

Engineering Justification Paper

BAU Capex

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2 Introduction

This paper provides architectural justification to support SGN's proposal to invest in IT consumables and peripherals such as printers, keyboards, mice, mobile phones and a limited number of break fix laptop and tablet devices. The scope of this investment covers activity necessary to ensure that IT consumables and peripherals for SGN devices are available continues to underpin SGN's ability to run and maintain a safe and reliable gas network to meet the needs of its customers throughout the GD2 period.

2.1 General Background

SGN employs approx. 4,500 staff (permanent and contract) and across the business a mix of devices are used by staff to perform their duties. The provision of peripherals and consumables for these devices ensures that our operatives continue to be able to meet their licence requirements around emergency response, leakage investigation, repair and planned maintenance.

2.2 Site Specific Background

IT is critical for users to perform their day to day activities in SGN, be it to access business applications, to communicate effectively and to collaborate. Office based staff typically use desktops, and field-based or mobile staff use laptops and tablets depending on their role and their technology requirements. Peripherals to support these devices, such as printers, mice, keyboards etc are an integral part of the service IT provides to users and these ensure effective use of the technology.

SGN field users are often interacting directly with customers and sharing information from their screen, gathering data from the customer and accessing corporate asset data - credibility for the field user is severely damaged if the technology to support them is not working, obsolete or damaged, resulting in reduced customer satisfaction scores and directly impacting one of our primary licence measures. Items like protective cases for a tablet, or a replacement stylus are key to maintaining efficiency. Office users often use a docking-station, so they can work with a laptop when in the office but are flexible and able to work remotely as required when out on site. Printing, albeit the world seems to be moving away from this due to the environmental impact, remains a key element in many office scenarios. All of these devices fall under the IT consumables and peripherals budget for investment.

3 Equipment Summary

SGN users will either have a laptop, tablet or desktop assigned to them depending on their role. In support of these client devices a user may require access to a printer, a laptop bag, a mouse and keyboard or a replacement stylus. Mobile phones are provided to support remote workers in the field, and these too are covered by this investment, and replaced on a break-fix, as needed basis.

The hostile working environment that a lot of SGN field-based staff operate in can also result in a shorter lifespan and higher volumes of break fix. As a result of the above, it is necessary to carry a

stock of break-fix spares to support users and respond rapidly when items fail to ensure continuation of service and minimal impact to licence obligations.

4 Problem Statement

IT consumables and peripherals are required to ensure effective use of technology and productivity, and to replace damaged or broken items on an as required basis. This investment is to ensure a stock of such consumables to be able to respond rapidly to user requests and to maintain minimal or no interruption to service. Investment is assumed to be flat, year on year, and is based on the known investment levels seen and required during GD1.

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

Failure to respond in a timely manner would impact SGN's user community, potentially leaving field users limited in their ability to perform their duties effectively, ultimately impacting on productivity and potentially impacting their ability to meet licence obligations. The break-fix service provided involves field based support engineers receiving a same day or next day swap out of failed devices, fulfilling requests and ensuring users have the necessary tools to do their job.

What is the outcome that we want to achieve?

The desired outcome is a continuation of the current break fix service levels achieved today, with an IT catalogue of peripherals and consumables, controlled through an approval mechanism, with stock available in a central location and regional 'drop points' where users can be supplied from, in a timely manner if they should require a swap out or a replacement item. This helps to support SGN's ability to meet its licence obligations and hit its targets.

How will we understand if the spend has been successful?

We will know if the spend has been successful if we adhere to our service levels and the user experience in the field is acceptable, with consumables being available and break-fix service being as good as the current experience.

4.1 Narrative Real-Life Example of Problem

A field operative recently experienced a fault with his tablet device. He raised a call through the service desk which was routed to the new 3rd party provisioned End User Computing service. They were able to arrange for the user to visit his base depot, and on the same day pick up a replacement tablet from a secure locker using a PIN number. The impact to the user was a 'down time' of less than 4 hours, limiting any knock-on impact to service levels and ensuring he was back out on the patch and available to take emergency calls within the shortest possible time. The budget allocated has been effectively used to provide swap-out hardware in key, accessible locations to maximise productivity.

