Low Carbon Gas Preheating

Project Progress Report 03

19 June 2015

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1.0 Executive Summary

1.1 Project Snapshot

The transition to a low carbon energy sector in the UK presents Gas Distribution Networks (GDNs) with a number of challenges, including reducing the Business Carbon Footprint (BCF) of operating gas networks. The requirement for GDNs to preheat gas at pressure reduction stations (PRS) to avoid freezing the outlet pipework and ensure continuity of supply is a significant contributor to our BCF. GDN's preheating requirement is currently delivered using aging Water Bath Heaters (WBH) or more modern Boiler Package technologies (BH). However, there are several key issues that GDNs currently face when appraising investment options for preheating technology. Firstly, the whole life costs and in particular the carbon impact of currently available technologies is not understood. Secondly, there has been limited research or development in this area resulting in no financially viable alternative to existing technologies. And finally, the current shrinkage arrangements provide no incentive to target reductions in BCF associated with preheating.

The Low Carbon Gas Preheating (LCGP)) seeks to address these issues directly. The project will install two 'alternative' preheating technologies across six NGN sites of differing scale - three Thermo Catalytic Systems (HotCat) and three Low Pressure Steam Systems (LP Steam). Smart metering technology will be installed on each of the six sites to provide data required to calculate and publish the system efficiency of each site and each technology. Additionally, smart metering technology will be installed separately on six sites that employ existing technologies. System efficiencies will be calculated and published for direct comparison.

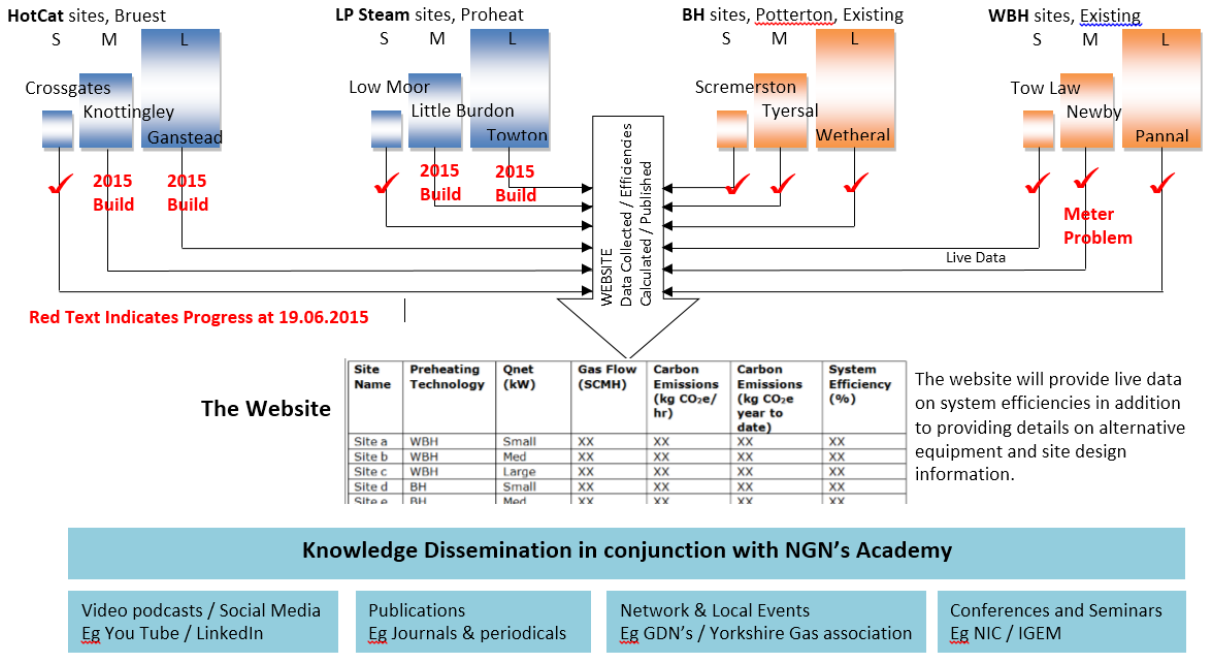

Figure 1. The LCGP Project

The project will have all equipment delivered and all remaining installation works completed by December 2015. Work Package costs have been firmed up based on actual tender returns whilst risk costs have subsequently been reduced as elements of the project are completed.

The current financial forecast shows the project will be delivered slightly under budget. All costs and analysis of costs is contained within the Confidential Annex.

With reference to Figure 1, the project progress can be summarised as follows:

1. Data Collection.

   As indicated on in Figure 1, 8 of the 12 sites shown in Figure 1 are sending live data back to the website. Data is being collected from all of the Boilerhouse (BH) sites and Water Bath Heater (WBH) sites. The website is also receiving data from the small hotcat site and from the small LP Steam site.

2. Website development / Knowledge Dissemination.

   The website is now live and accessible to all. From the NGN website users can compare the efficiency of the sites reporting into it. They can download all data collected to carry out their own data analysis.

   NB. The website currently shows data from early spring 2015 to present, as such we do not yet have data collected throughout a 'heating season' and data analysis is still to be carried out by NGN.

   The website can be viewed by clicking the 'Low Carbon Gas Preheating (LCGP) Project' title at: http://corporate.northerngasnetworks.co.uk/innovation/

