Renewable Gas
The key to a cleaner energy future

Gas Networks Going Green

Decarbonising Energy, Heat, Transport & Agriculture

Gas Networks Ireland

Ian O'Flynn | 20th September 2018

Introduction to Gas Networks Ireland

ervia

Aurora TELECOM · Gas Networks Ireland · UISCE ÉIREANN · IRISH WATER

€147m
capital expenditure in 2018

52%
of Ireland's electricity needs powered by natural gas

62%
ROI gas demand satisfied by Corrib

74,000GWh
of gas transported in 2017. Over twice the energy carried by the electricity network.

688,000
connections

14,172km
of gas pipeline could wrap around Ireland's coastline 4 times

100%
Reliability of our gas transmission network, including interconnectors to the UK.

1 in 50
Flexibility to meet the harshest weather events as seen in 2010 and more recently in 2018

Renewable gas will be injected into the grid in 2018 and has potential to meet

20%
of Ireland's gas needs by
2030

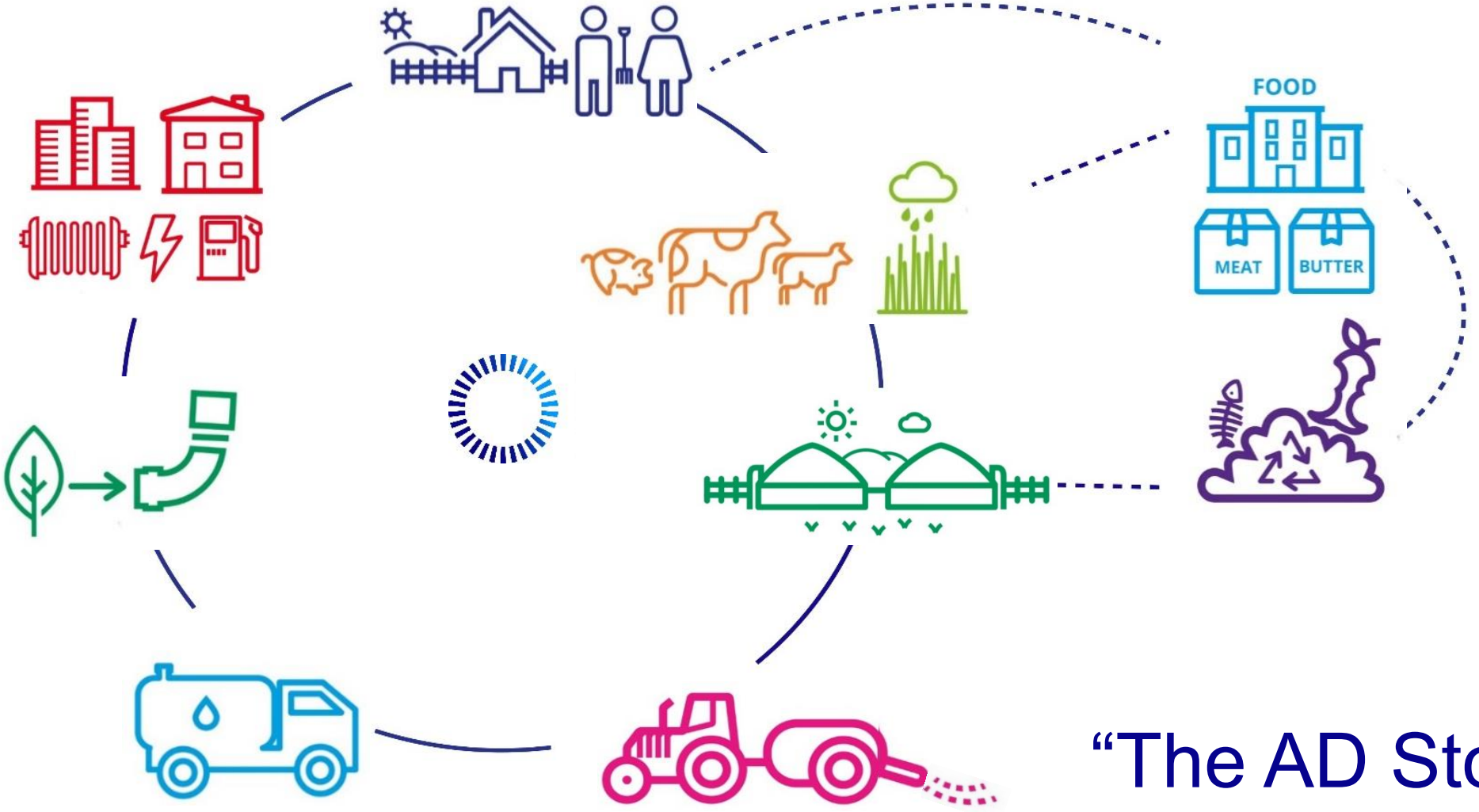
Renewable Gas
The key to a cleaner energy future

