gogreengas

nationalgrid

Advanced Plasma Power

Progressive energy

THIRD PROJECT PROGRESS REPORT (PPR) | JUNE 2015

Gas Network Innovation Competition

NGGD (National Grid Gas Distribution)
BioSNG Demonstration Plant

Partners Advanced Plasma Power, Progressive Energy, Carbotech, and National Grid are at the forefront of creating and developing the technology needed to turn our everyday rubbish into a high quality energy source.

100TWh

100TWh/year potential for BioSNG

33%

Equivalent to 33% of domestic gas demand in future

INTRODUCTION

DEVELOPING A MORE SUSTAINABLE WAY TO HEAT OUR HOMES

BioSNG addresses the issue of decarbonising heat which, accounts for 50% of all final energy use in the UK. It also offers an alternative route for gas supply - one that is greener and affordable which could help provide us with an improved and more secure energy future.

The funding and strategic backing for the project comes from Ofgem's Network Innovation Competition and the European BioEnergy Securing the Future ERANET programme.

The Gas Distribution arm of National Grid is working with specialist firms Advanced Plasma Power, Progressive Energy and Carbotech to develop new technology to convert the waste we discard daily into a valuable and long-term energy resource.

At the heart of the approach is an innovative project designed to convert waste to bio substitute natural gas (BioSNG) which can be used in the gas network.

Using BioSNG would greatly expand the supply of renewable gas over and above existing solutions such as anaerobic digestion (AD). Previously unused waste products diverted from landfill and other biomass material can act as the feedstock for gas generation via the cutting edge thermal Gasplasma® process developed by Advanced Plasma Power.

The technology will be showcased at a new demonstration process plant being built at Advanced Plasma Power's headquarters in Swindon. The test plant is designed to show the potential of BioSNG from both a technical and commercial perspective - and will move the technology from concept to reality. It will demonstrate the potential for communities to access locally generated renewable gas, using waste that would otherwise clog up valuable landfill space.

By proving that the approach works and can contribute to generating the volumes of pipeline-quality gas required to sustain the nation's energy requirements, National Grid believes that such plants can become the template for many others to serve regional needs across the country. Such a plant network could make a telling contribution to the future reliability of gas supplies at an affordable cost and with minimal environmental impact.

The approach could help solve an issue facing governments, energy suppliers, policy makers and consumer groups across the world: how to produce low carbon energy in a sustainable way through the development of advanced technology that is commercially viable, affordable, and acceptable to the energy-consuming public. It highlights National Grid's commitment to seeking economic and innovative ways to decarbonise energy, while making the best use of the existing UK gas network.

The environmental benefits will include contributing to the acceleration of a low carbon economy, the decarbonisation of heat, and a marked reduction of waste volumes going to landfill. The economic benefits include new investment opportunities which will provide affordable energy for consumers, and the possibility of increased local control over waste processing linked to green energy generation.