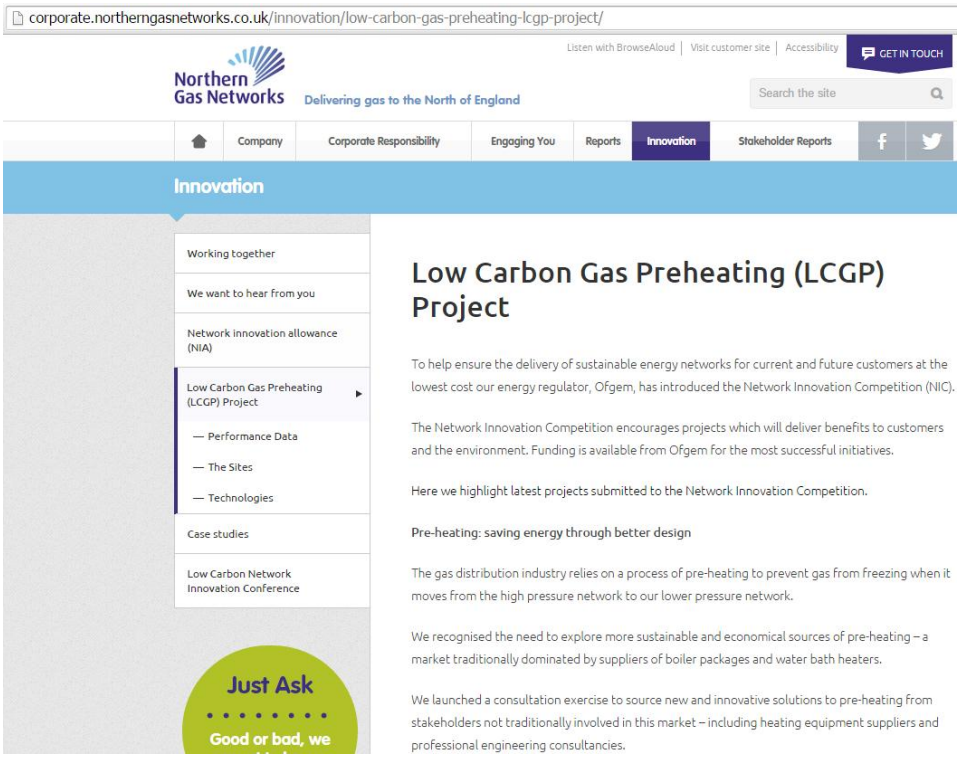

Figure 2. Project website

3. 2015 Procurement and Construction.

   Of the 4 sites due to be constructed in 2015 (large and medium hotcat / large and medium LP Steam), contracts have been placed to build 3 of them. The final contract is expected to be awarded in July 2015.

4. 2015 Alternative Technology Equipment

   Factory Acceptance Testing has been completed for the medium and large sites' LP Steam equipment. Construction is underway in Kansas, USA for the medium and large Hotcats with delivery to Liverpool docs expected in September 2015.

1.2 Project Summary

During the third 6 month period of the LCGP project the team have commissioned instrumentation on 8 sites which is now reporting back to the project website at:

The website can be viewed by clicking the 'Low Carbon Gas Preheating (LCGP) Project' title at: http://corporate.northerngasnetworks.co.uk/innovation/

The project website is now receiving live information from 8 of the planned 12 LCGP sites and has the functionality to allow any other users to download the full database. It should be noted that the data is from spring 2015 to present and as such does not cover a winter season when preheating is most utilised. Until data from all seasons can be obtained data analysis will be difficult. The LCGP team will carry out some data analysis of these 8 sites and report the findings in the next PPR in December 2015.

Tenders have been returned to install the new preheating equipment on the medium and large hotcat and LP Steam sites. 3 contracts have been placed with 3 different main works contractors, the remaining site will have a construction contract placed during July 2015.

1.3 Risk Section

An updated risk register is contained within the Confidential Annex.

Details of closed risks and live risks are given along with all costs to date and forecast costs to complete the LCGP project.

1.4 The Learning Section

The LCGP website is live and contains site data from 8 of the 12 LCGP sites along with mini case studies from the first LP Steam and hotcat sites to be built.

2.0 Project Manager's Report

2.1 Project Overview

8 of the 12 LCGP sites have been commissioned and are sending data back to the website. These sites include the 6 sites with 'existing technology' and the 2 'small' sites with 'alternative technology'.

Of the remaining 4 LCGP sites (medium & large hotcat and medium & large LP Steam) 3 main works contractors have been appointed to build 3 of the projects via NGN's delivery framework. A further main works contractor will be appointed in July 2015 to build Ganstead (Hotcat large).

Factory acceptance testing has been completed for the large and medium LP Steam equipment.

Manufacture of the large and medium Hotcats is ongoing at present with delivery to the UK expected in September 2015.

Additional project management resources have been employed to manage the medium and large installations.

Data is available for any visitors to the NGN website to see at:

The website can be viewed by clicking the 'Low Carbon Gas Preheating (LCGP) Project' title at: http://corporate.northerngasnetworks.co.uk/innovation/

The website also contains design data, manufacturer's data for the existing sites and the alternative sites.

2.2 Work Packages

The project has been broken down into 10 work packages. Each is detailed in this section but can be summarised as follows:

- WP01 to 06. Each of the 6 sites where alternative technology will be installed
- WP07. Work to be carried out on the existing boiler house / water bath heater sites
- WP08. The website and information management
- WP09. Training / System Control
- WP10. Project Management

2.2.1 WP01. Hotcat Small (Crossgates)

Figure 3. Small Hotcat installed at Crossgates.

- Site installation is complete.
- Commissioning of the hotcat was carried out for 5 days during w/c 23 February 2015.
- Classroom operative training was carried out by Bruest on Thursday 26 February 2015 at the Holiday Inn, Garforth.
- Site training (8 Yorkshire mech / elec / instr operatives) was carried out on Thursday / Friday 26 / 27 February 2015.
- All commissioning was successful and the unit was left fully operational.
- All measuring equipment has been installed and commissioned with results now being published on the project website.

2.2.2 WP02. Hotcat Medium (Knottingley)

As reported in PPR 02, at a meeting held in the UK with Bruest on 12 November 2014, to discuss all outstanding issues with the Crossgates hotcat, Bruest requested they were allowed to re-design the medium and large hotcats with a view of reducing heat losses from the equipment and hence increasing system efficiency. Whilst the LCGP team acknowledged this would result in a difference to the equipment design as installed at the small site, the team were aware that the fundamental preheating method (ie radiant heating) would remain unchanged. It was decided that, as the modifications would be likely to result in an incease in system efficiency, which would ultimately be an advantage to any GDN installing these units in the future, a re-design of the hotcat for the medium and large sites would be a benefit to the results of the project.

