



# Project Progress Report 1

*January – June 2014*

Version 1.0



Project number	SGNGN03
Report number	OGM_PPR_01
Title	OPENING UP THE GAS MARKET PROJECT PROGRESS REPORT 1
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Revision	1
Date	13/06/2014

Revision History:	Reviewer/Approver:	Date:
Draft v1	Project Team	30/05/2014
Draft v2	Project Team	03/06/2014
Draft v3	Regulation	09/06/2014
Draft v4	Project Director	12/06/2014
Final	Project Director	13/06/2014

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## 2. Glossary of Terms

Abbreviation	Term
CEP	Customer Engagement Plan
DECC	Department of Energy and Climate Change
EASEE	European Association for the Streamlining of Energy Exchange
GB	Great Britain
GIGG	Gas Innovation Governance Group
GS(M)R	Gas Safety (Management) Regulations
HHIC	Heating & Hotwater Industry Council
HSE	Health & Safety Executive
ICOM	Industrial and Commercial Energy Association
IGEM	Institution of Gas Engineers and Managers
LDZ	Local Distribution Zone
LNG	Liquefied Natural Gas
MD	Managing Director
MP	Member of Parliament
MSP	Member of Scottish Parliament
NIC	Network Innovation Competition
NBP	National Balancing Point (GB)
OGM	Opening up the Gas Market
PPR	Project Progress Report
RAG	Red/Amber/Green
SDRC	Successful Delivery Reward Criteria
SGN	Scotia Gas Networks
SIU	Scottish Independent Undertaking
WI	Wobbe Index
ZEE	Zeebrugge (Belgium)

### 3. Executive Summary

This document is the first of the project progress reports, detailing the progress made in the first six months of the Opening up the Gas Market project, from January – June 2014.

The project began in January 2014, and has progressed well, with the customer engagement plan underway and the appliance survey successfully completed. This leaves the project on schedule and well positioned to begin the next major stage – full appliance testing. The first six months of the project have been characterised by a broad range of activities including engagement of customers and stakeholders, introduction of the project within Oban, and fulfilling the appliance survey stage of 101 properties. The major events of the January – June period have included:

- Appliance survey in 101 properties throughout Oban successfully completed across a three week period, with a 66% success rate of accessing properties.
- Of the 34% not accessed, just 7.5% of this (4 properties) was due to customers refusing access.
- Identification of common appliances for testing in lab conditions.
- Engagement with local media, including Oban Times and Oban FM, leading to a positive article in the Oban Times and agreement to a Q&A feature on Oban FM.
- Positive endorsement from local MP, Alan Reid, and MSP, Michael Russell.
- Submission of a Change Request for the SDRC-1 document.
- Established LNG shipping arrangements up to Heads of Terms stage, with negotiations ongoing with shippers.
- Recruitment of Project Team for entire duration of project, including Project Officer and a stakeholder engagement role – as well as the set-up of a Project Steering Group.
- In-built external website now fully live and operational at [www.sgn.co.uk/oban](http://www.sgn.co.uk/oban)
- Social media campaign underway with the first project tweet and set-up of project hashtag - #SGNOban
- Positive initial discussions with HSE and DECC regarding future GS(M)R exemption for full trial.
- Comprehensive review of relevant standards and legislation, as well as current and past work in this area.

In summary, the project is on track to deliver significant and valuable learning. This report contains information on each of the bullets above, providing a comprehensive update on the achievements made and obstacles overcome to date.

#### 3.1 Dissemination Activities

As the project is in its first six months, dissemination activities have been predominantly limited to internal updates, and presentations to stakeholders. The initial appliance survey has meant that letters and leaflets explaining the project have been distributed to 152 customers, and the project website is now live. However, the project was discussed at the IGEM affiliates meeting and the GIGG conference in May 2014. We anticipate that Stage 2 will present many more dissemination opportunities, through town hall meetings and an increased presence in Oban, and we are scheduled to present on the project at the LCNI Conference in October.

#### 4. Project Manager's Report

Following the commencement of the project in January 2014, the project has successfully progressed as per the project plan. All required reports and approvals have been successfully collated, which has contributed to the project's development.

The project has completed Stage 1, the initial gas appliance survey in Oban, and benefitted from a 66% access rate to customer properties. The majority of the 'no access' properties were due to customer absence rather than our engineers being turned away. The customer services department also received interest from customers who would like to participate in the project, despite not having been included in the initial stage. We are delighted that customers are engaged so early in the project.

Furthermore, we have received positive feedback from customers through the customer service surveys, which will be utilised in the planning of the customer engagement in stage 2 of the project, to further enhance our services and meet the needs of all customers.

There is a detailed report of where the project is against the plan in the Full Submission in section 6 of this report, however a brief summary is included in the table below:

<b>Objective</b>	<b>Update</b>
Review of Standards & Regulations	Report completed by project partner. Highlighted key legislation and necessary exemptions.
Review of Current & Past Work	3 key pieces considered, suggesting optimum WI level for trial.
Customer Engagement Plan	Appliance survey a success, leaflets and letters well received.
Contracts with project partners	Signed and in place with three project partners.
Project team	Recruited and in place.
Project bank account	Set up with bank and funds being deposited.
Project steering group	Members nominated and first meeting held.
Project website	Went live in April and site address included on correspondence to customers.
Appliance survey	Completed successfully within timescales.
LNG shipping arrangements and supply chain	SDRC-1, which covers this objective, submitted on schedule, subject to the submitted Change Request
Identify limits for gas testing	Gases for testing phase identified, with gas for trial being finalised.

There has been one scheduled submission to Ofgem in this period, SDRC-1. The necessary actions for completion of this document were addressed and completed, with one exception; that of the signed gas shipping contract. This could not be included due to a contract management fee which was identified through the detailed procurement process. SGN are working hard to expedite this process and negotiate a contract that provides the best value for the GB customer. This has had no adverse effect on the project plan.

We expect to submit two further Change Requests over the coming weeks. These are explained in more detail within the Risk Management section later in this report, but a summary is provided below:

- An amendment to the funding within the cost categories will be required in order to make the purchase of LNG. Negotiations with the LNG shippers has made it clear that the amount currently allocated to the 'Payments to Users' category will be insufficient to cover the purchase. We are looking at costing in other categories against which we can offset this purchase.
- Following a review of the wording within the Project Direction, it has been identified that Clause 9 states that the project must secure HSE's agreement for an exemption from the GS(M)R prior to beginning Stage 2 of the project. As the purpose of Stage 2 is to secure the evidence needed to secure this exemption prior to beginning Stage 3 (the trial), it is not possible to achieve the exemption before this. We are looking to amend the wording in the Project Direction to reflect this and allow the project to continue as planned. HSE are fully engaged in the progress of this project, and supportive of its objectives.

#### 4.1 Stakeholder Engagement

The project has also gained valuable support from key stakeholders, which has been highly encouraging. Meetings have been held with the local MP and MSP, both of whom were supportive of the project. Other contacts, carefully selected to best support customers and inform our plans, including the local council and police, have been fully supportive of the project plans. They have provided feedback on how best to engage with customers, which we have incorporated into our plans. Many of the stakeholders have expressed their excitement regarding the project and the positive effect that they believe our project will have in the Oban community. They have been particularly pleased that Oban is leading the way and interested in the legacy benefits we hope to provide for Oban in the future. Moreover, the project stakeholders have been keen to get involved with the project themselves, and have offered their views and expertise to help plan and execute the project successfully. This is evidenced by the local media, The Oban Times, which featured the project in an article on 23 May 2014 that was supportive and positive in tone. The local radio station, Oban FM, have also been encouraging, with the offer of a Q&A section for airing during stage 2 of the project, as well as providing details during bulletins on their shows of the streets our engineers will be working in during Stage 2. Below is a demonstration of the project's engagement with its stakeholders thus far:

Who	Method	When	Outcome
Argyll & Bute Council Head of Customer Services and Head of Adult Services	Meeting	May 2014	The council has offered to help us identify which gas customers receive care support from them. They suggest we attend with a member of their staff known to the customer. They have also offered to help liaise with vulnerable customers' families to ensure the customer also has their relatives' support when we visit.
Oban Police	Letter	May 2014	The duty officers and control room have details of our survey appointment schedule and IDs for Kiwa staff. They were extremely positive about the fact we thought to notify them of the survey.

Mike Russell MSP and Alan Reid MP	Meeting	May 2014	Both willing to speak positively about the project and both gave us advice on other stakeholders we should approach.
Mike Mackenzie MSP (Parliamentary Liaison Officer to Fergus Ewing, Energy Minister)	Letter	May 2014	Mike is very supportive and keen to speak publicly about the project.
CEO of Argyll Voluntary Action (AVA)	Meeting	May 2014	AVA are keen to help facilitate access to harder to reach and vulnerable groups, and will co-produce customer literature with us (including testing it with some vulnerable customers for suitability). AVA advise us to permit customers to select their own appointment time for the main trial to encourage participation.
Oban Lorn & the Isles Area Meeting of councillors - Councillors Alistair MacDougall (Chair), Roddy McCuish, and Iain Angus MacDonald	Presentation	May 2014	All very positive and pleased Oban is leading the way.
Argyll Community Housing Association (ACHA)	Email	May 2014	Provided information on survey households who are ACHA properties. Meeting to follow.
British Gas and SSE	Meeting	May 2014	SSE very keen to carry updates on the Oban project on their intranet. Both will keep their customer teams advised. (One surveyed customer told us they had called British Gas when they got our letter, who were able to reassure them why we were visiting.)
Oban Times	Meeting	May 2014	Press releases to follow
Oban FM Radio Station	Meeting	May 2014	Oban FM keen to support fully during testing phase. Have offered to do daily updates on what streets we will be working in and when.
Argyll and Bute Community Planning Partnership. Attendees include Argyll & Bute Council, Police Scotland, Scottish Fire & Rescue, NHS Highland, Oban Community Council, Oban councillors	Presentation	June 2014	Stakeholders found presentation very interesting and are pleased that Oban is at the forefront of energy developments.  Meetings with the local housing association and community council, and further correspondence with the local fire service, will follow on from this engagement.
DECC, HHIC, ICOM & National Grid	Presentation & Meeting	June 2014	All stakeholders enthusiastic about the project.  DECC provided agreement for the trial and are keen to present on the project at the European Commission Working Group on harmonised gas standards.

## 4.2 Outlook for next six months

The next Project Progress Report is due on 19 December 2014. On this date the project will be midway through Stage 2 of the project, with the appliance testing well underway.