20% Renewable Gas by 2030

Equivalent to 11TW of thermal energy

Ireland has the highest potential for biogas production per capita within the EU by 2030 (European Commission)

Sustainable Energy Authority of Ireland (SEAI) study shows gas from animal manure, food waste and grass could provide 28% of Ireland's gas needs, cutting carbon emissions by as much as 2 million tonnes a year



“The AD Story”

AD Feedstock

13 million tonnes of additional grass silage or rotation crop (c. 3.3 Mt Dry Matter) required

50% increase on Irelands current yield of c.25 million tonnes

Significant scope to increase the average yield from **6.5t DM/ha to 13t DM/ha**

Slurry requirement is 7.8 million tonnes (Dry Matter)

60% of Irelands current yield of 13.3Mt.

2.4Mt – 4.4Mt available in 2020 based on current collection and storage

2018

63%

33g

37%

-24g to -84g

GHG emission saving of 70%
Carbon Intensity gCO_2eq/MJ

<24g

2026

-20g to -180g

GHG emission saving of 80%
Carbon Intensity gCO_2eq/MJ

<16g

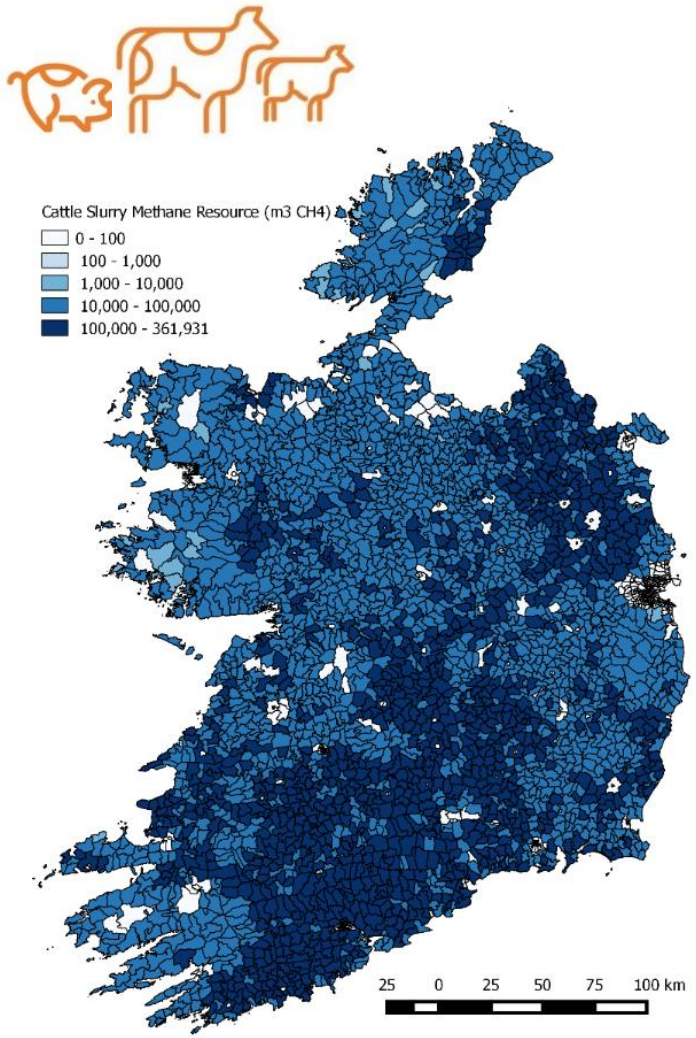
GHG emission saving of 100%
Carbon Intensity gCO_2eq/MJ

