

Engineering Justification Paper

Regulatory and mandatory change

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2 Introduction

This paper provides architectural justification to support SGN's proposal to spend £2 million (over five years starting in April 2021) on regulatory and mandatory IT change. The scope of this investment covers project activity necessary to ensure the SGN information technology estate remains fit for purpose, remains compliant with regulation, remains compliant with legislation and continues to underpin SGN's ability to run and maintain a safe and reliable network as required to meet the needs of its customers throughout the GD2 period.

In line with Customer and Stakeholder expectations this paper does not seek to justify enhancing or adding to the IT estate, it simply covers the funding necessary to ensure IT software and hardware remains compliant with regulatory and legislative change requirements ensuring the business can continue to operate within the bounds of the regulator and the law.

A failure in either of these areas would present significant risk to SGN and its customers leading to loss of licence.

2.1 General Background

Throughout GD1 there has been a requirement to implement or amend SGN applications in response to legislative and mandatory change. Examples include Xoserve UK Link, GDPR, Priority Service Register changes and numerous Network Code Modifications. The level of change throughout GD1 suggests that there will be a continued need to implement or amend supporting applications throughout GD2. This investment area aligns with the expectation that it will be necessary to maintain current levels of spend to ensure SGN can respond to potential challenges throughout GD2 to maintain statutory and regulatory compliance.

2.2 Site Specific Background

SGN systems of record must be compliant with both regulation and legislation. These systems support and underpin all areas of SGN.

3 Equipment Summary

Throughout GD1 there has been a requirement to implement or amend SGN applications in response to legislative and mandatory change it is expected this trend will continue throughout GD2.

The following table outlines how our systems underpin our regulatory outputs. At this point in time it is difficult to predict where the proposed investment will be required, however it is safe to assume that any of the IT services outlined below may require enhancements in line with regulatory or legislative change throughout GD2.

Safety	Emergency	Attend >=97% of uncontrolled PREs within 1hr	Front Office service provision (Maximo Work and Asset Management, ESRI Geospatial Asset Management, Click/Field Service Edge Scheduling, Agency Work Management and Data Capture, Geofield Geospatial Data Capture, Digital Asset Maps, Insight Streetworks Management, Clearman Reinstatement Management), Cognos and Tableau Reporting service provision, Back Office service provision (Oracle EBS, CIPS Contractor payment system), system and infrastructure upgrades, support and maintenance.
		Attend >=97% of controlled PREs within 2hr	
	Repair	Accumulated annual end of day repair risk <= 2012/13 base	
		Proportion of gas escapes prevented within 12 hrs > 60%	
Major Accident Hazard Prevention	Annual acceptance of Safety Case	O365 and productivity service provision, MHUB Policy service provision, Cognos and Tableau Reporting service provision, MOBI Inspector service provision, system upgrades, support and maintenance.	
	COMAH report reviewed by HSE		
Iron Mains risk removed	Cumulative iron mains 'off-risk' >= GD1 baseline by 2021	Front Office service provision (Maximo Work and Asset Management, ESRI Geospatial Asset Management, Click/Field Service Edge Scheduling, Agency Work Management and Data Capture, Geofield Geospatial Data Capture, Digital Asset Maps, Insight Streetworks Management, Clearman Reinstatement Management), Back Office service provision (Oracle EBS, CIPS Contractor payment system), Cognos and Tableau Reporting service provision, Mains Risk Replacement System Service Provision (MRPS), system and infrastructure upgrades, support and maintenance.	
Social	Carbon Monoxide Awareness	Increase in stakeholder awareness of CO risks (as measured relative to baseline survey).	O365 and Productivity service provision, Stakeholder Relationship Management Database service provision, SGN Website service provision, Social Media Tooling service provision, Cognos and Tableau reporting service provision, system and infrastructure upgrades, support and maintenance.
	Fuel Poor connx	Reduce fuel poverty through the connection of 20,000 households to the gas network by 2021.	Front Office service provision (Front Office service provision (Maximo Work and Asset Management, ESRI Geospatial Asset Management), Cognos and Tableau reporting service provision, Back Office service provision (Oracle EBS, CIPS Contractor payment system), O365 and productivity service provision, system and infrastructure upgrades, support and maintenance.

