Low Carbon Gas Preheating

Project Progress Report 04

18 December 2015

Issued by email to:

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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.

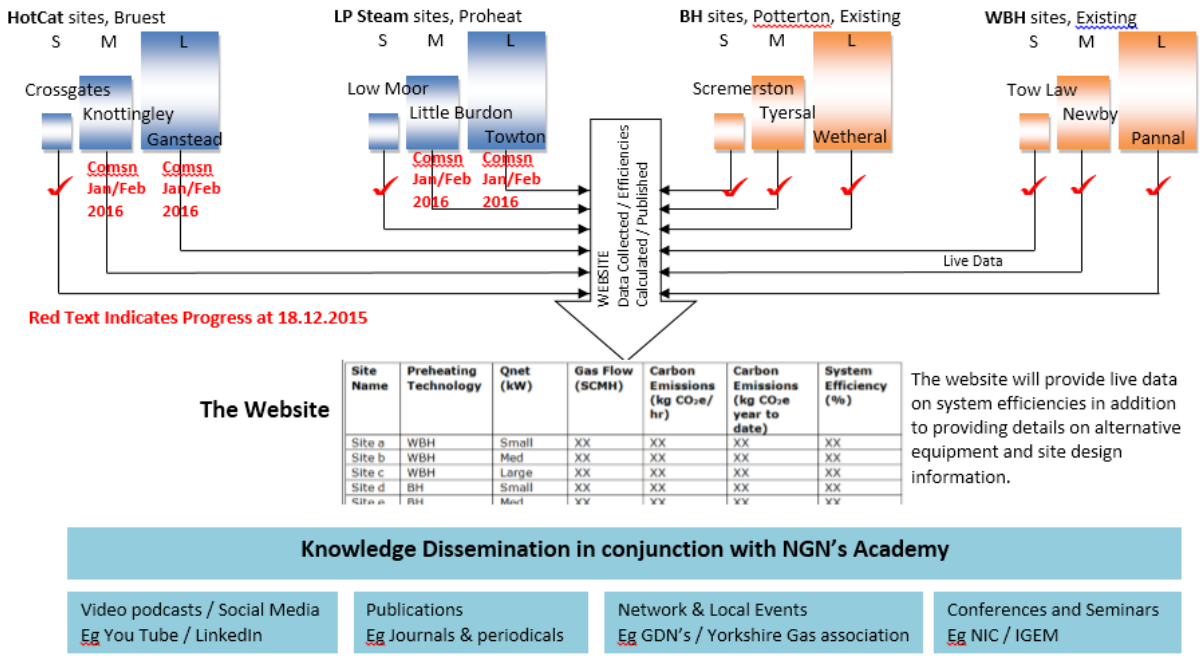

Figure 1. The LCGP Project

The project now has all new pre-heating equipment delivered and positioned on the relevant site. All of this equipment, subject to completion of snagging, should be commissioned in January / February 2016 and should therefore be in a position to provide data to the project website during the 2015 / 2016 winter period. Many of the work package costs will be finalized over the next 6 month period when subcontractors' costs are final accounted and there are no further commissioning costs of equipment.

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

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

1. Data Collection (Website).

   All 12 LCGP sites now have new equipment installed on site. 8 of the 12 sites are commissioned with 4 of the sites planned to be commissioned in early 2016.

2. Website development / Knowledge Dissemination.

   The website remains live and publically accessible via the NGN Website. From the website users can compare the efficiency of the sites reporting into it. All data is available for download to allow individuals to undertake their own data analysis should they wish to do so.

   Glitches within the website are currently being addressed. A detailed report will be produced within the next reporting period to allow website users to better understand the data being delivered.

   The website can be viewed by clicking:

   ngnclick.co.uk/performancedata

3. 2015 Procurement and Construction.

   Of the 4 sites being constructed in 2015 (large and medium hotcat / large and medium LP Steam), it is anticipated that the preheating elements will be commissioned in early 2016.

4. 2015 Alternative Technology Equipment

   All preheating equipment has been delivered and positioned on all LCGP sites (See photographs in section 2).

1.2 Project Summary

During the fourth 6 month period of the LCGP project the team have been focussed on installing and commissioning the new preheating equipment at the large and medium alternative technology sites. In addition, the team have been working to resolve glitches in the data being received from the other 8 sites on the website.