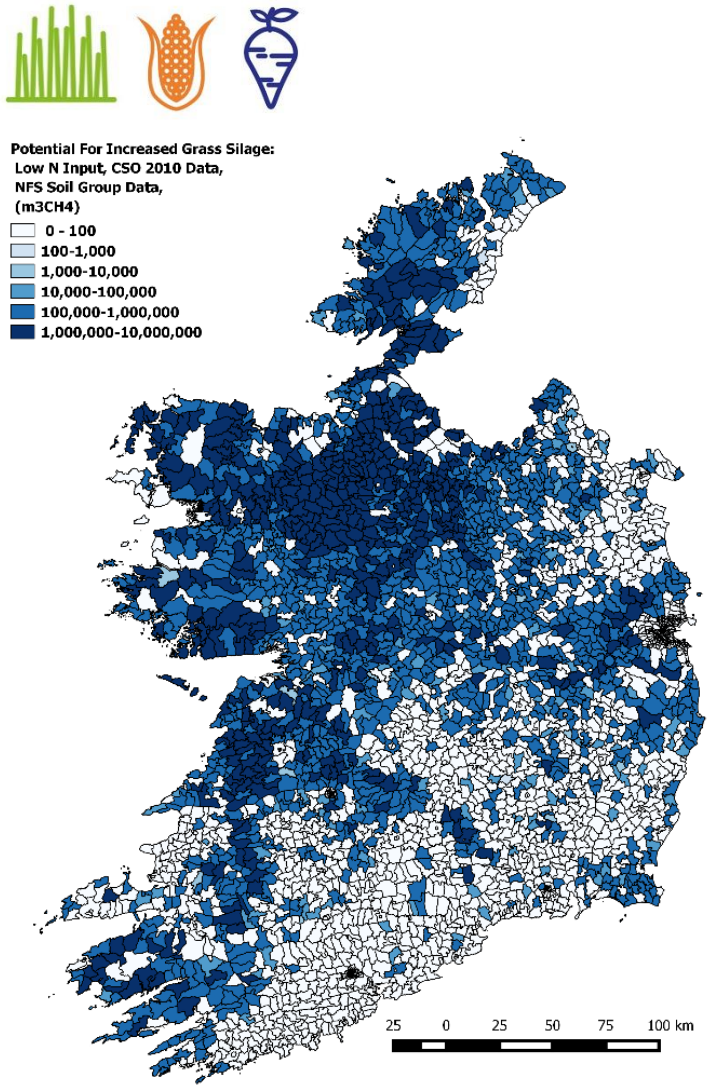
0g

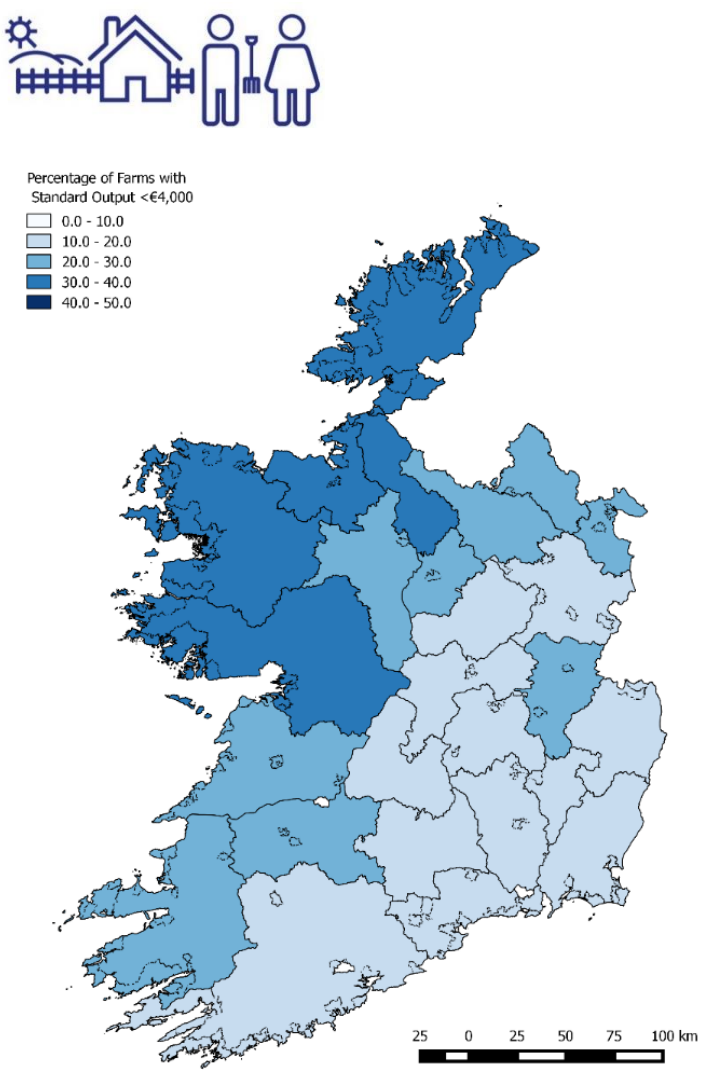
Negative Carbon Possible in AD through the collection of CO_2 to supply Industrial demand, replacing chemical fertiliser with digestate and recognition of the benefits of carbon sequestration.

Gas Networks Ireland