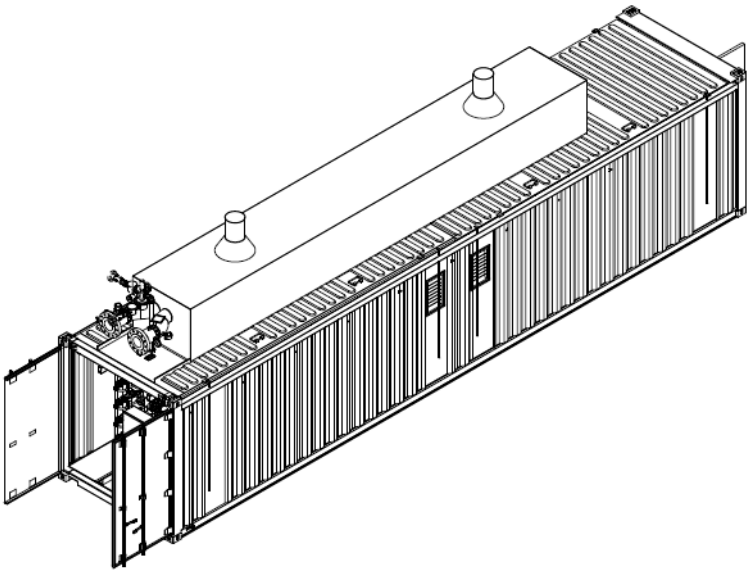

Figure 4. Revised Hotcat 3D image

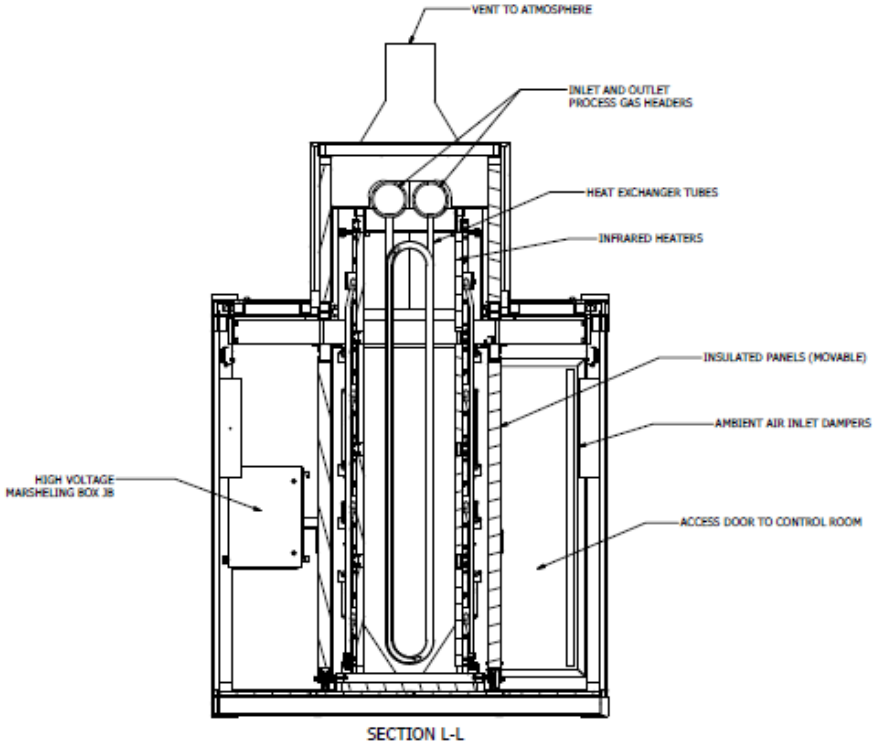

Figure 5. Hotcat section

The design changes have led to the following points:

1. The Hotcat has been almost totally redesigned by Bruest.
2. Detailed designs for Knottingley and Ganstead (medium / large sites) were received from Bruest w/c 02 March 2015.
3. During NGN's review of the new equipment, three main design questions were raised:
    a. Should the coil within the hotcat be designed to codes applicable to a 'heat exchanger' or should it be designed to those applicable to a 'pipe'?
    b. What hazardous area classification should be applied to the the internal areas of the hotcat container?
    c. Should the internal areas of the Hotcat container be classed as a 'confined space'?

    During weekly telecons with DNV GL, NGN and Bruest, these issues were resolved to allow the design to be completed.
4. DNV GL have been engaged to 'approve' the engineering drawings. Once this approval has been given, NGN will release the next staged payment for the equipment amounting to 30% of the order value.

Figure 6. Revised Hotcat design. Container

Other issues to report include:

1. Contaminated land has been identified at Knottingley. The designs have taken this into consideration and relocated the hotcat away from the land directly over the site of the old gas holder.
2. Following the Hotcat proving period, i.e. the time period between the hotcat being commissioned and the existing WBH's being removed, NGN (G17 User, Barry Dalus, Asset Strategy & Integrity Manager, NGN) identified that an additional heat exchanger will need to be designed into the site. This additional heat exchanger will provide a means of preheating

whilst the heat exchanger from the hotcat is removed and taken off site for inspection. It is a requirements to Inspect the Hotcat heat exchanger every 10 years.

3. A main works contractor has been appointed to carry out all works at Knottingley. The construction programme ends in November 2015 when all measuring equipment will be reporting back to website.
4. We are anticipating arrival in the UK of the new Hotcat for Knottingley in September 2015.

2.2.3 WP03. Hotcat Large (Ganstead)

Design changes for Ganstead are the same as those identified in section 2.2.2 Knottingley.

1. Hotcat detailed design drawings provided by Bruest will be approved by DNV GL.
2. The design Appraisal for mechanical / civil designs has been delayed due to outstanding information relating to the volumetric control system for the new regulator skid. This skid installation is part of the 'business as usual' works being carried out at the same time as the LCGP preheating works. Whilst this is not directly related to the LCGP project, it has delayed the appointment of a main works contractor as all elements from the site are being designed together prior to obtaining construction issue drawings.
3. Tenders have been sent out to build this project using detailed design packs. Tenderers will be asked to amend their price once the construction issue drawings are sent out before the contract is placed.
4. The tender construction programme for Ganstead is currently planned to be completed by February 2016 with all E&I enabling works complete by 4 November 2015. This would allow sufficient time to complete the E&I installation and commissioning by NGN's framework contractor within 2015. This would then ensure that the data is collected from site in the next reporting period in line with the SDRC. Although the start dates of the referenced programme have not been met (May 2015), we believe the end dates are still achievable.
5. We are anticipating arrival in the UK of the new Hotcat for Ganstead in September 2015.