Two problems have affected the progress of the installations;

1. An incident occurred at Little Burdon, the Medium LP Steam site on 10 October 2015, where one of the burner heads overheated leading to remedial works needing to be identified and carried out before any further LP Steam units could be commissioned.
2. The delay in the delivery of the hotcat units from Bruest. This delay was largely due to the hotcat units being radically re-designed as part of this project. This should ultimately improve the efficiency of the hotcats whilst reducing their carbon emissions. The new 'Hotcat Mark II' has now been approved for use within the UK gas industry.

The implications of the above problems are not seen as critical to the successful delivery of the original project benefits, their impact has only been in the delayed completion of the commissioning of the large and medium LP Steam units and Hotcats.

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. Further information detailing lessons learnt will be added once the large & medium alternative preheaters are commissioned, along with a report to give more detail into instrumentation used to acquire the data from each site.

2.0 Project Manager's Report

2.1 Project Overview

All new, alternative preheating equipment has now been delivered to the LCGP sites and is now in its final location. All new instrumentation installed on existing preheating equipment is also complete. Further to the new equipment and instrumentation being installed, data is flowing back from 8 of the 12 LCGP sites and is being published on an hourly basis on the NGN website. Data is available for any visitors to the NGN website to see and download. The final 4 sites will publish information on the website following commissioning which is planned in early 2016.

The website can be viewed by clicking:

ngnclick.co.uk/performancedata

Calculations are performed on NGN's SCADA system prior to data being issued and published to the website. The LCGP team are working to resolve glitches within the calculations being performed to ensure hourly and daily efficiency results and carbon emission data is accurate. A report detailing how data is collected and manipulated prior to being published on the website will be produced within the next reporting period.

Additional project management resources have been maintained to manage the medium and large installations. This additional resource will be reduced following successful commissioning of the remaining 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 is installed
- WP07. Work carried out on the 6 sites with existing technology; 3 boiler houses / 3 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 2. Small Hotcat installed at Crossgates.

This site installation and commissioning was completed prior to PPR 03. Details can be found in previous PPR's and in the mini case study published on the project website.

2.2.2 WP02. Hotcat Medium (Knottingley)

As reported in PPR 02 and PPR 03, Bruest have re-designed the Hotcats for the medium and large sites with a goal to improve the efficiency of the units. The designs were approved by a third party (DNV GL) in their report number TC-001 Rev 02, dated 10 July 2015, received by NGN 31 July 2015.

Figure 3. Hotcat at Knottingley

1. The Factory Acceptance Testing was completed Kansas, US on 12 November 2015.
2. The unit was delivered to Liverpool docks on Saturday 5 December 2015. It has since been delivered to site at Knottingley. Commissioning is due to take place w/c 15 February 2016.
3. Contaminated land which had been identified at Knottingley has been remediated. All bases for new equipment are now cast and the new fenceline along with other associated work with upgrading the preheating is largely complete (see photo).
4. The main works contractor was scheduled to complete the works in November 2015. This completion date has been delayed due to the late arrival of the Hotcat and ground contamination issues. The current forecast for the completion of the project is 25 April 2016 (Stanningley Programme dated 9/11/2015) it is anticipated that the Hotcat will be commissioned w/c 15 February 2016.
5. Stakeholders from NGN visited Ganstead on 3 December 2015 to familiarise themselves with the new Hotcats for Ganstead and Knottingley and to list any snagging of the units for action by Bruest. 36 comments were provided including an observation that the units have a wooden floor which needs to be addressed.
6. The SDRC states that 'HotCat, smart metering, monitoring & telemetry equipment installed to selected sites - December 2015'. The hotcats, smart metering and new telemetry is installed on site in line with the SDRC. However, as a result of the delay in the delivery of the Hotcats, caused by encouraging Bruest to re-design them to improve their efficency, the units will not be commissioned until early 2016 and as such cannot be considered to be 'monitored' until then. However, despite putting this SDRC achievement under pressure, the LCGP team believed that redesigning the hotcat would add to the benefits generated by the project and

the improved unit would ultimately be available for other GDN's to purchase. The LCGP team believe that the results from the Hotcat Mark II will be more beneficial, in terms of high efficiency and low carbon emissions, than a Hotcat Mark I.

