Statutory Independent Undertakings (SIU) Strategy

December 2024

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Section A Executive summary

1 We own and operate five independent gas networks in the more remote parts of Scotland, known by us and Ofgem as the Statutory Independent Undertakings (SIUs). In total, the five SIUs serve 9,509 customers.

2 To support our RIIO-GD3 (referred to as GD3 throughout this submission) plan, we have prepared an SIU strategy that will ensure we operate and maintain our existing assets in a safe and compliant manner and continue to provide our customers with a reliable supply, while also progressing our ambitious plan to decarbonise four of our SIU's by transitioning them to alternative fuels such as biomethane CNG and/or other potential green energy sources such as biomethane and bio propane as suggested in the Guidehouse report.

3 We are currently delivering a conceptual design study on the introduction of biomethane at the Wick and Thurso SIU sites and are committed to delivering these projects in GD3. We will also commence development works for alternative renewable, low carbon energy options for Campbeltown and Oban, while also considering a holistic approach to energy requirements. Biomethane production is currently taking place on the west coast of Scotland which could supply both SIUs and provide extra resilience to the sites, although electrification and other energy options will be considered as potential options adopting a whole systems approach.

4 The transition to biomethane for some of our most remote customers at the SIU's demonstrates our overall commitment to support decarbonisation plans for our network as well as a whole system approach to options for our customers.

5 The transition from Liquified Natural Gas (LNG) to biomethane brings numerous benefits including:

- Societal benefit from reduction in CO_2 emissions comparing biomethane to LNG is expected to be in the region of 10.95 kt CO_2 per annum for Wick and Thurso.
- Reduced operational carbon footprint from transportation of LNG from source (figure included in previous bullet point).
- Increased resilience to our network through locally produced green gas with less reliance on imported fuels to the UK.
- Reduced propane enrichment within the process.
- Reduces customer impact from swapping energy source and installing new equipment.
- Reduced risk of additional inconvenience for our customers in relation to issues with compatible appliances.

6 We have undertaken an extensive programme of stakeholder engagement to better understand our customers' and stakeholders' priorities. Ongoing, targeted investment in our network is essential to ensure the safety and security of our customers' energy supplies is not compromised over GD3 and throughout the transition to net zero.

7 Furthermore, we are looking beyond 2050 to the role our network will play in carrying decarbonised gas that will contribute to a whole systems approach to a secure and resilient energy future. Maintaining investment for maintenance and operation of our network to enable a secure and resilient supply, have been deemed a priority by stakeholders and customers and that we must maintain consistent investment levels for GD3.

8 Customers and stakeholders have also stated that increased investment for activities related to low carbon energy solutions is a priority for GD3.

9 Without this investment there is a risk to security of supply for our most remote customers in Scotland, there is also an inherent risk that the energy system remains siloed, preventing effective co-ordination of a

transition to net zero and potentially creating sub-optimal outcomes for consumers where networks become less resilient and more costly over time.

Table 1: Spend summary

Spend Area	Solution	GD3 total cost (£m)
Opex	BAU	45.33
Capex	Enduring Solutions	24.51
Capex	Interim Solutions	2.84
Capex	Other	4.70
UIOLI (NZARD)	Development costs (Oban and Campbeltown)	5.00
Reopener (NZASP)	Bio-CNG (Wick and Thurso)	15.80

Source: SGN

Section B Introduction

10 We own and operate five independent gas networks in the more remote parts of Scotland, known as the SIUs. In total, the five SIUs serve c.9.509k customers.

11 Each of the SIUs is deemed a Local Distribution Zone (LDZ) and calorific values are declared on a regular basis for the purposes of energy settlement and for use by gas suppliers in calculating customer bills.

12 The network at Stranraer in Dumfries and Galloway is a separate LDZ ("ST") and was historically classified as an independent system as it operated using tankered LNG. The network was connected to the Scotland to Northern Ireland Pipeline (SNIP) in the 1990s and the costs of operating the Stranraer network are included in the main Scotland network Totex figures as the Licence definition of an independent system is a network that is not directly or indirectly connected by pipes to the main pipe-line system of SGN.

13 Prior to natural gas, many towns around the UK were supplied by town's gas that was manufactured at a local facility. In general, these facilities were not connected to a wider network. At the time of conversion from town's gas to natural gas, the SIU locations were too remote from the National Transmission System to be supplied directly with gas from the North Sea. Instead, alternative provisions were made for these networks to be supplied with LNG and Liquified Petroleum Gas (LPG) (Stornoway) via road tankers and local storage facilities. The liquid gas is vaporised on site and fed into discrete local networks. The five sites are Stornoway, Campbeltown, Oban, Thurso and Wick.

14 For the four mainland sites, LNG provides the gas supply to customers in the local town with the market for gas supply open to full supplier competition. The Stornoway network is supplied with LPG and has no supplier competition. The single gas supplier framework is reflected in both the SGN and National Gas Transmission (NGT) Licence special conditions which require information to be provided by us to NGT to calculate the Bulk Price Differential payments made by NGT to the relevant gas supplier. The propane network that supplies Stornoway operates outside of the Uniform Network Code (UNC) and therefore cannot participate in the gas shipper / supplier switching arrangements which currently prevail.