4.2 Spend Boundaries

This paper only covers the costs associated with purchasing, implementing and rolling out IT consumables and peripherals. It does not cover any ongoing service costs as these are covered in the GD2 opex run costs.

5 Probability of Failure

Evidence from GD1 suggests an ongoing percentage of device and peripheral failure rate, which can have an impact on productivity and safety. This can then have an impact on credibility with customers and after a period of time could impact our ability to perform our licence obligations. A lot of IT consumables and peripherals have a limited lifespan these days, components wear out, items get damaged (e.g. a cup of coffee spilt on a keyboard), screens can get cracked if a device is accidentally dropped, all of this requires a limited level of investment just to keep things going.

5.1 Probability of Failure Data Assurance

IT industry bodies such as Gartner recognise the fact that there is an unavoidable requirement to replace failed devices, components and peripherals, added to the fact that accidents do happen and there will always be a percentage of accidental damage to company assets. Investment is required to replace these failed or damaged items as well as provide consumables to support these peripherals.

6 Consequence of Failure

In the event that we could not provide replacement peripherals, consumables and break-fix devices, we would progressively be unable to meet our licence conditions as our field operatives would be hampered in their ability to take jobs (emergency or planned), locate assets and record data about those assets.

Broken or failed devices would also mean that operatives and office-based staff would be unable to minimise travel as is the case today through the use of technology such as Skype. Instead there would be a greater environment impact and also potentially life-threatening delays to respond to emergency repair jobs.

7 Options Considered

It is important to maintain a regular supply of replacement peripherals, break-fix devices and consumables while ensuring good value for money, by only buying what is fit for purpose and required. In addition, a rigorous approval process needs to be in place to ensure no abuse of the request process.

The options outlined below are in line with our current approach which aims to ensure best value is achieved from all assets.

7.1 Option 1 – BAU Consumables and Break-Fix Devices

This option proposes investment break-fix devices, peripherals and consumables at a similar level to the investment in GD1. SGN field operatives work in a hostile environment and therefore devices do get accidentally damaged, despite precautions being taken.

Investing in replacement equipment ensures that our staff can continue to perform their duties uninterrupted thereby ensuring continued safe operation. It also ensures that the equipment in use meets the necessary security standards.

As hardware and components age, the failure rate will increase raising more incidents, and the risk of breakages or permanent damage grows. It is essential that we maintain spares and replacement peripherals and consumables to support users.

7.2 Option 2 – Extended Support for Break-Fix Devices

This option proposes not maintaining a BAU budget to replace damaged or broken equipment but to try to 'sweat the asset' further by extending support. Assuming vendors would agree to this (which is questionable) then that would only cover part of the investment. Smaller consumables like a mouse or keyboard, or a replacement mobile phone if one is lost or damaged could not be covered by such an 'extended support' arrangement, and therefore this option is not viable for SGN to maintain operational activity to meet licence commitments.

7.3 Options Technical Summary Table

Table 1: Options Technical Summary

| Option | First Year of Spend | Final Year of Spend | Volume of Interventions | Equipment / Investment Design Life | Total Cost |
|---|---|---------------------|---|--|------------|
| Option 1 - BAU Consumables and Break-Fix Devices | 2022 | 2026 | Continuous deployment as required throughout GD2 – assume two interventions per user per year – 9,000 | Break-fix tablets and laptops, mobile phones, keyboards, mice, printers etc. Typically, 3 years | £6.11m |
| Option 2 – Extended support | This is not a viable option so has not been costed. | | | | |

7.4 Options Cost Summary Table

Table 2: Cost Summary

| Option | Cost Breakdown | Total Cost (£m) |
|--|---|-----------------|
| Option 1 - Capital purchase and deployment of replacement, non-ruggedised devices | Devices, Peripherals and Consumables – £6.11m | £6.11m |
| Option 2 – Extended support ('Sweat the Asset') | This is not a viable option so has not been costed. | |

8 Business Case Outline and Discussion

This project is primarily driven by SGN's need to ensure working devices, peripherals and consumables for its users in offices and out in the field, which in turn ensures they can meet licence obligations. The level of investment requested is in line with what has recently been spent in GD1 to support user requests.

