



Gas
Networks
Ireland

Potential for a Green Hydrogen Supply Chain Cluster in Cork Harbour

#EUGreenDeal

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Energy Cork

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Part of **ervia** group

Overview of presentation

EU Hydrogen Strategy

Background and
Context



Energy Cork

Ireland's energy hub

Background and Context



Green Hydrogen Supply Chain Cluster

The Opportunity



EU Hydrogen Strategy

Background and context

EU Green Deal - 11 December 2019

Outlines main policy initiatives to reach net-zero GHG emissions by 2050

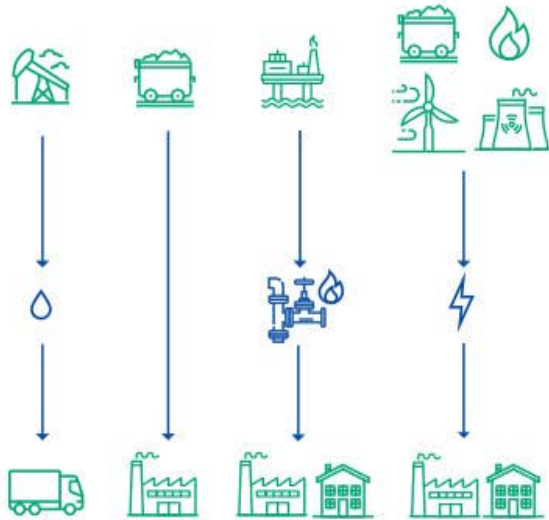
- **“Climate neutral”** Europe:
 - this is the overarching objective of the European Green Deal.
- Hydrogen identified as a key to meeting the Green Deal objectives
- **“smart sector integration”**
 - an objective to bring together the electricity and gas sectors closer together **“in one system”**
 - using green hydrogen as an energy vector
 - Smart sector integration package will be published in early 2021

EU Hydrogen Strategy and Energy System Integration Strategy - 8th July 2020

- Published under EU Green Deal
- To achieve net zero GHG by 2050, Europe needs to transform its energy system
 - Energy use accounts for 75% of the EU's greenhouse gas emissions.
- The two strategies present a new clean energy agenda,
- funded under the Commission's **Next Generation EU** recovery package

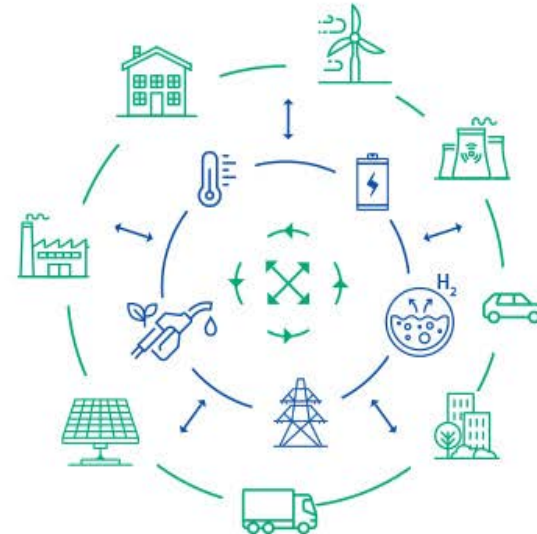
The energy system today :

linear and wasteful flows of energy,
in one direction only



Future EU integrated energy system :

energy flows between users and producers,
reducing wasted resources and money



EU Energy System Integration Strategy recognises the current “silo” linear model cannot deliver climate neutrality by 2050 in a cost efficient way for consumers.

- energy supplied and consumed in sectors - electricity, transport, heat
- each with separate value chains, rules, infrastructure and operations
- New innovative solutions have to be integrated in the way we operate our energy system.
- New links between sectors must be created to exploit new technologies
 - New integrated Value Chains for companies
 - New integrated EU Supply chains
- Hydrogen is one way to do this



EU Hydrogen Strategy – a phased approach

Phase 1 - 2020 to 2024



Phase 2 - 2025 to 2030



Phase 3 - 2030 to 2050

We are in this phase today !

- 6 GW of green H2 electrolysers in EU
- Production of up to **one million tonnes** of H2 in EU

H2 an intrinsic part of our integrated energy system

- 40 GW of green h2 electrolysers in EU
- Production of up to **ten million tonnes H2** in EU
- Member states already committed to 30GW in Climate Target Plans / Climate Action Plans/ NCEP

Renewable H2 technologies reach maturity

- Deployed at **large scale** across EU
- Particularly in all hard-to-decarbonise sectors.

Hydrogen Supply Chain - supply and demand

EU H2 Strategy seeks to answer the question

How can hydrogen be promoted in EU?