15 Table 2 below shows the customer numbers, peak hour demand and decarbonisation plan for each site. Our ambition is to have a decarbonisation strategy for each of our SIUs by the end of RIIO-GD4 (referred to as GD4 throughout this submission), by moving them from LNG and LPG to alternative fuels.

Table 2: SIU customer summary

Town	Customer Numbers	Peak Hour Demand (scm/h)	Decarbonisation Plan
Campbeltown	1,992	2,020	Ambition within GD4
Oban	1,172	2,000	Ambition within GD4
Thurso	2,472	2,650	Commitment within GD3
Wick	2,137	3,200	Commitment within GD3
Stornoway	1,736	1,900	Ambition within GD4

Source: SGN

16 This shows our commitment to supplying our Wick and Thurso SIUs with biomethane by the end of GD3. We are also committed to progressing Front-End Engineering Design (FEED) and detailed design for both Campbeltown and Oban SIUs to continue to progress decarbonisation plans for these networks within the control period.

17 There are two main strands to the strategy for the SIUs:

(a) **Short-term operating and maintaining existing assets** – This is a low risk and low commitment Capex and Opex strategy to continue to operate the existing plants in a safe and compliant manner for a reliable supply. This involves following the four Rs (repair, refurbish, replace, rebuild) investment strategy prioritising component replacement and refurbishment over system rebuild.

(b) **Medium-to long-term - transition to future energy state** – This is an ambitious stretch target for us to de-carbonise the SIUs primary energy source and transition to alternative fuels such as biomethane CNG and/or alternative energy sources.

18 Our medium to long-term strategy is to prioritise the transition to alternative fuels for the SIUs; however, the transition must be phased and the existing equipment must be kept in a safe and compliant condition to allow for continued operation throughout the transition and maintain resilient supplies to all of our customers. For this reason, the SIU strategy and submission will include Capex and Opex for operating a steady state and additional funding for future options and transition in a low / no-regret investment strategy.

Section C Short-term strategy

19 In this section we set out our short term strategy for our SIUs. We cover:

(a) The capital investment required to maintain their safe and resilient operation, covering:

- Our current position and RIIO-GD2 (referred to as GD2 throughout this submission) Capex allocation;
- Areas of investment required in GD3; and
- Our Capex requirement in GD3.

(b) The operational expenditure required to run our five SIUs, covering:

- Our current position and GD2 Opex allowance.
- Our operations activity in GD3.
- Our Opex requirement in GD3.

20 We must continue to invest to operate and maintain the plants that supply customers in our SIUs so their service remains safe and resilient while exploring future options for the sites and their transition to alternative fuel sources.

21 Our ambition is to continue the transition to net zero, decarbonising the SIUs primary energy source and building in supply contingency. However, we must continue to invest in the integrity of the existing on-site assets, while we transition to alternative operating models in a phased approach, so they remain compliant both now and in the future.

Background and context

22 The gas we transport in our network and the LPG and LNG transported by road, rail and sea, is a hazardous substance. Continued investment is required to ensure that our assets remain fit for purpose and in a safe operational condition. Our customers and stakeholders have told us that maintaining a safe and reliable network should be our priority for GD3, which align with Ofgem's Consumer Interest Framework which includes 'Secure and resilient supplies' as a key outcome. The expectations of Ofgem and our stakeholders are supported by a strong legislative and regulatory framework that provides how we should deliver this.

23 There are capital and operational expenditure requirements for the five SIUs for GD3. The capital investment costs associated with new and replacement SIU assets are asset managed in the same way as our LTS assets.

24 However, there is an important distinction between the Opex funding arrangements for the five SIUs compared to the rest of our network in Scotland. This is because the operational costs are funded via an arrangement set out in both our and National Gas Transmission's Special Licence Conditions. This arrangement effectively funds the SIU Opex costs from all GB gas customers by including them in National Gas's allowed revenues.

Past performance and current position

Capex

25 In GD2, we proposed a 'low risk' investment strategy in the SIUs with a safe and resilient network approach to asset integrity. A low regrets investment basis allowed us to maintain a safe and resilient network over the RIIO GD2 period without investing heavily in new assets which may in future conflict with newly emerging alternative energy solutions for the SIU locations.

26 The capital expenditure proposed will ensure the continued safe and resilient operation of these critical assets. The capital investment proposals were justified through robust Investment Decision Packs (Engineering Justification papers and associated Cost Benefit Analysis). The overall approach to GD2 was a

continuation of the LNG energy supply for the existing four mainland SIU networks and also the continuation of the LPG supply for Stornoway.

Opex

27 Opex profiling remains steady for the SIU networks. The general forecasting of yearly budgets is heavily focussed on winter due to the seasonal nature of the operation, however, there is little difference between each financial year for finance profiling as it is very much routine as we have an extensive track record managing and delivering this.