8.1 Key Business Case Drivers Description

Table 3: Summary of Key Value Drivers

| Option No. | Desc. of Option | Key Value Driver |
|------------|---|---|
| 1 | Option 1 - Capital purchase and deployment of replacement, non-ruggedised devices | The key value driver behind this investment in ensuring continuity of service for users which in turn protects SGN's ability to meet its licence obligations. |
| 2 | Option 2 – Extended support ('Sweat the Asset') | This is not a viable option as it puts SGN's licence obligations seriously at risk |

Table 4: Summary of CBA Results

| Option No. | Desc. of Option | Preferred Option (Y/N) | NPVs based on Payback Periods (absolute, £m) | | | | | |
|------------|--|------------------------|--|-----------|----------------|----------------|----------------|----------------|
| | | | Total Forecast Expenditure (£m) | Total NPV | 2030 | 2035 | 2040 | 2050 |
| Baseline | Do Nothing / Do minimum | N | 0.00 | -117.73 | -117.73 | -117.73 | -117.73 | -117.73 |
| 1 | Purchase Business as Usual Consumables and Break-Fix Devices Absolute NPV | Y | -6.11 | -28.33 | -6.61 | -10.32 | -13.79 | -19.76 |
| 1 | Purchase Business as Usual Consumables | Y | -6.11 | -28.33 | 111.12 | 107.41 | 103.94 | 97.96 |

| | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|
| | and Break-Fix Devices NPV relative to Baseline | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|

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

Option 1 Assumptions:

- Device life is assumed to be approx 3 years as has been proven historically within SGN and the wider industry. Gartner research supports this timeline assumption.
- Pricing levels are assumed to remain roughly as at present. This is based on the fact that although there will be some inflation, commoditisation of new technology will keep prices roughly as they are now.
- The project cost for the refresh deployment of devices and associated hardware has been benchmarked against the current live activity underway in SGN in 2019, and so is believed to be accurate. Any change to this approach would have an impact on costs/project timelines.

Baseline Assumptions:

- SGN manage its IT estate in line with the HSEs ALARP (as low as reasonably practicable) risk management principles. On that basis SGN have assumed a failure to invest in required (see engineering justification paper for more detail) upgrade, replacement or refresh activity for safety critical systems, would lead to catastrophic system failure as well as a lack of 3rd party support (based on support contracts, 3rd party roadmaps, architectural standards and internal policies, designed to ensure upgrade, replacement or refresh activity is carried out at the appropriate point in time to in order to prevent a non-recoverable functional, technical or security failure).
- SGN have assumed that a lack of investment combined with a lack of support would prevent the reinstatement of systems should they fail.
- SGN have assumed a catastrophic failure of safety critical systems and an inability to reinstate systems after failure would lead to an inability to respond to gas emergencies, an inability to know where our assets are and an inability to track performance and regulatory outputs.
- SGN have assumed a catastrophic failure of safety critical systems and an inability to reinstate systems after failure would lead to an inability to manage Personal Identifiable Information and would inevitably lead to a significant breach of GDPR legislation (up to £40m fine)
- SGN have assumed an inability to respond to gas emergencies, an inability to know where our assets are and an inability to track performance and regulatory outputs would inevitably lead to a catastrophic incident e.g. explosion and loss of life (£16m). This assumption is supported by section 2 of the Health and Safety at work act which identifies scenarios that would result in loss of life.
- SGN have assumed an inability to respond to gas emergencies, an inability to know where our assets are and an inability to track performance and regulatory outputs would inevitably lead to an inability to operate. This would lead to a catastrophic breach of license conditions (up to £100m fine)

SGN have assumed catastrophic failures in regard to loss of life (£16m), a breach of license conditions (up to £100m) and/or a breach of GDPR legislation (up to £40m) will occur within a year of failing to adhere to support contracts, 3rd party roadmaps, architectural standards and internal policies designed to ensure upgrade, replacement or refresh activity is carried out at the appropriate point in time to in order to prevent a non-recoverable functional, technical or security failure.

8.2 Business Case Summary

This project is primarily driven by SGN's need to ensure working devices, peripherals and consumables for its users in offices and out in the field, which in turn ensures they can meet licence obligations. The level of investment requested is in line with what has recently been spent in GD1 to support user requests.