At present, we anticipate that by this date the project achievements for documentation in the PPR will include:

- Successful completion of laboratory testing of 18 appliances removed from properties in Oban as identified in the appliance survey.
- Development of house to house testing kit, and finalised testing protocols.
- Appliance testing programme underway.
- Quantified Risk Assessment underway.
- Procurement and replacement of appliances that don't meet the requirements as set out in the full submission.
- Established base in Oban.

The next six months are critical to the success of this project, with the customer engagement being particularly important as the project becomes much more prominent within the Oban community, and we begin the process of testing the new gases on all properties in the Oban network. There is one report due for Ofgem submission in the next six months:

- Delivery of SDRC-3 (Agreement of Trial with HSE, Ofgem and DECC) to Ofgem by 18 July 2014;

The next PPR will provide an update as to how each of the stages above is progressing, with PPR-3 (for submission in June 2015) providing a fuller report once Stage 2 is complete.

## **5. Business Case Update**

At present there are no developments or events that have taken place that may affect the benefits to be gained from this project. We have progressed as planned and Stage 1 is now completed. Stage 2, the appliance testing, is on schedule and will commence in August 2014 as planned.

## **6. Progress against Plan**

The following summary outlines the progress to date for each objective within the Project Plan that has taken place during the initial six months of the project.

### **6.1 Review of Relevant Standards and Legislation**

This report was completed by external contractor Dave Lander Consultants on 31 January 2014. The primary legislation that this project touches is the Gas Safety (Management) Regulations 1996 which set out the framework for the health and safety regulation of the gas transport industry. The report highlighted that the LNG being used in the trial does not comply with these regulations and that the HSE are likely to attach conditions to the granting of any exemption certificate.

The executive summary of this report is attached to this document as an appendix<sup>1</sup>, with the full version available upon request.

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<sup>1</sup> Appendix 1 – 'Opening up the Gas Market – Review of Relevant Standards & Legislation'





The appliance survey was a success, with the target of 100 properties exceeded within the three week time scale, with no complaints received from customers across the duration of the survey. Upon visiting a customer we ensured a project team member was in attendance at the property to explain the reasons for the visit, seek and record consent, answer any queries, take notes of any questions or detail any reasons for entry refusal, so that this information could be recorded and used to make improvements ahead of Stage 2.

#### **6.4 Legal contracts with Project Partners**

The legal contracts with project partners are all complete and in place. The project partners are detailed below:

- Dave Lander Consulting
- Kiwa Gastec
- GL Noble Denton (now DNV GL)

#### **6.5 Project Team**

The Project team is now recruited and in place. In addition to the Project Manager, the team now consists of a Project Officer, Administrative Assistant and a Stakeholder Engagement role. Contractors to the project team are also in place, as detailed in 4.2.4 above.

#### **6.6 Project Bank Account**

The bank account has been set up with Barclays Bank, and the project funds are now being deposited.

#### **6.7 Project Steering Group**

Members have been nominated to the Project Steering Group, and the first meeting took place on 11 June 2014. The purpose of this group is to champion the project within SGN, as well as providing strategic guidance and to be a point of escalation for key decisions and issues.

The Project Steering Group is made up of the following members:

- Project Director
- NIC Project Manager
- Meeting Secretary
- MD Scotland
- Head of Operations, SIUs
- Head of Operations, Oban SIU Depot
- Head of Stakeholder Engagement
- SIU Enduring Solutions, Project Manager
- Safety, Health & Environment Manager
- Head of Network Management, Trans & Storage Assets
- Head of Engineering Policy

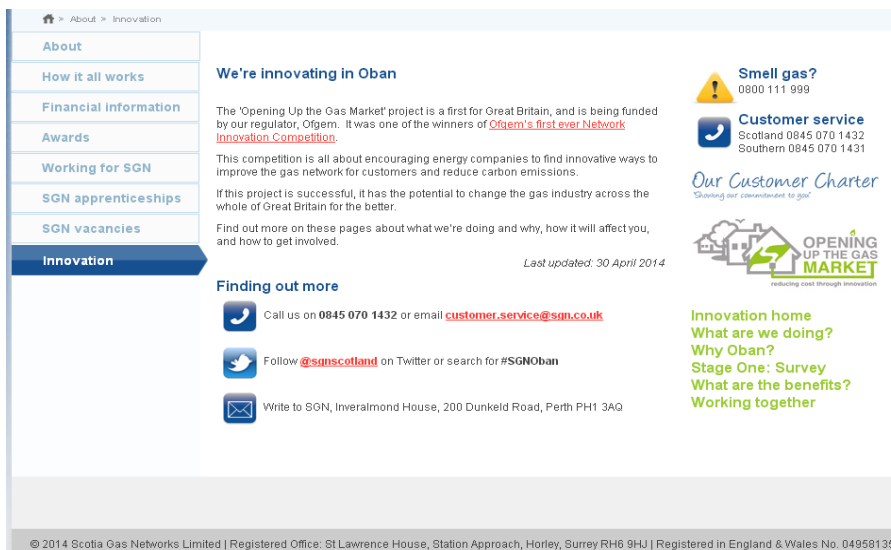
The agenda for the first meeting of this group included a review of the project's progress, including details of Stage 1's appliance survey, as well as the next steps, a financial summary and the project's overall RAG status.

## 6.8 Project Website

The project website went live in April 2014, with the address ([www.sgn.co.uk/oban](http://www.sgn.co.uk/oban)) included in the letters that were sent to customers. The website includes sections relevant to the current stage of the project and will develop as the project moves forward.

The existing pages include sections on 'Why Oban?', 'What are we doing?', 'Stage One: Survey' and 'What are the benefits?' Two screenshots of the website are provided below:

:



This screenshot shows the 'Innovation' section of the website. The left-hand navigation menu includes: About, How it all works, Financial information, Awards, Working for SGN, SGN apprenticeships, SGN vacancies, and Innovation (highlighted). The main content area is titled 'We're innovating in Oban' and contains the following text:

The 'Opening Up the Gas Market' project is a first for Great Britain, and is being funded by our regulator, Ofgem. It was one of the winners of [Ofgem's first ever Network Innovation Competition](#).

This competition is all about encouraging energy companies to find innovative ways to improve the gas network for customers and reduce carbon emissions.

If this project is successful, it has the potential to change the gas industry across the whole of Great Britain for the better.

Find out more on these pages about what we're doing and why, how it will affect you, and how to get involved.

*Last updated: 30 April 2014*

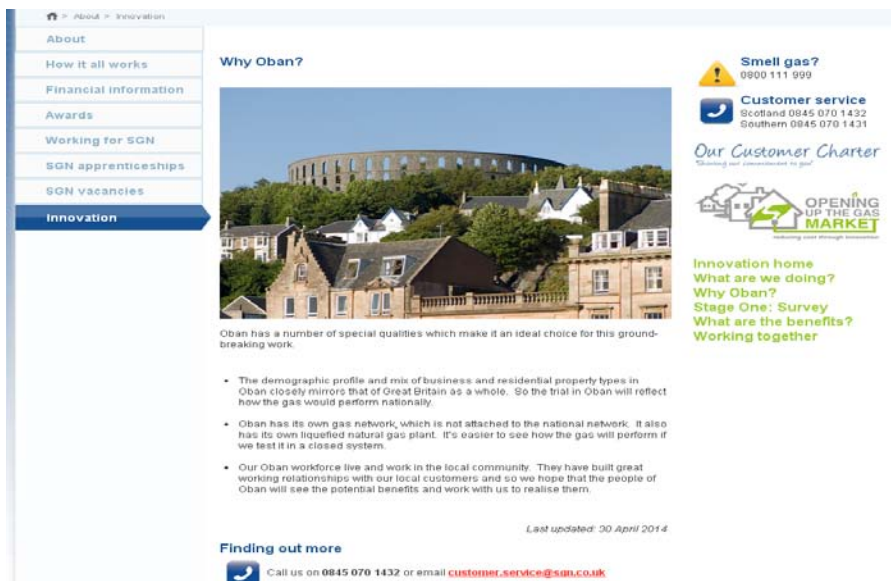
**Finding out more**

- Call us on **0845 070 1432** or email [customer.service@sgn.co.uk](mailto:customer.service@sgn.co.uk)
- Follow [@sgnscotland](#) on Twitter or search for [#SGNOban](#)
- Write to SGN, Inveralmond House, 200 Dunkeld Road, Perth PH1 3AQ

On the right side of the page, there are several links and icons:

- Smell gas?** 0800 111 999
- Customer service** Scotland 0845 070 1432 Southern 0845 070 1431
- Our Customer Charter** *Sharing our commitment to you*
- Opening Up the Gas Market** *reducing cost through innovation*
- Innovation home**
- What are we doing?**
- Why Oban?**
- Stage One: Survey**
- What are the benefits?**
- Working together**

At the bottom of the page, the footer reads: © 2014 Scotia Gas Networks Limited | Registered Office: St Lawrence House, Station Approach, Horley, Surrey RH6 9HJ | Registered in England & Wales No. 04958135



This screenshot shows the 'Why Oban?' section of the website. The left-hand navigation menu is the same as in the previous screenshot. The main content area is titled 'Why Oban?' and features a photograph of a residential street in Oban. Below the photo, the text reads:

Oban has a number of special qualities which make it an ideal choice for this ground-breaking work.

- The demographic profile and mix of business and residential property types in Oban closely mirrors that of Great Britain as a whole. So the trial in Oban will reflect how the gas would perform nationally.
- Oban has its own gas network, which is not attached to the national network. It also has its own liquefied natural gas plant. It's easier to see how the gas will perform if we test it in a closed system.
- Our Oban workforce live and work in the local community. They have built great working relationships with our local customers and so we hope that the people of Oban will see the potential benefits and work with us to realise them.

*Last updated: 30 April 2014*

**Finding out more**

- Call us on **0845 070 1432** or email [customer.service@sgn.co.uk](mailto:customer.service@sgn.co.uk)

On the right side of the page, there are several links and icons, identical to the previous screenshot:

- Smell gas?** 0800 111 999
- Customer service** Scotland 0845 070 1432 Southern 0845 070 1431
- Our Customer Charter** *Sharing our commitment to you*
- Opening Up the Gas Market** *reducing cost through innovation*
- Innovation home**
- What are we doing?**
- Why Oban?**
- Stage One: Survey**
- What are the benefits?**
- Working together**

Over the coming months, the website will be regularly updated to reflect project progress, with any reports submitted to Ofgem added.

## **6.9 Initial appliance survey**

The first stage of this project was to carry out a detailed survey of a sample of the appliance population within the Oban network. The objective of this was to provide information on the number and age of appliances within the network.

