



Sligo Sustainable Energy Community

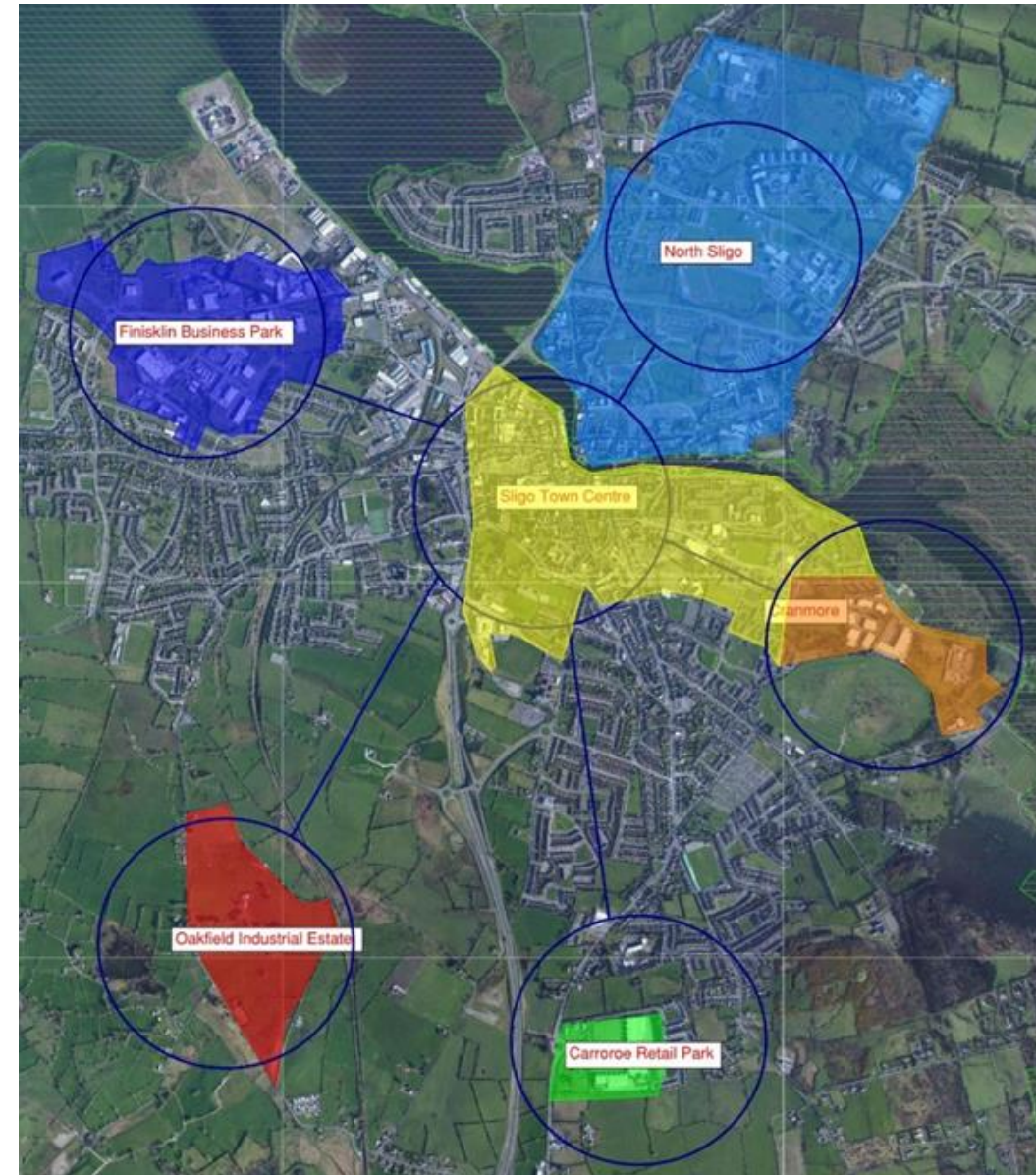
Sligo Local Gas Network

REGATRACE, 29th July 2021



Sligo Local Gas Network

- Industry standard & regulated* gas network
- Supplied by CNG virtual pipeline
- Preliminary FEED & BCA (Fingleton White)
 - Sufficient demand in 3 main hubs
 - 40% cost savings
 - 15% Carbon savings
 - Commercially viable gas project
- Funding secured for Biogas feedstock study



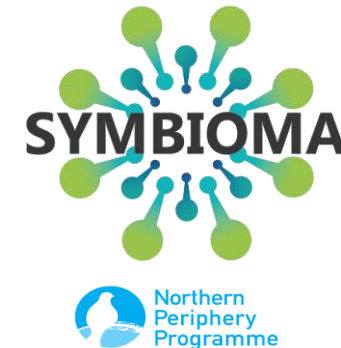
Sligo Local Gas Network

KEY ADVANTAGES TO SLIGO

- Large energy users carbon reduction, moving from oil to gas
- Energy use cost savings, protecting circa 3000 FDI roles & attracting tenants to new IDA Business Park at Oakfield, Sligo
- Green Gas transport for buses and haulage – Gas Networks Ireland priority
- Circular Economy; Hub for Agri-sector bio gas / methane from wastes
- Hydrogen Economy; future proofing infrastructure for Hydrogen

IT Sligo Contract Research Unit

The CRU as part of the IT Sligo Research Department provides dedicated outreach Research, Development & Innovation support to regional enterprises, communities, individuals and public sector.



Sligo Sustainable Energy Community



Vision:

To provide a leading role in the region for sustainability, health and learning

We will do this by:

- Promoting sustainability and energy efficiency
- Supporting reductions in CO₂ in premises
- Full regional approach working with cross-border partners
- Increasing academic collaboration
- Energy Contracting

Sligo SEC Energy Master Plan (EMP) for Sligo Town

- Est. Dec 2016 as leader for regional sustainability
- €350K+ energy efficiency capital works 2017 - 2019
- Energy Master Plan Sligo Town 2020 (€25k)