28 The SIU sites require a minimum staffing level to operate an emergency standby covering both district emergencies and plant alarms or issues. As such, there are constraints on staffing numbers and consequently associated budgetary categories for the upkeep and maintenance of the plants themselves. These operational storage plants are up to 50 years old and require regular maintenance and inspections to ensure compliance with UK regulations.

29 We have also taken into account the impact of complying with the new Fatigue Management Requirements for our ongoing SIU strategy. This includes ensuring that no-one works for longer than 12 hours at a time and is explained further within our Workforce and Supply Chain Resilience Strategy (SGN-GD3-SD-03) document.

30 Volumes of workload are expected to remain close to previous years, however, due to the UK energy crisis and unprecedented market prices for gas, the annual demand for 2022 to 2024 has not been considered as there is a notable drop in tonnage requirements. Subsequently, the average annual demand from years 2017 to 2022 has been taken and an additional 1% growth has been included from 2026 onwards for GD3. The growth is fairly limited across the SIU towns due to site capacity. The forecast annual demand used as the basis of this costing exercise are shown in Table 3.

Table 3: SIU loads and tonnage requirements

Year	No. Loads	Tonnage	kwh	Twh
2017/18	594	10152	154533744	0.154534
2018/19	536	9350	142325700	0.142326
2019/20	601	9948	151428456	0.151428
2020/21	577	9482	144335004	0.144335
2021/22	562	9324	141929928	0.14193
2022/23	507	8326	126738372	0.126738
2023/24	503	8258	125703276	0.125703
2024/25	520	8711	132598842	0.132598842
2025/26	556	9229	140483838	0.140483838
2026/27	570	9650	146910566.4	0.146911
2027/28	576	9747	148379672.1	0.14838
2028/29	581	9844	149863468.8	0.149863
2029/30	587	9942	151362103.5	0.151362
2030/31	593	10042	152875724.5	0.152876

Source: SGN Data

31 This table shows that workload is expected to remain close to what has been seen in the previous years, with an additional 1% growth from 2026 onwards for GD3 with connections in line with historical trends. We have shown actual data up to 2023 / 24 with forecasted data used thereafter.

Strategy areas

Operations

32 The SIUs' operational costs can be categorised as follows:

- Fuel (Fuel) – LNG shipper services for LNG supply, costs for securing LNG capacity at Isle of Grain and European contingency terminals (Rotterdam or Zebrugge).
- Transportation (Transportation) – All associated haulage costs for transporting LNG and other ad-hoc trips, tanker fleet maintenance and other associated transport and plant for five SIU sites.
- Staff costs (Leadership, Management and Administration) – Managers, senior and industrial staff salaries and other staff associated costs.
- Storage (Storage) – All associated maintenance costs for the five SIU sites including odorant costs.
- Gas Quality (Processing) – Appliance testing and maintaining the requirements of the Gas Safety (Management) Regulations exemption.
- Other (Other) – District emergency work, tooling, leakage control, transmission and utilities, office and property costs, instrumentation.

33 Forecast volumes have been calculated for GD3 at a 1% growth rate in network capacity with a base point taken from an average of gas demand in years 2017 to 2022. With a settling energy price, it is anticipated that customer demand will return to pre-2022 levels.

34 The growth rate is relatively low, this is due to a number of reasons:

- More energy efficient boilers are regularly being installed by SIU customers, using less gas as a result.
- SIUs have a limited storage site capacity built into our safety case, therefore there is a reduced appetite for seeking out larger connections to our local networks. Each SIU site, with the exception of Stornoway, currently sit under the Top Tier Control of Major Accident Hazards (COMAH) regulations threshold of 200t liquid gas storage. Any additional large connection requests may require additional storage installed and this is not an option due to compliance limitations
- Historically the SIUs have installed over 200 new customer connections across the last 5 year period (2018 to 2023), averaging 40 homes per year. Local customer's awareness is growing through our service care business but the SIUs suffered a drop in connections during the pandemic.

35 As highlighted, the SIUs are advancing feasibility studies looking at greening 71% of the gas supply to the two Caithness sites: Wick and Thurso. The proposal is utilising available bio-methane in the Scottish Highlands, then compressing this into CNG tankers and trucking north. This operation at a high level would reduce the SIUs LNG demand by approximately 50% and further reduce the transportation requirements due to the proximity of the biomethane-CNG source to the northern sites. If implemented this would also improve the security of supply to the two LNG SIUs, providing two sources of supply.

36 This project is still in early stages and therefore any potential cost savings have yet to be fully developed. The long-term strategic plan would be proving this concept for Caithness, then investing in more infrastructure to implement in the two remaining LNG sites in Argyll (Campbeltown and Oban).

Capex

37 The capital expenditure at the SIU sites covers both Electrical and Instrumentation (E&I) and Mechanical assets across compliance, integrity, and decarbonisation investment activities. The implementation of the work will be undertaken by the Major Projects and SIU Operations departments.

38 All the workload identified excluding the CNG investment at Caithness, is compliance work. This workload is to comply with regulations such as Pressure Systems Safety Regulations 2000, IGEM/TD/13, NFPA 59A, Standard For The Production, Storage, And Handling Of Liquefied Natural Gas (LNG), Electricity at Work Regulations 1989, and The Dangerous Substances and Explosive Atmospheres Regulations 2002.