The purpose of the survey was to allow us to analyse common appliances as well as assess ventilation and installation issues in customer homes, thus allowing us to calculate the likely success rate during the testing phase in Stage 2. This also means we can deduce the need for repairs and replacements, and multiply this across the Oban gas network (1,104 properties) to ensure an appropriate resource strategy.

The project appliance survey took place across 101 properties in Oban, chosen randomly to represent the mix of properties across the Oban population as a whole. This happened over 3 weeks from 12 May 2014.

The appliance survey was completed successfully within the timescales, with the target of 101 properties surveyed. Details of the planning and actions taken to ensure this success are provided below:

### *Customer Contact*

Kiwa Gastec, project partners, provided SGN with a list of 127 representative properties across the Oban area. The criteria used to assess which properties to use were:

- Age and type of property construction e.g. Victorian, Edwardian, Post WW2 and modern;
- Flats v Tenements v Houses;
- Likely type of occupant e.g. owner occupier, long term tenant, itinerant tenant etc.

The properties in the representative areas were then counted and properties chosen to broadly represent the preponderance of that type of property in Oban. Kiwa Gastec visited Oban on 17 & 18 March to 'walk the streets' and check on the suitability of the properties chosen in the desktop analysis. The list was finalised to include:

- Housing Association properties
- Private 3 bed houses built in 1930s-70s
- Shops and flats above shops
- Commercial properties, including B&Bs, Cinema and take-aways
- New-build flat blocks
- Large Victorian houses
- New-build executive detached houses
- Tenements

Although only 100 properties were to be surveyed, it was assumed that a number of these would be 'no access' properties, whereby the customers would either choose not to participate in the survey or not be at the address (as Oban is a tourist hotspot, there are a number of holiday lets and second homes which can be vacant, as well as customers being absent during working hours). As such, SGN sent a letter and leaflet to 127 customers detailing the project, the benefits to the customer and providing an appointment date and time, which the customer could amend or cancel if the time wasn't convenient or they did not wish to take part.

The letters were sent out to customers providing notice of their appointment date. The project team then held meetings with the customer service contact centre in Perth, to advise them of the project and notify them to anticipate possible phone calls to cancel/rearrange appointments.

SGN briefed the customer services team on the project, meaning that they could discuss the project with customers and explain the purpose and benefits of the visit should the customer contact us for further information.

SGN created an appointment schedule which was distributed to the customer services team, to provide them with a check sheet, which they could amend if a customer rearranged or cancelled an appointment. Details of such changes were sent daily to the project's Administrative Assistant who could then amend the master copy and notify the team in real time of any changes to appointment times.

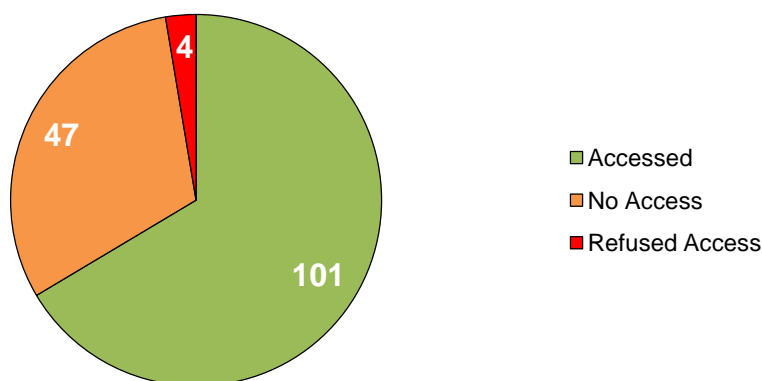
The appliance survey began on 12 May 2014. The team calling at the customer properties comprised of an local SGN engineer, whose role it was to complete a visual gas safety check on the appliances; a Kiwa Gastec 'Senior Test Engineer', whose role it was to complete the survey itself, and a member of the project team, who could explain the project to customers. Throughout the 3 weeks, there was a continuous presence from the project team in Oban. A member of the team accompanied engineers on every property visit to greet the customer and ensure they were happy to proceed with the engineers entering the property and completing the survey, as well as being there to answer any questions that customers may have. The photograph below shows one of SGN's engineers performing a safety check on a gas fire in a customer home.



After week one, the project had a 73% access rate within properties, and as such SGN sent out a further 25 letters to customers for appointments during week commencing 26 May 2014, to ensure that the target of 100 properties was reached.

The 100 target was reached, and exceeded, on 30 May 2014. The charts below provide further analysis on these properties:

## Access Rate



SGN received 14 cancellations from customers across the duration of the survey, representative of 9.21% of those contacted. Customers who cancelled their appointments or refused consent on the doorstep were asked for their reasons. The main reasons given were:

- Unwilling to give up the time
- Inconvenience, unwilling to be disturbed.

Several customers who refused consent on the doorstep thought we were gas suppliers trying to engage in sales. Two felt the timing was inconvenient but could not agree a time which would be convenient in the coming weeks. SGN did not follow up with any 'no access' properties to attempt to retry entry or arrange future appointments due to the time constrictions of the survey. SGN anticipates that this would have resulted in a higher access rate and this information will inform Stage 2 of the project.

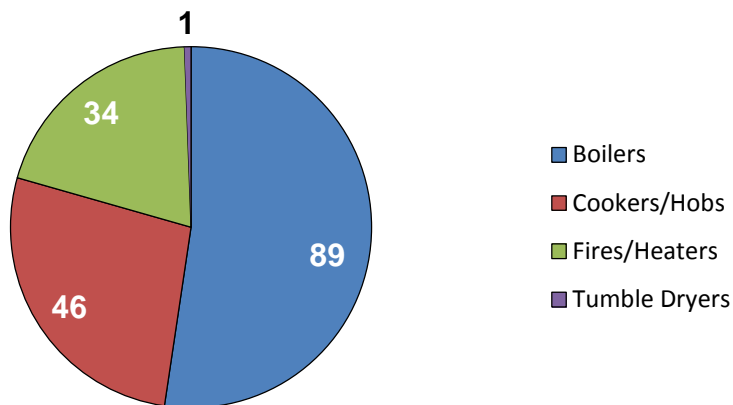
A log of any queries received by customers was kept, and answers to these will be incorporated into the website in advance of Stage 2.

There were a number of lessons from this stage which will inform our planning of Stage 2:

- Offer customers the opportunity to select their own appointment time
- Offer more evening appointments
- Make the appointment time more prominent in the letter
- Address letters to customers by name
- Undertake more promotion in the local community to raise awareness before the letters are sent.

Of the 101 properties surveyed, this was made up of 169 appliances in total: 89 boilers, 33 local space heaters (gas fires or heaters), 46 cookers and 1 tumble dryer. Of these, 15 services or repair jobs were necessary with 2 requiring replacements.

## Appliance Population

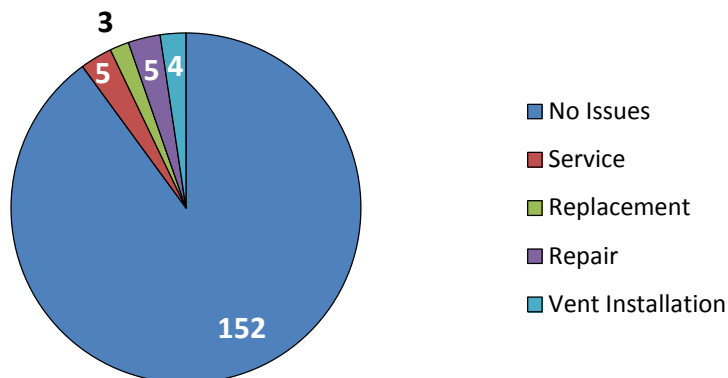


Of these 169, replacements were necessary in two properties, for a grill and fire in one property, and a fire in another. Replacements were required as the appliances were considered immediately dangerous and beyond repair. Repairs, services or vent installations were required on 14 appliances<sup>3</sup>. The appliances that we are replacing will be taken into the lab for further testing, to measure the impact a change in gas composition has on already existing issues and if the change in gas quality would exacerbate the situation, for example in the case of the broken glass seen in the photograph below:



<sup>3</sup> Appendix 3 – ‘List of Repairs & Services’

## Appliance Findings

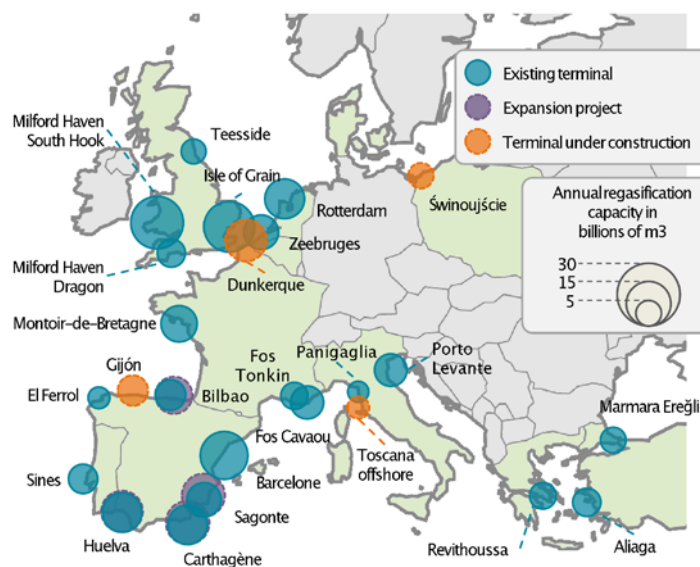


The project has provided, within the Full Submission, an estimate of up to 40% of appliances requiring replacement. While this is still possible once Stage 2 begins, the initial survey has a replacement rate of 2% suggesting that this estimate may be higher than required.

### 6.10 LNG shipping arrangements and supply chain

This is discussed in the SDRC-1 report, which was submitted to Ofgem on the delivery date of 23 May 2014. Details on this submission are provided in section 7 of this report, however to summarise:

- SGN are in final negotiations with LNG shippers to secure procurement of the necessary LNG for the trial.
- The consideration process involved consulting various shipping terminals and routes, as per the diagram below:





## 6.11 Identify limits for gas testing

The test gas is required during Stage 3 of the project. Based on the studies carried out in the appliance survey and via a technical review of previous gas quality interchangeability studies, the limit values for the field trial are to be established. As the results of the appliance survey are not yet known (the lab testing results are due for submission in July 2014) we cannot finalise the exact limits, as these results are to be taken into account in this decision.

However, Stage 2 of the project involves the testing of all gas appliances in Oban using bottle gases to represent the higher and lower end of the EASEE gas specification. The purpose of this stage is to identify all appliances to be replaced before the trial commences.