Infrastructure

- **SLGN – Biogas / Transport / H2**
- Community-led generation - RESS

Sligo SEC members

- Share learnings from exemplar projects
- Provide regional leadership

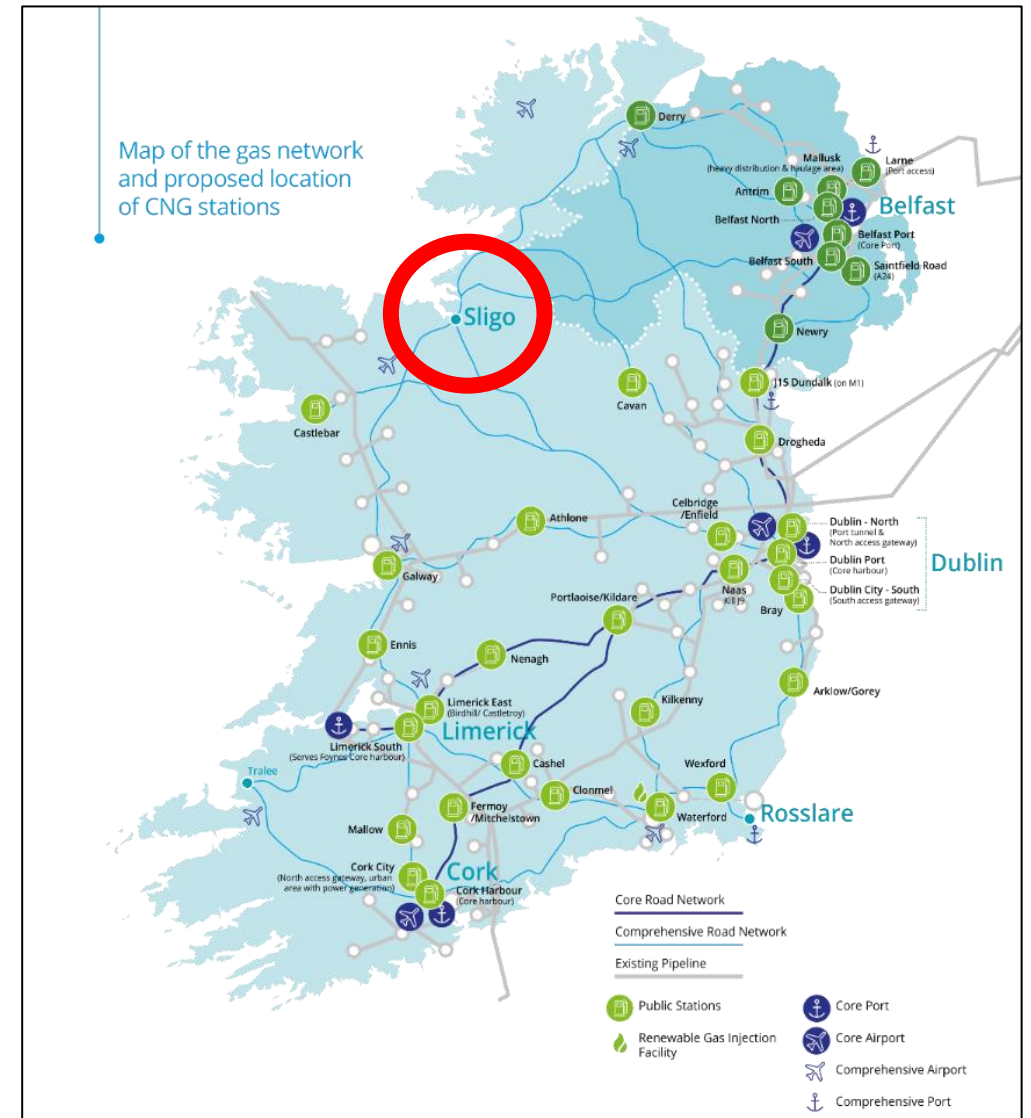
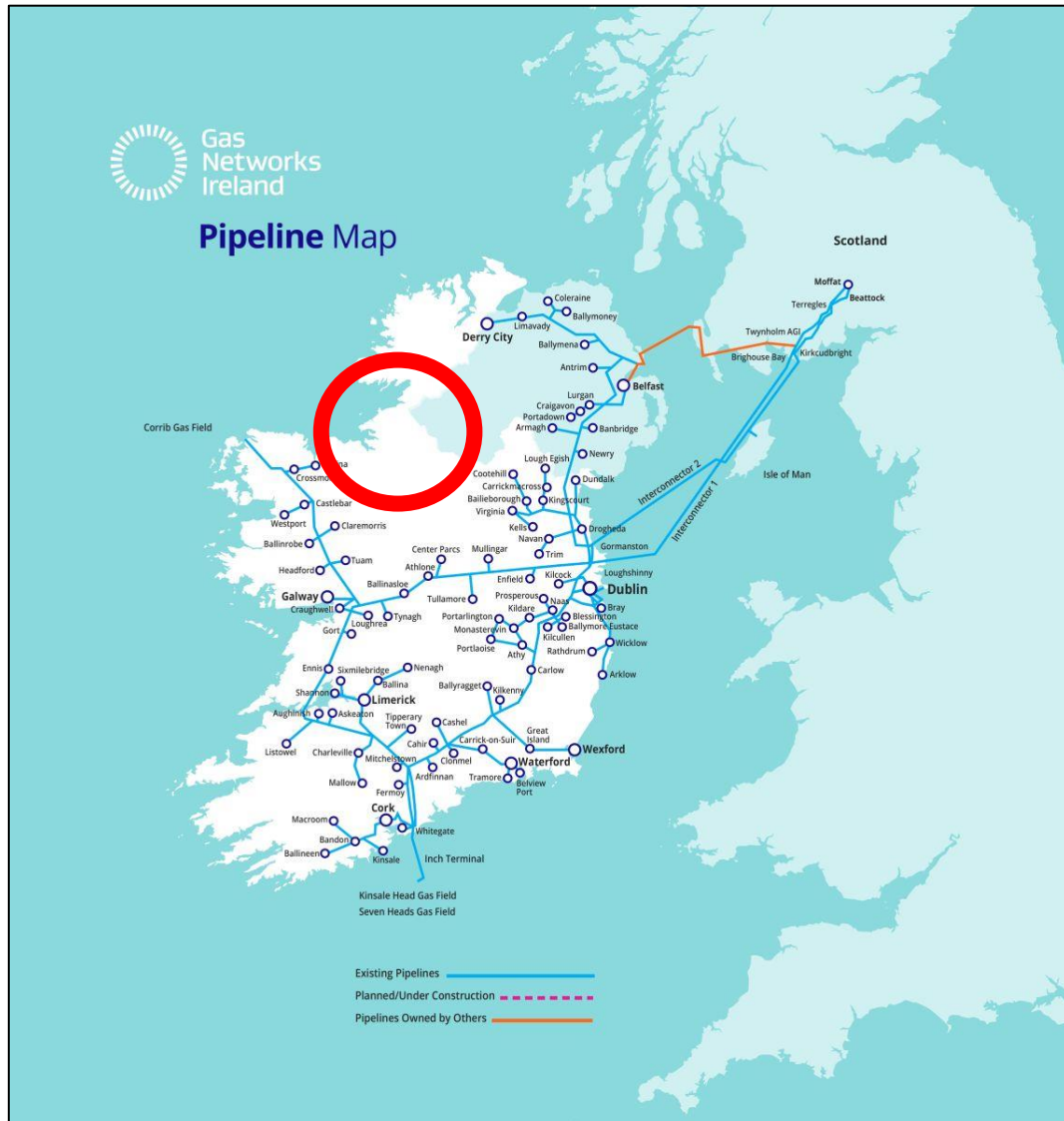
SME & Community Sector

- Group project for economies of scale
- Share common solutions

Residential Sector

- Multi-annual workplan required for 2030
- Establish one-stop-shop for home retrofitting
- Group SCC and private homes for impact