39 In the GD2 period, there were 36 individual Capex projects identified for the SIUs, within the GD3 period there are 49 individual Capex projects identified (excluding CNG investment). The GD3 figures include interventions in areas such as security and property (£4.26 million) which were not included in the GD2 baseline figures. The project descriptions, costs, and which sites they apply to are detailed in the Business Plan Data Templates (BPDT). Table 4 provides the GD3 Capex submission in detail, with forecasted annual spend.

Table 4: SIU GD3 Capex Submission

Site	Project Description	Forecasted Spend					Total
		2027	2028	2029	2030	2031	
All SIU Sites	Gas Quality Review (PTi)	£ 1.36	£ 0.10	£ -	£ 0.20	£ 0.11	£ 1.76
All SIU Sites	Functional Safety (not incl Oban)	£ -	£ 0.26	£ 0.66	£ 0.64	£ 0.21	£ 1.78
All SIU Sites	CM4 E&I Inspection and Remediation	£ 0.10	£ 0.10	£ 0.09	£ 0.10	£ 0.11	£ 0.49
All SIU Sites	CM4 Survey and Remedials (Mech)	£ 0.10	£ 0.10	£ 0.09	£ 0.10	£ 0.11	£ 0.49
All SIU Sites	Drawing and Record Updates	£ 0.17	£ -	£ -	£ -	£ -	£ 0.17
All SIU Sites	LNG Vessel Refurbishment Works	£ -	£ 0.20	£ 0.16	£ 0.18	£ 0.20	£ 0.73
All SIU Sites	LGT Refurbishment Costs	£ -	£ -	£ 0.04	£ 0.04	£ 0.09	£ 0.16
All SIU Sites	LNG Vessel Painting	£ -	£ 0.24	£ 0.27	£ 0.30	£ 0.26	£ 1.08
All SIU Sites	Minor Civil Upgrades	£ -	£ -	£ -	£ -	£ 0.19	£ 0.19
All SIU Sites	Property Costs	£ 1.63	£ 0.84	£ 0.81	£ 0.65	£ 0.33	£ 4.26
All SIU Sites	Haz area motors	£ -	£ -	£ -	£ 0.13	£ -	£ 0.13
Oban	Water tank replacement	£ 0.44	£ 0.40	£ -	£ -	£ -	£ 0.84
Oban	Generator and fuel bunds	£ 0.14	£ 0.20	£ -	£ -	£ -	£ 0.34
Oban	Vapour barrier remediation	£ 0.32	£ 0.19	£ -	£ -	£ -	£ 0.51
Oban	Full E&I Remedials	£ 0.47	£ 0.28	£ -	£ -	£ -	£ 0.75
Oban	Boiler Replacement	£ 0.27	£ 0.21	£ -	£ -	£ -	£ 0.48
Oban	DG Kiosk Replacement and remove chart recorder	£ 0.05	£ -	£ -	£ -	£ -	£ 0.05
Campbeltown	Generator and fuel bunds	£ 0.14	£ 0.20	£ -	£ -	£ -	£ 0.34
Campbeltown	Holder Decommissioning and HP storage Feasibility and Design	£ -	£ -	£ -	£ -	£ 1.46	£ 1.46
Campbeltown	Antifreeze E&I Equipment Upgrade	£ -	£ -	£ -	£ 0.49	£ 0.21	£ 0.71
Campbeltown	Electrical Rationalisation	£ -	£ -	£ -	£ 0.50	£ 0.31	£ 0.81
Campbeltown	Water Tanks	£ -	£ -	£ -	£ 0.44	£ 0.44	£ 0.88
Campbeltown	Kiosk Replacement	£ 0.05	£ -	£ -	£ -	£ -	£ 0.05
Campbeltown	Rough Cuts Skid Replacement/ Kiosk Addition	£ 0.07	£ 0.08	£ -	£ -	£ -	£ 0.15
Campbeltown	Site Security	£ -	£ -	£ -	£ -	£ 0.22	£ 0.22
Campbeltown	Holder Painting	£ -	£ -	£ -	£ 0.13	£ -	£ 0.13
Thurso	Generator and Fuel Bunds	£ 0.14	£ -	£ -	£ 0.20	£ -	£ 0.34
Thurso	Fire Pond / Water Tanks	£ -	£ -	£ 0.40	£ 0.40	£ -	£ 0.80