2.2.4 WP04. LP Steam Small (Low Moor)

Figure 7. Low Moor site photo

1. Site installation is now complete.
2. Site operative training was carried out by Proheat on Tuesday & Wednesday 02 / 03 March 2015. 12 operatives attended.
3. All measuring equipment has been installed and commissioned with results now being published on the project website.

2.2.5 WP05. LP Steam Medium (Little Burdon)

Figure 8. Little Burdon Proheat Units during factory testing

1. Factory acceptance testing of the new Proheat preheating equipment took place on Friday 15 May 2015.
2. A main works contractor has been appointed to build the site between June 2015 and October 2015.
3. Delays have occurred to the design of the site due to the site designers having difficulties in obtaining a 'pass' on the mechanical stress analysis software. This issue is currently under review. We expect this to be resolved in June 2015.
4. Measuring equipment will be installed and data sent back to the project website in the next reporting period.

2.2.6 WP06. LP Steam Large (Towton)

Figure 9. Towton Proheat Units during factory testing

1. Factory acceptance testing of the new Proheat preheating equipment took place on Friday, 05 June 2015.
2. A main works contractor has been selected to build the site between June 2015 and November 2015.
3. Delays have occurred to the design of the site due to the site designers having difficulties in obtaining a ‘pass’ on the mechanical stress analysis software. This issue is currently under review. We expect this to be resolved in June 2015.
4. Measuring equipment will be installed and data sent back to the project website in the next reporting period.

2.2.7 WP07. Existing Technology (Boilerhouses (BH) and Water Bath Heaters (WBH))

The 6 'existing sites' (Boilerhouses and water bath heaters) have all had the additional measuring equipment commissioned in the last 6 month period. The data is now available to view and download on the project website.

Of the 6 sites, each with 8 measuring devices, all except the outdoor air sensors are shown in Figure 10 below.

We have encountered a problem with one device (flow meter, Newby). The purchase order was re-raised in May 2015, delivery is due on 29 June 2015.

The sites referred to are:

1. Scremerston – all signals installed and commissioned.
2. Tyersal – all signals installed and commissioned.
3. Wetheral – all signals installed and commissioned.
4. Tow Law – all signals installed and commissioned.
5. Pannal – all signals installed and commissioned.
6. Newby – all signals installed and commissioned except the site flow meter.

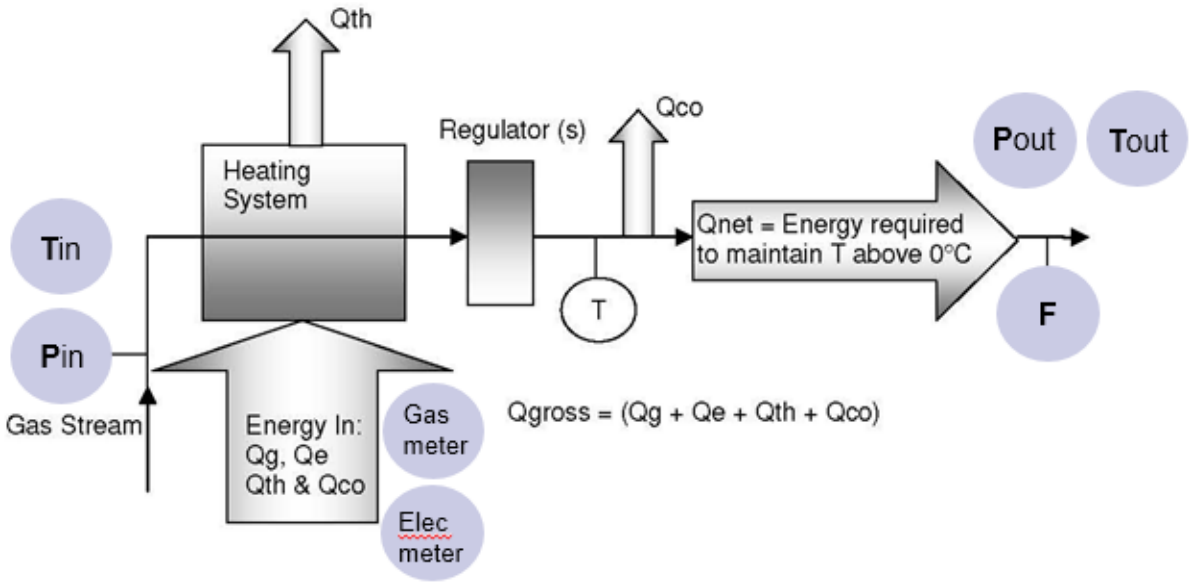

Figure 10. Data captured from all LCGP sites

Figure 11. Example of gas meter monitoring and site inlet temperature monitoring

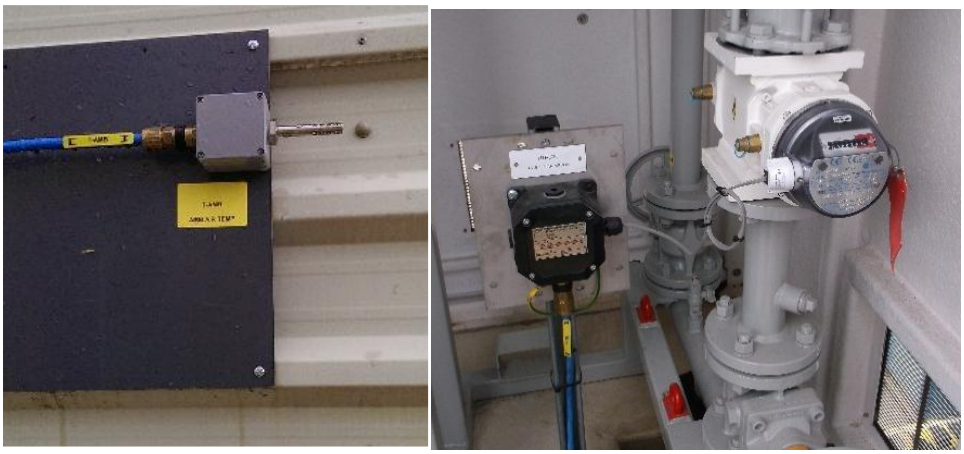

Figure 12. Examples of outdoor air temperature sensor and gas meter monitoring

Photographs shown in Figures 11 and 12 show some on the instrumentation installed.