2.2.3 WP03. Hotcat Large (Ganstead)

Design changes for Ganstead are the same as those identified in section 2.2.2 Knottingley i.e. the hotcats have been modified to improve efficiency by Bruest. Both Hotcat units are now positioned on site at Ganstead. The new electrical supply to site is scheduled to be installed w/c 15 Jan 2016. Commissioning of the hotcats will follow the new electrical supply completion.

Figure 4. Ganstead Hotcats

1. The Factory Acceptance Testing for Unit #1 was completed in Kansas, US on 25 September 2015.
2. Unit #1 was delivered to Liverpool docks on 16 October 2015. It has since been delivered to site at Ganstead. Commissioning is due to take place beginning w/c 25 January 2016.
3. The Factory Acceptance Testing for Unit #2 was completed in Kansas, US on 9 October 2015.
4. Unit #2 was delivered to Liverpool docks on 4 November 2015. It has since been delivered to site at Ganstead. Commissioning is due to take place beginning w/c 25 January 2016.
5. The construction programme for Ganstead is currently planned to be completed by 04 April 2016 (demobilisation shown on J Murphy's programme 01).
6. Stakeholders from NGN visited Ganstead on 3 December 2015 to familiarise themselves with the new Hotcats for Ganstead and Knottingley and to list any snagging of the units for action by Bruest. 36 comments were provided including an observation that the units have a wooden floor which needs to be addressed.
7. The SDRC states that 'HotCat, smart metering, monitoring & telemetry equipment installed to selected sites - December 2015'. The hotcats, smart metering and new telemetry is installed on site in line with the SDRC. However, as a result of the delay in the delivery of the Hotcats, caused by encouraging Bruest to re-design them to improve their efficency, the units will not be commissioned until early 2016 and as such cannot be considered to be 'monitored' until then. However, despite putting this SDRC achievement under pressure, the LCGP team believed that redesigning the hotcat would add to the benefits generated by the project and the improved unit would ultimately be available for other GDN's to purchase. The LCGP team

believe that the results from the Hotcat Mark II will be more beneficial, in terms of high efficiency and low carbon emissions, than a Hotcat Mark I.

2.2.4 WP04. LP Steam Small (Low Moor)

Figure 5. Low Moor site photo

This site installation and commissioning was completed prior to PPR 03. Details can be found in previous PPR's and in the mini case study published on the project website.

2.2.5 WP05. LP Steam Medium (Little Burdon)

Figure 6. LP Steam Units at Little Burdon

1. Proheat units have been delivered and positioned on site.
2. All mechanical design issues noted in PPR 03 were resolved (stress analysis), all gas pipework on site is now installed.
3. Commissioning began 30 September 2015. Site Acceptance Testing (SAT) was not completed fully.
4. Unit A was left running in 'hand' mode on 7 October 2015.
5. 10 October 2015 - An incident occurred with Unit A leading to overheating of the Stage 2 burner head which subsequently caused damage to the unit.
6. 13 October 2015 – An instruction was issued from Barry Dalus, Head of Asset Integrity, appointing Peter Bates, High Pressure Investment Lead, to carry out an investigation into the incident. Towton commissioning was put 'on hold' until this investigation was concluded.
7. The incident has lead to delays in the commissioning of the Proheat units which has affected the full achievement of the SDRC.
8. The current planned de-mobilisation date by Darke Engineering Ltd is; 3 March 2016 (Programme Rev 05 dated 26/11/2015)
9. The SDRC states that 'LP Steam, smart metering, monitoring & telemetry equipment installed to selected sites - December 2015'. The LP Steam equipment, smart metering and new telemetry is installed on site in line with the SDRC. Remedial works proposed and installed by Proheat prior to re-commissioning the units during w/c 7 December 2015 were found to be inadequate on re-inspection of the burner grates on Monday 14 December 2015. All information regarding the overheating incident and the agreed remedial works will be shared on the project website within the next reporting period.