The three gases to be used in this stage have been identified and are confirmed. The gas types which have been selected are known as G20, G21 and G23. The gas is likely to be supplied in single cylinders that have internal volumes of 50.0 litres (0.05m<sup>3</sup>) and storage pressures ranging from 45-200bar(g). The physical characteristics each gas cylinder type is given in the table below:

Gas Type	Pressure Bar (g)	Vol (m <sup>3</sup> )	Volume of gas at atmospheric pressure/temperature (m <sup>3</sup> )	Wobbe Index (mJ/m <sup>3</sup> )	Dimensions Height x Width (mm)
G20	200.0	0.05	9.87	50.72	1650x200
G21	45.6	0.05	2.25	54.76	1650x200
G23	161.0	0.05	7.94	45.66	1650x200

Further details of these gases is provided in the appendices<sup>4</sup>

## 7. Progress against Budget

Project expenditure is within the budget defined in the Project Direction. The table below details expenditure against the project budget and compares this with planned expenditure to date. Projected variance is also listed, though at present this is 0%.

					Projected variance (at project conclusion)	
	Task	Budget (£000s)	Expenditure ITD (£000s)	Comparison with expected expenditure (%)	(£000s)	%
<i>See notes below table</i>				#1	#2	
<b>LABOUR</b>		<b>266</b>	<b>10</b>	<b>0.0%</b>	<b>0</b>	<b>0.0%</b>
Agree Trial protocols		1.5	10	0.0%	0	0.0%
Other tasks		Other	256	0	0	0.0%

<sup>4</sup> Appendix 4 – ‘Gases – type, handling, transport and storage’

<b>EQUIPMENT</b>	<b>All</b>	<b>1123</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0.0%</b>
<b>CONTRACTORS</b>		<b>471</b>	<b>22.3</b>	<b>3.4%</b>	<b>0</b>	<b>0.0%</b>
Review Previous studies	1.1	15	3.5	9.4%	0	0.0%
Appliance Population survey	1.2	155	18.8	-6.0%	0	0.0%
Other tasks	Other	301	0	0.0%	0	0.0%
<b>TRAVEL AND EXPENSES</b>		<b>12</b>	<b>1.1</b>	<b>0.0%</b>	<b>0</b>	<b>0.0%</b>
Agree Trial protocols	1.5	8	1.1	0.0%	0	0.0%
Other tasks	Other	4	0	0.0%	0	0.0%
<b>PAYMENTS TO USERS</b>	<b>All</b>	<b>15</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0.0%</b>
<b>OTHER</b>	<b>All</b>	<b>235</b>	<b>20.3</b>	<b>1.5%</b>	<b>0</b>	<b>0.0%</b>
<b>TOTAL</b>		<b>2122</b>	<b>53.7</b>	<b>4.9%</b>	<b>0</b>	<b>0.0%</b>

#1 – Actual expenditure to date is compared with phased projected spend over the same period

#2 – Projected expenditure is reported as budget. SGN have indicated to Ofgem that a Change Request will be submitted when contractual negotiations are further advanced.

## 8. Bank Account

Appendix 6 provides details of the latest statement from the Project Bank Account.

## 9. Successful Delivery Reward Criteria (SDRC)

SDRC-1 has been completed and submitted to Ofgem with the exclusion of the evidence for the signed shipping contract. This was preceded by a change request to extend the final delivery date to 29 September 2014 as one of the primary evidence measures, an agreed contract for the procurement of the LNG, could not be provided. This does not impact the project plan as a whole and there is no risk of future delays to SDRC reports. SGN is on track to complete SDRC-3 (the next due for submission) by its delivery date of 18 July 2014. A summary of SDRCs is provided overleaf:

SDRC No	SDRC	Delivery Date	Status
1	Establish supply chain and shipping arrangements for LNG	23 May 2014	Completed*
2	Carry out Quantified Risk Assessment	6 March 2015	On Target
3	Agreement of Trials with HSE, DECC & Ofgem	18 July 2014	On Target**
4	Testing of all affected appliances	20 February 2015	On Target
5	Procurement and installation of replacement appliances	24 July 2015	On Target

6	Construction and installation of required site infrastructure	21 December 2014	On Target
7	Successful completion of field trial	8 February 2016	On Target
8	Successful completion of Knowledge Dissemination task	27 February 2016	On Target

\*Submitted in provisional state pending change request approval of an extended deadline of 29 September 2014.

\*\*This is an agreement-in-principle and does not provide the necessary exemption required prior to beginning the trial. The formal request for the exemption will be submitted in Dec-14 using the evidence gathered during Stage 2.

## 10. Learning Outcomes

The learning outcomes for this project were contained in section 2.1 of the full submission. These are all overall learning outcomes that are to be achieved across the length of the project. As the project is only six months in, none of the learning outcomes have been reached at this stage, but all remain on target. The table overleaf provides details of these learning outcomes and the progress against them to date.

Dissemination activities, as detailed in the Executive Summary, have been limited at this stage to providing updates to customers and project partners. As the project analyses the results from Stage 1 and moves into Stage 2 across the next six months, these activities will increase, culminating (for the next six months) in a presentation at the LCNi conference in Aberdeen in October.

Learning Objective	Comments	Status
To demonstrate that gas which meets EASEE Gas specification but sits outside GS(M)R can be conveyed safely and efficiently in the GB gas network	<ul style="list-style-type: none"> <li>• This is the primary objective of the project.</li> <li>• The results of this will be published following the year long trial.</li> <li>• If full EASEE range cannot be achieved the project will recommend a more suitable WI range for GB</li> </ul>	Ongoing
To demonstrate that all GAD compliant gas appliances are capable of safely and efficiently burning gas which meets EASEE gas specifications but sits outside GS(M)R	<ul style="list-style-type: none"> <li>• Appliance survey completed.</li> <li>• Repairs and replacements are minimal at this stage.</li> <li>• Full results will follow Stage 2 of the project.</li> </ul>	Ongoing
To establish the proportion of older gas appliances that constrict gas quality specification in GB through assessment of a representative appliance sample from the Oban network	<ul style="list-style-type: none"> <li>• Due for completion in Stage 2 of the project.</li> </ul>	Ongoing
To demonstrate through the sample population what is required to ensure GB's appliance population is capable of operating safely and efficiently over a wider range of gas quality	<ul style="list-style-type: none"> <li>• Full results of this will follow the completion of the year long trial.</li> </ul>	Ongoing
To identify and record all types/makes of gas appliances, identified through the representative appliance sample from the Oban network that are not fit for operation using gas which meets EASEE gas specifications but outside GS(M)R	<ul style="list-style-type: none"> <li>• Due for completion in Stage 2 of the project.</li> </ul>	Ongoing
To capture and record all project learning to assist in a full GB roll out in the future	<ul style="list-style-type: none"> <li>• All reports and results from Stage 1 of the project have been recorded. Updates will be provided in written form through reporting, via the project website and through presentations at dissemination events.</li> </ul>	Ongoing
To compile a project completion report assessing the technical and commercial viability of accepting EASEE compliant gas in GB	<ul style="list-style-type: none"> <li>• Full results of this will follow the completion of the year long trial.</li> </ul>	Ongoing
To compile a list of appliances found to be incompatible which will be shared among all relevant stakeholders	<ul style="list-style-type: none"> <li>• Due for completion in Stage 2 of the project.</li> </ul>	Ongoing

## 11. IPR

There has been no IPR registered during the six month reporting period. At this stage, there are also no IPR forecasted for the coming reporting period.

## 12. Risk Management

The table contained in the appendices<sup>5</sup> provides an update of the project Risk Register report on the risks highlighted in the full submission, with each risk rated in terms of its impact and likelihood. There are three additional risks that have been highlighted since the project's inception. These are now included in the Risk Register but have been detailed below to explain their necessary inclusion:

(i) *Negative Press Reports*

When the project begins in earnest during Stage 2, the likelihood of press involvement is more likely, as we will have a more prominent presence within the town for a sustained period.

As a result, it is important that we continue to listen to customers and stakeholders and take their views into account. In addition we will look to maintain a positive relationship with the Oban Times and Oban FM. Negative press reports could hinder the project significantly during stage 2, as we are reliant upon customer goodwill and the ability to enter their homes. We have already engaged the Oban Times and Oban FM and meetings have been positive. The customer engagement plan has prioritised this, and ensuring the Oban community is kept updated is paramount to our plans.

(ii) *Testing Phase incomplete by February 2015*

As part of the full submission, and the SDRC reports we must submit to Ofgem, we have committed to the full trial being completed by February 2016. As the trial must run for one year, this means we need the testing phase to be completed by February 2015. The necessity to test every appliance in Oban means it is a real possibility that the testing phase could run beyond this date. To mitigate this, we will seek to contract a site manager to be based in Oban for the duration of the project to resolve any issues and avoid delays. We will also ensure there is a contingency plan for any no-access properties, as without this we could have engineers waiting up to 3 hours for their next appointment. The case for exemption will be made to HSE in December 2014 based on the evidence acquired up to that date. At this stage, HSE may be satisfied that the evidence presented is sufficient and there is no real requirement to test all properties.

(iii) *Transport Issues with LNG*

The project will be using gas sourced from Zeebrugge terminal in Belgium, which will be shipped to Killingholme, Lincolnshire and then tankered to Oban. As there is only one road in and out of Oban, this means there is a possibility over the winter months

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<sup>5</sup> Appendix 4 – 'Risk Management Table'

particularly of snow preventing a tanker reaching Oban. To avoid this risk, we will retain LNG on site in storage facilities which can be used should this happen.

*(iv) Installation of Gas Chromatograph not completed by February 2015*

A gas chromatograph is needed to measure the content of the various components within the LNG, namely the WI. As the WI must be between specific values for the duration of the trial, the chromatograph must be installed prior to the injection of the gas.

The project cannot begin without this installation so the sole alternative to this risk is to delay the injection of the gas until the chromatograph can be fitted. To avoid any delay however, this installation can be managed by SGN's internal network construction department to avoid external contractor risks.

In addition to these four added risks, and those already highlighted in the Risk Register, the project has also identified the necessity for three Change Requests, one of which (c) was submitted to Ofgem on 21 May 2014. These are detailed below:

*(a) Transfer of funds between cost categories*

This risk was highlighted at the earliest possible stage to Ofgem, and a formalised Change Request is due for submission once costs have been finalised with the LNG shippers. A notification of this change was sent to Ofgem on 8 May 2014, where it is explained in detail. A summary is provided below:

- A key part of the Opening up the Gas Market project is to contract with a shipper to arrange shipping of gas from a source that can supply gas that is non-compliant with GS(M)R as amended.
- As part of the bid submission, a risk was identified that the cost for the LNG shipping and loading may change.
- Following further discussions with these shippers, it became likely that the actual costs for shipping the LNG were likely to be higher than the budgeted costs. In order for the project to succeed, SGN requires certainty that these additional costs are recoverable.

