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Ervia's Carbon Capture, Utilisation & Storage Study

Gearóid FitzGerald, Nordic-Irish Partnership Event

14th January 2021

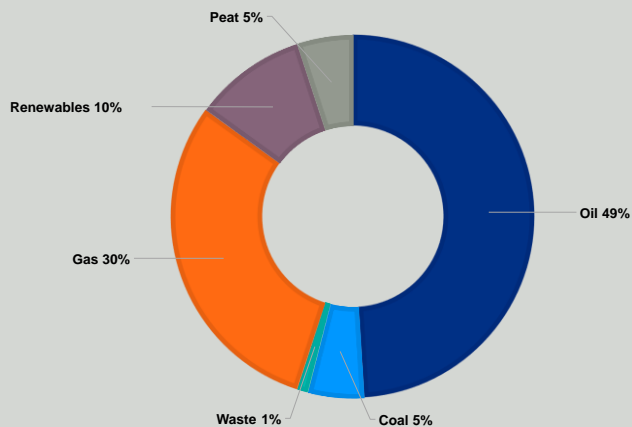
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Gas provides 30% of Ireland's primary energy today

Primary Energy Sources



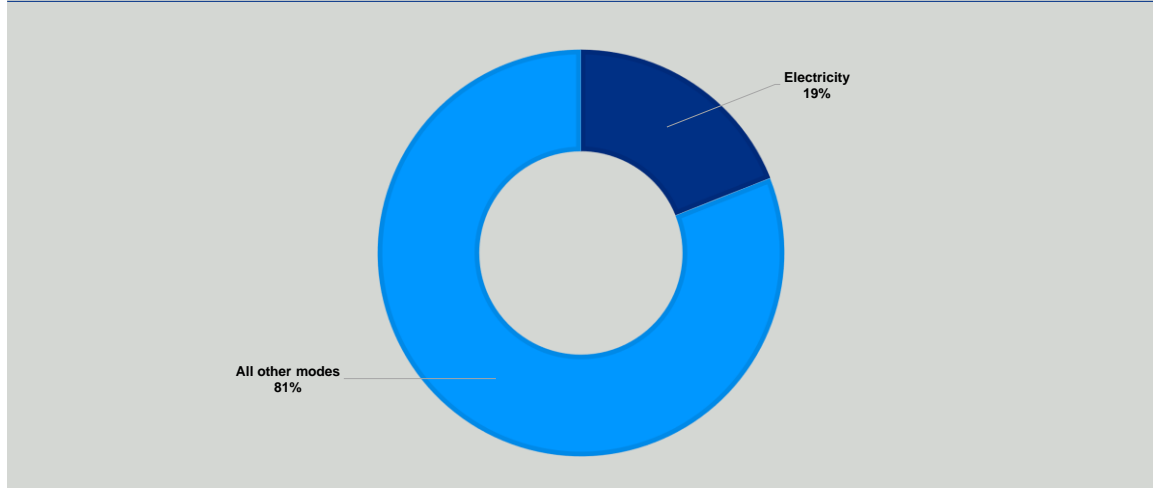
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Electricity meets 20% of Ireland's energy demand. EU set a target of 50% by 2050.



Energy share by usage



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Net Zero changes everything



- To address climate change, Ireland has committed to **net-zero** emissions by 2050
- To achieve this, Ireland needs to completely transform its energy system
- This requires decarbonisation of the gas network
- It also requires a complete integration of our energy system



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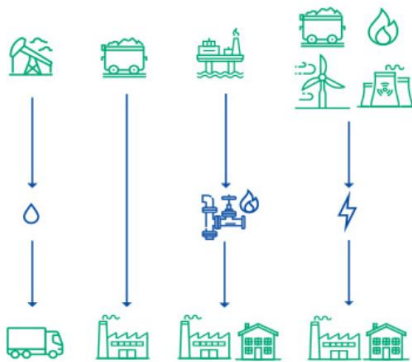
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European Green Deal needs energy system integration



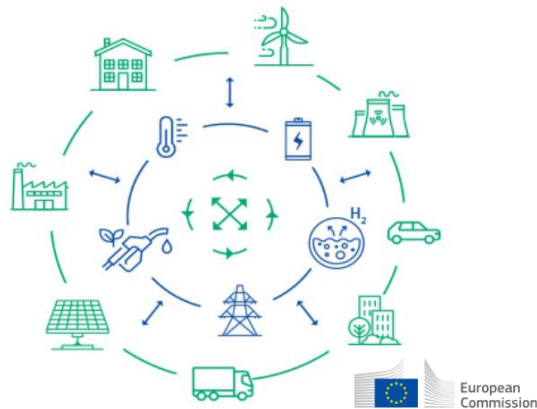
The energy system today:

linear and wasteful flows of energy, in one direction only



Future EU integrated energy system:

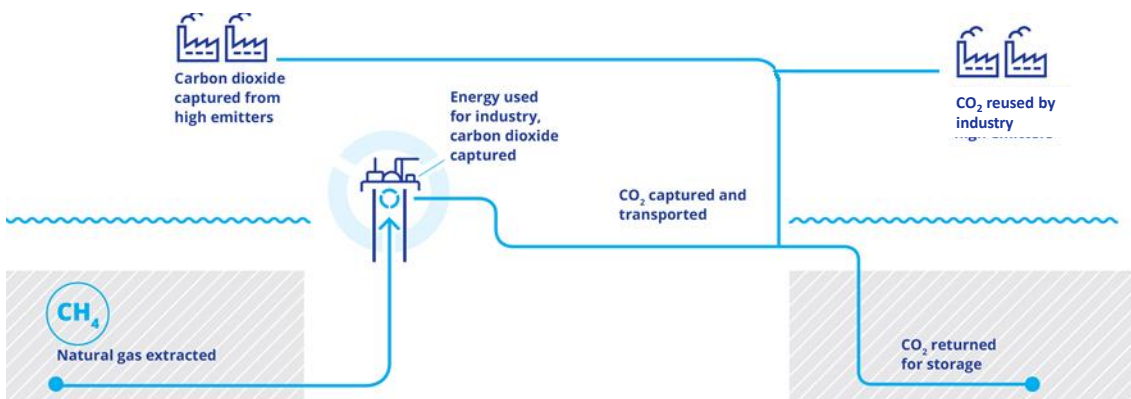
energy flows between users and producers, reducing wasted resources and money



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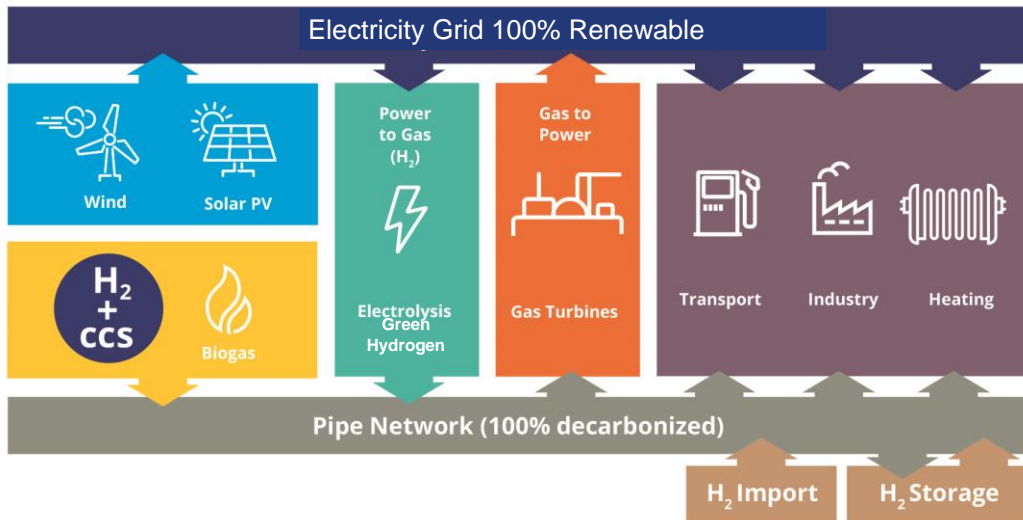
What is Carbon Capture, Utilisation and Storage?



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Energy system integration supports renewables



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Net zero 2050 requires CCUS




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Five largest industrial emitters : 4 Mt/CO2

This equates to....




Removing
1.8 million cars from
Irish roads

or



Emissions from
1,480,000 cows

or



Emissions from
1,200,000 oil heated
homes

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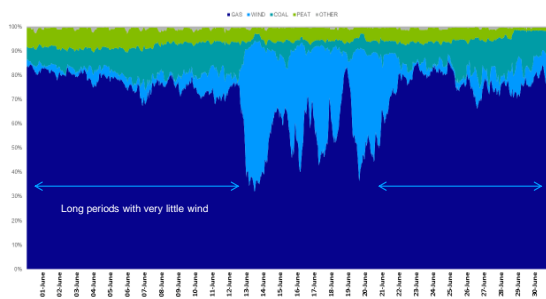
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Gas provides a back up to renewable energy powered electricity today

Decarbonising Electricity Generation with CCUS – Ireland needs ‘Zero Emission Firm Power’

- ⚙️ **Nuclear** – not acceptable here
- 💧 **Hydro** – maximised our resources
- 🌿 **Biomass** – environmentally unsustainable
- 📄 **Batteries** - scale unachievable
- ⚡ **Electrical I/C** – provides market benefits not security of supply
- H₂ **Hydrogen** - Requires significant build out of RE production & storage infrastructure
- 🏭 **CCUS** can achieve Zero Emissions Firm Power with the potential for negative emissions at lowest cost