2.2.8 WP08. Website.

The website is now live at:

The website can be viewed by clicking the 'Low Carbon Gas Preheating (LCGP) Project' title at: http://corporate.northerngasnetworks.co.uk/innovation/

The team experienced problems in pushing data through the various systems shown in Figure 13 before it was able to be sent to the project website. Following a series of teleconferences chaired by Enzen and involving NGN, Schneider and Grapple (Digital Wellie), the data was able to be sent to the NGN 'Business Application'.

Further issues involving various date fields within the programming code meant the data was delayed in reaching the project website. All issues have now been resolved.

All data being sent from the gas sites is now being published on the website. The website is accessible for anyone to view and download data as required in line with the SDRC.

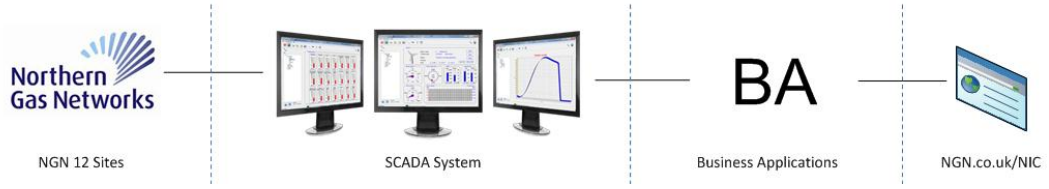

Figure 13. Data flow. Gas site to Website

8 signals are collected from each of the LCGP sites as detailed in Figure 13. From 7 of the signals obtained, a further 9 pieces of information are calculated before the information is pushed from SCADA to the website (via BA). Utilising NGN's SCADA system for data management has assisted managing the costs associated with developing the software and the website.

Item 9 in Figure 14 is calculated using the algorithm developed by NGN's System Control department to show heat requirements of the gas stream for any given hour in terms of kilowatts.

Ref	Reference (date and time tagged)	Obtained from:	Data										Digital Wellie to produce all graphics All values to be calculated by SCADA (All values to be stored separately BY DIGITAL WELLIE and available for download)	Added for Rob Yorke to base anticipated results on. 11.07.2014
				Data to be used to calculate VALUE										
1	T(in)	Site signal	VALUE	x									-	(°C) to 1 decimal point
2	T(out)	Site signal	VALUE	x									-	(°C) to 1 decimal point
3	T(amb)	Site signal	VALUE										Plot	(°C) to 1 decimal point
4	P(in)	Site signal	VALUE	x									-	(Bar) to 2 decimal places
5	P(out)	Site signal	VALUE	x									-	(Bar) to 2 decimal places
6	Q(gas)	Site signal	VALUE		x			x					-	(kWh) to 2 decimal places
7	Q(elec)	Site signal	VALUE		x		x						-	(kWh) to 2 decimal places
8	F(gas)	Site signal	VALUE	x									-	(kscmh) to 1 decimal place
9	Qnet	Value from System control		VALUE		x					x		Plot	(kW) to 2 decimal places
10	Qgross	[6]Q(gas) + [7]Q(elec)			VALUE	x							-	(kW) to 2 decimal places
11	Hourly Efficiency	([9]Qnet / [10]Qgross)*100				VALUE							Plot	(%) integer
12	Carbon equiv (elec)	[7]Q(elec) * DECC Co-efficient (0.5246kg per kWh elec)					VALUE		x				-	(kg equivalent) to 2 decimal places
13	Carbon equiv (gas)	[6]Q(gas) * DECC Co-efficient (0.1836kg per kWh gas)						VALUE	x				-	(kg equivalent) to 2 decimal places
14	Total Carbon equiv per hour	[12]Carbon equiv (elec) + [13]Carbon equiv (gas)							VALUE	x			Plot	(kg equivalent) to 2 decimal places
15	Daily cumulative carbon emissions	[14]sum of each hourly value from previous full day								VALUE		x	-	(kg equivalent) integer
16	Daily cumulative Qnet	[9]sum of each hourly value from previous full day									VALUE	x	-	(kW) integer
17	Daily Efficiency	[15]Daily CO2e / [16]kW duty (Qnet)										VALUE	1. Publish (single figure, daily) - organise comparison table in order of lowest value at the top (this is the most efficient) 2. Plot	(%) integer

Figure 14. Signals obtained from site and used in calculations

Knowledge dissemination activities in this period are shown in Figure 15 below.

Item	Event / Publication	Date	Presenter(s)	Attendees	Comments
01	Bruest Training	26 & 27.02.2015	D.Miller (Bruest)	8	Familiarisation / Fault finding and maintenance (Classroom and on site at Crossgates)
02	Proheat Training	Feb 2015	T.Hoyland (Proheat)	12	Familiarisation / Fault finding and maintenance
03	NGN Innovation Day	11 May 2015	Circa 17	NGN Delegates	LCGP Project / Preheating Overview

Figure 15. Knowledge Dissemination December 2014 - June 2015

2.2.9 WP10. Project Management

The project management forecast has been amended to incorporate additional personnel to deliver the 4 medium / large site builds within 2015. From lessons learnt on the construction projects for the small alternative sites we have decided to dedicate a full time supervisor and a full time project lead to each of the sites (Ganstead, Knottingley, Little Burdon, Towton). As these are relatively large sites they include works associated with the LCGP project and business as usual (BAU) construction tasks. The elements of both LCGP and BAU have been separated financially using detailed design drawings and the tender return Activity Schedules received from the successful contractor.

2.3 The next 6 months

Priorities over the next 6 months can be categorized into 5 main areas:

1. Construction – Medium Hotcat – Knottingley
2. Construction – Large Hotcat – Ganstead
3. Construction – Medium LP Steam – Little Burdon
4. Construction – Large LP Steam –Towton
5. Data collection and website development

2.3.1 Construction – Medium Hotcat – Knottingley

I. Derfel Owen assigned as Project Lead

II. Bob Boughton assigned as Project Supervisor

III. Stanningley Engineering Services have been appointed to build the site (Mechanical and Civil)

IV. Aughtons, Major Projects' framework Electrical and Instrumentation contractor, will be installing the 'alternative technology additional signals'.