Reducing CO2 footprint in the North West





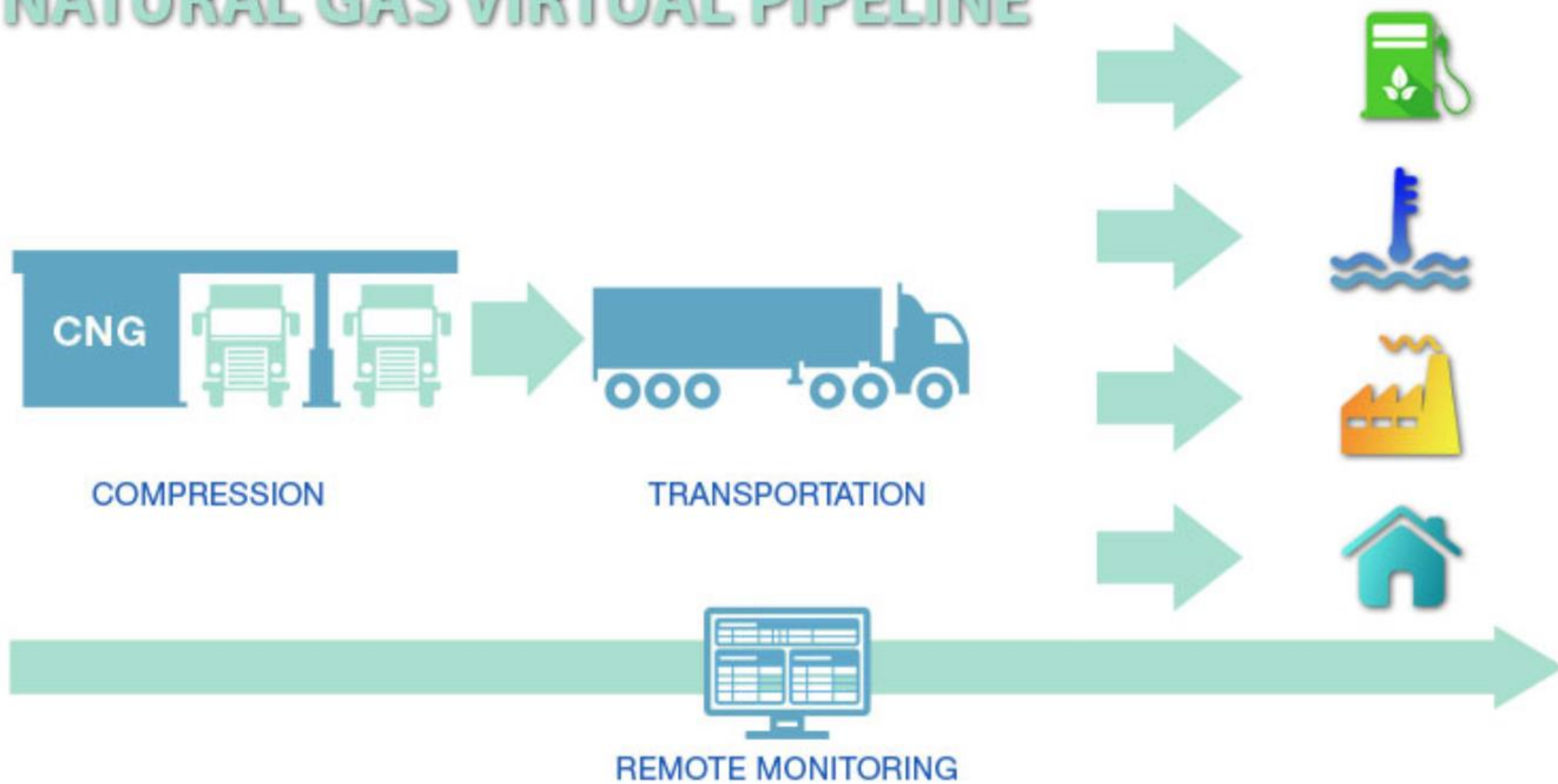
Summary Results for Phase III Towns:

Viable Towns	Distribution NPV (€m)	Transmission NPV (€m)	Total NPV (€m)	NPV / Therm (€/Th)
Tipperary Town	-3.35	3.71	0.36	1.65
Kinsale	-0.76	3.71	2.95	13.19
Innishannon	-0.18	0.10	-0.09*	-19.67
Kells	-0.48	1.58	1.10	13.71

*when included in the Kinsale Regional Economic grouping

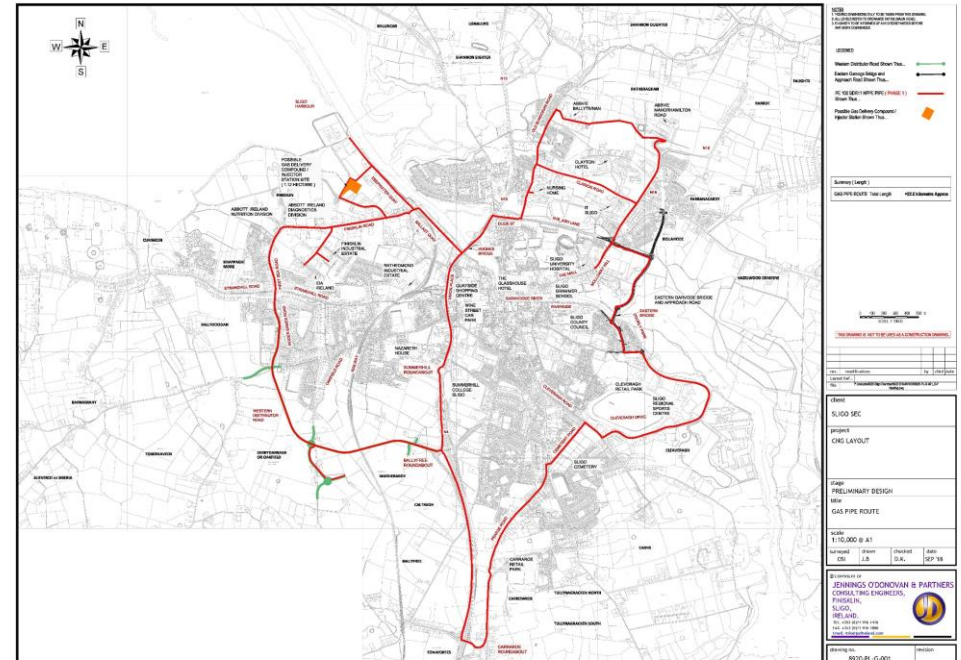
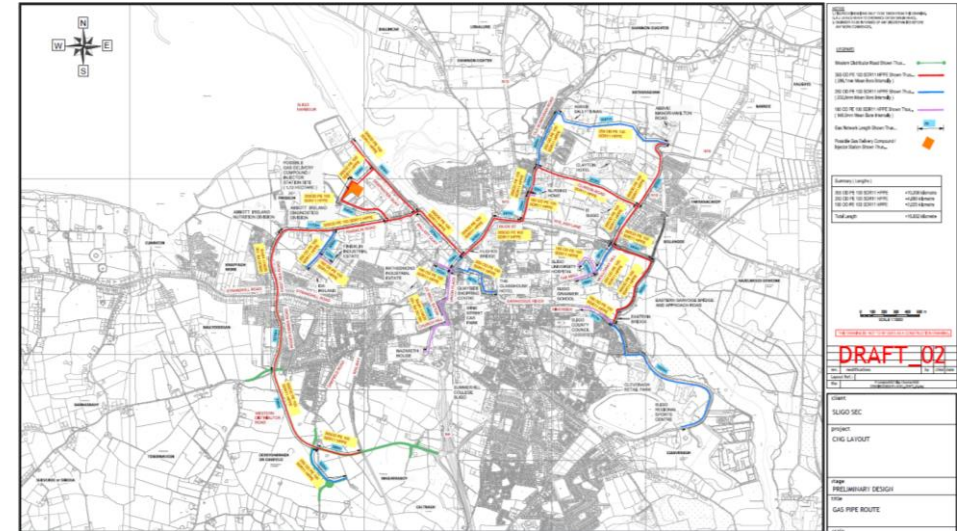
Non-Viable Towns	Distribution NPV (€m)	Transmission NPV (€m)	Total NPV (€m)	NPV / Therm (€/Th)
Newcastle West	-2.85	-0.53	-3.38	-65.77
Portumna	-4.56	-0.46	-5.02	-176.52
Shercock	-1.85	0.31	-1.54	-110.63
Sligo	4.54	-43.14	-38.60	-124.63
Letterkenny	-0.08	-14.50	-14.58	-69.94
Castlecomer	-1.87	1.20	-0.67	-8.71
Ballaghaderreen	-2.51	-15.54	-18.04	-112.95
Moate	-1.51	0.32	-1.19	-81.05
Kilbeggan	-1.04	0.20	-0.84	-91.62
Macroom	-4.38	-0.53	-4.90	-136.83
Clonakilty	-1.95	0.01	-1.94	-25.51
Callan	-0.88	-0.63	-1.51	-65.29
Thurles ¹	-9.55	0.89	-8.66	-94.02
Oldcastle	-1.09	0.44	-0.64	-31.82

NATURAL GAS VIRTUAL PIPELINE



What about a Satellite Distribution Network?