2.2.6 WP06. LP Steam Large (Towton)

Figure 7. LP Steam Units at Towton

1. Proheat units have been delivered and positioned on site.
2. All mechanical design issues noted in PPR 03 were resolved (stress analysis), all gas pipework on site is now installed.
3. Following the incident with overheating at Little Burdon and the subsequent instruction issued 13 October 2015, Towton commissioning was put 'on hold' until this investigation was concluded.
4. The incident at Little Burdon has lead to delays in the commissioning of the Proheat units at Towton. As such, the water bath heaters have been recommissioned to provide preheating to the site until further notice.
5. The current planned de-mobilisation date by J. Murphy is; 22 January 2016 (Programme Rev 05 dated 09/12/2015)
6. The SDRC states that 'LP Steam, smart metering, monitoring & telemetry equipment installed to selected sites - December 2015'. The LP Steam equipment, smart metering and new telemetry is installed on site in line with the SDRC. The units at Towton have not been commissioned in line with the contractor's original programme due to the overheating incident on Little Burdon. However, some remedial works agreed at Little Budon have begun to be carried out by Proheat at Towton. Further to the problems identified at Little Burdon on Monday 14 December 2015, the work at Towton will be completed once all works at Little Burdon have been agreed, tested, installed and proven. The retained water bath heaters will continue to provide preheating to the site throughout this period.

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

This work was installed and commissioned on this aspect of the project prior to PPR 03.

The problem identified in PPR 03 regarding the meter at Newby is planned to be resolved when the meter is commissioned this month. This took longer than expected as the meter itself was on a long lead delivery, in addition the cables delivered with the meter were not suitable. The cables then ordered from the meter supplier were also on a long lead delivery. The cables were delivered to NGN on 15 December 2015 and are planned to be fitted on site on during December 2015.

2.2.8 WP08. Website.

The website can be viewed by clicking ngnclick.co.uk/performancedata

Data on the website is currently being reviewed as there are a number of glitches within the calculations. It has been difficult to rectify all glitches in this reporting period as most of the sites' preheating has not operated close to design capacity due to an uncharacteristically mild winter and a subsequent reduction in peak load heating requirements occurring. Retrospective work to some signals has also taken place, for example, in providing insulation as detailed in Figure 8, for the surface mounted temperature probes. This will increase the accuracy of the calculations being carried out as the inlet temperature measured should be closer to the temperature of the gas and not closer to ambient air temperature. It also stops the probe being affected significantly by direct sunlight.

Figure 8. T_In at Crossgates. Before and after insulation

The team are currently producing a report to detail the instrumentation provided on each site. This will give users a better understanding of the data being captured from each site and will provide reasons for any limitations in the data produced. For example, the small LP Steam site and the small Hotcat sites both have orifice plate meters which are unreliable at low flows, however, some of the medium and large sites (Towton, Ganstead and Little Burdon), have fiscal metering installed, able to report flows accurately at all flows. The report will be published on the project website during the next reporting period.

Further mini-case studies will be added to the website within the next reporting period.

It has become apparent that the hourly values available on the website can show large fluctuations in efficiency. Whilst this hourly data is still of use to other GDN's who wish to carry out their own data analysis, we believe that the more accurate figure to use to appreciate the 'system efficiency' of each preheater is the 'daily value' which are also shown. The daily values will be more clearly identified within the next reporting period.

Knowledge dissemination activities in this period are shown in Figure 9 below.

Item	Event / Publication	Date	Presenter(s)	Attendees	Comments
01	BRG (NGN)	4 Aug 15	A.Sadler	12	NGN Directors (Business Review Group)
02	CIDS (NGN)	14 Oct 15	A.Sadler	6	NGN Senior Managers (Capex)
03	LCNI Conference	26 Nov 15	A.Sadler	delegates	Breakout session 5.8
04	LGCP Video	Dec 15	n/a	n/a	Website users

Figure 9. Knowledge Dissemination June 2015 –December 2015

2.2.9 WP10. Project Management

The project management forecast includes site supervisors and project leads for the medium and large, alternative technology sites. This was first explained in PPR 03.
Once the preheaters are operational and all work associated with commissioning the new preheaters is complete, we are not forecasting the supervisors / project leads to remain part of the NIC ongoing costs in 2016.

2.3 The next 6 months

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

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

2.3.1 Commissioning – Medium Hotcat – Knottingley.

I. Bob Boughton assigned as Project Supervisor

II. Stanningley Engineering Services - Mechanical & Civil site contractor

III. Aughtons, Major Projects' framework Electrical and Instrumentation contractor

IV. Main risks to the project include; New electrical supply to site, completion of the hotcat snagging, successful commissioning of the new hotcat, approval of approved and appraised design by NGN Asset department.