Feedstock Sources Analysis







Likely Scale & Location of AD Plants

20GWh (1MWe)

3 tank system which can integrate within a **rural farm setting**

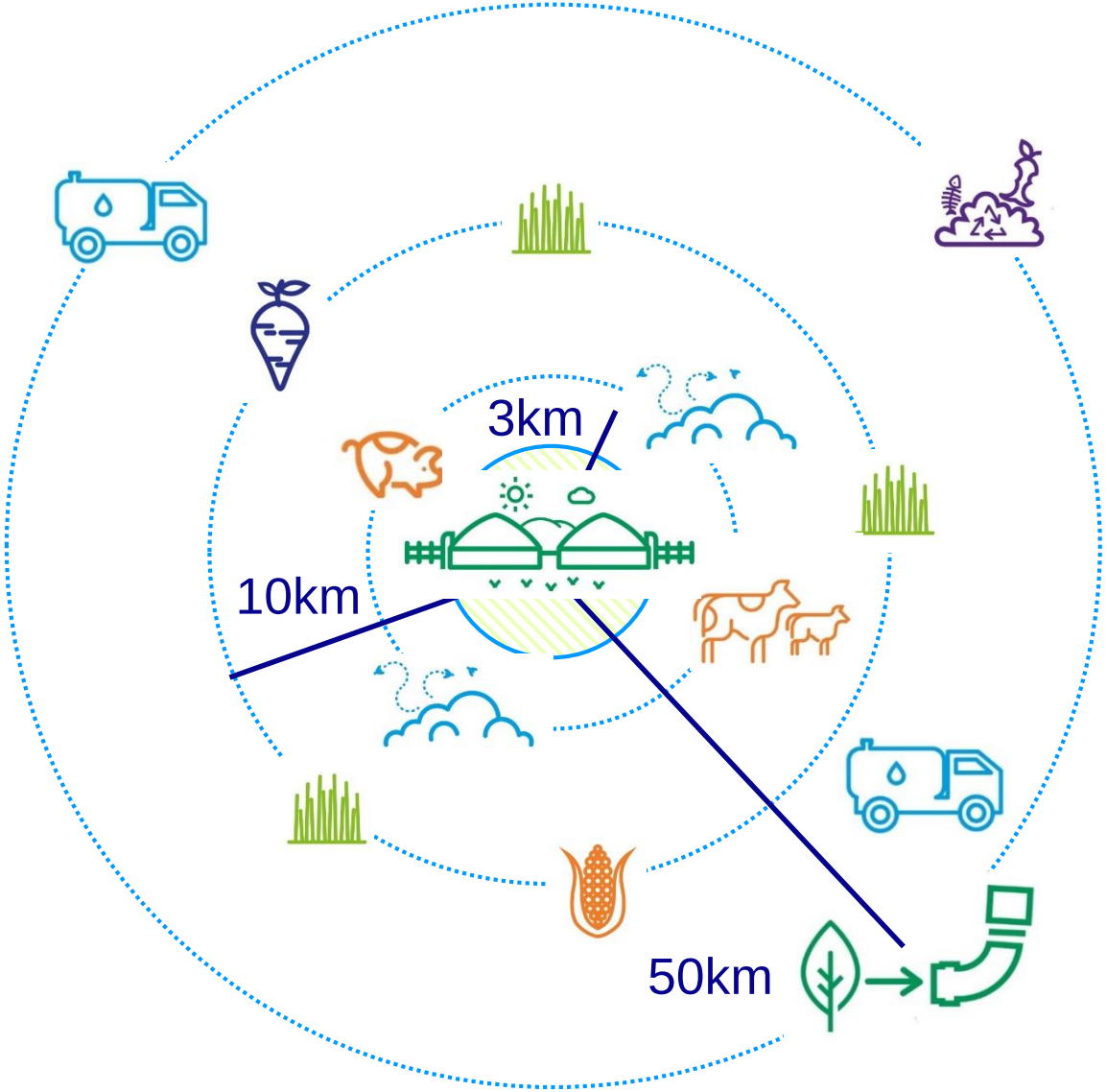
Land requirement of 1,300 acres dedicated to feedstock delivering 27 thousand tonnes pa