*(b) HSE exemption*

Clause 9 of the Project Direction states that '*prior to starting activities 2 and 3, SGN must secure agreement from the Health and Safety Executive for the necessary exemption from the GS(M)R for injecting higher WI gas into the Oban network.*' Stage 2 of the project does not involve injecting gas into the network, rather it is the testing of all gas appliances in Oban using bottled gas. The results of this testing will be used to evidence that injecting the gas into the network will be safe. Therefore, a Change Request will be submitted for the wording of this clause to allow for Stage 2 to go ahead without the exemption, due to the purpose of Stage 2 being to provide the necessary evidence to acquire the exemption.

*(c) SDRC-1 Delivery Date*

A Change Request was submitted to Ofgem requesting an extension to the final SDRC delivery date on 21 May 2014. This was needed due to SGN being unable to exchange contracts, a requirement within SDRC-1, until the funds transfer had been approved. The Change Request explained that SGN would still submit a SDRC

report by the agreed date of 23 May 2014, and that a further submission would be delivered by 29 September 2014, once contracts had been signed.

SGN did submit the SDRC-1 document on 23 May 2014.

### **13. Other**

SGN will be undergoing a company-wide rebrand during the next six month period of this project. This rebrand includes a new company logo, website and colour scheme. As part of this, all SGN vans will be rebranded with the new logo and colours to align with the new brand guidelines. The OGM logo may also be subject to change to align with this. To harmonise the brand change in Oban, the OGM project has agreed that the vans there will be among the first to display the new branding, to avoid changes part way through the major stages of the project and cause customer confusion.

### **14. Accuracy Assurance Statement**

This report, as with all reports created by the project team for submission to Ofgem, has been through a rigorous authenticity and accuracy process to comply with the project governance document.

The document has been approved by the Project Manager, Project Director and SGN's internal regulation department.

## 15. Appendices

### Appendix 1 – Review of Relevant Standards and Legislation

## davelanderconsulting

### EXECUTIVE SUMMARY

#### BACKGROUND

Scotia Gas Networks (SGN) has engaged the services of Dave Lander Consulting Limited to provide technical support to the Network Innovation Competition Project “Opening up the Gas Market”. The Project intends to demonstrate that gas that is compliant with the EASEE-Gas specification, but not compliant with the requirements of the Gas Safety (Management) Regulations, can be safely conveyed and used within Great Britain.

A key aspect of the Project is a field trial utilising one of SGN’s Scottish Independent Undertakings (SIUs), discrete gas distribution systems that are isolated from the UK National Transmission, Regional Transmission and Distribution systems. Gas conveyed within the SIUs is supplied as revaporised Liquefied Natural Gas (LNG) and during the field trial selected LNGs will be conveyed in the Oban SIU.

This report is the first deliverable to be provided for SGN by DLC and comprises a review of existing legislation and standards applicable to distribution and use of natural gas. Impacts on the Project are highlighted.

#### SUMMARY OF IMPACTS OF LEGISLATIVE FRAMEWORK ON THE OGM PROJECT

- Two main sets of regulations in the UK drive the minimum gas quality requirements for grid injection: the Gas Safety (Management) Regulations (GSMR) and the Gas (Calculation of Thermal Energy) Regulations (GCOTER). These regulations are enforced by HSE and Ofgem respectively.
- Consumers in the SIUs are billed under the Declared CV regime as set out in the GCOTER and if no change in the current arrangements is made, unbilled energy in the Oban SIU will increase during the field trial because the CV of gas conveyed will be significantly higher than the value currently declared in the SIUs.
- The gas conveyed during the field trial will not comply with the requirements of the GSMR and an exemption certificate will be required. The HSE are likely to attach conditions to the granting of any exemption certificate.
- The Gas Appliance (Safety) Regulations implement the requirements of the Gas Appliances Directive, which set out essential requirements for gas appliances so as to permit their supply throughout Europe. The UK declaration of gas quality corresponds to the wider range in Wobbe index that is permitted by the GSMR in order to prevent a supply emergency. The field trial is likely to convey gas that is within this wider range.

#### SUMMARY OF IMPACTS OF STANDARDISATION FRAMEWORK ON THE OGM PROJECT

- LNG conveyed during field trial will be within the WI range classification for group H of the second gas family.
- It is likely that the WI of gas conveyed during the field trial will have a WI less than that of the incomplete combustion and sooting limit gas.



## Appendix 2 – Review of Current & Past Work

# davelanderconsulting

## Opening up the gas market – Review of Current & Past Work

### Executive summary

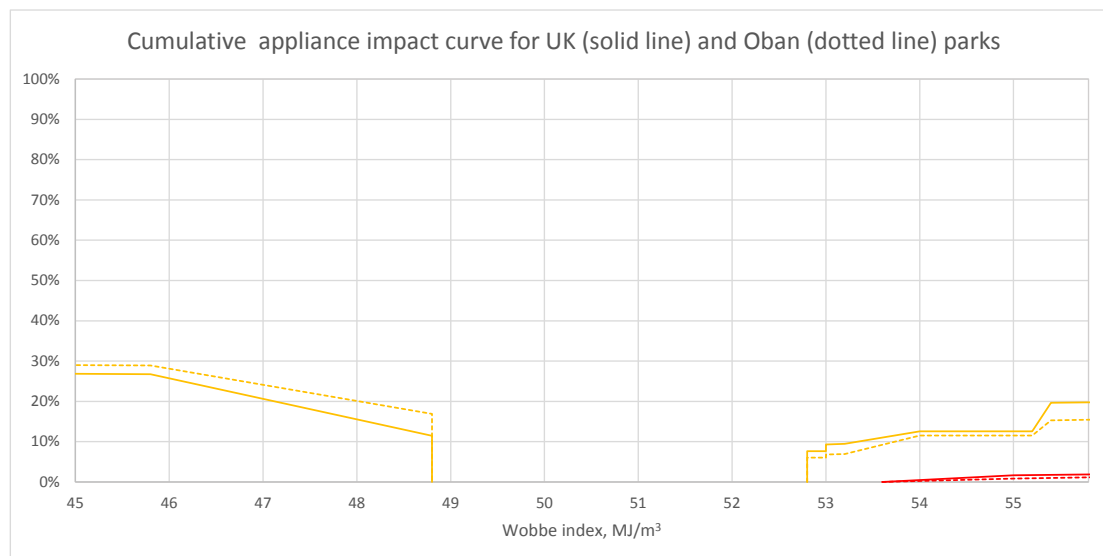
#### BACKGROUND

Scotia Gas Networks (SGN) has engaged the services of Dave Lander Consulting Limited to provide technical support to the Network Innovation Competition Project “Opening up the Gas Market” (OGM). The Project intends to demonstrate that gas that is compliant with the EASEE-Gas specification, but not compliant with the requirements of the Gas Safety (Management) Regulations, can be safely conveyed and used within Great Britain.

A key aspect of the Project is a field trial utilising one of SGN’s Scottish Independent Undertakings (SIUs), discrete gas distribution systems that are isolated from the UK National Transmission, Regional Transmission and Distribution systems. Gas conveyed within the SIUs is supplied as revaporised Liquefied Natural Gas (LNG) and during the field trial selected LNGs will be conveyed in the Oban SIU.

This report is the second deliverable to be provided for SGN by DLC and comprises a review of current and previous work carried out in this area.

#### SUMMARY



The GASQUAL study highlighted the issue of adjustable appliances and potential to limit their range of operation at high WI, if adjusted on low WI gases, and *vice versa*. Adjustable appliances with their factory settings (i.e. adjusted on G20 reference gas) such appliances tolerate a wide range in WI.

The incomplete combustion limit currently in the GSMR is for an ICF of 0.48. This corresponds to a WI of between 50.96 and 51.41MJ/m<sup>3</sup> (the line corresponding to ICF of 0.48 is not horizontal). The value of 0.48 was selected by Dutton on the basis of the upper limit traditionally being 105% of the reference gas. However, there are

inconsistencies in Dutton's statements about this limit, in that this value is stated to be 52.1 MJ/m<sup>3</sup>, when it is in fact 53.2 MJ/m<sup>3</sup>. The final value of ICF of 0.48 was made on the basis that it approximated that of gases around 51.2 MJ/m<sup>3</sup>, which was the WI limit at the time imposed by the British Gas Corporation, following a survey of appliances in 1978.

At the time of this survey, all gas appliances were essentially placed on the market prior to the Gas Appliance Directive and most are likely to have been converted from Town gas operation (conversion to natural gas in the UK was carried out 1966-1978).

Regarding the lower Wobbe limit, the GASQUAL and Advantica studies suggest that operation at low WI is less of a concern. The limit currently in the GSMR is set at 47.3 MJ/m<sup>3</sup> from solely heat service considerations and the emergency limit of 46.2 MJ/m<sup>3</sup> is set from Dutton's suggested limiting value of LI. Again there are some inconsistencies in Dutton's justification for this lower value.

The OGM project intends to carry out in-premises testing within the Oban network using three test gases:

- G20 (50.72 MJ/m<sup>3</sup>)
- G21 (54.76 MJ/m<sup>3</sup>)
- G23 (45.66 MJ/m<sup>3</sup>)

Following this, gas with a WI greater than GS(M)R but below 54 MJ/m<sup>3</sup> will be sourced from the continent, tankered to Oban and injected into the network. The network will be run on this gas for a period of one year.