The production of clean hydrogen needs to be increased by;

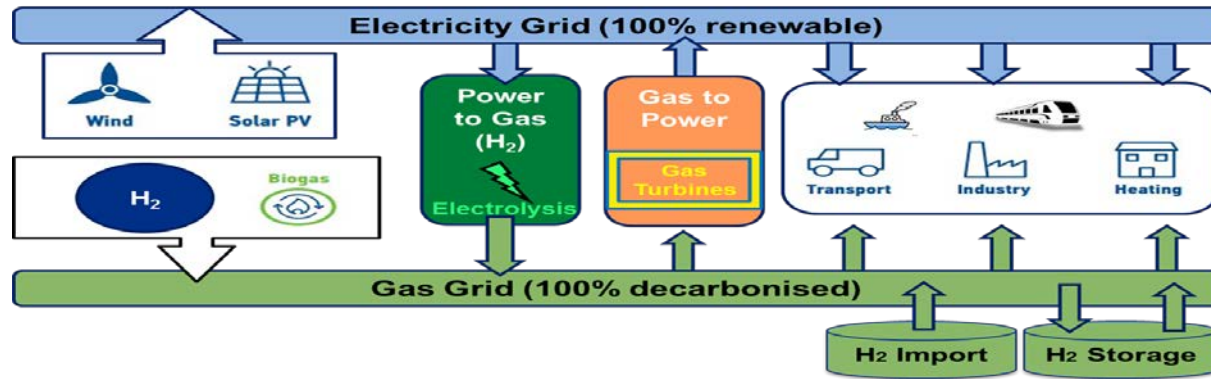
- **creating sustainable value chains feeding into a robust and co-ordinated overall EU Supply Chain .**

EU hydrogen Strategy - policy and regulatory measures to create investor certainty, facilitate and promote the development of a robust EU hydrogen supply chain from ;

- **Supply** and production and of hydrogen
- **Delivery** of hydrogen to markets - connecting Supply with Demand
- **Demand** - Markets for the consumption of hydrogen

Hydrogen Strategy - Role of Existing Grid infrastructure

- Hydrogen Strategy recognises adapting existing infrastructure is required
 - particularly existing gas and electricity networks
- Gas Grids – a key element of H2 Supply Chain
- TSOs throughout EU already looking at this
 - 20% h2 blends in API 5L steel pipeline networks happening today in NL, Germany, Italy and GB
- **Smart Sector Coupling**
 - New innovative ways of operating “coupled” gas and electricity networks to facilitate high levels of RES-E via green h2



EU Clean Hydrogen Alliance

- Launched on 8th July with EU H2 Strategy
 - clean energy investment cycles -25 years+
 - therefore for 2050 targets the time to act is now
- The European Clean Hydrogen Alliance;
 - will help build up a robust pipeline of investments.
 - support the scaling up of the hydrogen Supply and value chains across Europe
 - Implement the actions of the new EU hydrogen strategy
 - in particular its investment agenda of €430 billion to 2030
 - provide a broad forum to engage civil society.
- Gas Networks Ireland
 - invited to be one of the first members of EU Clean H2 Alliance



Energy Cork - Ireland's energy hub

Background and context

Cork Harbour - Ireland's Energy Hub

Large Scale RES-E

Plans for 100MW +
Offshore wind
Solar PV

Community Scale RES-E

Cork Lower Harbour Energy Group 4
x3MW wind turbines - largest in
Ireland

Dispatchable Electricity Generation

Modern gas fired CCGT Power Stations
ESB Aghada and Bord Gais Energy
generation capacity in excess of 1000MW
31% of Irelands dispatchable generating capacity

World Class Energy Research

UCC MAREI
CIT NMCI
Beaufort Research Centre
Irish Maritime and Energy Research
Cluster (IMERC)
Supporting development and innovation
in the maritime and energy fields

Modern Gas and Electricity Grid Infrastructure

Potential to re-purpose Gas Field

Potential to store Natural Gas or
CO2

LNG and H2 importation potential in future

Irving Whitegate Refinery

Supplies 40% of Irelands liquid transport
and heating fuels

Calor Gas -LPG Bottling Plant



Green Hydrogen Supply Chain Cluster

The Opportunity

Green Hydrogen Supply Chain Cluster - The Opportunity



Dispatchable RES-E

generated from gas turbines using green H2 delivered by the gas grid



Storage of surplus intermittent otherwise curtailed RES-E in gas grid as green H2

Robust cost effective energy Storage solutions will be required for 70 by 30 RES-E



RES-H decarbonisation of heat production with green h2 delivered via the gas grid

All CE current CE marked gas appliances already capable of 20% green H2 blends

All domestic gas boilers have been tested on 23% H2



Datacentres as flexible demand enabling 70 by 30 switching between;