2.3.2 Commissioning – Large Hotcat - Ganstead

I. Bill Fleming assigned as Project Lead

II. Andy Coyne assigned as Project Supervisor

III. J Murphy & Sons Ltd are completing the installation of mechanical, civil, electrical and instrumentation.

IV. Main risks to the project include; New electrical supply to site, completion of the hotcat snagging, successful commissioning of the new hotcat, approval of approved and appraised design by NGN Asset department.

2.3.3 Commissioning – Medium LP Steam – Little Burdon

I. James Cowley assigned as Project Lead

II. Darke Engineering Services are completing the site installation (Mechanical and Civil)

III. Aughtons, Major Projects' framework Electrical and Instrumentation contractor, are installing the 'alternative technology additional signals'.

IV. Main risk to the project include; obtaining an acceptable remedial solution from Proheat following the overheating incident at Little Burdon.

2.3.4 Commissioning – Large LP Steam – Towton

I. Derfel Owen assigned as Project Lead.

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

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

IV. Main risks to the project include; Suitable solution obtained from Proheat on Little Burdon.

2.3.5 Data collection & Website Development

Data will continue to be collected from the 8 sites completed so far. As the large and medium sized sites are commissioned further data will be obtained and shared on the website over the next reporting period. 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 early 2016.

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 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*.

The Hotcat Mark II is available for other GDN's to purchase from Bruest, as is the Hotcat Mark I. The developments in the Proheat equipment will also be available to other GDN's to purchase.

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*.

We will carry out our own data analysis and share this through presentations or via the website once all 12 LCGP sites are commissioned and are reporting back to the website.

4.0 Progress Against Plan

There have been 5 main areas of work over the last 6 months. These are:

1. Installation of the large and medium Proheat sites
2. Installation of the large and medium Bruest sites
3. Commissioning of the Proheat units
4. Manufacture and delivery of the Hotcat units
5. Monitoring site data and reviewing data on the website

4.1 Installation of the large and medium Proheat sites

Contractors have installed the new preheating equipment at Little Burdon and at Towton along with the associated other upgrades including things such as new e&I kiosks, new power supplies to site, removal of asbestos, new civil bases and electrical ducting etc.

4.2 Installation of the large and medium Bruest sites

Contractors have installed the new preheating equipment at Knottingley and Ganstead along with the associated other upgrades including things such as new e&I kiosks, new power supplies to site, removal of asbestos, new civil bases and electrical ducting etc.

4.3 Commissioning of the Proheat units

Whilst commissioning was planned to be completed well in advance of the SDRC (December 2015) associated with this element of work, the overheating incident at Little Burdon has caused a delay. Some remedial works and re-commissioning at Little Burdon has been carried out although a final solution has not yet been tested and proven. Work will continue to develop a suitable solution prior to re-commissioning. Remedial works at Towton shall begin in December 2015 with completion and commissioning due after Little Burdon.

4.4 Manufacture and delivery of the Hotcat units

3 x Hotcat Mark II units have been manufactured, factory tested, shipped and positioned on site in Knottingley and Ganstead. Design approval was received from DNV GL for these units on 31 July 2015.

4.5 Monitoring site data and reviewing data on the website

8 x sites (6 x existing sites / 2 x alternative sites) are being monitored on the website. Work has been ongoing throughout this reporting period and will continue to be carried out over the coming colder months to rectify any data glitches in the information being returned to the website.

4.6 The next 6 months

Over the next 6 months the team will focus on;

1. Commissioning of the 4 x Medium or large alternative preheating sites

The installation of the equipment is complete but the dedicated Project Leads will remain on the sites until the units are commissioned and operational. Once all work associated with the preheating is complete, the project leads' time will not be charged to the LCGP account.

2. Data collection and website development

Verify that the data and calculations associated with the data are correct. Where data may be inaccurate, for example, due to a meter being inaccurate at low flow. This will be done by reviewing calculations on each site and providing details, including any limitations of instruments, in a separate report to be published on the website.

The system to record reactive and planned maintenance activities on each site will be developed. This data will then be used in calculating anticipated whole life costs.