### Appendix 3 – List of repairs and services

Job Ref	Survey Date	Job Type	Engineer	Date of Completion	Invoice Rec'd?	Price (Excl. tax)	Payment Date	Comments
N/A	13/05/2014	Cap off pipe on gas fire	SGN SIU	13-May-14				Closed out
N/A	13/05/2014	Vent for boiler	SGN SIU	13-May-14				Closed out
N/A	14/05/2014	Vent required (not sure where)	SGN SIU	14-May-14				Closed out
OGM001	16/05/2014	Service Fire and Boiler	Kenny Wotherspoon	23/05/2014	29/05/2014	£120.00		Closed out
N/A	20/05/2014	Gas fire on carpet, closure plate loose, wrong terminal. Isolated as immediately dangerous.	SGN SIU	20/05/2014				Alan Hamilton spoke to cusomter's son in law, offered to remove fire. Happy for fire to be removed.
N/A	20/05/2014	Flu terminal cover damaged.	SGN SIU					SGN Oban to order and fit replacement cover, charge to project.
OGM002	20/05/2014	Service Fire	Kenny Wotherspoon	23/05/2014	29/05/2014	£70.00		Closed out
N/A	20/05/2014	Poor flame on simmer burner on cooker.	SGN SIU	20/05/2014				Closed out
OGM003	21/05/2014	Service Fire	Kenny Wotherspoon	Not completed	29/05/2014	N/A		Kenny has condemned fire but not charged for work. SGN to discuss options for replacment with customer. Customer happy at present as doesn't use fire. SGN Stakeholder team to contact customer to offer replacement.
OGM010	21/05/2014	Replace grill (and cooker if necessary) & replace fire.	Donald MacLean					Susan G has spoken to cust. Cust will make own contact with D McLean to organsie work.
OGM004	22/05/2014	Service Boiler	Kenny Wotherspoon	23/05/2014	29/05/2014	£85.00		Closed out
OGM005	27/05/2014	Vent for gas fire	Kenny Wotherspoon					KW has made contact with cust and will carryout work w/c 9 June.
N/A	27/05/2014	Vent for boiler in door of outhouse.	SGN SIU	27/05/2014				Closed out
OGM006	29/05/2014	Service Fire	Kenny Wotherspoon					KW has made contact with cust and will carryout work w/c 9 June.
OGM007	29/05/2014	Service Fire	Kenny Wotherspoon					KW has made contact with cust and will carryout work w/c 9 June.
OGM008	29/05/2014	Broken thermocouple on hob	SGN SIU	?	N/A	N/A	N/A	KW has made contact with cust but cust no willing to wait until w/c 9 June. Oban depot currently dealing with Job.
OGM009	29/05/2014	Fire to be replaced & fix broken thermocouple on hob	Kenny Wotherspoon					KW has provisionally agreed to visit property with Susan G on 12 June. KW will advise on replacement options for cust. SG to call KW to firm up on time of visit.

## Appendix 4 – Gases – Type, Handling, Transport and Storage

### *Type*

Three gas types have been selected which are G20, G21 and G23. The gas is likely to be supplied in single cylinders that have internal volumes of 50.0 litres (0.05m<sup>3</sup>) and storage pressures ranging from 45-200bar(g). The physical characteristics each gas cylinder type is given in the Table 1 below.

*Table 1 – Physical characteristics of each gas cylinder type*

<b>Gas Type</b>	<b>Pressure Bar (g)</b>	<b>Vol (m<sup>3</sup>)</b>	<b>Volume of gas at atmospheric pressure/temperature (m<sup>3</sup>)</b>	<b>Wobbe Index (mJ/m<sup>3</sup>)</b>	<b>Dimensions Height x Width (mm)</b>
G20	200.0	0.05	9.87	50.72	1650x200
G21	45.6	0.05	2.25	54.76	1650x200
G23	161.0	0.05	7.94	45.66	1650x200

### *Handling*

The cylinders should be handled in accordance with the British Compressed Gas Association [BCGA] guidance Technical Information Sheet TIS 12: 2010 - Handle Gas Cylinders Safely. Information for Customers Handling Gas Cylinders. Revision 1: 2010, which gives appropriate guidance in relation to help users of large gas cylinders to be handled in a safe manner. This document can be seen in Annex 1, but is available for download from the BCGA website at: <http://www.bcg.co.uk/publications/TIS12.html>

### *Transport*

The cylinders should be transported as specified in the British Compressed Gas Association [BCGA] document Carriage of gas cylinders by road in cars, vans and other vehicles guidance for drivers at work Rev. 1 2005, which summarises applicable legislation in relation to the rules concerning the way in which the gases industry must classify gases and label cylinders for transport and use. This document can be found and downloaded from the BCGA website at: <http://www.bcg.co.uk/preview/publications/L12005.pdf>

A useful method to assess risk associated with the transportation of cylinders is provided in the British Compressed Gas Association [BCGA] Technical Information Sheet TIS 26: 2012, Model risk assessment for the transport of gas cylinders, which can found and downloaded from the BCGA website at: <http://www.bcg.co.uk/publications/TIS26.html>

The BCGA also provides an accompanying spreadsheet as a model template to help perform a risk assessment for the transport of cylinders, which can be found and downloaded from the BCGA website at: [www.bcgga.co.uk/publications/TIS26.xls](http://www.bcgga.co.uk/publications/TIS26.xls)

### **Removal of the gas meter**

It is expected that all, if not most, of the gas meter installations encountered will be low pressure, and should therefore be removed, temporarily stored and reinstalled in accordance with BS 6400-1: Specification for installation, exchange, relocation and removal of meters with a maximum capacity not exceeding 6m<sup>3</sup>/h - Low pressure 2<sup>nd</sup> family gases.

If medium pressure installations are encountered, then the procedures outlined in BS 6400-2: Specification for installation, exchange, relocation and removal of meters with a maximum capacity not exceeding 6m<sup>3</sup>/h – Medium pressure 2<sup>nd</sup> family gases should be used.

### **Nature of the gas supply line and method of purging**

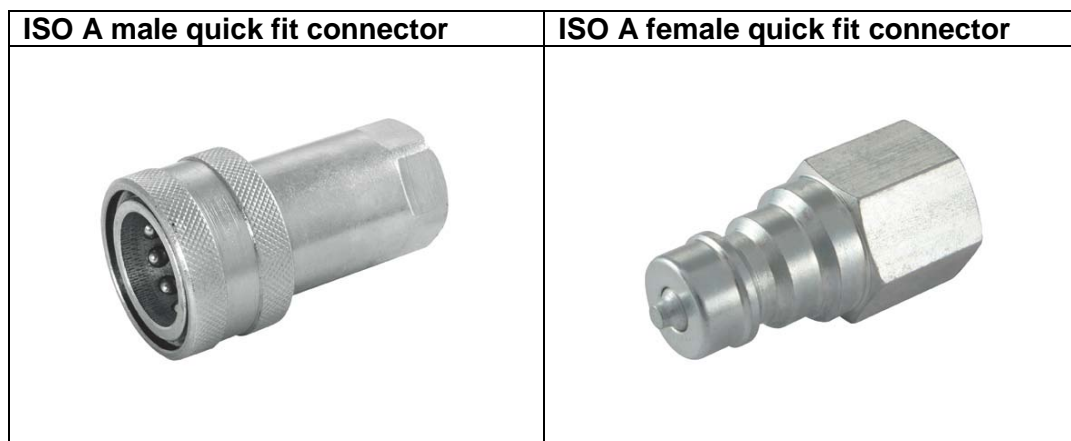
#### ***Gas supply line***

The gas supply line from the cylinder transport vehicle will be constructed of a suitably durable, high pressure flexible hose for LPG (certified to BS 3212: 1991) of inside/outside diameter of 18/9.5mm, which is capable of withstanding the supply pressures to which it is exposed (up to 250mbar, but maximum working pressure of 17.5bar). The type of hose described is shown in the image below:



### ***Hose end connections***

Each end of the flexible supply pipes from the gas cylinders and gas meter supplies will have ISO A type female, double shut-off quick connect fittings (self closing) to ensure that there is negligible gas leakage when disconnected from the house gas supply circuit. The connections from the cylinders and gas meter will be male and will also be ISO A type double shut-off quick connection types to ensure minimum gas leakage on disconnection (see below).



### ***Purging method***

It will be possible to pre-purge the whole gas delivery circuit by connecting the cylinder supply hose, mobile meter rig and supply hose from the meter by filling the system with test gas and venting to atmosphere outside the property

### **Connection at gas meter**

The gas circuit of the houses will be connected to the gas cylinders supply using a specially designed mobile gas meter rig, which will comprise of two pressure regulators and an ultrasonic meter of low internal volume (E6 type). A rig similar to the type which will be used in the appliance testing is shown in the photograph below (a GT 2.5 meter is shown).



The meter rig will be supplied by the high pressure flexible LPG hose as above, which will be fed via a hole in the side of the vehicle 25-50mm in diameter (tbc).

The incoming pressure into the medium pressure regulator (see below) is expected to be between 75-250mbar (g) (max) so that the meter outlet pressure is regulated to 20mbar for appliance test purposes.

Once connected the gas soundness of the gas installation should be established using the procedures outlined in the IGEM standard IGEM UP 1B.



### **Purging within the house**

The purging of gas installation shall be performed according to the procedures outlined in the IGEM standard IGEM UP 1B. Two methods are specified and vary depending on installation volume (IV). Using the methodology in UP 1B, examples of how this calculation is performed is given in Table 2 for two typical installations of 5m of 15mm diameter and 10m of 22mm diameter copper pipe connected to the test rig fitted with an E6 type gas meter.

Table 2 – Calculation of typical total installation volume (IV)

Pipe material	Copper	Copper
Pipe diameter, mm	15	22
Volume of 1m length, m <sup>3</sup>	0.00024	0.00032
Pipe length, m	5	10
Installation pipe volume (IV <sub>p</sub> ), m <sup>3</sup>	0.0012	0.0032
Test rig meter volume (IV <sub>m2</sub> ), m <sup>3</sup>	0.0024	0.0024
Installation volume of fittings (IV <sub>f</sub> )*, m <sup>3</sup>	0.00012	0.00032
Total installation volume (IV), m <sup>3</sup>	0.00372	0.00592

\*based on 10.0% of IV

### Crossing pavements

While the testing is being undertaken appropriate safety notices/warning signs should be positioned to notify passers by. If the cylinder flexible hose supply crosses pedestrian thoroughfares/walkways, a ramp walk over should be used. The image below gives an illustration of the type which may be used.



### Test equipment

The test equipment will comprise of a portable gas analyser conforming to BS EN 50379-3. The products of combustion will be sampled using the techniques and multi-holed sample probes as specified in the British Standard BS 7967-2: 2005 - Carbon monoxide in dwellings and the combustion performance of gas-fired appliances —Part 2: Guide for using electronic portable combustion gas analysers in the measurement of carbon monoxide and the determination of combustion performance.



## Bottle capacity and length of tests

### *Bottle Capacity*

The volumetric capacity at atmospheric pressure for each gas cylinder type is shown in Table 3 below. The G21 cylinder has the lowest capacity, so is likely to be used more rapidly than the other two gases.

*Table 3 - Volumetric capacity of test gas cylinders*

Gas type	Volume of gas at atmospheric pressure/temperature (m <sup>3</sup> )
G20	9.87
G21	2.25
G23	7.94

### *Appliance test duration*

For every appliance a test duration of between 5-10 minutes for each burner on each gas is a suitable time that will achieve stable measurement conditions. (it should be possible to reduce this time if the appliance is run on the normal gas supply prior to test).