- **RES-E** supplied by electrons via the electricity grid and
- **RES-E** supplied via gas grid as green H2

and using

RES -H on-site CHP /trigeneration using gas grid delivered green H2



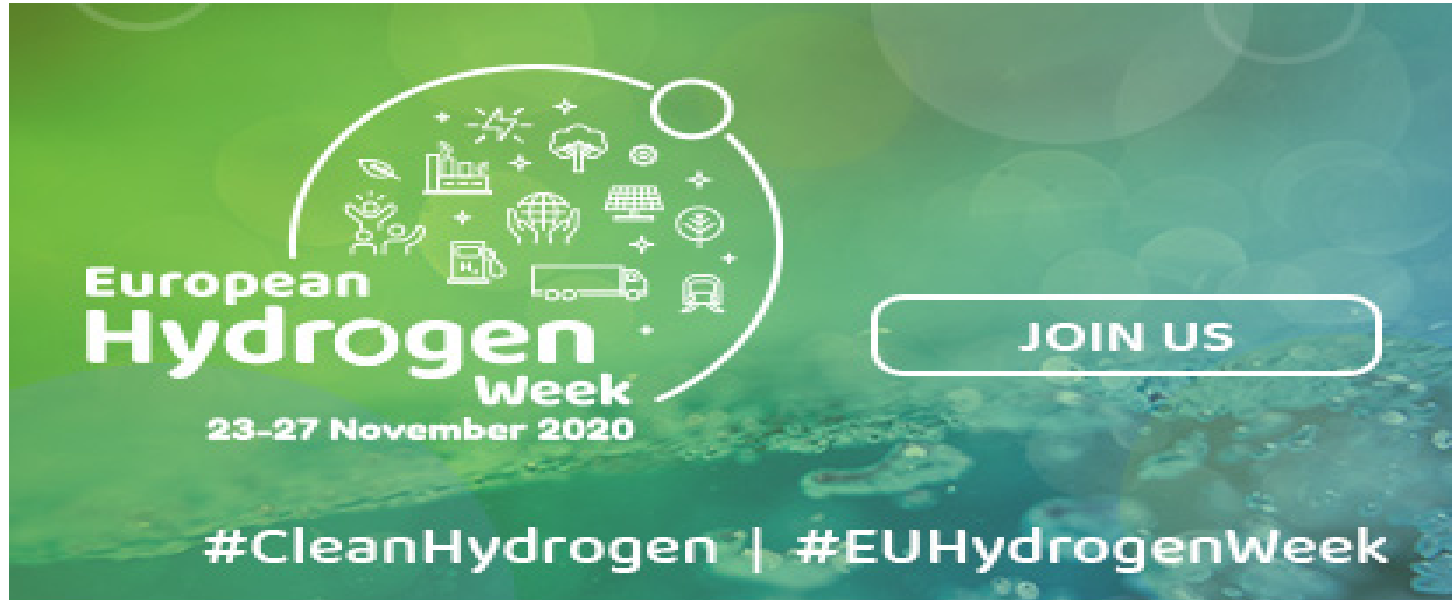
RES - T

Green H2 into transport blended with bio-CH4 Use existing gas vehicles and gas refuelling infrastructure No need for new fleet of fuel cell vehicles

Green Hydrogen Supply Chain Cluster – Why Cork Harbour ?

- All of the elements of green h2 supply chain already in place in Cork harbour
- Long tradition of energy industry in Cork Lower Harbour
- Energy Sector co-exists and collaborates successfully with other industry sectors including
 - Marine and Fishing
 - Agriculture
 - Manufacturing and Pharma
 - Tourism
- Already a successful Energy Cluster - **Energy Cork**
 - New focus on RES-E in Cork Energy Hub - logical follow on from traditional energy sources
- Datacentres - Large energy users -constrained in other locations due to elec grid capacity
 - No elec grid constraints Cork harbour
 - Excellent Data cable connectivity Cork harbour
- Cork Harbour – An ideal location for Ireland’s first large scale electrolyser project

EU Hydrogen Week - This week 23rd to 27th Nov



The banner features a green background with a bokeh effect of light circles. In the center, a white circle contains various icons representing clean energy and hydrogen: a leaf, a factory, a tree, a globe, solar panels, a hydrogen fuel cell, a truck, and a train. Below the icons, the text reads "European Hydrogen Week" in a large, bold font, followed by "23-27 November 2020". To the right of the central graphic is a white rounded rectangle containing the text "JOIN US". At the bottom of the banner, the hashtags "#CleanHydrogen | #EUHydrogenWeek" are displayed in white.

European
Hydrogen
Week
23-27 November 2020

JOIN US

#CleanHydrogen | #EUHydrogenWeek



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Part of **ervia** group