Site	Project Description	Forecasted Spend					Total
		2027	2028	2029	2030	2031	
Thurso	Instrument Refresh (Solenoids and Transmitters)	£ -	£ -	£ 0.24	£ 0.14	£ -	£ 0.38
Thurso	Site lighting Towers/JB's	£ -	£ -	£ 0.21	£ 0.25	£ -	£ 0.46
Thurso	Compressor Kiosk Remediation	£ -	£ -	£ -	£ -	£ 0.20	£ 0.20
Thurso	District Skid Replacement	£ -	£ -	£ 0.13	£ -	£ -	£ 0.13
Wick	Fire Pond / Water Tanks	£ -	£ -	£ 0.40	£ 0.40	£ -	£ 0.80
Wick	Generator and Fuel Bunds	£ 0.14	£ -	£ -	£ 0.20	£ -	£ 0.34
Wick	Instrument Refresh (Solenoids and Transmitters)	£ -	£ -	£ 0.24	£ 0.14	£ -	£ 0.38
Wick	Site Lighting Towers/JB's	£ -	£ -	£ 0.21	£ 0.25	£ -	£ 0.46
Wick	Compressor Kiosk Replacement / Remediation	£ -	£ -	£ -	£ -	£ 0.20	£ 0.20
Wick	District Skid Replacement	£ -	£ -	£ 0.06	£ -	£ -	£ 0.06
Wick	Nitrogen Ballasting Mothballing	£ -	£ -	£ -	£ -	£ 0.07	£ 0.07
Stornoway	C&I Kiosk, Removal of Existing Plant Room	£ -	£ 0.60	£ 0.49	£ -	£ -	£ 1.09
Stornoway	Site Lighting Tower Upgrade	£ -	£ 0.21	£ 0.19	£ -	£ -	£ 0.40
Stornoway	Deluge System	£ -	£ 0.58	£ 0.32	£ -	£ -	£ 0.90
Stornoway	Water Tanks	£ -	£ 0.44	£ 0.36	£ -	£ -	£ 0.80
Stornoway	10 Yearly Vessel Inspections x3 vessels (V3 = 2026, V4 = 2027, V5 = 2028).	£ 0.27	£ 0.27	£ 0.24	£ -	£ -	£ 0.77
Stornoway	Addition of Access Platform Facilitating Access at Both Ends of Vessel 3.	£ -	£ -	£ -	£ 0.07	£ -	£ 0.07
Stornoway	Anti-freeze System as a Whole on the Holder	£ -	£ 0.07	£ 0.06	£ -	£ -	£ 0.13
Stornoway	Install of Level Gauging at Vessel Inspections and Associated Instrumentation	£ 0.12	£ 0.12	£ 0.11	£ -	£ -	£ 0.36
Stornoway	Removal of Redundant Vessels (1&2) and Associated Pipework.	£ -	£ -	£ -	£ -	£ 0.12	£ 0.12
Provan	Replacement of Gas Detection Control Panel	£ 0.10	£ 0.25	£ -	£ -	£ -	£ 0.35
Provan	CNG/Tanker Purchase	£ -	£ 0.08	£ 3.29	£ -	£ -	£ 3.38
Provan	E&I Equipment Refresh	£ 0.07	£ -	£ -	£ -	£ -	£ 0.07

Source: SIU BPDT

Section D Managing risk and uncertainty

40 Unlike the rest of the GB gas market, the effects of indigenous and imported pipeline supplies do not have an effect on the price of LNG. Normal pipeline markets are largely constrained by the supplies entering them and the demand markets they serve. The time and cost of laying pipelines means these developments are undertaken on a very strategic and long-term basis. The availability of LNG in the UK and Europe is therefore dependent on global market conditions, and whether it is profitable enough for producers to import LNG to certain locations. The effect of this for small scale applications is that supply will be constrained for as long the UK and European domestic markets are trading significantly below the world LNG market.

41 While a minimum amount of LNG will continue to be delivered, the availability of LNG for small scale applications is unlikely to be guaranteed and may attract a premium in line with world prices. Throughout GD2, SGN was exposed to significant uncontrollable costs due to market fluctuations in the costs associated with the provision of LNG capacity at the Isle of Grain facility. These costs stemmed from market differences between LNG world prices and the value of gas molecules once injected into the GB gas market. Historically, these price indices tracked each other consistently and differences between price indices were small. However, with the advent of market pressures associated with the war in Ukraine and Covid-19 impacts these price indices deviated significantly. We consider it would be appropriate to implement a pass-through cost mechanism to cover our potential exposure to these specific costs. This mechanism could be achieved through National Gas Transmission's Special Licence condition which currently facilitates the recovery of our LPG costs from GB gas shippers via a bulk price differential mechanism. Any attempt to implement contractual clauses for guaranteed supply is unlikely to be agreeable to the capacity holder or result in an even more significant premium being paid. In addition, the scale of profits which could be made by reselling a commodity in another market may be so great as to make the guarantee worthless.

42 Additionally, there is a continued risk that the Isle of Grain LNG facility, currently on the market for sale from National Grid Grain LNG Ltd, is the single source supply for loading LNG to road or ISO tankers. This facility still operates at roughly 40% capacity, and with an uncertainty surrounding potential future buyers the future reliability of the Isle of Grain may be hindered. We currently manage this risk through an annually tested contingency loading plan from either Fluxys LNG facility, Zeebrugge, or Gate Terminal, Rotterdam. However, these operations incur additional costs around both the commodity itself, customs fees and transport outside the UK. If SGN was forced to deliver this operation on a full-time basis due to an outage or shutdown at the Isle of Grain then the associated Opex costs with running the SIUs would increase significantly.