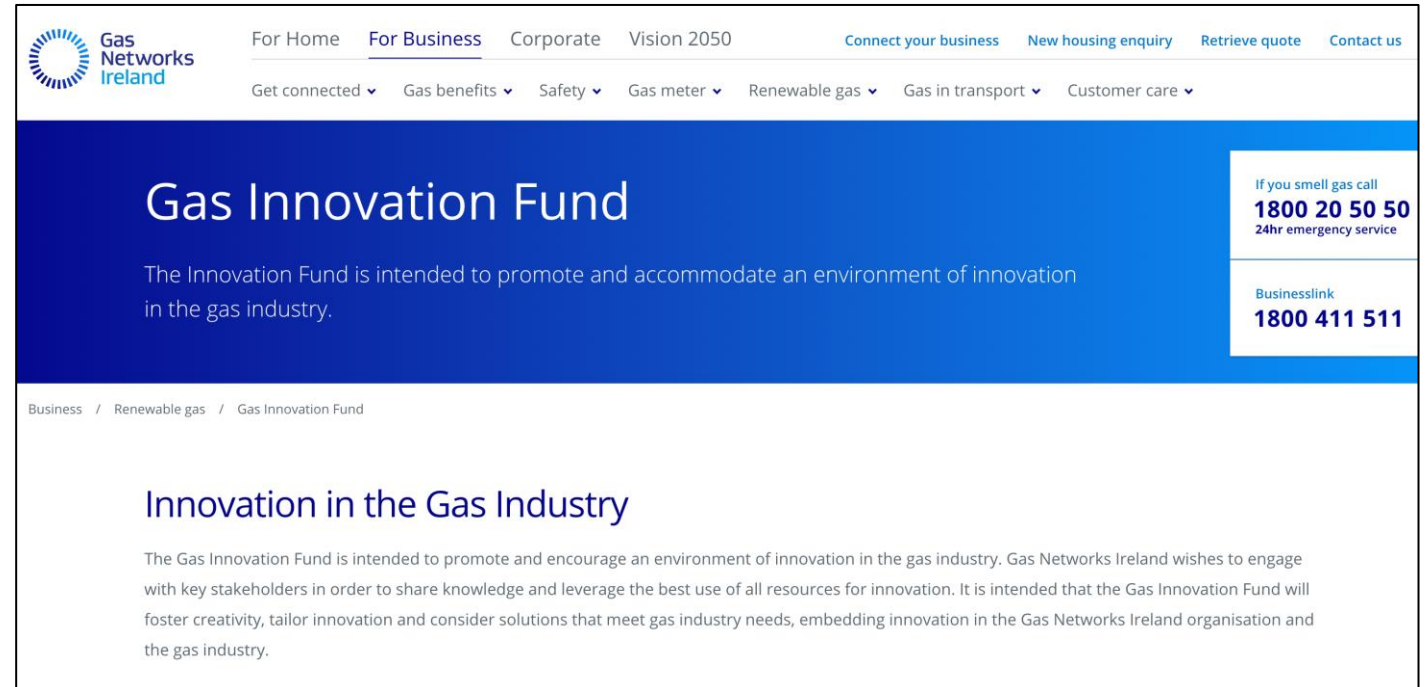
- Energy data analysed (24 no. large energy users)
- Electricity 43 GWh, LPG 29 GWh, Oil 15 GWh
- Oil and LPG spend approx. €3.6m per annum
- Natural gas would cost approx. €2.6m
- €1m (28%) saving in energy spend (1,500 tCO₂ pa)
- 22 km local gas network supplied connecting large users
- €10m (pipeline installation, gas injection, gas transport vehicles, consents & contingencies)
- SLGN is an enabler for Green gas in the North West of Ireland



- Project Ireland 2040 Urban Regeneration & Development Category B application



- GNI Innovation Fund application for Frond End Engineering Design (FEED)



SLGN Technical Steering Committee

- **Steering Group:** Provide strategic direction, monitor progress and oversee project execution. Membership to comprise Commercially & Technically experienced people in delivering large scale infrastructure projects (external industry reps, RGFI, IDA, GNI, SCC, IT Sligo, Teagasc, Commission for Regulation of Utilities)

