVO** (RENEWABLE DIESEL)
- **JET FUEL** (SAF READY)
- **CO-PROCESSED SAF** (SAF VIA CO-PROCESSING)
- **SAF (HEFA)** (SUSTAINABLE AVIATION FUEL)
- **NEAT HVO** (RENEWABLE DIESEL)

FEEDSTOCKS



FOSSIL FEEDSTOCKS

- Straight Run Gas Oil (SRGO)
- Kerosene
- Naphtha

RENEWABLE FEEDSTOCKS

- Used Cooking Oil (UCO)
- Animal Fats
- Waste Oils and Greases
- Other Lipid Feedstocks

LEGEND

- Fossil H_2 (Grey H_2)
- RFNBO H_2 (Green H_2)
- Excess H_2 to Fuel

KEY BENEFITS

- Both fossil H_2 and RFNBO H_2 can be used seamlessly in existing hydrotreaters and HEFA units.
- Enables production of low carbon fuels: Diesel, Co-processed HVO, Jet, Co-processed SAF, Neat HVO and SAF (HEFA).
- Excess H_2 used as fuel in refinery gas main reduces Scope 1 ETS emissions.
- Supports refinery transition to lower carbon operations and compliance with decarbonisation targets.

A BRIDGE BETWEEN TODAY AND TOMORROW:
GREEN HYDROGEN STARTS OUT IN CONVENTIONAL FUEL MARKETS WHILE UNLOCKING FUTURE SAF AND E-FUEL GROWTH

Emerging European pathways for recognising renewable hydrogen in refining

For 2030, RED III requires RFNBOs to represent at least 1% of transport energy consumption.

NETHERLANDS

POLICY
1% RFNBO transport sub-target by 2030

REFINERY ROUTE
Renewable hydrogen used in refining expected to play a significant role in meeting the target.
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IRELAND

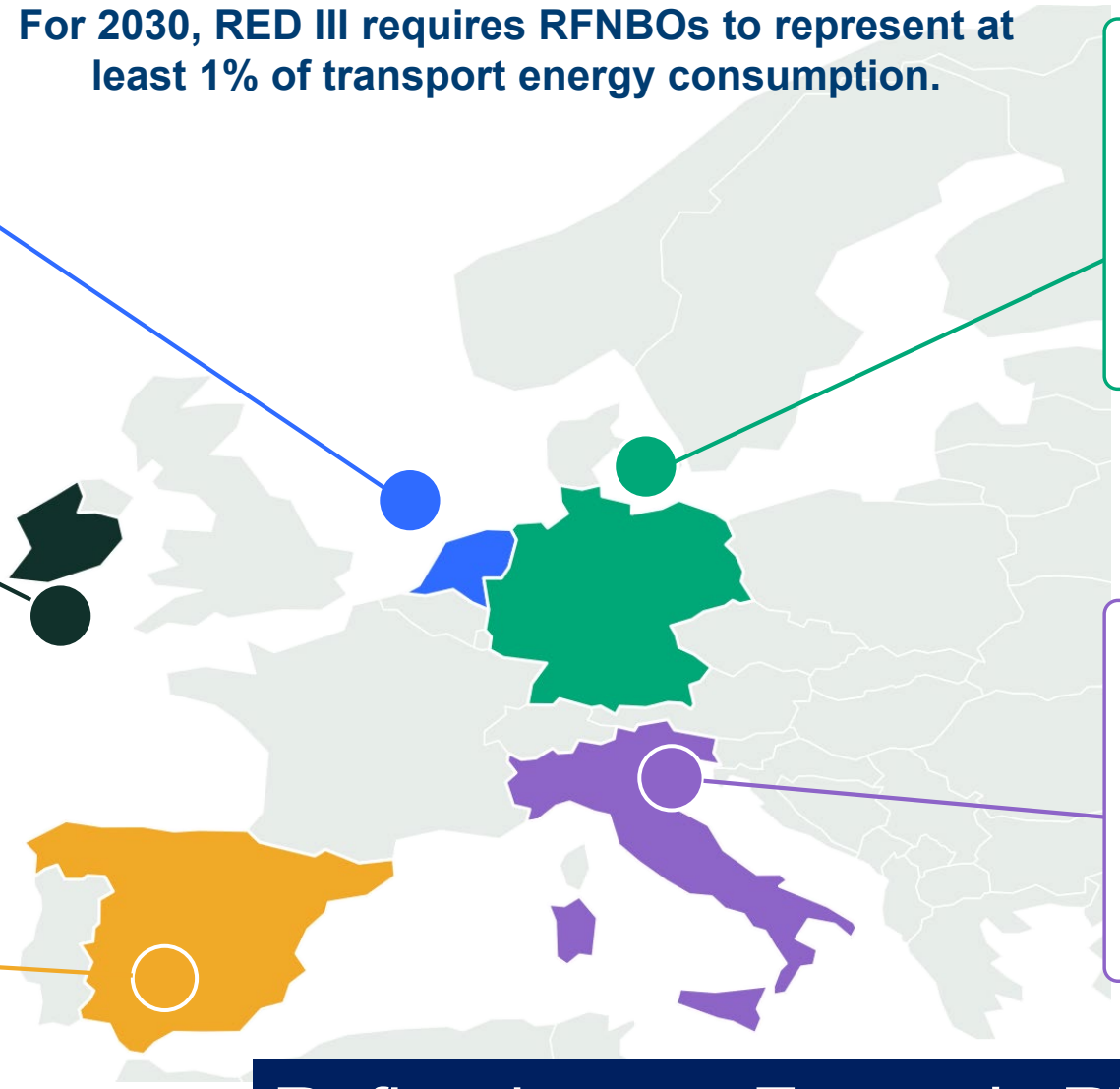
POLICY
Certified RFNBO hydrogen used in refining can contribute towards RTFO advanced fuels and RFNBO targets.