43 There are emerging opportunities that will allow the continued use of our assets within the SIU networks and set them on a trajectory to net zero using low carbon gases. To avoid the risk of stranded assets our GD3 Business Plan is based on a low or no risk investment policy for managing the SIUs in their current condition but also coupled with an ambitious future strategy to decarbonise our SIUs in a phased approach. Our '4Rs' asset strategy minimises investment: we repair, refurbish or replace before we carry out more expensive rebuild. In addition, we are required to revalidate assets in accordance with our Written Scheme of Examination (WSE), drafted to comply with the Pressure Systems Safety Regulations 2000; and to revalidate our road tankers in accordance with Department for Transport codes.

44 Our SIUs require the provision of emergency services, inspection and maintenance regimes. We carry out repair and revalidation of assets as well as refurbishment, replacement and/or rebuild across the five independent networks.

45 We aim to explore and invest in future options as highlighted in the appendix alongside the delivery of the Capex and Opex activities highlighted in this strategy paper.

Section E Feasibility study

46 We partnered with consultants Guidehouse to deliver an updated analysis of alternative, enduring energy solutions for the decarbonisation of the five SIU sites in Scotland, aiming to replace the use of fossil LNG and LPG.

47 Our previous reports on the enduring options for the SIUs concluded that the continuation of the current LNG/LPG provision was the most economic and efficient solution at the time, avoiding large capital investment and adverse impacts on customers. Prior work was instigated by the closure of the Avonmouth LNG facility and the proposal to move to the Isle of Grain LNG facility.

48 However, recent advancements in renewable energy necessitate a reassessment of enduring energy options per SIU. The report considered short-, medium-, and long-term solutions for the provision of low-carbon energy to the remote SIU locations, taking into account movements and changes since prior publications.

Methodology

49 Following initial screening aligned with prior reports, selected options for in-depth analysis were:

- Continuation of LNG/LPG, as the baseline;
- Conversion to electricity;
- District heat networks;
- Hydrogen networks;
- Biomethane Compressed Natural Gas (Biomethane-CNG); and
- Bio-Liquified Petroleum Gas (Biomethane-LPG).

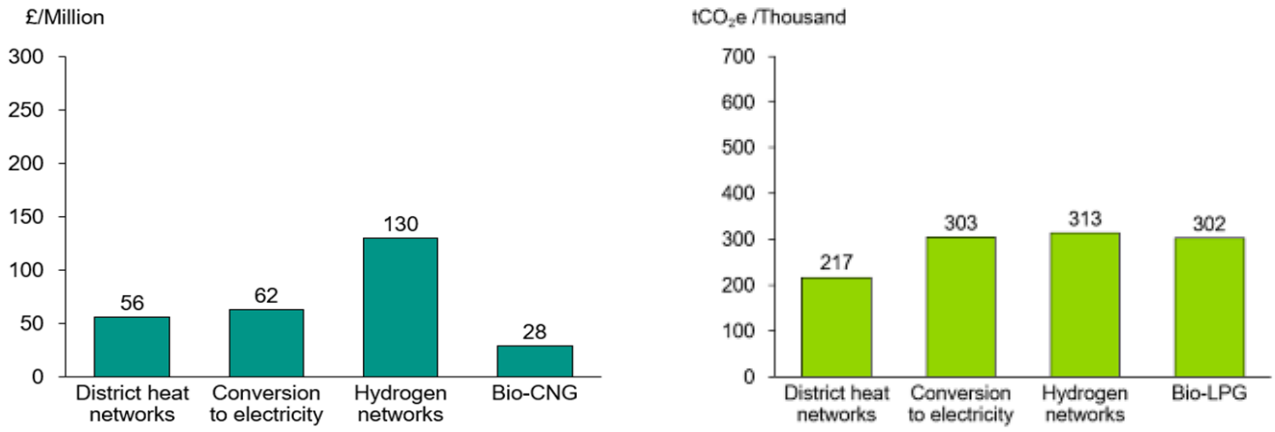
50 To analyse and compare each of the potential enduring energy solutions per SIU, a three-step methodology was used. First, for the purposes of the study a 100% conversion to each solution was assumed. This simplification avoided the need to consider numerous solution combinations. Secondly, an assessment framework, based on multi-criteria decision analysis was used to determine the preferred enduring solution per SIU. This modelling provided a cost benefit, as well as carbon abatement analysis for each solution. Finally, based on the selected enduring solution per SIU, an implementation timeline was developed to determine the short- and medium-term provision of energy as the respective SIU transitions to the enduring, decarbonised solution.

Conclusion

51 The outputs from this study and the modelling analysis undertaken, have provided guidance and a strategy for the role of green gases in the future decarbonisation of our independent networks. Based on available information, Bio-CNG and Bio-LPG (in the case of Stornoway) were the determined enduring energy solutions for the SIUs, given their comparison with Net Present Cost and cumulative emissions savings to the other solutions.