Connections	GSOS	Maintain or improve connections standards of performance and, voluntarily, extend standards to distributed gas connections.	Front Office service provision (Maximo Work and Asset Management, ESRI Geospatial Asset Management, Click/Field Service Edge Scheduling, Agentry Work Management and Data Capture, Geofield Geospatial Data Capture, Digital Asset Maps, Insight Streetworks Management, Clearman Reinstatement Management), Back Office service provision (Oracle EBS, CIPS Contractor payment system), Cognos and Tableau reporting service provision, O365 and productivity service provision, system and infrastructure upgrades, support and maintenance.
Reliability	Loss of supply	Management of number of interrupt's and duration by cause such that volume and duration <= baseline by 2021.	SCADA and Telemetry High Pressure Network Control and Monitoring service provision, Demand Management service provision, Tlme to Fail service provision, Front Office service provision (Maximo Work and Asset Management, ESRI Geospatial Asset Management, Click/Field Service Edge Scheduling, Agentry Work Management and Data Capture, Geofield Geospatial Data Capture, Digital Asset Maps), Back Office service provision (Oracle EBS, CIPS Contractor payment system), Cognos and Tableau reporting service provision, system and infrastructure upgrades, support and maintenance.
	Network reliability	Maintaining Operational Performance Achieved through secondary deliverables: Controlled reduction in 'fault hrs per site' and 'PSSR faults per site' <= 2021 target. Elimination of 'Off-take metering errors'.	SCADA and Telemetry High Pressure Network Control and Monitoring service provision, PMAC Pressure Management service provision, Front Office service provision (Maximo Work and Asset Management, ESRI Geospatial Asset Management, Click/Field Service Edge Scheduling, Agentry Work Management and Data Capture, Geofield Geospatial Data Capture, Digital Asset Maps), Cognos and Tabeau reporting service provision, Lotus Notes Logbook service provision, Alarm Response System service provision, High Pressure Management Gas Quality Information System (HPMIS) service provision, 3rd Party Connection Management (SQS) service provision, system and infrastructure upgrades, support and maintenance.
	Network capacity	Achieving 1:20 obligation Delivered through secondary deliverables: 'Utilisation' of capacity at DN sites does not exceed 'post investment' parameters.	Synergi Gas Low Pressure Modelling service provision, Falcon High Pressure Modelling service provision, Demand Derivation Modelling service provision, Synergi Forecaster High Pressure Modelling service provision, Cognos and Tableau reporting service provision, system and infrastructure upgrades, support and maintenance.

Customer	Broad Customer Measure	Satisfaction: maximise customer satisfaction score across three categories	<p>Brochure Website (SGN) service provision, ReciteMe (translation and read aloud technology on the website) service provision, eCommerce Website (connections) service provision, CiTNow (Connections work outcomes video technology) service provision, eGain (CRM, Livechat, Social Media Monitoring, 2 way SMS) service provision, Connection Plan Dates (Connection appointment booking) service provision, Elgin Roadworks (online customer information portal) service provision, Stakeholder Relationship Management Database and Survey Tools service provision, Front Office service provision (Maximo Work and Asset Management), Back Office service provision (Oracle EBS) O365 and productivity service provision, system and infrastructure upgrades, support and maintenance.</p>
		Complaints: minimise customer complaints across all 4 metrics	
		Engagement: identify key stakeholder issues, develop effective engagement and show change	

Environmental	Environ-mental (Broad measure)	Support the development of a low carbon energy sector through facilitating the connection of renewable gas sources as measured by the number of enquires and volume of capacity connected.	SCADA and Telemetry High Pressure Network Control and Monitoring service provision, PMAC Pressure Management service provision, High Pressure Management Gas Quality Information System (HPMIS) service provision, Synergi Gas Low Pressure Modelling service provision, Falcon High Pressure Modelling service provision, O365 and productivity service provision, system and infrastructure upgrades, support and maintenance.
	Gas transport losses	Manage and reduce the gas transportation network losses resulting from leakage, own use and theft from GD1 GWh baseline.	SCADA and Telemetry High Pressure Network Control and Monitoring service provision, PMAC Pressure Management service provision, High Pressure Management Gas Quality Information System (HPMIS), Theft of Gas Database service provision, O365 and productivity service provision, system and infrastructure upgrades, support and maintenance.