REFINERY ROUTE
Unlocks existing refinery hydrogen demand as an early market for renewable hydrogen.

SPAIN

POLICY
Dedicated RFNBO quota for transport fuels, starting 2027

REFINERY ROUTE
Renewable hydrogen used in refining counts towards RFNBO compliance.



GERMANY

POLICY
Dedicated RFNBO sub-quota within the fuel-supplier GHG quota.

REFINERY ROUTE
Creates a legally required market for renewable hydrogen and e-fuels, with tradable compliance value and a penalty for shortfalls.

ITALY

POLICY
1% RFNBO transport sub-target by 2030

REFINERY ROUTE
Refineries are expected to be the primary compliance route

Refineries are Europe's RFNBO Launchpad

Government Actions to Unlock Green Hydrogen at Whitegate

1 ENABLE EARLY HYDROGEN DEPLOYMENT

Provide long-term policy certainty that there will be a market for renewable hydrogen produced at Whitegate

Establish refining as a recognised pathway for meeting Ireland's RFNBO obligations

DoT, DECC, NORA, Industry

Government Output

- **Recognition of the refinery route**
- **Long term policy certainty**

2 CLOSE THE COST GAP

Mobilise support mechanisms to enable first-of-a-kind RFNBO projects

- Assess economics of meeting RFNBO obligations via the refinery route
- Evaluate funding mechanisms required to bridge green hydrogen costs
- Identify the optimal mix of capital and operating support
- Align State supports with available EU funding mechanisms

Government Output

- **CfD similar to UK**
- **CAPEX Grant**
- **Production Premium (Fixed €/kg)**

3 SUPPORT HYDROGEN HUB DEVELOPMENT

Position Whitegate as Ireland's first industrial hydrogen hub

- Recognise Whitegate as a strategic hydrogen project under Ireland's hydrogen and industrial decarbonisation strategy
- Align energy, transport and industry policy
- Coordinate infrastructure and grid planning
- Create a pathway to increased biofuels, e-fuels and industrial decarbonisation

Government Output

- **Ireland's first integrated hydrogen hub.**

OUTCOME: Deliver RFNBO targets through a bankable hydrogen hub at Whitegate.