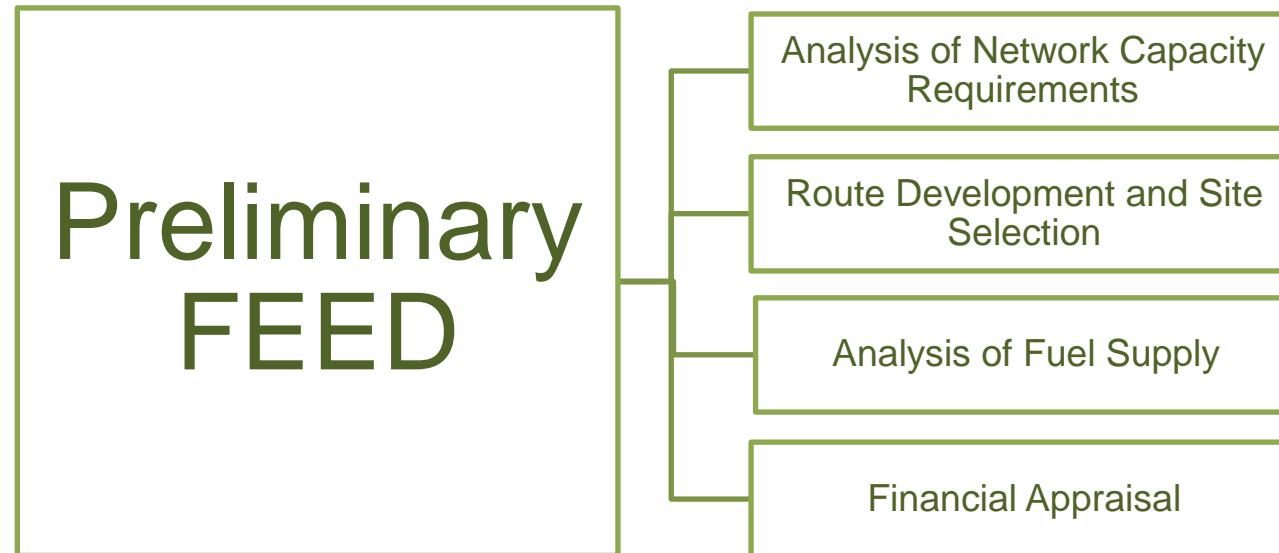


Sligo Local Gas Network

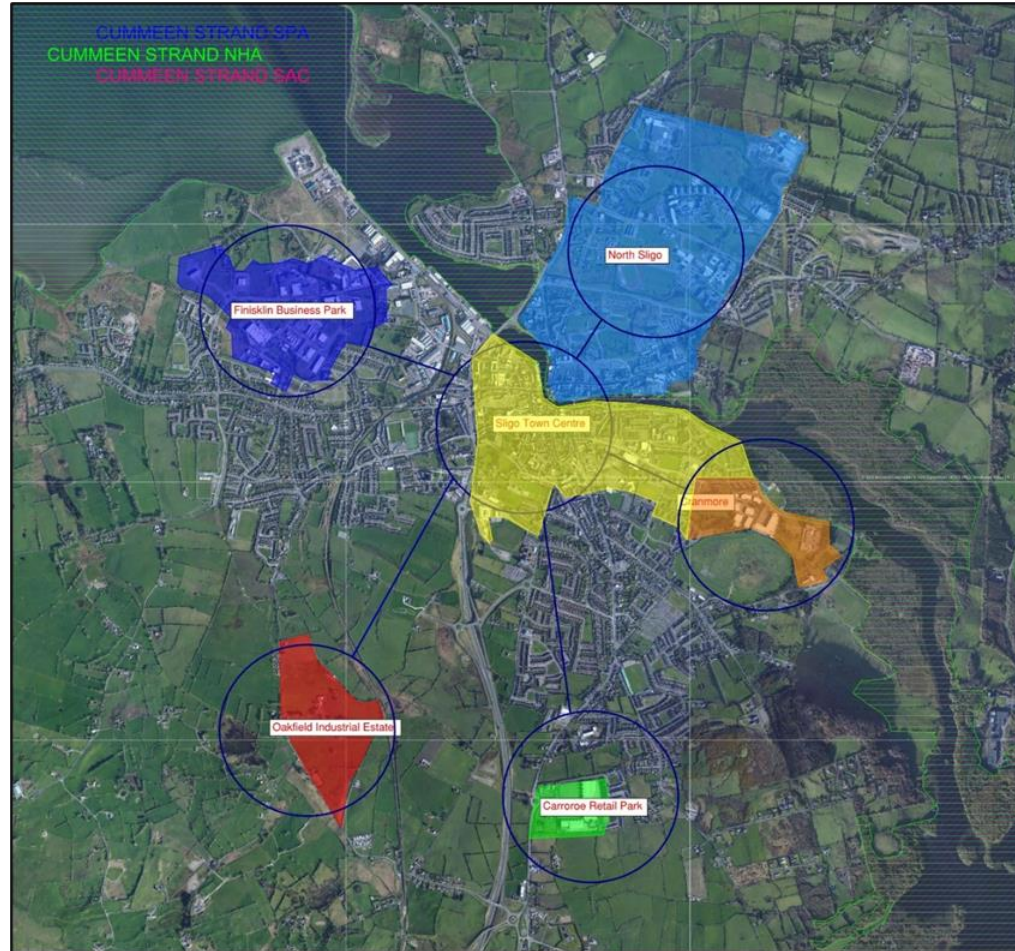
Preliminary FEED

10/09/2020

Introduction & Scope



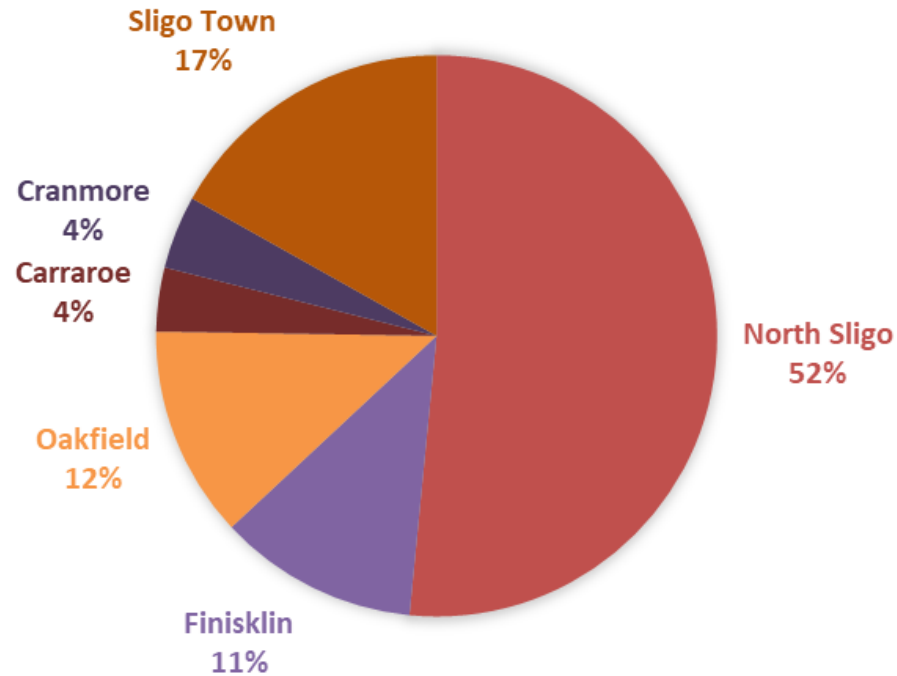
Energy User Hubs



Forecast Gas Demand

	High		Medium		Low	
	EAC (MWh)	% of Total	EAC (MWh)	% of Total	EAC (MWh)	% of Total
North Sligo	36,989	48%	32,191	52%	27,393	58%
Finisklin	7,859	10%	7,187	12%	6,516	14%
IDA Oakfield	7,850	10%	7,611	12%	7,372	16%
Carraroe	3,676	5%	2,297	4%	919	2%
Cranmore	4,218	5%	2,637	4%	1,055	2%
Sligo Town	16,839	22%	10,524	17%	4,210	9%
	77,431		62,448		47,464	

Medium Uptake Scenario



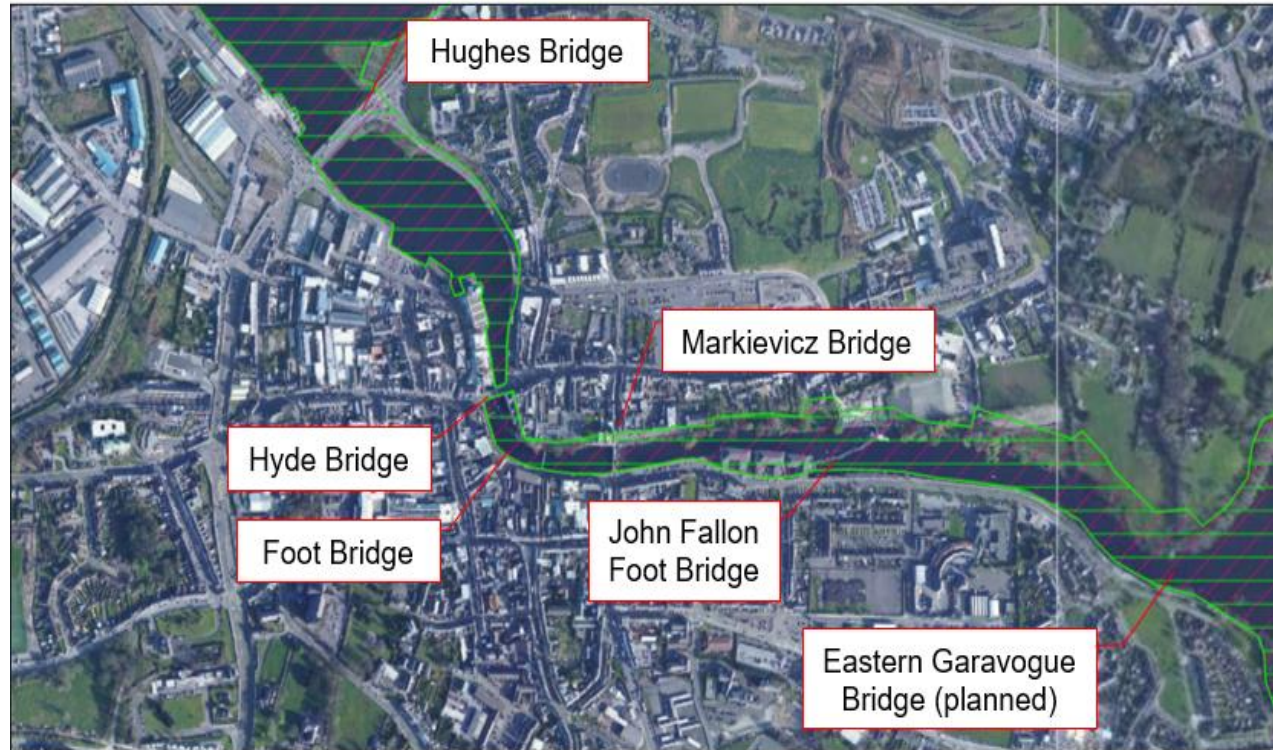
Pipeline Route Options

Priority	Fixed Point
1	North Sligo
2	River Crossing & Finisklin Business Park
3	Oakfield Business Park
4	Sligo Town Centre
5	Carraroe Retail Park and Cranmore Region