V. Main risks to the project include; Delivery of the re-designed hotcat from USA, NGN sign off (G17 paperwork) and other NGN paperwork requirements (permitry / NRO)

2.3.2 Construction – Large Hotcat - Ganstead

I. Bill Fleming assigned as Project Lead

II. Andy Coyne assigned as Project Supervisor

III. Appraised mechanical and civil designs are anticipated to be received mid-late June 2015.

IV. A main works contractor will be appointed to build the site (Mechanical and Civil) following receipt of revised designs

V. Aughtons, Major Projects' framework Electrical and Instrumentation contractor, will be installing the 'alternative technology additional signals'.

VI. Main risks to the project include; design completion and the delivery of the re-designed hotcat from USA, a large amount of BAU works being carried out alongside the LCGP project, NGN sign off (G17 paperwork) and other NGN paperwork requirements (permitry / NRO).

2.3.3 Construction – Medium LP Steam – Little Burdon

I. James Cowley assigned as Project Lead

II. Frank Connaughton assigned as Project Supervisor

III. Darke Engineering Services have been appointed to build the site (Mechanical and Civil)

IV. Aughtons, Major Projects' framework Electrical and Instrumentation contractor, will be installing the 'alternative technology additional signals'.

V. Main risk to the project include; a large amount of BAU works being carried out alongside the LCGP project, NGN sign off (G17 paperwork) and other NGN paperwork requirements (permitry / NRO).

2.3.4 Construction – Large LP Steam – Towton

I. Derfel Owen assigned as Project Lead

II. Bob Boughton assigned as Project Supervisor

III. J Murphy's and Sons Ltd have been appointed to build the site (Mechanical and Civil)

IV. Aughtons, Major Projects' framework Electrical and Instrumentation contractor, will be installing the 'alternative technology additional signals'.

V. Main risks to the project include;

- Unknown construction issues (eg ground conditions / weather / asbestos)
- Delays in delivery of business as usual equipment (ultra-sonic meters / FWACV rack)
- Delays in preheating equipment (Proheat / Let down unit / generator)
- NGN sign off (G17 paperwork) and other NGN paperwork requirements causing delay (permitry / NRO)

2.3.5 Data collection & Website Development

Data will continue to be collected from the 8 sites completed so far. Graphics and data will be developed on the website to ensure users are able to obtain meaningful preheating data for their own analysis.

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3.0 Business Case Update

The benefits to be gained from this project have not changed since the full submission. The four key objectives will be achieved:

1. *Assess the potential for alternative technologies to meet preheating requirements across a range of heating system sizes and operating site parameters*.

Construction is now complete for the small hotcat and LP steam sites. Results are available for download from the project website. The medium and large versions of these technologies will be assessed following commissioning in 2015.

2. *Provide an independent and accurate model for assessing the efficiency of preheating systems across the UK based on reducing business carbon footprint (BCF) and whole life costs*.

Information on system efficiency is available in a standard format for all preheating technologies. Data on carbon footprint and whole life costs is also provided on the website. Data is flowing automatically from the gas sites to the project website, the data is available for download to all website users.

3. *Increase the technological options available to gas transporters for the replacement of preheating assets and increase the supply side of this market*.

Along with our project partners we are continuing to develop the designs of the Hotcat and of the LP Steam unit. The developments we incorporate into the equipment we procure will be available for all other networks to gain the benefit should they purchase one of these units. Bruest are currently concentrating on product developments for incorporation into the medium and large sites, these product developments will be available to any future Bruest customers. The aim of the product developments is to increase the system efficiency of the units.

4. *Provide quantified data on system efficiency of both alternative and existing technologies that can provide the industry with information that will allow more informed investment decisions and a more efficient operation of the network*.

Following commissioning of the 'existing technology' sites and the completion of the information route to the website, we are now able to provide this data to all website users. We will carry out our own data analysis and share this through presentations or via the website.

4.0 Progress Against Plan

There have been 3 main areas of work over the last 6 months. These are:

1. Commissioning of 6 existing sites and 2 alternative sites
2. Tendering and appointing main works contractors
3. Finalising the information route (gas site to website)

4.1 Commissioning of 6 existing sites and 2 alternative sites

NGN personnel have been involved in commissioning all 8 sites. This has included telemetry commissioning on each site and subsequent modifications to the SCADA system at NGN, Moorside. The alternative technologies have been commissioned by our project partners (Proheat and Bruest). As part of the alternative technology commissioning, classroom and site based training also took place.

Data began to be sent to the website following the successful commissioning of each gas site. Delays were experienced in commissioning each site. As such, data shown on the website is not available from the milestone dates shown on the programme. However, as all sites have now been commissioned (with the exception of the flow meter at Newby), the programme is back on schedule and will continue to collect data hourly for the remainder of the project.

4.2 Tendering and appointing Main Works Contractors

For the 4 sites due for construction in 2015, tender packs containing approved and appraised designs have been issued to the Major Project's contractor delivery framework. 3 out of the 4 projects due for construction in 2015 have been awarded. For the remaining build, Ganstead, we anticipate a contractor to be appointed in July 2015. All of the construction projects have elements of business as usual being delivered alongside the LCGP equipment installation. Costs have been separated to ensure only the LCGP element of the works is apportioned to the LCGP budget / account. This process has been evidenced and will be signed by the project team and the project sponsor.

The construction activities, shown on the original programme were scheduled to begin in March 2015 and be completed in September 2015. These dates were selected before the sites were identified. As such, construction programmes have had to adjust to suit other work being carried out on the network. Regardless of this, all 4 sites are scheduled to be reporting preheating system efficiencies back to the website during 2015. This is in line with the SDRC (December 2015).

4.3 Finalising the Information Route (Gas site to Website)

Information being published to the website is now on schedule. Information was not published to the website in line with the original plan as insufficient time was allowed in the plan for commissioning following installation of additional signals. Also, technical issues occurred in managing the information route from the gas sites to the website. This was largely due to a relatively small piece of software required from Schneider which was not produced in a timely manner.