Table 5: Business Case Matrix

| Business as Usual Consumables and Break-Fix Devices | |
|---|-----------|
| GD2 Capex (£m) | 6.11 |
| Number of Interventions | 10,000.00 |
| 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) | 17.73 |
| Other Benefits (35yr PV, £m) | 100.00 |
| Direct Costs (35yr PV, £m) | -22.75 |
| NPV (35yr PV, £m) | 94.98 |
| High Carbon Scenario | |
| Carbon Emission Savings (35yr PV, £m) | 0.00 |
| High Carbon NPV (35yr PV, £m) | 94.98 |

9 Preferred Option Scope and Project Plan

9.1 Preferred option

The preferred option is to allocate a budget figure for each year to service users requests for break-fix devices, peripherals and consumables.

9.2 Asset Health Spend Profile

Table 6: Asset Spend Profile

| Asset Health Spend Profile (£m) | | | | | | |
|---|---------|---------|---------|---------|---------|-------------------------|
| | 2021/22 | 2022/23 | 2023/24 | 2024/25 | 2025/26 | Post GD2 |
| Business as Usual Consumables and Break-Fix Devices | 1.00 | 1.10 | 1.21 | 1.33 | 1.46 | Spend profile continues |

9.3 Investment Risk Discussion

The main risk identified with this investment approach is that users could abuse the request process to acquire kit that they do not actually require. To prevent this a rigorous request and approval process is used, with automated workflow to ensure that adequate manager approval is secured but hopefully without delaying the request fulfilment.

| Risk Description | Impact | Likelihood | Mitigation/Controls | Comments |
|-------------------------------|-------------------|--------------|--|---|
| Change in capex expenditure | Capex expenditure | >20% & <=40% | Early engagement with the business with regards to change to set expectations and ensure that solutions are compatible with SGN devices. | Changing business circumstances lead to a change in requirement for devices, increasing potential cost. |
| Change in capital expenditure | Capex expenditure | >40% & <=60% | Reviewing and managing supply change risks, early engagement with potential suppliers. | Cost increases due to supply or other global factors e.g. BREXIT. |

Table 7: Capitalisation Sensitivity Results

| | Low | Mid | High |
|---|--------|--------|--------|
| GD2 Capex (£m) | 4.58 | 6.11 | 9.16 |
| Number of Interventions | 10,000 | 10,000 | 10,000 |
| Carbon Savings ktCO2e (GD2) | - | - | - |
| Carbon Savings ktCO2e /yr | 0 | 0 | 0 |
| Carbon Emission Savings (35yr PV, £m) | 0.0 | 0.0 | 0.0 |
| Other Environmental Savings (35yr PV, £m) | 0 | 0 | 0 |
| Safety Benefits (35yr PV, £m) | 3.5 | 17.7 | 17.7 |
| Other Benefits (35yr PV, £m) | 20.0 | 100.0 | 100.0 |
| Direct Costs (35yr PV, £m) | -17.1 | -22.7 | -34.1 |
| NPV (35yr PV, £m) | 6.5 | 95.0 | 83.6 |

Low case: SGN have applied a reduction of 25% to the costs which could be achieved by applying less rigour to the development and testing of new devices and by achieving greater cost savings on hardware purchases. Furthermore, an 80% reduction has been applied to the Safety Benefits associated with the risk of a fatality and Other Benefits associated with the impact of a Breach of Licence Conditions.

Mid case: No changes have been applied.

High case: SGN have applied an increase of 50% to the costs as SGN cannot fix the price that suppliers charge us for devices and associated hardware peripherals.

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 through 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.

| 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) | 105.15 | 103.20 | 107.98 | |
| NPV (35yr PV, £m) | 96.38 | 94.98 | 98.42 | |
| NPV (45yr PV, £m) | 91.99 | 91.00 | 93.43 | |
| Payback | 3.00 | 3.00 | 3.00 | 3.00 |

Appendix A - Acronyms

| Acronym | Description |
|---------|------------------------------------|
| BAU | Business as Usual |
| CBA | Cost Benefit Analysis |
| GDPR | General Data Protection Regulation |
| HSE | Health & Safety Executive |
| SGN | Scotia Gas Network |