The length of time the lasts clearly depends on the appliance types present in each property. The following examples attempt to show the number of houses that each bottle would last, based on the following parameters:

- Prepurge volume of 0.010m<sup>3</sup> as specified by IGEM UP 1B for smaller installations fitted with G4/U6 gas meters.
- 30kW combi boiler, 7kW gas fire and 10kW Cooker (with 4 hob burners, oven and grill);
- Appliance operation periods of 5 or 10 minute using each gas (tbc during lab tests)
- Testing of 3 houses per day.

Individual gas usage scenarios for appliance operation periods of 5 and 10 minutes are given in the tables below.

*Table 4 – Operation period of 5 minutes*

Appliance	Combi Boiler	Gas Fire	Cooker	Total
Maximum Gas Rate, m <sup>3</sup> /h	2.914	0.666	0.952	<b>4.532</b>
Test period, minutes	5	5	5	-
Total used in test period, m <sup>3</sup>	0.243	0.056	0.079	<b>0.378</b>
Purge volume (1V), m <sup>3</sup>	0.010			<b>0.010</b>
Total volume used per house, m <sup>3</sup>				<b>0.388</b>

<b>Gas Type</b>	<b>G20</b>	<b>G21</b>	<b>G23</b>
Cylinder gas volume, m <sup>3</sup>	9.87	2.25	7.54
Houses tested before empty	25	5-6	19
No. of days before replacement	8	1.5-2	3

Table 5 – Appliance operation period of 10 minutes

<b>Appliance</b>	<b>Combi Boiler</b>	<b>Gas Fire</b>	<b>Cooker</b>	<b>Total</b>
Maximum Gas Rate, m <sup>3</sup> /h	2.914	0.666	0.952	<b>4.532</b>
Test period, minutes	10	10	10	-
Total used in test period, m <sup>3</sup>	0.486	0.111	0.158	<b>0.755</b>
Purge volume (IV), m <sup>3</sup>	0.010			<b>0.010</b>
Total volume used per house, m <sup>3</sup>				<b>0.765</b>

<b>Gas Type</b>	<b>G20</b>	<b>G21</b>	<b>G23</b>
Cylinder gas volume, m <sup>3</sup>	9.87	2.25	7.54
Houses tested before empty	13	3	10
No. of days before replacement	4	1	3

Consideration should be given to transporting 2 cylinders of each gas type to avoid multiple visits to replenish gas supplies. This depends on whether the type of vehicle used is suitable for this purpose.

#### **Action to be taken in the event of a risk installation**

The British standard BS 7967-3: 2005 Part 3: Carbon monoxide in dwellings and the combustion performance of gas-fired appliances — Guide for responding to measurements obtained from electronic portable combustion gas analyse gives guidance to the service engineer in relation to the required maximum allowable combustion performance (CO/CO<sub>2</sub> ratio) action levels for gas appliances. If during testing, the particular action level is exceeded this should be noted and appropriate action should be taken and the unsafe situations procedures must be applied which can be found and downloaded from the GASSAFE website at: <http://www.gassaferegister.co.uk/pdf/GIUSP%20Edition%206%20-%20publication%20web%20version%20V1%201.pdf>

Project Risk Register

Appendix 5 - Risk Register



Definition	Explanation	Probability	Score
Almost certain	event is expected to occur in most circumstances	>90%	5
Likely	event will probably occur in most circumstances	50-90%	4
Possible	event should occur at some time	30-50%	3
Unlikely	event could occur at some time	10-30%	2
Rare	event may occur only in exceptional circumstances	<10%	1

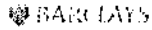
AM - Angus McIntosh  
 JM - Jamie McAinsh  
 DL - Dave Lander  
 GL - GL Noble Denton  
 SG - Susan Gray

Scoring Key		
16-25	10-15	1-9

Ref No	Risk	Business Risk	Inherent Risk			Controls & Mitigation	Owner	By When	Residual Risk			Status
			Likelihood	Impact	Score				Likelihood	Impact	Score	
1	<b>Insufficient resources</b> Insufficient resources assigned to the Project management team lead to delays in the progression of the project and ultimately delay the NIC Submission to OFGEM	Time	3	3	9	A - Regular resource review at Monthly innovation group meeting. B - Implement and maintain a project programme to monitor deliverables against the timescales and ensure that any shortage of resources impacting delivery of the overall project are clearly identified. Review programme at Monthly progress meetings. C - Appointment of Dave Lander (gas quality consultant) and Kiwa Gastec (appliance experts) to assist with project. D - Contracting out of service and repair work required in Oban properties, to local Oban engineers and plumbers.	A - JM B - JM C - AM	Ongoing	2	3	6	
2	<b>Stakeholder Opposition</b> Stakeholder resistance to potential change. Has the potential to lead to bad publicity and ill feeling towards the project significantly limiting the options available for appliance swap over. Potential to limit the public's cooperation with the project and lead to bad publicity and damage to SGN's reputation.	Reputation	4	4	16	A - Implement and maintain a stakeholder management plan. B - Input from the SGN Regulation and Corporate communications team engage with high level stakeholders as early as possible. This will allow preferences to be understood and documented ensuring the project fully understands in what format technical solutions will be politically acceptable.	A - SG B - JM & AM	01/06/2014	2	4	8	
3	<b>Insufficient funding</b> Insufficient funding available to utilise external providers to reduce uncertainty on the technical details and there commercial implications. Carrying uncertainty into the business plan may result in a financially unachievable project.	Financial	3	5	15	A - Agreement and approval of budget by the project steering group for presentation to SGN investment committee. B - Investment paper and T005 to be prepared and submitted to the investment committee to release funds required in order to deliver bid. C - Funding requested for NIC to be verified and checked by Finance Manager D - We have allowed for a 35% appliance replacement, whilst in reality we expect this to be far lower. surplus funds to be returned to Ofgem. E - Submission of a Change Request to ensure funds are in correct cost categories prior to agreement of contracts.	A - Project steering group B - JM C - JM D - JM	Ongoing	2	4	8	
4	<b>HSE Exemption not granted for Project</b> The field trial requires that gas not compliant with the requirements of the GSMR is conveyed to consumers. This can only be done under exemption granted by the HSE. Our judgement is that a sound technical case for granting exemption can be made, based on previous work done and existing precedence of a previous exemption. However, non-technical views may prevail if the case is not clearly presented and understood. Potential for lobbying against a trial from external sources.	Reputation	2	3	6	A - Sound technical case for granting exemption can be made, based on previous work done and existing precedence of a previous exemption. B - Regular engagement with HSE and DECC. Meetings are scheduled in the programme in which the technical case will be made. C - A sound technical and practical assessment of appliances completed in Oban to ensure safety is paramount and there are no 'at-risk' properties.	A - DL B - DL & AM	See project programme	1	3	3	
5	<b>High Wobbe Gas not available</b> The field trial requires that substantial supplies of high Wobbe index gas are available. The project proposal suggests that most testing is carried out with LNG supplied from Zeebrugge, which will have a Wobbe index of around 51.7 MJ/m3. Short-duration testing using gases of even higher Wobbe index are proposed so as to ensure that final proposals for an upper Wobbe index limit for the UK will carry an adequate safety margin. Suppliers of such high Wobbe index gases could be limited.	Regulatory	2	3	6	A - The most likely supplier of high Wobbe index LNG is Enagas in Spain, which is likely to be able to supply LNG with a Wobbe index of 53.9 MJ/m3. Early contact is required to complete successful negotiations for a relatively small consignment, compared with normal supply contracts. B - Artificial ageing of LNG to increase its Wobbe index is technically feasible, but could have some operational impacts at Oban - largely through lack of storage capacity whilst the LNG is aged and disposal of the boil-off gas (which would have a low Wobbe index). However, by appropriate timing and planning these may not be insuperable. C - Agreement contained within contract with LNG provider that the gas provided will be within a specified range, and this range will be fit-for-purpose for the trial.	A - DL B - DL	See project programme	1	3	3	
6	<b>High number of appliances not passing test</b> If more appliances fail the test and need replaced than accounted for the Project will not have sufficient funds to continue.	Financial	2	4	8	A - Project will be terminated if initial test programme shows that an unforeseen level of appliance replacement is required. B - Initial appliance survey had 2% of appliances to be considered 'unsafe'. The lab testing will provide an early indication of what the likely percentage of failures may be at the testing phase.	A - AM	End of test programme	2	1	2	
7	<b>Appliance is missed from the test programme</b> If any appliance is missed there is a possibility of an appliance operating on higher WI without being checked for safety.	Safety	2	2	4	A - SGN records to be checked prior to testing B - Review, monitor, check and audit test records C - Trial will only go ahead once SGN are happy that all appliances have been checked, replaced or isolated, or where this is not possible due to no-access, that every step has been taken to ensure those appliances are not at-risk.	A - JM B - TBC C - MC	Prior, during and after test programme	1	2	2	
8	<b>HSE not accepting GS(M)R change for GB Roll Out</b> HSE may not accept the methodologies used to produce the QRA are sufficiently robust in order to lead to a GB wide relaxation GB WI band.	Regulatory	3	4	12	A - Carry out full statistical analysis of Oban to compare representativeness with GB B - Opportunity to recommend extending WI further than GSMR but not as far as EASEE C - Prove through QRA no increase in risk and or ALARP D - Continuous engagement with HSE E - Technical Stakeholder Group to help lobby roll out	A - GL Noble Denton B - DL and Kiwa C - GL Noble Denton D - DL E - JM	Jan-16	2	4	8	
9	<b>Oban not representative of GB</b> Oban needs to be representative of GB in order to scale results	Regulatory	2	4	8	A - Carry out full statistical analysis of Oban to compare representativeness with GB B - QRA to apply confidence range and margin of error	A - GL Noble Denton B - GL Noble Denton	Nov-13	1	2	2	
10	<b>Not gaining access to all properties</b> All appliances should be checked and tested in order for trial to commence	Safety & Time	3	4	12	A - Sufficient and effective customer engagement plan B - Isolation of gas supply at no access properties and testing and restoration at a later suitable date C - HSE may allow the GS(M)R exemption without the requirement to access all properties, reducing the % rate required. D - GL Noble Denton will complete a 'no-access' risk assessment ahead of the testing phase beginning.	A - AN B - MC C - JM & AM D - GL	Jan-15	2	2	4	
11	<b>Cost Escalation</b> Costs may escalate due to unforeseen circumstance and / or unknown commercial arrangements at Zeebrugge	Financial	2	5	10	A - Thorough research of Zeebrugge costs B - 5% over-run allowance C - Project stage gates and opportunity to halt Project D - Change Request submitted to Ofgem to alter funding arrangements within cost categories prior to any agreements with external contractors.	A - DL B - AM C - AM	May-14	2	4	8	
12	<b>Timetable Slippage</b> Timetable may slip due to unforeseen circumstance	Time	2	4	8	A - Build sufficient float into Project plan B - Regular steering group reviews to monitor progress against the programme C - Opportunity to halt programme at stage gate if required	A - JM B - JM & AM C - AM	Ongoing	2	3	6	
13	<b>Negative Press Reports</b> Coverage in the Oban Times and Oban FM generates negative public opinion of the project, leading to an increased 'no-access' rate in properties	Reputation	2	4	8	A - Strong stakeholder management fosters a good relationship with press allowing us to have a form of control over any media coverage. B - Customer engagement plan prior to beginning the testing and trial will gauge public opinion, with town hall meetings and poster campaign planned to promote the project.	A - SG B - SG	Ongoing	2	3	6	
14	<b>Testing Phase incomplete by February 2015 (scheduled trial start date)</b> Bid Submission and SDRCs require project to have begun trial (gas injection into Oban network) by Feb 2015 to ensure completion by Feb 2016 and planned project end date.	Time	3	4	12	A - Site Manager contracted to be based in Oban and ensure project is on track and tackle any minor issues rather than delay the project. B - Contingency plan for 'no-access' properties to ensure there is minimal downtime where engineers are waiting for the next appointment.	A - TBC B - JM	Feb-15	2	3	6	
15	<b>Transport issues with LNG (Shipping and Tankers)</b> Higher WI gas must be in network for full 12 month period and is not available in the UK, meaning if the LNG transport to Oban is compromised, there is no replacement gas that can be sourced from elsewhere and used.	Safety	2	5	10	A - LNG storage available on site in Oban for contingency purposes. This will be kept full for duration of trial unless required. B - Contract with LNG shippers will include clause on liability due to failure to supply, as well as a Force Majeure clause for weather conditions. C - HSE may allow the GS(M)R exemption without the requirement to access all properties, reducing the % rate required. D - GL Noble Denton will complete a 'no-access' risk assessment ahead of the testing phase beginning.	A - JM B - JM C - AM & JM D - GL	Feb-15 - Feb-16	2	3	6	
16	<b>Installation of Gas Chromatograph not completed by Feb-15</b> Gas Chromatograph required to monitor WI levels during trial. As trial is due to begin in Feb-15 the Gas Chromatograph must be installed ahead of the injection of the LNG.	Safety	3	5	15	A - Delay the start date of the LNG injection. This will have a domino effect in that a Change Request for the final SDRC will need to be submitted, but this may be in the project's best interests. B - SGN's Net Construction department will manage the installation of the Gas Chromatograph ensuring the integrity is retained.	A - AM B - JM	Feb-15	2	4	8	