40GWh (2MWe)

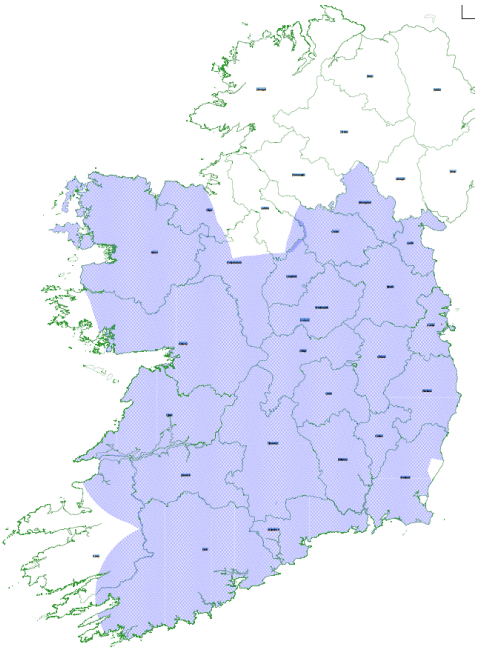
Larger industrial scale plant in a non-farm setting

Land requirement of 2600 acre dedicated to feedstock delivering 54 thousand tonnes pa

High energy food waste also an appropriate feedstock



Logistics & Central Injection Points



Production Biogas

Road Transport

Grid Injection

AD

Logistics Service

Gas Network Injection

- Biomethane will be either **directly injected** into the Gas Grid or safely transported by specialist gas tankers by an experienced logistics firm to a **central injection point**
- Modern composite trailer units (40ft) can transport up to **110 MWh** of energy per trip and are ideal for distances of up to 100 km.