3. Data Analysis & Knowledge Dissemination

Once data from all 12 sites has been obtained and analysed by the LCGP team the information will be shared at events including IGEM organized events.

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 was commissioned on the existing technology sites prior to PPR 03. Of the 8 signals recorded from each site, only 1 instrument signal has proven difficult to obtain. Resolving the issue with the Newby meter has been problematic within this reporting period. The team have spent over 10 weeks awaiting delivery of a specific cable from the manufacturer. This was delivered to NGN on 15 December 2015.

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

Construction Issue drawings have been produced for all medium and large sites. All designs have been approved and appraised.

7.3 Technology Build & Installation

The large and medium hotcats have been installed in line with the SDRC as detailed earlier in this document. However, as a result of the delay in the delivery of the Hotcats, caused by encouraging Bruest to re-design them to improve their efficency, the units will not be commissioned until early 2016. Following commissioning the data produced will be sent back to NGN's SCADA system where it will be manipulated prior to being published for monitoring on the project website in terms of hourly / daily efficiency and carbon emissions. This 'monitoring' aspect of the SDRC is later than initially planned for the hotcat. This is as a result of improving the design of the hotcats with a view to increasing the efficiency and decreasing the carbon emissions. The improved hotcat design is now available for other GDN's to benefit from should they chose to procure and install one following this project.

The SDRC states that 'LP Steam, smart metering, monitoring & telemetry equipment installed to selected sites - December 2015'. The medium LP Steam equipment, smart metering and new telemetry is installed on site in line with the SDRC. A solution to the problem which occurred at Little Burdon is currrently being detailed by Proheat and their burner manufacturer. Details of the overheating incident and the agreed remdial works will be shared on the project website within the next reporting period. The monitoring of this technology will only be available following the testing, installation and proving of any remdial works to each unit at Little Burdon and at Towton.

The large LP Steam units have been installed in line with the SDRC as detailed earlier in this document. However, the overheating incident at Little Burdon lead to a delay in the completion of the commissioning of the medium LP Steam units, this then lead to a subsequent delay in commissioning the large LP Steam units at Towton. The team would like to stress that the medium LP Steam units at Little Burdon were the first units of this size and burner configuration to be commissioned in the UK. As with the developed Hotcat design, the subsequent remedial works which we believe will now form part of the 'standard design' of this size unit from Proheat, is a development which will hopefully be seen by NGN and other GDN's as beneficial for future Proheat orders.

7.4 Successful trialling and demonstration of alternative preheating technologies

This SDRC was largely complete prior to PPR 03.

Case studies for the large and medium sites were scheduled to be uploaded to the website in line with the SDRC by January 2016. However, these case studies will be issued following successful commissioning of each of the sites to ensure they provide as much relevant information as possible for other GDN's to use.

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. Meetings have been held at System Control, Moorside to resolve the efficiency values which appear to be inaccurate (eg, some show 255%), whilst these meetings have resolved quite a number of issues, we cannot be sure that there are no other glitches in the calculations until there is a period of cold weather where the demand on all of the preheaters is high. All issues with data accuracy and calculation co-efficients should be resolved within the next reporting period.

4 of the sites (medium & large, hotcat and medium & large LP Steam) will not have data flowing back to the website in line with this SDRC (December 2015) due to issues as described in 7.3.

7.6 Knowledge, Learning & Dissemination Strategy

The functionality of the website was proven prior to PPR 03.

As per 7.5, 4 of the sites (medium and large, hotcat and LP Steam) will not have data flowing back to the website in line with this SDRC (December 2015) due to issues as described in 7.3.

7.7 Project Evaluation & Final Project Report

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

8.0 Learning Outcomes

Within the next reporting period the Bruest designs will be published on the project website to allow other GDN's to better understand the Hotcat Mark II.

Once any remedial work has been carried out on the Proheat units following the overheating incident at Little Burdon, and the modifications have been proven to be successful, we will produce a mini case study of the events and the proposed / accepted improvements to the units for other GDN's to be able to see.

Data continues to flow through to the website where other GDN's can view and download it.