June Power Generation by Fuel Type



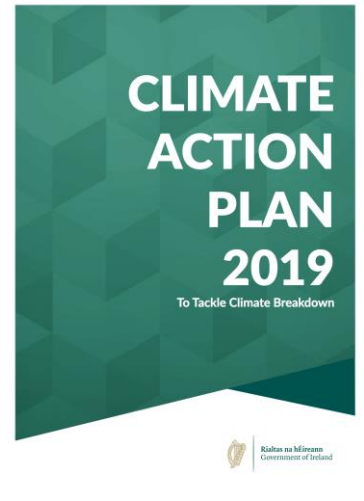
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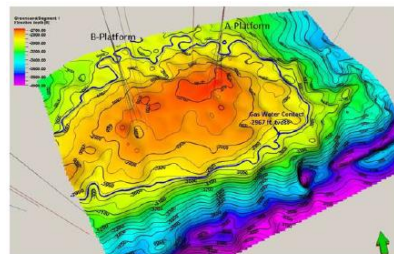
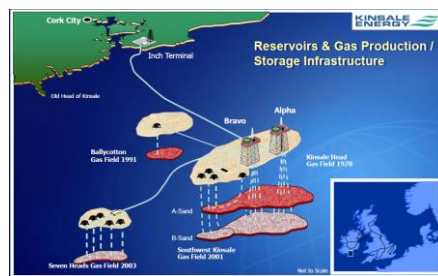
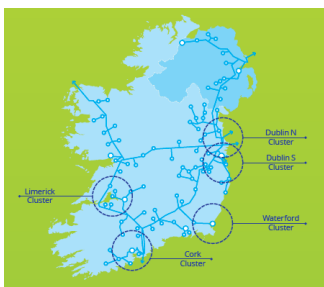
CCUS Study forms part of Ireland's Climate Action Plan

Action 33: Establishment of a Steering Group to examine and oversee the feasibility of the utilization of CCUS in Ireland and report to the Standing Committee on Climate Action as appropriate

Q2 2020 measure:	Monitor progress of Ervia proposal in Cork
Responsible body:	DCCA

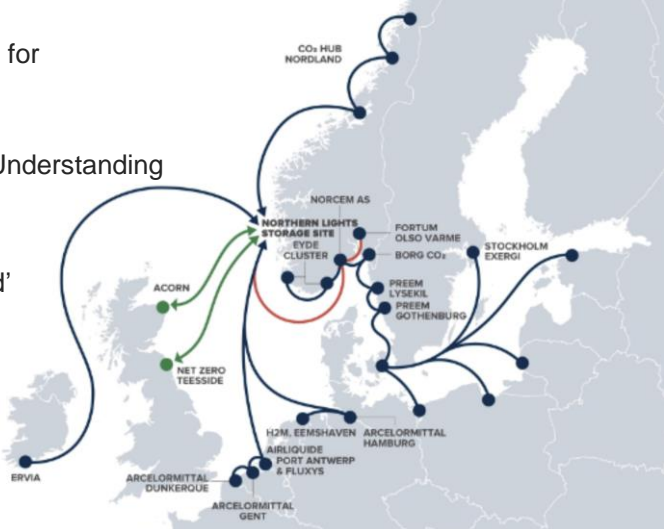


CCUS Feasibility Study: Progress



We are examining options for carbon dioxide export

- Capture CO₂ in Ireland and transport for permanent storage in Norway
- Ervia and Equinor Memorandum of Understanding Northern Lights Project
- CO₂ export option enables 'bite-sized' CCUS deployment



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Funded Projects- Ervia

- Pre-Front End Engineering Design studies:
 - Pipeline transport & conditioning of CO₂ for export & indigenous storage
 - Port facilities for CO₂ import/export
- Studies completed by Q4 2022
- Realise – Horizon 2020 project
- Demonstrating Carbon Capture at an Oil Refinery



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Experts agree that CCUS is a necessity not an option



CCUS is critical to achieving climate targets
 138% higher costs without CCUS



Eirgrid’s Tomorrow’s Energy Scenarios: CCUS is deployed in two of the three scenarios.
 Climate objectives are only met in the scenario which deploy CCUS



Without CCUS transformation of power sector....
 \$3.5 trillion more expensive



The UK Committee on Climate Change’s Net-Zero report (May 2019) states...
 “CCUS is a necessity not an option”

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CCUS is a necessity not an option



The gas network is critical to Ireland’s energy system



CCUS can decarbonise large industrial emitters



A decarbonised gas network is key for a net-zero energy system



Export option reduces risk, reduces Capex cost, increases Opex cost, simpler regulatory regime

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