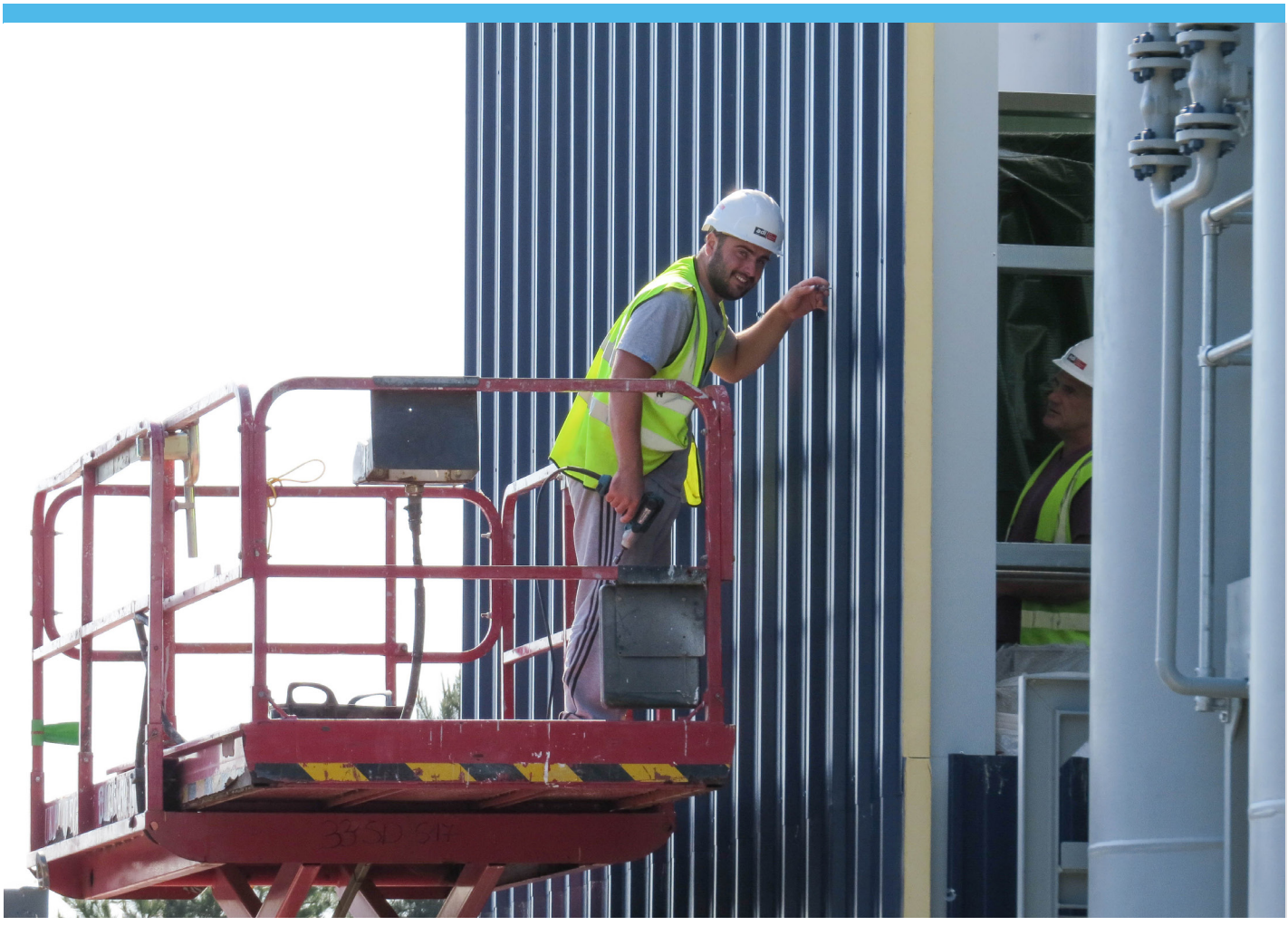
The BioEnergy Securing the Future (BESTF) ERANET programme is a consortium of 8 EU member States and Associated Countries to provide funding to collaborative and innovative bioenergy demonstration projects. For more information see: http://eranetbestf.net/

EXECUTIVE SUMMARY

This report period covers the main fabrication and construction phase of this project. As is clear from the images in this report, despite being at pilot scale, it is a substantial facility. Therefore this has required careful project management to deliver the equipment to site and install it safely, particularly with regard to interfaces between package providers, mechanical, electrical and control engineers.

This has been an ambitious build programme, still less than a year after final sanction of the European funding element of this project. As indicated in the previous report, the changes to the procurement approach to address project risk, combined with outturn delivery schedules for long lead items, placed pressure on the programme. The equipment is now installed onsite, albeit with a slight delay to this compared with the original programme, and the final connections of pipework, electrical and control systems, and instrumentation are in progress. There is expected to be some consequences to the final, integrated commissioning phase, although much of the equipment has already been cold commissioned as individual packages in factory or onsite. This does not represent any impairment of the quality of project outcomes, nor a material delay to the testing and demonstration programme as the original schedules were designed to provide an extensive period of testing in two phases.

Through the extensive value engineering exercise reported in the previous period and through careful project management, the equipment has been delivered largely within budget. The slight over run on the equipment costs can be accommodated through contingency provision in the original budget and minor savings elsewhere.