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: Stephen Parker

Position: Regulation Director

Signature: 

Date: 18 December 2015

Project: BSR02 Preheating NIC Projec Task Split Progress Milestone Summary Project Summary External Tasks External Milestone Deadline
Date: Thu 10/12/15

Appendix A – Programme

ID	Task Name	Start	Finish	Resource Names
1	DSR02 Preheating NIC Project Programme	Mon 19/08/13	Fri 29/11/13	
6	Website	Mon 22/04/13	Tue 30/04/19	
7	Procure Website & Set Up	Mon 02/12/13	Tue 20/12/16	
8	Website Development	Tue 01/04/14	Fri 19/12/14	
9	Show Live Info On Website	Mon 05/01/15	Fri 16/12/16	
10	Water Bath Heater & Boiler Site (Existing Site)	Thu 10/12/15	Tue 30/04/19	
11	Design Site Modification	Mon 03/03/14	Thu 19/06/14	
12	Finalise Site Selection	Thu 01/08/13	Fri 28/02/14	
13	Info Published Live to Website	Fri 19/12/14	Fri 19/12/14	
14	Monitoring & Analysis of Small, Medium & Large Sites	Mon 27/04/13	Tue 29/11/16	
15	Procure & Set Up Monitoring / Telemetry Equipant	Fri 01/08/14	Fri 12/12/14	
16	HotCat sites	Mon 27/05/13	Tue 30/04/19	
17	Small Site (CrossGates)	Thu 01/08/13	Tue 20/12/16	
18	Info Published Live to Website	Fri 19/12/14	Fri 19/12/14	
19	Monitoring & Analysis of Small Sites	Mon 05/01/15	Tue 20/12/16	
20	Procure & Set Up Monitoring / Telemetry Equipment	Fri 01/08/14	Fri 12/09/14	
21	Small Site Construction and Commissioning	Fri 01/08/14	Fri 12/09/14	
22	Small Site HotCat Design	Thu 01/08/13	Mon 31/03/14	
23	Small Site HotCat Procurement	Fri 01/11/13	Thu 31/07/14	
24	Medium & Large site (Knottingley&Garnstead)	Mon 27/05/13	Tue 20/12/16	
25	Info Published Live to Website	Wed 30/09/15	Wed 30/09/15	
26	Monitoring & Analysis of Medium & Large Sites	Mon 05/01/15	Tue 20/12/16	
27	Procure & Set Up Monitoring / Telemetry Equipment	Mon 02/03/15	Wed 30/09/15	
28	Proposed Site Design	Mon 16/06/14	Fri 31/10/14	
29	Proposed Sites Construction & Commissioning	Mon 02/03/15	Wed 30/09/15	
30	Proposed Sites Procurement	Thu 14/08/14	Fri 08/05/15	
31	LP Stream Sites	Fri 01/11/13	Tue 20/12/16	
32	Small Site (Low Moor)	Fri 01/11/13	Tue 20/12/16	
33	Info Published Live to Website	Fri 19/12/14	Fri 19/12/14	
34	Monitoring & Analysis of Small Sites	Mon 27/05/13	Tue 29/11/16	
35	Procure & Set Up Monitoring / Telemetry Equipment	Wed 04/06/14	Fri 18/07/14	
36	Small Site Construction and Commissioning	Wed 04/06/14	Fri 18/07/14	
37	Small Site Design	Fri 01/11/13	Fri 30/05/14	
38	Small Site Procurement	Fri 01/11/13	Mon 30/06/14	
39	Medium & Large sites(Little Burden & Towton	Thu 01/08/13	Tue 30/04/19	
40	Info Published Live to Website	Wed 30/09/15	Wed 30/09/15	
41	Monitoring & Analysis of Medium & Large Sites	Thu 01/10/15	Tue 20/12/16	
42	BSR02 Preheating NIC Project Programme	Thu 01/08/13	Tue 30/04/19	
1	BSR02 Preheating NIC Project Programme	Mon 19/08/13	Fri 29/11/13	
2	NIC Submission	Mon 19/08/13	Fri 29/11/13	
3	Decision	Fri 29/11/13	Fri 29/11/13	
4	Presentation	Mon 02/09/13	Tue 01/10/13	
5	Submit proposals	Mon 19/08/13	Fri 23/08/13	
6	Website	Thu 01/08/13	Tue 30/04/19	