4.4 The next 6 months

Over the next 6 months the team will focus on;

1. Data collection and website development

Ensure all data continues to flow from each gas site to the website. From the website the team will begin to be able to establish how each of the technologies is performing.

Records will also be collected to demonstrate the maintenance activities occurring at each site. Records will show whether maintenance activities have been planned or are reactive.

2. 4 Medium or large construction projects

A considerable amount of spend will occur over the next 6 month period when the 4 sites are constructed. Project management personnel of this large build programme has been increased to reflect the amount of work involved and to avoid some of the construction delays experienced with the construction of the 8 sites in 2014.

5.0 Progress Against Budget

The project against budget summary is contained in the confidential annex.

6.0 Bank Account

The bank account details are contained in the confidential annex.

7.0 SDRC

7.1 Preheating Site Selection

Completed in the first 6 month period of the project.

7.2 Preheating Site & Technology Design

7.2.1 Smart Metering (Existing Technology)

All smart metering is commissioned on the existing technology sites. Of the 8 signals recorded from each site, only 1 signal is still due to be installed. This is the gas flow meter at Newby. This is due for delivery on 29 June 2015 and has been delayed due to an administration error in the original Purchase Order. Telemetry has already been commissioned to allow the meter to report back to the website as soon as it has been installed.

7.2.2 HotCat and LP Steam Small Site Designs

This aspect of the project was completed prior to PPR01. The site layouts and the equipment layouts can be found on the project website.

7.2.3 HotCat & LP Steam Medium and Large Site Design

Detailed design have been produced for NGN to comment on and for tender purposes. These have been used for tender purposes. Tenders have been issued to the contractors on NGN's construction framework (Major Projects). Whilst there are still items within the design which are stopping the Construction Issue drawings being produced (i.e. stress analysis at Little Burdon and Towton, Volumetric control details at Ganstead, Hotcat re-design at Ganstead & Knottingley), it is not believed that these issues will delay the installation of the preheating equipment. Construction Issue drawings are anticipated to be received on all 4 projects by July 2015.

7.3 Technology Build & Installation

All smart metering, monitoring and telemetry equipment has been installed and commissioned with the exception of the gas flow meter at Newby (Newby is a site with an existing water bath heater). All data being captured can been seen appearing hourly on the project website. The remaining hardware will be installed on the 4 medium / large sites during the 2015 construction period in line with the SDRC.

7.4 Successful trialling and demonstration of alternative preheating technologies

The website has been established with click through pages for each site and for each technology. Each of the LCGP sites has information provided to give users an understanding of the designs. This is currently available on the project website in line with the SDRC requirement.

The knowledge and learning associated with the design, installation and commissioning of the 2 alternative sites installed to date has been added to the project website in the form of a case study for Crossgates (hotcat) and a case study for Low Moor (LP Steam).

Case studies for the large and medium sites will be uploaded to the website in line with the SDRC by January 2016.

7.5 Successful estimation of system efficiencies of existing preheating technologies

The system efficiency of the preheaters can be clearly seen on the project website. Calculations are being carried out within NGN's SCADA system as detailed in Section 2.2.8. The website is currently showing some results which are not what the LCGP team expected to see. The LCGP team are currently revisiting each of the LCGP sites to check outlet temperature setpoints and any gas meter coefficients which may be leading to incorrect gas consumption values used in the calculations. However, following this exercise the team may justify the spurious results due to extra low flow being experienced throughout the summer period. This was an anticipated problem and one which could not be resolved for a reasonable cost. Further analysis on this issue will be provided when the data is analysed.

The results we obtain during the heating season are expected to give more stable results due to the higher preheating demand.

7.6 Knowledge, Learning & Dissemination Strategy

The information route shown below suffered delays due to a small piece of software being completed in an untimely manner (by Schneider) and through computer programming issues between BA and the NGN website (the date format between the two programmes caused a delay). The information route is now complete and the website is live. This SDRC has been achieved 6 months after its intended date due to these problems but is now fully functional.

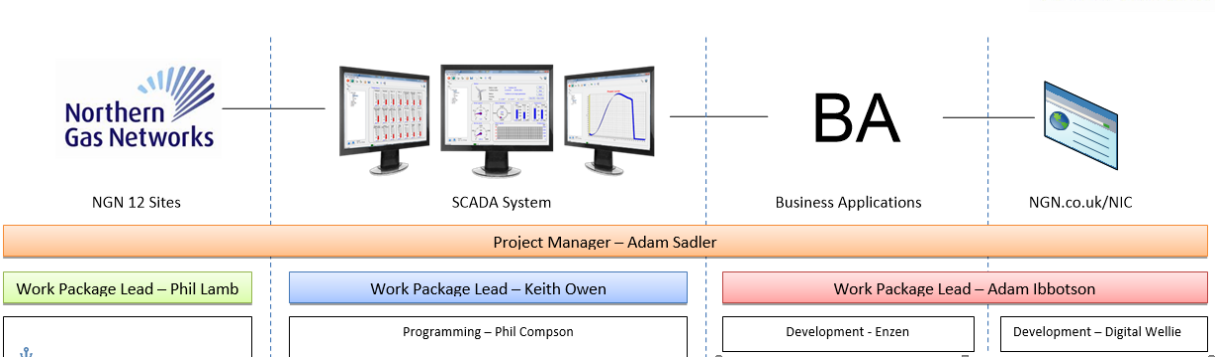

Figure 16. Information route from gas site to website

7.7 Project Evaluation & Final Project Report

The detailed final report is not yet due to be produced.

8.0 Learning Outcomes

Commissioning of the small LP Steam unit and the small hotcat has been carried out and training given to the operatives who will be responding to faults and maintaining the equipment. Knowledge has been shared through the training itself. Case studies have been uploaded to the website to give a brief overview of the some of the challenges faced and overcome in the design and installation of the alternative technologies.

Although data is being collected by the website on an hourly basis for 8 of the 12 sites, as the data is only recording summer preheating performance it is difficult to carry out meaningful data analysis without seeing the results obtained by the preheaters throughout a heating season. Regardless of this, the data is being published on the website and is available for any other GDN to download and carry out their own data analysis to assist them in optimising their preheating investment decisions.