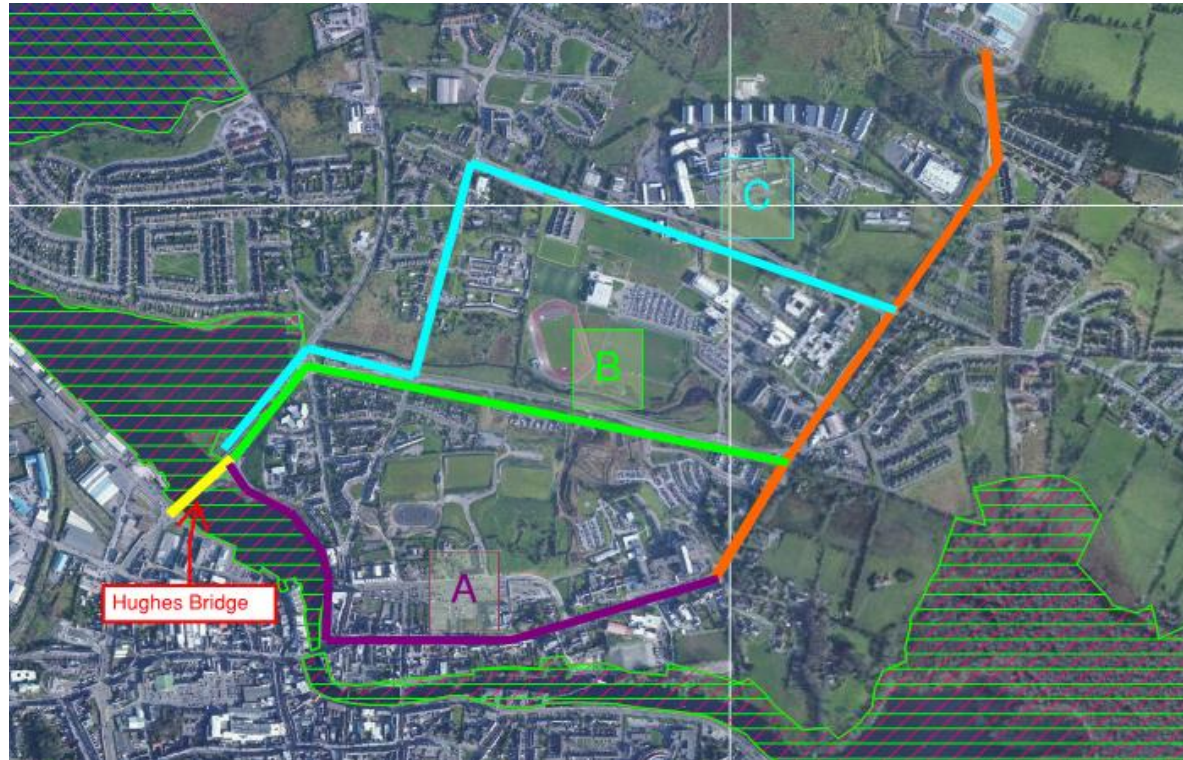
Key considerations when assessing routes were:

- Route Length
- Future expansion of network
- Proximity to possible future I/C users
- Gas injection location
- Special Engineering Difficulties (SED) (e.g. rivers, trenches, road-crossings)
- Constructability
- Traffic management requirements
- Wayleaves
- National Road Crossings (N4, N15, N16)
- Rail crossings
- Architectural areas
- Environmental concerns
- Network re-enforcement