52 As can be seen in Figure 1, this provides an example from the outputs of the study for Campbeltown, above the baseline LNG option. Both Bio-CNG and Bio-LPG options are relatively low-cost, do not result in end-consumer disruption, and have the potential to significantly reduce carbon emissions levels. Bio-CNG and Bio-LPG serve as drop-in fuels that can be blended with the current gas supply in the SIUs, thereby accelerating emissions reduction efforts. The blending of Bio-CNG and Bio-LPG is expected to increase over time as production capacity expands through the development of new facilities.

Figure 1: Campbeltown net present cost with CO_2 savings and cumulative emissions savings

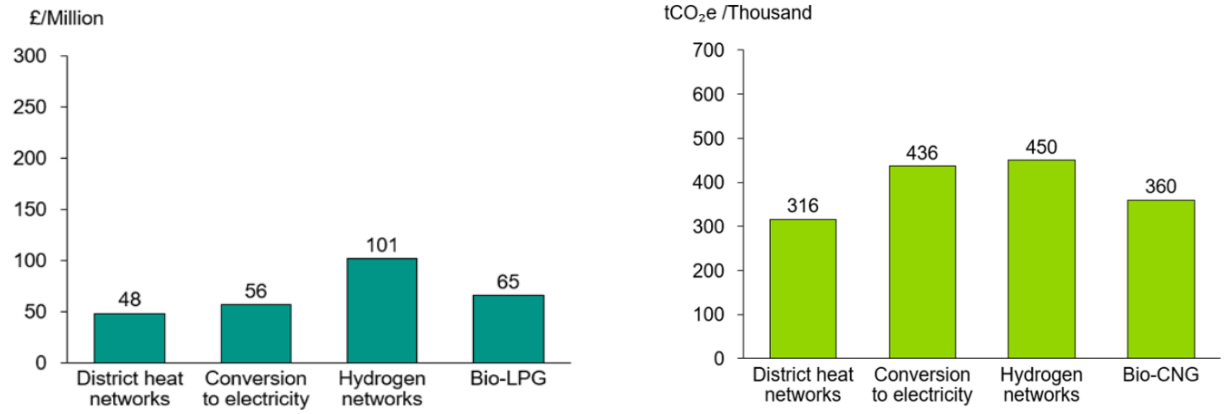


Source: Guidehouse report SIU Enduring Solutions 2024

53 A primary concern associated with the use of Bio-CNG and Bio-LPG revolves around ensuring a reliable and secure energy supply for SIUs. This consideration should be paramount when evaluating the transition to alternative solutions.

54 In Stornoway while Bio-LPG came out favourably, once its deliverability and impact on consumer disruption were taken into consideration hydrogen networks could also be a solution, see Figure 2 below.

Figure 2: Results of Stornoway net present cost with CO_2 savings and cumulative emissions savings



Source: Guidehouse report SIU Enduring Solutions 2024

55 Hydrogen networks have potential in Stornoway due to the high emission reduction and high levels of support from the local authority and developments in onshore and offshore wind in the region for hydrogen production. This would be subject to the UK Government decision on the role of hydrogen under their Hydrogen Heat Policy expected in 2026. The main drawback of this solution is its high NPC with CO_2 savings - £101m, which is similar to the mainland SIUs and is associated with high above-ground storage costs.

Section F Conceptual design

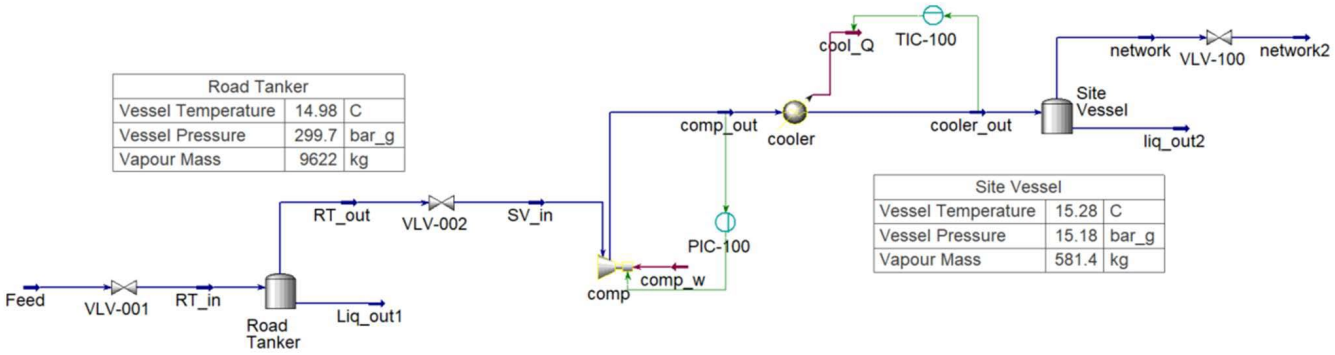
56 We used the outputs from our initial feasibility study to provide recommendations for our long-term strategy to transition to a decarbonised future for the four mainland SIUs in a phased approach throughout GD3 and future price control periods.