Gas Networks Ireland

Renewable Gas
Driving a cleaner energy future

Cleaner (significantly reduced vehicle emissions)
Cheaper (save up to 35% on fuel costs)
Proven (>20 million vehicles worldwide)

3% of vehicles in Ireland use **20%** of the energy

CNG in transport produces **16%** less CO_2 than Diesel
and Renewable Gas is **Carbon Neutral**

CNG in transport produces **70%** less Nitrogen oxide,
80% less Sulphur Dioxide & **99%** less Particulate Matter

Decarbonising Transport in Ireland

1st National **CNG Network**

1st 100% Natural Gas **Powered Vehicles**

1st Renewable Gas **Injection Point**

€25 million project budget

Co-financed by EU

14 CNG **filling stations**

1 Renewable Gas injection Facility

1 **final network study**

20% Renewable Gas by **2030**

Results disseminated in Europe

1 CNG truck = 50 houses gas usage

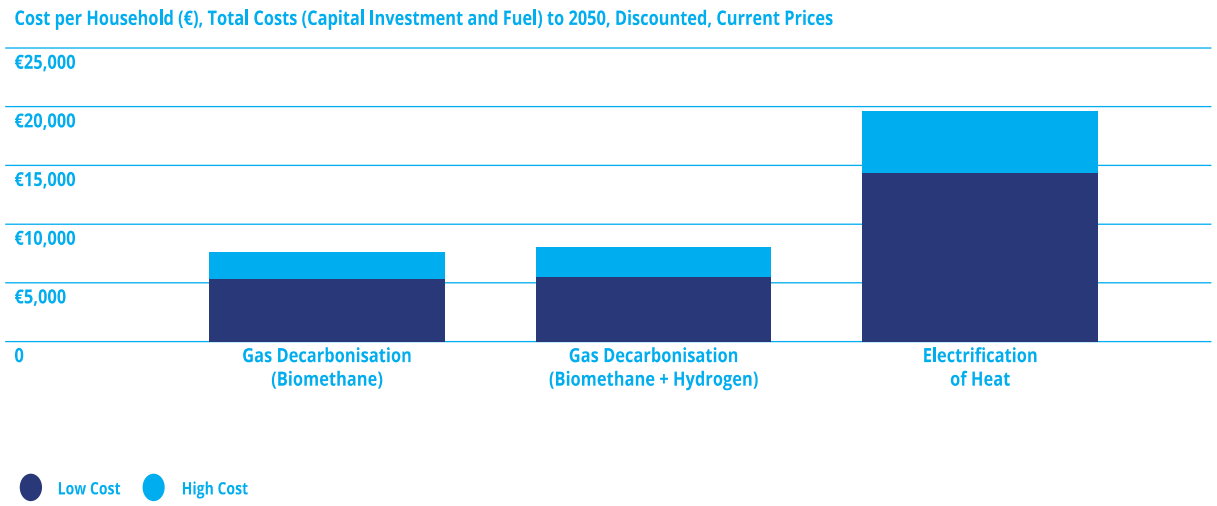
€700k CNG Vehicle Fund

POWERED BY **NATURAL GAS**

Gas Networks Ireland

Decarbonising Domestic Heating in Ireland

KPMG developed and evaluated a number of scenarios for the decarbonisation of the one million Irish residential homes currently connected, or within close proximity, to the existing gas network.



27 AD projects could deliver 1.4% of renewable gas (770gwh pa) which delivers the **same emission benefits** as the proposed **deep retrofit of 170,000 existing homes** which is targeting savings of 2% renewable heat target (770gwh pa) at a **third of the cost.**

Gas Networks Ireland

Decarbonising Agriculture in Ireland

Slurry Storage & Digestate

Slurry and land spreading contributes significantly to **agricultural emissions** Digestate is **90% absorbed** into the land vs 10% of slurry. Pasteurised digestate can replace 90% of chemical fertilisers.

Grass short rotation

3 cuts a year gives multiple harvests, higher growth and higher carbon absorption. Flowering Grass types (such as Red Clover) will have multiple flowering cycles supporting **biodiversity** and our all-important **pollinators**

Carbon Sequestration

Carbon is sequestered in Pasture land naturally. Higher sequestration levels of carbon are associated with digestate absorption.

One third of Irish farms are financially vulnerable and a further third are breaking even, AD provides the opportunity to diversify farming practices, bring unproductive farmland back in to productive use and provide an opportunity for hundreds of thousands of farms to contribute to a revolution in delivering sustainable energy for Ireland.

Gas Networks Ireland

Renewable Gas

The key to a cleaner energy future

Gas Networks Ireland