A key learning outcome over this period has been the need to develop the roadmap towards commercialisation. The pilot project is vital to demonstrate the technology and to undertake extensive experimental trials cost effectively to refine and optimise the process, using currently available syngas. To enable commercial deployment an intermediary full chain project will be required. This will need to be around a hundred times larger than the pilot plant such that the final scale-up to a full-scale plant is only a factor of ten. To provide the necessary confidence for investors, it is also important that the intermediary plant can operate under the same conditions that a commercial plant would need to be run. This requires not only full time operation over a substantial period in excess of 12 months, but also taking feedstock under typical commercial arrangements and delivery of gas to commercial customers.

The project partners have acted upon these findings over the last six months and have made substantial progress in developing this next scale of BioSNG facility on the roadmap to deployment. The partners have identified opportunities for funding such a project, and have submitted proposals for a ~5MWth scale project to both the DfT Advanced Biofuels Competition, and to the 2015 Network Innovation Competition. Proposals for this larger scale BioSNG demonstration project have successfully passed the first assessment stages of both competitions.

Marketing and communications have also remained an important focus over this period. A new brand, ‘gogreengas’, has been developed to facilitate promotion, which has been used in the production of this report.

Construction of the Visitor Centre is under way. This will provide a dynamic and attractive experience for stakeholders, to communicate the merits of BioSNG and the project, including a demonstration hob fuelled by BioSNG.

PROJECT MANAGER'S REPORT

The project continues to make good technical progress, remaining on scope and schedule to deliver all its objectives, as outlined in the Project Direction document.

PROJECT SCOPE AND PROGRESS

The focus over the past 6 months has centred on procurement, installation of equipment and preliminary testing. Current deliverables and milestones are largely being met on time and the project is close to meeting its planned timetable. There has been a slippage of 6-8 weeks in the construction programme due to delays associated with undertaking a value engineering exercise in September/ October 2014 and the revised procurement approach. However since the new schedule was drawn up in October 2014, there has been no further slippage of the programme.

A Visitor Centre is in the process of being established with the important aim of promoting the project and technology and developing a brand presence. The Centre is set to be delivered ahead of schedule.

PROJECT BUDGET

The project is forecast to be delivered within its budget but costs are being incurred slightly more slowly than expected. Overall expenditure in the 14 months to 31st May is around 9% lower than budget. It is expected that expenditure will catch up with budget in the next 6 monthly reporting period.

RISK MITIGATION

The very nature of a development project is clearly not without some level of risk. However, our risk management approach is designed to identify potential risks at an early stage and then determine the most appropriate way of mitigating that risk. The risk mitigation management system that has been set-up supports the project meeting all of its key aims as set-out in the original Project Direction.

Specific risks that are currently being closely managed include:

- Training of personnel.
- Maintenance of ATEX and Pressure Systems Safety Regulations (PSSR) equipment.
- Operation of methanation process.
- Commissioning and training on the PSA unit.

NEXT STEPS

The focus is now moving to the commissioning and the subsequent process testing and optimisation phases.

BUSINESS CASE UPDATE

There has been considerable activity with regard to the business case over the last 6 months:

Biomethane tariff support changes have taken place as expected under the RHI legislation in February 2015.

The roadmap to commercial deployment has been further developed, including (a) the role for an intermediary scale demonstration facility operating under commercial conditions, and (b) the additional opportunities afforded for biomethane by the transport sector. Bids have been submitted for financial support for such a demonstration project

Further work has been undertaken to enhance commercial deliverability through the involvement of third party engineering companies.

BIOMETHANE TARIFF SUPPORT CHANGES

The proposed changes to the biomethane tariff under the RHI have taken place as anticipated following the consultation process in 2014, and came in force on 12th February 2015. Based on upgrading of biogas, a tiered tariff has been introduced, based on Megawatt hours of gas produced, with break points at 40,000 and 80,000MWh per annum.

BioSNG is captured under the definition of biomethane, although currently there are no BioSNG facilities in the UK. DECC have been clear that the existing tariff levels are based on biomethane produced from anaerobic digestion of wet biomass. One of the purposes of this project is to provide the evidence base for the costs and carbon credentials of biomethane produced from mixed biomass and waste feedstocks which could not otherwise be converted to biomethane via conventional routes. This will inform the expected level of support required for BioSNG under the RHI as a transitionary measure.