4 Problem Statement

The investment outlined in this paper is considered mandatory by SGN. It relates to the effort required to enhance IT systems in line with regulatory and legislative requirements to ensure safety critical systems remain compliant with the law as well as regulatory expectations as defined by Ofgem. SGN have assumed the same level of spend will be required throughout GD2 as has been seen throughout GD1.

Why are we doing this work and what happens if we do nothing?

In the event of legislative or regulatory change impacting SGN, systems and process investment will be required to ensure continued compliance. Regulatory and Legislative compliance is mandatory for SGN and failure to invest would lead to legal action and ultimately loss of license.

What is the outcome that we want to achieve?

SGN systems of record will remain compliant with legislative and regulatory change throughout the GD2 period.

How will we understand if the spend has been successful?

Legislative and regulatory compliance throughout GD2. Retention of our License to Operate.

4.1 Narrative Real-Life Example of Problem

The following provide some specific GD1 examples that are likely to drive demand throughout GD2. As well as the below it is fully expected that SGN will need respond to legislative or regulatory change in relation to security of supply, safety, customer experience and environment (see section 3 for more information regarding IT services that may require enhancement throughout the GD2 period).

GDPR – Legislative changes required SGN to amend all process and systems to ensure Personal Identifiable Information was appropriately captured, managed, accessed and archived in line with legal requirements.

Fatigue – SGN were required to deliver significant changes in the analytics space to enable improved reporting related to employee fatigue, reducing the risk of non-compliance with the law and reducing the risk of a safety incident affecting our employees or our customers. It is expected ongoing investment will be required to ensure compliance or improvements related to employment law throughout GD2.

Tax Reporting – Legislative changes as defined by HMRC required changes to SGN systems to ensure compliance. It is expected that ongoing investment will be required throughout GD2 to ensure continued compliance with changes as required via the HMRC.

National Minimum Wage – Changes to the Minimum Living Wage required changes to our systems to ensure internal benefits e.g. salary sacrifice never put an individual at risk of being paid less than the legal requirement. It is expected ongoing investment will be required to ensure compliance or improvements related to employment law throughout GD2.

As discussed previously other areas likely to require investment (based on experience throughout GD1) include Xoserve release management, Network Code Modifications and Vulnerable Customer Management.

4.2 Spend Boundaries

The investment covered in this paper relates to mandatory change to applications driven by legislative or regulatory requirements. Please see section 3 for more information regarding the IT services potentially in scope.

5 Probability of Failure

SGN are committed to implementing low cost solutions to meet the expectations of our customers and stakeholders when it comes to regulatory and legislative compliance. Failure to invest in regulatory and legislative compliance for IT systems would make failure to comply with the expectations of our customers, the general public and governing bodies throughout the GD2 period inevitable.

SGN are also committed to preventing failure of IT assets that underpin critical business services. Probability of failure is linked to technology roadmaps as defined by application and infrastructure providers. If we do not maintain our IT estate as contractually* required, applications become end of life, support becomes unavailable and SGN would be unable to meet its regulatory outputs due to critical process and system failures. SGN predict the probability of failure to be 100% if we do not maintain our critical systems in line with recommendation from 3rd party suppliers, SGN IT policy and agreed architectural principles.

*Contracts expect applications to be upgraded prior to reaching the point where probability of failure indicates systems will fail in one of three ways (functional failure, technical failure or security failure).

5.1 Probability of Failure Data Assurance

Not applicable for IT assets. Probability of failure is based on industry insight, 3rd party guidance and experience.

6 Consequence of Failure

SGN's licence to operate requires us to be compliant with the Uniform Network Code and the Supply Point Administration Agreement. It is critical that we can comply with legislation regarding how we manage our organisation and run operations daily. Failure to comply could lead to a breach of licence conditions leading to significant fines and loss of license or a failure to comply with the law which could lead to fines and / or legal action being taken against SGN.

Loss of Supply to Customers

Loss of license would mean SGN are no longer able to supply gas to customers. As such the impact on security of supply would be catastrophic.

Safety Impact of Failure

SGN must be able to respond to HSE improvement requests. A lack of funding to enable this would mean we are unable to amend our systems as required to address areas of failure or improvement. The subsequent impact of this failure to invest would directly impact our ability to keep our customers and employees safe.