7	Procure Website & Set Up	Mon 02/12/13	Tue 20/12/16	
8	Website Development	Tue 01/04/14	Fri 19/12/14	
9	Show Live Info On Website	Mon 05/01/15	Fri 16/12/16	
10	Water Bath Heater & Boiler Site (Existing	Thu 10/12/15	Tue 30/04/19	
11	Design Site Modification	Mon 03/03/14	Thu 19/06/14	
12	Finalise Site Selection	Thu 01/08/13	Fri 28/02/14	
13	Info Published Live to Website	Fri 19/12/14	Fri 19/12/14	
14	Monitoring & Analysis of Small, Medium &	Mon 05/01/15	Tue 20/12/16	
15	Procure & Set Up Monitoring / Telemetry E	Fri 01/08/14	Fri 12/12/14	
16	HotCat sites	Thu 01/08/13	Tue 20/12/16	
17	Small Site (CrossGates)	Thu 01/08/13	Tue 20/12/16	
18	Info Published Live to Website	Fri 19/12/14	Fri 19/12/14	
19	Monitoring & Analysis of Small Sites	Mon 05/01/15	Tue 20/12/16	
20	Procure & Set Up Monitoring / Telem	Fri 01/08/14	Fri 12/09/14	
21	Small Site Construction and Commis	Fri 01/08/14	Fri 12/09/14	
22	Small Site HotCat Design	Thu 01/08/13	Mon 31/03/14	
23	Small Site HotCat Procurement	Fri 01/11/13	Thu 31/07/14	
24	Medium & Large site (Knottingley&Garnste	Fri 01/11/13	Tue 20/12/16	
25	Info Published Live to Website	Wed 30/09/15	Wed 30/09/15	
26	Monitoring & Analysis of Medium & L	Mon 05/01/15	Tue 20/12/16	
27	Procure & Set Up Monitoring / Telem	Mon 02/03/15	Wed 30/09/15	
28	Proposed Site Design	Mon 16/06/14	Fri 31/10/14	
29	Proposed Sites Construction & Comm	Mon 02/03/15	Wed 30/09/15	
30	Proposed Sites Procurement	Thu 14/08/14	Fri 08/05/15	
31	LP Stream Sites	Fri 01/11/13	Tue 20/12/16	
32	Small Site (Low Moor)	Fri 01/11/13	Tue 20/12/16	
33	Info Published Live to Website	Fri 19/12/14	Fri 19/12/14	
34	Monitoring & Analysis of Small Sites	Mon 05/01/15	Tue 20/12/16	
35	Procure & Set Up Monitoring / Telem	Wed 04/06/14	Fri 18/07/14	
36	Small Site Construction and Commis	Wed 04/06/14	Fri 18/07/14	
37	Small Site Design	Fri 01/11/13	Fri 30/05/14	
38	Small Site Procurement	Fri 01/11/13	Mon 30/06/14	
39	Medium & Large sites(Little Burden & To	Mon 16/06/14	Tue 20/12/16	
40	Info Published Live to Website	Wed 30/09/15	Wed 30/09/15	
41	Monitoring & Analysis of Medium & L	Thu 01/10/15	Tue 20/12/16	
42	Procure & Set Up Monitoring / Telem	Mon 02/03/15	Wed 30/09/15	
43	Proposed Site Design	Mon 16/06/14	Mon 03/11/14	
44	Proposed Sites Construction & Comm	Mon 02/03/15	Wed 30/09/15	
45	Proposed Sites Procurement	Thu 14/08/14	Thu 30/04/15	
46	Information Sharing	Tue 01/09/15	Tue 20/12/16	
47	Disseminate All Information Through	Wed 01/06/16	Tue 20/12/16	
48	Trials To Reduce Overall NGN Busin	Tue 01/09/15	Tue 20/12/16	
43	Procure & Set Up Monitoring / Telemetry Equipment	Mon 02/03/15	Wed 30/09/15	
44	Proposed Site Design	Mon 16/06/14	Mon 03/11/14	
45	Proposed Sites Construction & Commissioning	Mon 02/03/15	Wed 30/09/15	
46	Proposed Sites Procurement	Thu 14/08/14	Thu 30/04/15	
47	Information Sharing	Tue 01/09/15	Tue 20/12/16	
48	Disseminate All Information Through Presentations	Wed 01/06/16	Tue 20/12/16	
49	Trials To Reduce Overall NGN Business Carbon Fo	Tue 01/09/15	Tue 20/12/16	