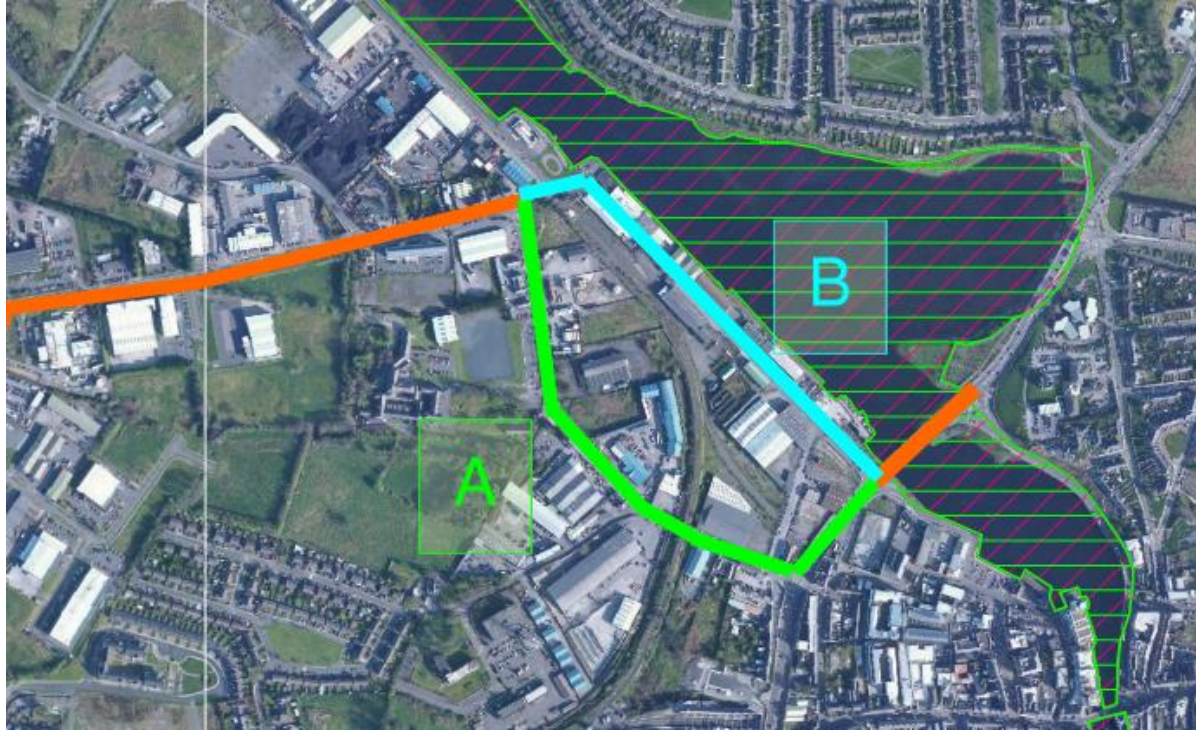
River Crossing



North Sligo



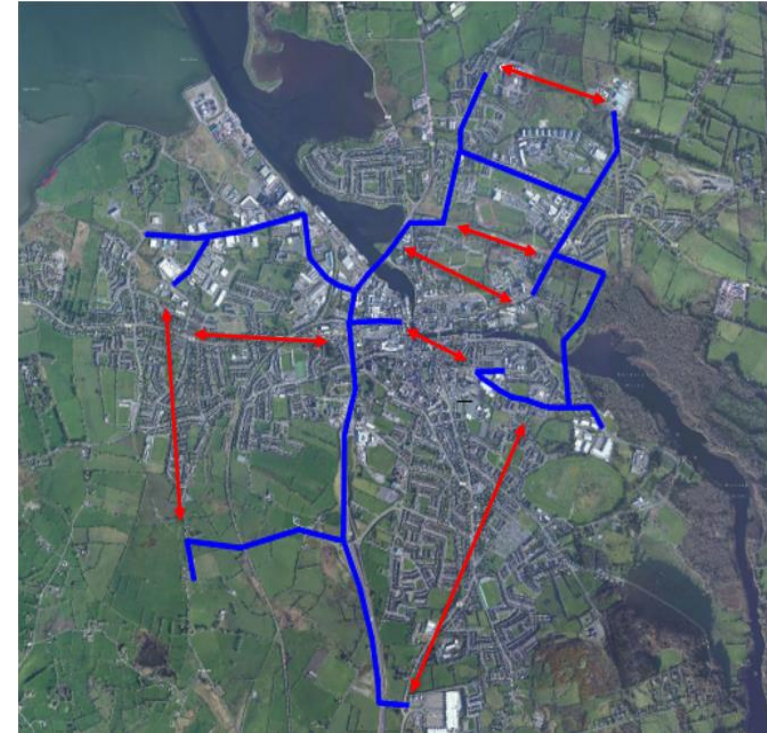
Finisklin - Hughes Bridge



Oakfield Business Park



Preferred Network Route



Potential Network Reinforcements

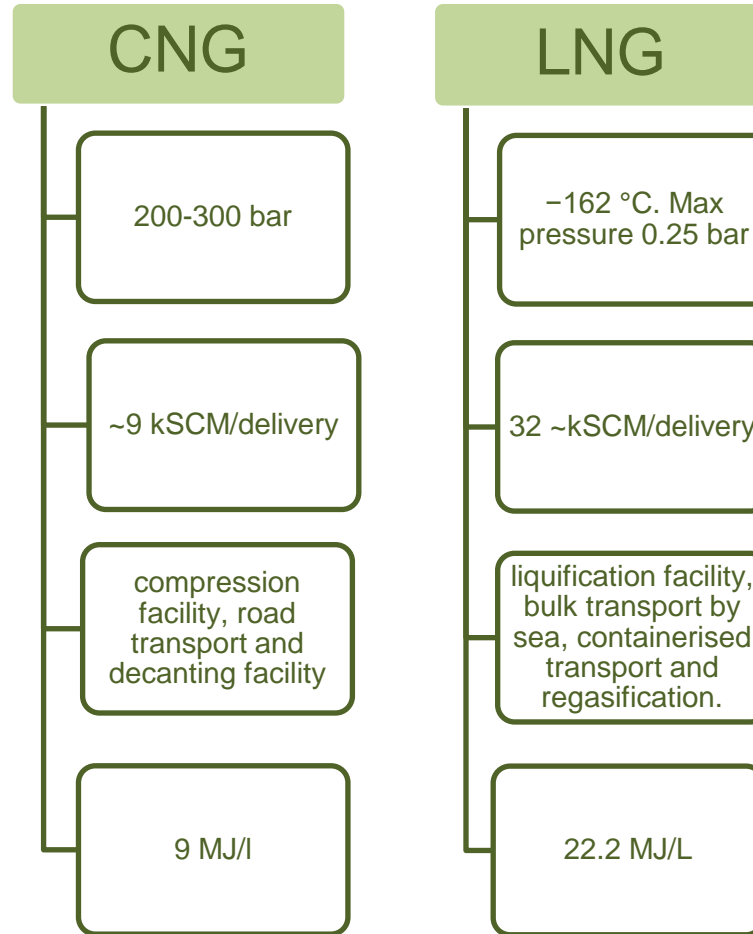
Decanting Site Options

Site Name	Site Number
Finisklin Business Park	Site 1
Barroe, N16	Site 2
Caltragh Roundabout	Site 3
Ballydoogan Road	Site 4

*Subject to landowner consent



Fuel Supply Options



Security of Supply

LNG

Strengths:

- LNG is traded internationally from a number of sea ports throughout Europe, diversification of supply points provides supply chain options and enhanced security
- LNG is shipped in standard ISO shipping container sized vessels
- Established supply chain for LNG into Ireland
- Higher energy density good for storage and transport

Weakness:

- The carbon footprint associated with the LNG supply chain can be larger due to the processing and shipping requirements.
- Limited supply chain within Ireland.
- Current business model requires contract with a single shipper over a 10-15 year period.

CNG

Strengths:

- Gas can be procured from multiple shippers
- CNG has the shorter supply chain.
- The virtual pipeline is, in effect, an extension of the Irish national grid.

Weakness:

- lower relative density, greater number of deliveries required
- There is currently no suitable compression facility within Ireland
- Reliance will be on a single compression site (Site should have duty / standby compressors)

Renewable Fuels

- Biomethane in the form of Bio-LNG (imported) or Bio-CNG (imported or indigenous)
- Hydrogen (blend or 100%)
- Potential for indigenous production

Financial Appraisal

Assumptions: Simple Payback Method over 25 years using the CNG medium uptake scenario as the base case.

Discount rate of 5%

Inflation rate 2%

Calculated unit cost of gas to the end user is the rate at which the medium uptake scenario yields a Net Present Value of zero over a 25 year period

	Growth/Year
Large I/C	25%
Medium I/C	20%
Small I/C	15%

	Cost
CNG	0.02 €/kWh
LNG	0.034 €/kWh

CAPEX

CNG Injection Facility Budget Estimate (Total +/- 40%)	
Project Management (inc Design Consultancy)	€ 200,000
Conceptual Design & Planning	€ 80,000
Equipment & Material Procurement:	
Decanting & PRS skids	€ 370,000
Package Boiler Units	€ 180,000
Other materials	€ 150,000
Civil / Utilities	€ 160,000
Construction	€ 770,000
Site Acquisition	€ -
C&I	€ 90,000
Miscellaneous:	
Network Setup costs (Safety Case etc)	€ 200,000
Distribution network 1st fill	€ 1,150,000
Compression Facility (2 x compressors - duty / standby)	€ 2,500,000
CNG Trailers x 2	€ 1,000,000
Contingency	€ -
Total	€ 6,850,000

LNG Injection Facility Budget Estimate (Total +/- 40%)	
Decanting facility capex included in gas supply rate + annual service charge	€ -
Site Acquisition	€ -
Miscellaneous:	
Network Setup costs (Safety Case etc)	€ 200,000
Distribution network 1st fill	€ 1,950,000
Contingency	€ -
Total	€ 2,150,000

CAPEX

Network CAPEX Budget Estimate (Total +/- 40%)	
Energy Hub	Cost
North Sligo	€ 635,564
Finisklin Business Park	€ 402,528
IDA Oakfield Park	€ 368,984
Carraroe Retail Park	€ 201,264
Sligo Town	€ 227,720
Total	€ 1,836,059

	Services and Meters		
	High	Medium BASE CASE	Low
Small I/C	610	387	155
Medium I/C	30	19	10
Large I/C	9	6	3
Total No. of Meters	649	412	168
Unit Cost	€ 2,500	€ 2,500	€ 2,500
Total Cost	€ 1,622,500	€ 1,030,000	€ 420,000
Total Cost less 30% Contribution	€ 1,135,750	€ 721,000	€ 294,000

Total CAPEX (+/- 40%)	
CNG	€9,401,184
LNG	€4,704,298

OPEX

OPEX ESTIMATE		Total CNG	Total LNG
Operational Requirements			
Engineer		€ 85,000	€ 85,000
1st Response Fitter		€ 80,000	€ 80,000
Emergency Repair Crew		€ 100,000	€ 100,000
Average callout per km/year	2.5		
Callout Cost	€210	€6,458	€6,458
Average Repair callout per km/year	0.065		
Repair Callout Cost	€4,100	€3,278	€3,278
Office/Depot		€ 20,000	€ 20,000
Sales Team		€ 60,000	€ 60,000
Management / Admin		€ 150,000	€ 150,000
Meter replacements after 15yrs/yr		€ 16,667	€ 16,667
CNG Compression & Transport @ 3 deliveries/wk		€ 436,800	
Total OPEX		€ 958,202	€ 521,402
LNG Facility Service Charge per annum.			€ 120,000

Potential Savings

Annual Fuel Usage (known)				
	Total LPG (kWh)		Total Oil (kWh)	Total (kWh)
North Sligo	22,917,692		15,534,818	38,452,510
Finisklin Business Park	6,556,792		408,000	6,964,792
Sligo CoCo	1,330,534		1,209,488	2,540,022
Totals	30,805,018		17,152,306	47,957,324
Annual Fuel Cost				
	c/kWh	Total LPG (€)	Total Oil (€)	Total (€)
LPG (Bulk 3.1 - 40t)	9.18	€ 2,827,901		
Oil	7.18		€ 1,231,536	
Total (Existing Fuel Mix)		€ 2,827,901	€ 1,231,536	€ 4,059,436
Total (CNG)	4.52	€ 1,393,665	€ 775,996	€ 2,169,661
Annual Energy Cost Difference				€ 1,889,776

Conclusions

- Financial Appraisal indicates there is sufficient thermal demand to support the network
- Potential savings for business when converting from LPG or Oil
- The network will offer significant carbon savings with realistic routes to decarbonisation in the future
- Potential for indigenous biomethane and hydrogen to be injected into the network in the future



Rialtas
na hÉireann
Government
of Ireland

Tionscadal Éireann
Project Ireland
2040

Climate Action Fund

28 November 2018

On completion of the Assessment Stage of the First Call for Applications for support under the Climate Action Fund, the following seven projects have been approved as eligible for support by the Minister for Communications, Climate Action and Environment, Richard Bruton T.D.