9.0 IPR

No relevant IPR's have been generated or are forecast to be generated.

10.0 Risk Management

The project risk register has been updated and is contained in the Confidential Annex.

Over the last 6 months we have obtained actual base costs for certain lines of the risk register. Base costs have been updated and the associated 'risk' values have been reduced. Analysis of the risks and opportunities is contained in the Confidential Annex.

11.0 Other

All information and progress relating to the LCGP project is contained in the sections above or in the confidential annex.

12.0 Accuracy Assurance Statement

The report has been prepared in accordance with the Network Innovation Competition Guidance document published by Ofgem. Additionally, this report has been subject to review and challenge via NGN's independent Internal Audit function to provide further assurance on the accuracy and integrity of the data and information being presented.

Senior Manager Sign Off:

I can confirm that the process followed to compile and check this return is compliant with the control requirements outlined above have been completed and the information presented is robust, accurate and complete.

Name: Martin Alderson

Position: Asset Risk Management & Safety Director

Signature: 

Date: 19 June 2015

Date	Revision	Checked	Approved
18-Nov-13	Rev01 Initial	AS	DS
14-Jun-14	Rev02 Project Progress Report 1	AS	DS
19-Dec-14	Rev03 Project Progress Report 2	AS	DS
19-Jun-15	Rev04 Project Progress Report 3	AS	DS

Appendix A – Programme

Date
19/06/15

BSR02 - Preheating NIC Project Programme

Remaining Work
Remaining Work
Work Done
Milestone
Summary

ID	Activity Name	Start	Finish
BSR02-NIC-2	BSR02 - Preheating NIC Project Programme	01-Aug-13 A	20-Dec-16
BSR02-NIC-2.1	NIC Submission	19-Aug-13 A	29-Nov-13 A
A1000	Submit proposals	19-Aug-13 A	23-Aug-13 A
A1010	Presentations	02-Sep-13 A	01-Oct-13 A
A1020	Decision		29-Nov-13 A
BSR02-NIC-2.2	Website	02-Dec-13 A	20-Dec-16
A1050	Procure Website & Set Up	02-Dec-13 A	31-Mar-14 A
A1060	Website Development	01-Apr-14 A	19-Dec-14 A
A1130	Show Live Info On Website	05-Jan-15 A	20-Dec-16
BSR02-NIC-2.3	Water Bath Heater & Boiler Sites (Existing Sites)	01-Aug-13 A	20-Dec-16
A1030	Finalise Site Selection	01-Aug-13 A	28-Feb-14 A
A1140	Design Site Modification	01-Mar-14 A	30-Jun-14 A
A1040	Procure & Set Up Monitoring / Telemetry Equipent	01-Jul-14 A	19-Dec-14 A
A1120	Info Published Live to Website		19-Dec-14 A
A1070	Monitoring & Analysis of Small, Medium & Large Sites	05-Jan-15 A	20-Dec-16
BSR02-NIC-2.4	Hot Cat Sites	01-Aug-13 A	20-Dec-16
BSR02-NIC-2.4.1	Small Site (Crossgates)	01-Aug-13 A	20-Dec-16
A1080	Small Site HotCat Design	01-Aug-13 A	31-Mar-14 A
A1090	Small Site HotCat Procurement	01-Nov-13 A	31-Jul-14 A
A1100	Small Site Construction and Commissioning	01-Aug-14 A	12-Sep-14 A
A1110	Procure & Set Up Monitoring / Telemetry Equipment	01-Aug-14 A	12-Sep-14 A
A1360	Info Published Live to Website		19-Dec-14 A
A1320	Monitoring & Analysis of Small Sites	05-Jan-15 A	20-Dec-16
BSR02-NIC-2.4.2	Medium & Large Sites (Knottingley & Garnstead)	16-Jun-14 A	20-Dec-16
A1200	Proposed Site Design	16-Jun-14 A	31-Oct-14
A1210	Proposed Sites Procurement	14-Aug-14 A	08-May-15
A1220	Proposed Sites Construction & Commissioning	02-Mar-15*	30-Sep-15
A1230	Procure & Set Up Monitoring / Telemetry Equipment	02-Mar-15 A	30-Sep-15
A1370	Info Published Live to Website		30-Sep-15
A1330	Monitoring & Analysis of Medium & Large Sites	01-Oct-15	20-Dec-16
BSR02-NIC-2.5	LP Steam Sites	01-Nov-13 A	20-Dec-16
BSR02-NIC-2.5.1	Small Site (Low Moor)	01-Nov-13 A	20-Dec-16
A1240	Small Site Design	01-Nov-13 A	30-May-14 A
A1250	Small Site Procurement	01-Nov-13 A	30-Jun-14 A
A1260	Small Site Construction and Commissioning	04-Jun-14 A	18-Jul-14 A
A1270	Procure & Set Up Monitoring / Telemetry Equipment	04-Jun-14 A	18-Jul-14 A
A1380	Info Published Live to Website		19-Dec-14 A
A1350	Monitoring & Analysis of Small Sites	05-Jan-15 A	20-Dec-16
BSR02-NIC-2.5.2	Medium & Large Sites (Little Burden & Towton)	16-Jun-14 A	20-Dec-16
A1280	Proposed Site Design	16-Jun-14 A	03-Nov-14
A1290	Proposed Sites Procurement	14-Aug-14 A	30-Apr-15 A
A1300	Proposed Sites Construction & Commissioning	02-Mar-15*	30-Sep-15
A1310	Procure & Set Up Monitoring / Telemetry Equipment	02-Mar-15*	30-Sep-15
A1390	Info Published Live to Website		30-Sep-15
A1340	Monitoring & Analysis of Medium & Large Sites	01-Oct-15	20-Dec-16
BSR02-NIC-2.6	Information Sharing	01-Sep-15	20-Dec-16
A1400	Trials To Reduce Overall NGN Business Carbon Footprint	01-Sep-15*	20-Dec-16
A1410	Disseminate All Information Through Presentations etc	01-Jun-16	20-Dec-16