## **Appendix 6 – Project Bank Account Statement**

Please note that expenditure on the bank statement differs from the expenditure in the progress report by £6,000 due to a transaction awaiting processing.



**Account Statement**

Printed On 13/06/2014 11:41

Search Criteria: Account Number: [REDACTED] Statement Date: Absolute From: 01/06/2014 To: 13/06/2014

**Search Result**

<b>Account Number</b> [REDACTED]	<b>Account Name</b> CCS INTEREST ACC	<b>Currency</b> GBP	<b>Account Type / Status</b> Deposit / OPEN
<b>IBAN</b> [REDACTED]	<b>Bank Identifier</b> [REDACTED]	<b>Bank Name</b> BARCLAYS BANK PLC	

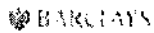
**Address**

Chesster Leicestr Strce, 14, Leicestr, LE1 7JH

<b>Opening Ledger</b> 276,485.76 As At 01/06/2014	<b>Total Payment Amount/Payment Count</b> 39,121.87	<b>Total Receipt Amount/Receipt Count</b> 155,644.60	<b>Transaction Count</b> 3	<b>Latest / Closing Ledger</b> 393,875.46 As At 13/06/2014
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Entry Date	Transaction Details	Transaction Type	Payment Amount	Receipt Amount	Ledger Balance
	<b>Balance Brought Forward</b>				<b>276,485.76</b>
13/06/2014	INTEREST PAYMENT ON OPENING BALANCE	Credit		1.57	276,487.33
13/06/2014	TRANSFER FROM [REDACTED]	Transfer		155,644.60	432,131.93
13/06/2014	TRANSFER TO [REDACTED]	Transfer	4,200.00		427,931.93
13/06/2014	TRANSFER TO [REDACTED]	Transfer	33,909.87		393,875.46
	<b>Balance Carried Forward</b>				<b>393,875.46</b>

You may have to adjust to a larger paper size and/or use a landscape paper orientation to have all the data found in summary grids appear on the printed paper.



Account Statement

Printed On: 13/06/2014 11:58

Search Criteria: Account Number: [REDACTED] Statement Date: Absolute From: 01/05/2014 To: 31/05/2014

Search Result

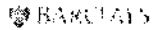
Account Number	Account Name	Currency	Account Type / Status
[REDACTED]	OGS INTEREST ACC	GBP	Deposit / OPEN
IBAN	Bank Identifier	Bank Name	
[REDACTED]	[REDACTED]	BARCLAYS BANK PL	

Address  
Leicester, Leicestershire LN7 2DN, LE87 2BB

Opening Ledger	Total Payment Amount: Payment Count	Total Receipt Amount/Receipt Count	Transaction Count	Latest / Closing Ledger
000 As At: 01/05/2014	N/A/0	276,485.76*	1	276,485.76 As At: 30/05/2014

Entry Date	Transaction Details	Transaction Type	Payment Amount	Receipt Amount	Ledger Balance
	<b>Balance Brought Forward</b>				<b>0.00</b>
30/05/2014	3001 LEICESTER CAS NET 276485.76	Transfer		276,485.76	276,485.76
	<b>Balance Carried Forward</b>				<b>276,485.76</b>

You may have to adjust to a larger paper size and/or use a landscape paper orientation to have all the data found in summary grids appear on the printed paper.



**Account Statement**

Printed On: 13/06/2014 11:37

**Search Criteria:**

Account Number: [REDACTED] Statement Date: Absolute From: 01/04/2014 To: 30/04/2014

**Search Result:**

Account Number	Account Name	Currency	Account Type / Status
[REDACTED]	0399 ACCOUNT	GBP	Current / OPEN
IBAN	Bank Identifier	Bank Name	
[REDACTED]	[REDACTED]	BARCLAYS BANK PLC	

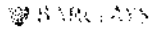
**Address:**

Leicester Leicestershire LE1 7EQ UK (LEB) 206

Opening Ledger	Total Payment Amount/Payment Count	Total Receipt Amount/Receipt Count	Transaction Count	Latest / Closing Ledger
000 As At 30/04/2014	N/A/0	276,485.76/2	2	276,485.76 As At 30/04/2014

Entry Date	Transaction Details	Transaction Type	Payment Amount	Receipt Amount	Ledger Balance
	<b>Balance Brought Forward</b>				<b>0.00</b>
30/04/14	BARCLAYS BANK PLC (LEB) 206	DEBIT		165,485.76	165,485.76
30/04/14	BARCLAYS BANK PLC (LEB) 206	CREDIT		121,000.00	276,485.76
	<b>Balance Carried Forward</b>				<b>276,485.76</b>

You may have to adjust to a larger paper size and/or use a landscape paper orientation to have all the data found in summary grids appear on the printed paper.



Account Statement

Printed On 13/06/2014 11:36

Search Criteria:

Account Number: [REDACTED] Statement Date: Absolute From: 01/04/2014 To: 30/04/2014

Search Result

Account Number	Account Name	Currency	Account Type / Status
[REDACTED]	CGS INTEREST ACC	GBP	Deposit / OPEN
IBAN	Bank Identifier	Bank Name	
[REDACTED]	[REDACTED]	BARCLAYS BANK PL	

Address

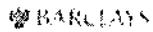
Leicester City Council, 14 FID, 101, LE17 1BB

Opening Ledger	Total Payment Amount/Payment Count	Total Receipt Amount/Receipt Count	Transaction Count	Latest / Closing Ledger
0 00 As At 30/04/2014	NA/0	NA/0	0	0 00 As At 30/04/2014

Entry Date	Transaction Details	Transaction Type	Payment Amount	Receipt Amount	Ledger Balance
	<b>Balance Brought Forward</b>				<b>0.00</b>
	<b>Balance Carried Forward</b>				<b>0.00</b>

You may have to adjust to a larger paper size and/or use a landscape paper orientation to have all the data found in summary grids appear on the printed paper.





Account Statement

Printed On: 13/06/2014 11:33

Search Criteria:

Account Number: [REDACTED]

Statement Date: Absolute From: 01/03/2014 To: 31/03/2014

Search Result

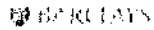
Account Number	Account Name	Currency	Account Type / Status
[REDACTED]	OGS INTEREST ACC	GBP	Deposit / OPEN
IBAN	Bank Identifier	Bank Name	
[REDACTED]	[REDACTED]	BARCLAYS BANK PLC	

Address  
Leicester Leicestershire LN7 0JN TEL: 01533 667288

Opening Ledger	Total Payment Amount: Payment Count	Total Receipt Amount: Receipt Count	Transaction Count	Latest / Closing Ledger
0 00 AS At: 03/03/2014	N/A:0	N/A:0	0	0 00 AS At: 31/03/2014

Entry Date	Transaction Details	Transaction Type	Payment Amount	Receipt Amount	Ledger Balance
	<b>Balance Brought Forward</b>				<b>0.00</b>
	<b>Balance Carried Forward</b>				<b>0.00</b>

You may have to adjust to a larger paper size and/or use a landscape paper orientation to have all the data found in summary grids appear on the printed paper.



Account Statement

Printed On: 13/06/2014 11:31

Search Criteria:

Account Number: [REDACTED] Statement Date, Absolute From: 01-02-2014 To: 28-02-2014

Search Result

Account Number	Account Name	Currency	Account Type / Status
[REDACTED]	[REDACTED]	GBP	Deposit / OPEN
IBAN	Bank Identifier	Bank Name	
[REDACTED]	[REDACTED]	BARCLAYS BANK PLC	

Address

1, Grosvenor Gardens, London, W1B 3BB

Opening Ledger	Total Payment Amount/Payment Count	Total Receipt Amount/Receipt Count	Transaction Count	Latest / Closing Ledger
0.00 As At: 13-02-2014	N/A/0	N/A/0	0	0.00 As At: 28-02-2014

Entry Date	Transaction Details	Transaction Type	Payment Amount	Receipt Amount	Ledger Balance
	<b>Balance Brought Forward</b>				<b>0.00</b>
	<b>Balance Carried Forward</b>				<b>0.00</b>

You may have to adjust to a larger paper size and/or use a landscape paper orientation to have all the data found in summary grids appear on the printed paper.