Environmental Impact

The likelihood of regulatory and legislative change in this area will continue to rise in line with the attention and focus of our customers, the public, activist groups and governing bodies. A lack of funding in this area would mean we are unable to amend our systems in response to customer and stakeholder expectations. The subsequent impact of this failure to invest would directly impact our ability to invest in system change associated with reducing our environmental impact where required.

7 Options Considered

Regulatory and legislative compliance is mandatory for SGN. As such the only alternative option to be considered in this scenario is 'Do Nothing'

7.1 Regulatory and mandatory change

As previously outlined, SGN's licence to operate requires us to be compliant with the Uniform Network Code and the Supply Point Administration Agreement. It is critical that we can comply with legislation regarding how we manage our organisation and run operations daily. Failure to comply could lead to a breach of licence conditions leading to significant fines and loss of license or a failure to comply with the law which could lead to fines and / or legal action being taken against SGN.

As well as the above meeting stakeholder expectations regarding keeping the gas flowing safely, sustaining our future, keeping energy affordable, improving our service and supporting our communities is wholly dependent on investment enabling us to respond effectively to legislative and regulatory requirements impacting our systems.

The technical detail of the option

This option recommends approval of the investment required to enable mandatory change to IT services driven by legislative or regulatory requirements. Please see section 3 for more information.

Please be aware that the investment forecast in this area has been estimated based on past data and experience. Within the GD2 period each individual change found necessary because of a legislative or regulatory requirement will be subject to robust analysis, design and approval processes. Proposed options will be subject to the SGN investment approval process at the point of investment within GD2. This process requires review and approval of detailed options and cost benefit analysis papers at an appropriate level (dependent on value and risk) before funding is released. This process provides assurance that internal procedures have been followed and that there is evidence to support the recommendation of a 'best value' option for progression.

The basis for the cost estimate/unit cost

Based on uncertainty associated with specific requirements relating to legislative or regulatory change throughout the GD2 period the cost estimate provided assumes broadly the same level of spend throughout GD1 as in GD2.

The perceived benefits of the option

Funding approval in this area will ensure regulatory and legislative compliance throughout the GD2 period.

Delivery timescales

Change will be delivered throughout the GD2 period in line with legislative and regulatory compliance deadlines driven by key stakeholders and governing bodies.

Key assumptions made

This option assumes investment will be required at the same level in GD2 as GD1. We expect this to be front loaded within the period due to potential change associated with Brexit and GD2. Specific change is unknown but SGN IT policies and procedures including strict cost benefit analysis processes will ensure value for money within GD2.

Any other items that differentiate the option from the others considered

Regulatory and legislative compliance is mandatory for SGN. As such the only alternative option to be considered in this scenario would be to do nothing.

7.2 Do Nothing

This option is not viable as SGN must implement legislative and regulatory change to comply with our licence conditions.

7.3 Options Technical Summary Table

The table below only summarises one investment option. This is on the basis that investment in IT related change to underpin regulatory and legislative change is unavoidable. As such there are no alternative options.

Table 1: Options Technical Summary

Option	First Year of Spend	Final Year of Spend	Volume of Interventions	Equipment / Investment Design Life	Total Cost
Baseline - Do nothing	2025	2025	0	0	0.00
Regulatory and Mandatory IT System Change	2022	2026	10	5	2.00

Please note the costs outlined in the Options Technical Summary Table are based on the following assumptions:

Baseline Assumptions:

- SGN have assumed an inability to respond to regulatory and legislative change would lead to non-compliance with our licence conditions, the law and the Health and Safety at work act. Non-compliance would inevitably lead to an inability to operate within the bounds of the law and this would lead to a breach of licence conditions (up to £100m fine).

Regulatory and Mandatory IT System Change Assumptions:

- Demand for regulatory and legislative change in GD2 and therefore investment required will be broadly like that in GD1.
- Brexit may impact level of spend required in year 1 (hence front loading of spend within the GD2 period).
- Transition from GD1 to GD2 may impact level of spend required in year 1 (hence front loading of spend within the GD2 period).
- Regulatory and Legislative change could impact any application within the SGN estate.
- Standard SGN investment approval process will be followed for individual change items at the point of change throughout the GD2 period.