With nth of a kind facilities, operating on waste and at commercial scale, it is anticipated that the BioSNG route can provide biomethane competitively with fossil derived natural gas. In order to ensure that the policy environment for renewable gas remains supportive, it is important that the communications and dissemination from the project are maintained.

THE ROADMAP TO COMMERCIAL DEPLOYMENT

Expediting commercialisation has been an area which the team has been focused on during the last six months. The pilot project is vital to demonstrate the technology and to undertake extensive experimental trials to refine and optimise the process. The scale of this plant was dictated by practical constraints including the quantity of arising syngas from the existing gasification system. However, this facility, whilst substantial for a pilot plant, is still ~1000x smaller than a commercial facility would need to be.

Review of the market sector has shown that in order to secure investment in a commercial plant, a 100x larger reference plant will be necessary. This means that final scale up would only be around 10x. Furthermore, this plant would need to operate under commercial conditions, ideally demonstrating the full chain from feedstock acquisition through to delivery of gas to a commercial customer.

Over the course of the last six months, a further commercial opportunity has been identified. Compressed Natural Gas has been a transport fuel vector for a number of years, in particular for the Heavy Goods Vehicle market. It addresses air quality concerns associated with diesel vehicles, and provides quiet operation, whilst leading to a reduction in carbon emissions. However, this has traditionally been accessed via retrofitted vehicles, which has been a

key factor in limited uptake. International providers have now developed Original Equipment Manufactured Euro VI vehicles, giving fleet owners greater confidence.

The UK has an extensive natural gas network, and is well placed to exploit this through development of distributed gas fuelling stations throughout the country. This would provide an additional market for the gas distribution and transmission network, enhancing utilisation and therefore providing better value for its customers. Carbon benefits would be accessed through the use of biomethane, offering a very low carbon fuel vector for HGVs which cannot otherwise be substantially decarbonised, as this is not a sector where electric vehicles can compete.

Furthermore, the gas network provides a valuable fuel distribution function, allowing biomethane plants to be constructed where the feedstocks arise, with the fuel distributed using existing infrastructure to filling stations located where the transport network demands.

European legislation requires deeper decarbonisation of the transport sector. This has been recognised by the Department for Transport who have recently launched an Advanced Biofuels Competition to support the construction of demonstration projects to produce more than one million kg per annum of transport fuel.

The project partners have acted upon these findings and opportunities over the last 6 months and have made substantial progress in developing this next scale of facility on the roadmap to deployment. The proposed new commercial demonstration project will take waste under contract and convert it to grid quality biomethane in an integrated facility which will prepare the waste, gasify it, upgrade to biomethane and then distribute it both via the local gas distribution network, and through an existing local gas filling station to fuel a fleet of haulage vehicles.

This exciting project at 5MWth scale (around 1.5 million kg of biomethane pa) has been successfully evaluated during the first phases of the DfT Advanced Biofuels Competition, and the 2015 Network Innovation Competition.

FURTHER WORK HAS BEEN UNDERTAKEN TO ENHANCE COMMERCIAL DELIVERABILITY

As part of developing the deliverability of the BioSNG process, the partners have been working closely with a number of UK and international third party engineering companies. It is recognised that their participation will be necessary in the transition from experimental pilot facilities to commercial scale demonstration and beyond. Investors will require the confidence this provides along with associated performance guarantees necessary for financing.

PROGRESS AGAINST PLAN - JUNE 2015

The major activity over the past six months has been in the procurement and on site installation of the process equipment work packages. This work has included the completion of a range of associated cold commissioning tasks.

As referred to in the Second Project Progress Report it was necessary to carry out a value engineering exercise during September/October 2014 in order to reduce capital expenditure, in line with the permitted spend, without compromising the rated performance of the process or any of key objectives of the project. This resulted in an approximate 6-8 week delay in the overall programme, and accordingly, a new project schedule was drawn up in October 2014 to reflect this change. There has not been any further slippage in the project schedule since this update.

The original detailed design and safety assessment for the plant was completed and signed off. The plant safety study was conducted by the independent Safety Consultants, Rowan House. The scope of work included: HAZID, DSEAR and a HAZOP studies to: identify specific risks, check that the materials of construction were compatible with process conditions and systematically evaluate and protect against the potential hazards and operability issues associated with the plant.