These projects will now proceed to the Validation Stage of the process. Projects that do not satisfactorily complete this stage will not progress to be supported by the Climate Action Fund.

Organisation / Lead Applicant	Project Name	Maximum Support Approved
ESB eCars	ESB Electric Vehicle High Power Charging Infrastructure Development Project	€10,000,000
Gas Networks Ireland	GRAZE Gas – Green Renewable Agricultural Zero Emissions Gas	€8,474,340
Irish Rail	Hybrid Drive for Inter City Railcar (ICR 22000) fleet	€15,000,000
Dublin City Council	Dublin District Heating System	€20,000,000
South Dublin County Council	The South Dublin County Council Tallaght District Heating Scheme	€4,447,952
Road Management Office	Local Authority Public Lighting Energy Efficiency Project	€17,470,000
3 Counties Energy Agency CLG	Driving HGV Efficiently into Brexit	€1,373,400
Total		€76,765,692



Roinn Cumarsáide, Gníomhaíthe
ar son na hAeráide & Comhshaoil
Department of Communications,
Climate Action & Environment

- GNI Innovation Fund application for Biogas feedstock study
- Sligo SEC members match funding



For Home For Business Corporate Vision 2050

Connect your business New housing enquiry Retrieve quote Contact us

Get connected ▾ Gas benefits ▾ Safety ▾ Gas meter ▾ Renewable gas ▾ Gas in transport ▾ Customer care ▾

Gas Innovation Fund

The Innovation Fund is intended to promote and accommodate an environment of innovation in the gas industry.

If you smell gas call
1800 20 50 50
24hr emergency service

Businesslink
1800 411 511

Business / Renewable gas / Gas Innovation Fund

Innovation in the Gas Industry

The Gas Innovation Fund is intended to promote and encourage an environment of innovation in the gas industry. Gas Networks Ireland wishes to engage with key stakeholders in order to share knowledge and leverage the best use of all resources for innovation. It is intended that the Gas Innovation Fund will foster creativity, tailor innovation and consider solutions that meet gas industry needs, embedding innovation in the Gas Networks Ireland organisation and the gas industry.

Sligo Local Gas Network – Next Steps 2021

Key actions:

- Detailed Design
- Environmental Studies
- Planning Application
- Stakeholder Engagement
- Operator procurement

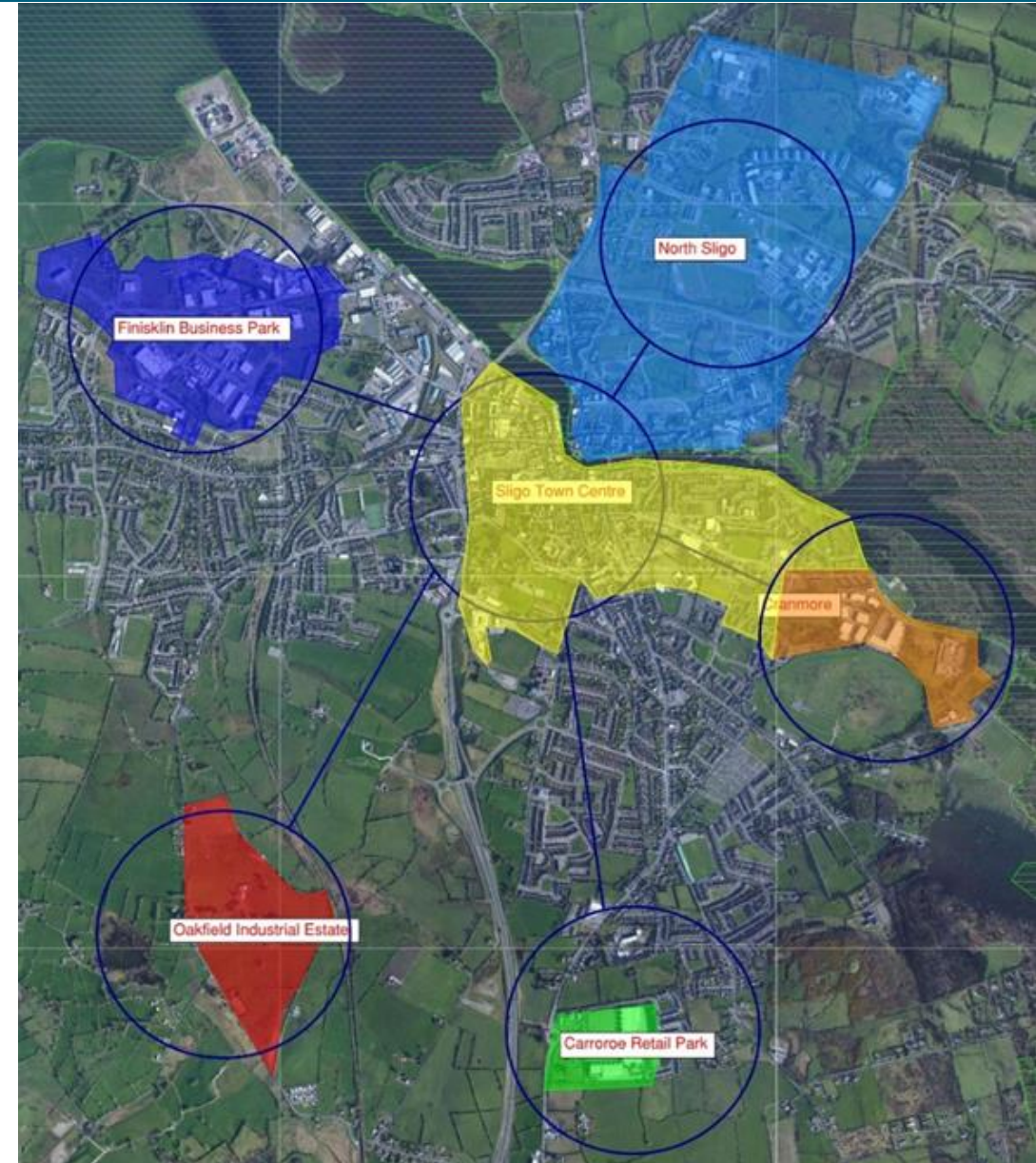
National Recovery & Resilience Plan consultation response

EU Strategy for Energy System Integration:

For those sectors where electrification is difficult, the strategy promotes clean fuels, including renewable hydrogen and sustainable biofuels and biogas

ACER's Gas Target Model:

The GTM recognises new developments in the gas supply chain including the intensification of gas use in the transportation sector and small-scale applications of liquefied natural gas (LNG) and compressed natural gas (CNG), such as virtual pipelines



Thank you

Stevie Donnelly– IT Sligo

Donnelly.stevie@itsligo.ie

083 3166379

Mel Gavin – IT Sligo

Gavin.mel@itsligo.ie

086 3099184