7.4 Options Cost Summary Table

Table 2: Options Cost Summary Table.

Option	Template	Total Cost (£m)
Regulatory and Mandatory IT System Change	IT Capex	1.3
		0.7
		0
		0
		2.00

8 Business Case Outline and Discussion

8.1 Key Business Case Drivers Description

As previously outlined, SGN's licence to operate requires us to be compliant with the Uniform Network Code and the Supply Point Administration Agreement. It is critical that we can comply with legislation regarding how we manage our organisation and run operations daily. Failure to comply could lead to a breach of licence conditions leading to significant fines and loss of license or a failure to comply with the law which could lead to fines and / or legal action being taken against SGN.

As well as the above meeting stakeholder expectations regarding keeping the gas flowing safely, sustaining our future, keeping energy affordable, improving our service and supporting our communities is wholly dependent on investment enabling us to respond to legislative and regulatory requirements impacting our systems in the most effective way.

Table 3: Summary of Key Value Drivers

Option No.	Desc. of Option	Key Value Driver
1	Regulatory and Mandatory Change	Regulatory and legislative compliance. Compliance with SGN license conditions.

Table 4: Summary of CBA Results

Option No.	Desc. of Option	Preferred Option (Y/N)	Total Forecast Expenditure (£m)	Total NPV	NPVs based on Payback Periods (absolute, £m)			
					2030	2035	2040	2050
Baseline	Do Nothing / Do minimum	N	0.00	-100.00	-100.00	-100.00	-100.00	-100.00
1	Regulatory and Mandatory IT System Change Absolute NPV	Y	-2.00	-6.59	-1.99	-2.81	-3.56	-4.83
1	Regulatory and Mandatory IT System Change NPV Relative to Baseline	Y	-2.00	-6.59	98.01	97.19	96.44	95.17

*Please note, to minimise the cost and timeframes associated with maintaining or introducing IT assets related to regulatory and legislative compliance, our architectural principles and IT strategy advocate a cloud first, buy not build approach. This ensures that the total cost of ownership for any solution is best value for money when comparing options that are available at the point of investment. Our programme and project governance structure will ensure that appropriate business case development and options analysis will be done at the relevant time in GD2 to ensure best value for money when it comes to delivering against feedback that requires SGN to maintain current levels of regulatory and legislative compliance and that we leverage the availability of new technology throughout the GD2 period.

** It is also of note that it is not possible to clearly define exactly how this investment would be utilised in GD2 based on the availability of solutions at the point of requirement. Technology is moving so fast that what may be available now is likely to be fundamentally different to what is available at the point of investment in GD2.

8.2 Business Case Summary

The investment outlined in this paper is intended to ensure regulatory and legislative compliance throughout the GD2 period, as such it does not align with the business case areas outlined below other than NPV.

Table 5: Business Case Matrix

Regulatory and Mandatory IT System Change	
GD2 Capex (£m)	2.00
Number of Interventions	10.00
Carbon Savings ktCO2e (GD2)	0.00
Carbon Savings ktCO2e /yr	0.00
Carbon Emission Savings (35yr PV, £m)	0.00
Other Environmental Savings (35yr PV, £m)	0.00
Safety Benefits (35yr PV, £m)	0.00
Other Benefits (35yr PV, £m)	100.00
Direct Costs (35yr PV, £m)	-5.44
NPV (35yr PV, £m)	94.56
High Carbon Scenario	
Carbon Emission Savings (35yr PV, £m)	0.00
High Carbon NPV (35yr PV, £m)	94.56

9 Preferred Option Scope and Project Plan

9.1 Preferred option: - Regulatory and mandatory change

Mandatory change to applications driven by legislative or regulatory requirements as necessary throughout the GD2 period. Please see section 3 for more information regarding potential IT services in scope, dependant on external drivers for regulatory and mandatory change.