57 We have progressed with initial conceptual design on the introduction of biomethane at the Wick and Thurso sites and will have the outputs to this by the end of November 2024. The Front-End Engineering and Design (FEED), culminating in detailed design by quarter 3 of 2025 which will allow us to start preparation and preliminary work for construction activities to start early in GD3. Furthermore, we will explore alternative renewable, low carbon energy options for Campbeltown and Oban within GD3 and aim to have detailed design completed by the end of the price control. Biomethane production is currently taking place on the west coast of Scotland which could supply both of these SIUs with the fuel required to provide a sustainable, decarbonised future for the communities.

58 We partnered with consultancy WSP to undertake early feasibility work to assess the potential options for supplying the Wick and Thurso SIUs with compressed biomethane gas (Biomethane-CNG) from a biomethane production site utilising distillery waste in Invergordon. The study focussed on understanding the current LNG logistics model and developing suitable alternative Biomethane-CNG model options for various scenarios. The study looked at replacing approximately 71% LNG demand with Bio-CNG and retaining 29% LNG.

59 The recommended option would see biomethane transported via road tanker from the production facility at Invergordon to the Wick and Thurso SIU sites. The study estimated that this has the potential to save 10.95 kt CO_2e per annum and potentially reduce Opex costs across both sites compared to the existing LNG supply arrangements and would require an estimated Capex investment of ~£15.8 million.

Figure 3: Process flow model of SIU converted to accept Bio-CNG. For illustrative purposes only



Source: WSP SIU Bio-CNG feasibility study 2023

60 Details of the options are shown below:

- Approximately 71% LNG demand would be replaced with Biomethane-CNG, while the remaining 29% would be continued to be met by LNG, with LNG storage on site.
- The Biomethane-CNG trailer is to be delivered to the SIU site, connected and discharged based on the SIU site demand.
- The minimum discharge time is specified as 15 hours during peak demand but can be as long as 84 hours during low demand
- Heating and pressure reduction are required to reduce the gas from 300 barg to 2.5 barg, to match the existing pressure of the LNG.

Next steps

61 To progress the recommended option from the WSP conceptual design study we will progress to a FEED project that will develop the design of the required Biomethane-CNG tanker filling facility at Invergordon and downloading facilities at SGN's Wick and Thurso sites and provide more certainty around equipment and plant costs as well as construction costs and timeline estimates.

62 We will then transition into detailed design phase which is due to be completed by Quarter 3 of 2025 financial year and then start to prepare for preliminary work to commence construction early in GD3.

63 We are proposing the use of the following uncertainty mechanisms for progressing with strategic work for our SIUs within GD3:

- For Wick and Thurso, we propose use of the Net Zero Pre-construction and Small Projects Re-opener (NZASP) re-opener. This will allow us to progress with the construction work associated with delivery of the biomethane CNG projects for both sites. Based on early engineering design work, the capital cost is estimated to be £15.8m, including cost for CNG road tankers. In the remaining years of GD2 we will progress towards detailed design and either provide a full cost estimate at the time of the draft determination or in the first year of GD3 through the net-zero reopener mechanism early in GD3. Subject to progress on the design work and experience of Wick and Thurso there is the opportunity to extend decarbonisation to Oban and Campbeltown (noting that planning for these remains at an early stage and therefore they have not been included in the anticipated value).
- The Net Zero and Small Project (NZASP) use it or lose it (UIOLI) mechanism will be utilised for our ambition, supported by stakeholders, to substantially decarbonise the remaining 3 SIUs by converting energy supplies away from fossil fuels. We will use this for both the Campbeltown and Oban SIUs with options also being considered for Stornoway. The UIOLI funding will take these projects through to detailed design phase necessary to enter contract and support the application for a NZARD reopener.

64 The use of the uncertainty mechanisms will allow us to explore alternative renewable, low carbon energy options for Campbeltown, Oban and Stornoway within RIIO-GD3 and aim to have progressed with detailed design completed by the end of the price control.

65 Our Climate Resilience Strategy will support delivery of a number of our GD3 outcomes and associated commitments, that will contribute to us achieving Ofgem's Infrastructure fit for a low-cost transition to net zero outcome. This is summarised below and detailed within our main business plan document.

- **We will contribute to the development of the Regional Energy Strategic Plans (RESPs) and relevant local authority energy plans in Scotland and the South of England.**
- **We will transport locally produced biomethane to Wick and Thurso SIUs to replace liquified natural gas supplies**.

66 This is built on strong foundations laid in GD2 that have enabled us to evaluate options that are best for our customers, followed with strong commitment to deliver in GD3 to supply both of these SIUs with the fuel required to provide a sustainable, decarbonised future for the communities.

Section G Engineering Justification Papers (EJP) and Cost Benefit Analysis

67 The SIU strategy is supported with an Engineering Justification Paper (EJP) and Cost Benefit Analysis (CBA). These documents support our GD3 submission with detailed Engineering Justifications and costs for investment detailed in this document.

Table 5: EJPs and CBAs

Network	Name / Project	Value (£)	NPV (2043 PV, £m)	EJP Reference	CBA Reference

SIU	Wick and Thurso SIU Compressed Biomethane (CNG) Project	15.8	26.64	SGN-GD3-EJP-SIU-001	SGN-GD3-CBA-SIU-001