9.2 Asset Health Spend Profile

Table 6: Asset Health Spend Profile

Asset Health Spend Profile (£m)						
	2021/22	2022/23	2023/24	2024/25	2025/26	Post GD2
Regulatory and Mandatory IT System Change	1.00	0.25	0.25	0.25	0.25	Investment profile continues post GD2

9.3 Investment Risk Discussion

As previously discussed the recommended option assumes investment will be required at the same level in GD2 as GD1. We expect this to be front loaded within the period due to potential change associated with Brexit and GD2. Specific change is unknown but SGN IT policies and procedures including strict Cost Benefit Analysis processes will ensure value for money within GD2.

The assumptions made present 2 key risks:

The phasing may change based on industry requirements and associated timeframes. This risk will be mitigated through close engagement with the regulatory team within SGN ensuring that the IT

Change Delivery Teams can appropriately plan and adjust in line with regulatory and legislative expectations.

There is a risk that the amount we have forecast is incorrect as we have a limited a view of future change in this area. This is mitigated by the fact that the forecast amount in this area has been based on historic data and we have no reason to believe that the volume of change will vary significantly from GD1.

Table 7: Sensitivity Analysis

The following table reflects the potential impact on spend should demand for regulatory or legislative change be lower or higher than assumed or implementation complexity be lower or higher than assumed.

	Low	Mid	High
GD2 Capex (£m)	1.9	2.0	3.0
Number of Interventions	10.0	10.0	10.0
Carbon Savings ktCO2e (GD2)	0.0	0.0	0.0
Carbon Savings ktCO2e /yr	0.0	0.0	0.0
Carbon Emission Savings (35yr PV, £m)	0.0	0.0	0.0
Other Environmental Savings (35yr PV, £m)	0.0	0.0	0.0
Safety Benefits (35yr PV, £m)	0.0	0.0	0.0
Other Benefits (35yr PV, £m)	20.0	100.0	100.0
Direct Costs (35yr PV, £m)	-5.2	-5.4	-8.2
NPV (35yr PV, £m)	14.8	94.6	91.8

Low case: SGN have applied a reduction of 5% to the capex costs which could be achieved by applying less rigour to the development and testing of regulatory and legislative change. Furthermore, an 80% reduction has been applied to Other Societal Benefits associated with the impact of a Breach of Licence Conditions on the basis that we may be fined less than 10% of turnover.

Mid case: No changes have been applied.

High case: SGN have applied an increase of 50% to the costs as SGN do not know the volume of regulatory and legislative change that will be required during GD2. We have assumed in the mid case that the volume of change is proportional to GD1 but if this assumption is incorrect and there is significantly more change, this would lead to an increase in development and testing costs which would increase the investment required by 50%.

Project payback has not been carried out as part of this analysis due to the effect of the Spackman approach. For a cash-flow traditional project payback period please see scenario 4 of our Capitalisation Sensitivity table.

Capitalisation Sensitivity

Consumers fund our Totex in two ways – opex is charged immediately though bills (fast money – no capitalisation) and capex / repex is funded by bills over 45 years (slow money – 100% capitalisation). The amount deferred over 45 years represents the capitalisation rate. Traditionally in ‘project’ CBA’s the cashflows are shown as they are incurred (with the investment up front which essentially is a

zero-capitalisation rate). Therefore, we have developed scenarios that reflect both ways of looking at the investment – from a consumer and a ‘project’.

The scenarios are summarised as follows:

- Scenario 1 - we have used the blended average of 65%, used in previous iterations of this analysis.
- Scenario 2 - we have represented the Capex and Opex blend for the two networks, as per guidance.
- Scenario 3 - addresses our concerns on capitalisation rates whereby Repex and Capex spend is deferred (100% capitalisation rate) and Opex is paid for upfront (0% capitalisation rate).
- Scenario 4 - this reflects the payback period in ‘project’ / cash-flow terms and provides a project payback.

We have taken a view of the NPV in each of the scenarios, except for scenario 4, at the 20, 35 and 45 Year points, to demonstrate the effect of Capitalisation Rate on this value.

Table 8: Capitalisation Rate Variation

Scenario	1	2 SGN	3	4
Capex (%)	65	41	100	0
Opex (%)	65	41	0	0
Repex (%)	100	100	100	0
Output				
NPV (20yr PV, £m)	96.72	96.30	97.34	
NPV (35yr PV, £m)	94.85	94.56	95.26	
NPV (45yr PV, £m)	93.94	93.74	94.23	
Payback	3.00	3.00	3.00	3.00