A further HAZOP assessment was necessary following the value engineering exercise, which incorporated the various changes to the plant and also looked into the wider operating aspects of the plant during (a) normal (steady state) operation, (b) in transition (start-up and shutdown) and (c) when emergency shut-down of the plant is required. This HAZOP study was co-ordinated and chaired by 6Engineering Ltd and the panel members included representatives from the key equipment suppliers.

A major on-going task is to prepare and achieve sign-off of all the necessary safety documentation to ensure that the plant has been designed, installed and will be commissioned, operated and maintained in a manner that is consistent with an ATEX / DSEAR facility operating at elevated (up to 20 Bar) pressure.

This documentation includes inter alia: fire risk assessment, acceptance test procedures, preventative maintenance plan, commissioning plan and check-list, noise testing, DSEAR assessment, hazardous area zoning, pressure and electrical system lock-outs, design risk assessments, HAZIDs and HAZOPs, working at height assessments, plant signage assessments, maintenance system operating and work instructions, training instructions, written schemes of examination, permit(s) to test, entry control, incident management, ATEX certification of plant, CE marking of plant and specific material assessments.

There has been tight control of suppliers throughout the procurement and installation period to ensure that the equipment is manufactured to specification and to schedule. There is an on-going review and approval by APP for the design documentation being prepared by the suppliers. The progressive sign-off of equipment was developed to enable substantially more offsite integration and testing and so much of the cold commissioning of equipment was conducted at factory, prior to delivery at site at Swindon. This work included loop testing on the control cabinets and leak testing on pressure vessels.

Cold and some hot commissioning work has continued with the delivery of equipment to site. The main flare stack and associated services has been tested, operating on air, where critically, the stable maintenance of a pilot flame was demonstrated over a day of operation under the most stringent operating condition.

All the main equipment items have now been installed on site. The associated installation of the mechanical piping, electrical and control systems is now very well advanced and is being closely managed through regular daily site meetings and more detailed weekly meetings between APP and ADI, who are main contractor and are responsible for overall CDM management.

Commissioning of the full integrated facility is due to commence at the end of June, with completion in September. Given the research nature of this facility the short delay on the programme is not considered to be a substantial issue, with over 18 months available for the experimental phase of the programme.

We are also conducting bench scale testing of the catalyst material which we are proposing to use in the main plant. This will enable us to determine the kinetic rate equations for the catalyst and hence determine the configuration (i.e. depth and concentration of catalyst beds) to be employed in the main Swindon plant vessels. It should certainly expedite the proving and optimisation of the methanation section of the facility.

We have been working closely with our German partners, Carbotech to ensure that the PSA BioSNG refining unit will be tested and brought on-line in a controlled way and that our plant operating staff will be adequately trained as to its operation. The commissioning of the unit is planned for August/September.

The Visitor Centre is now nearing completion with the important aim of presenting the project and its associated technology to stakeholders. A further purpose is for it to assist in developing a clear brand identity for the project. The Centre is due to be completed at the end of June, ahead of its planned SDRC milestone (3rd August 2015).

PROGRESS AGAINST BUDGET

The project is forecast to be delivered within its budget but costs are being incurred slightly more slowly than expected. Overall expenditure in the 14 months to 31 May is £2,323.0k which is £209.5k lower than budget. A summary of the project's financial performance is set out in the following table.

PROJECT'S FINANCIAL PERFORMANCE TABLE

	PROJECT TO DATE			TOTAL		
	ACTUAL	BUDGET	VARIANCE	ACTUAL	BUDGET	VARIANCE
LABOUR	691,086	553,239	137,847	691,086	1,353,724	662,638
EQUIPMENT/CONSUMABLES	1,552,274	1,578,857	26,583	1,552,274	2,273,480	721,206
CONTRACTORS	54,258	180,896	126,638	54,258	240,677	186,419
IT	9,081	36,767	27,686	9,081	59,900	50,819
IPR COSTS	0	12,444	12,444	0	32,000	32,000
TRAVEL AND EXPENSES	16,294	33,567	17,273	16,294	88,400	72,106
CONTINGENCY		136,733	136,733		202,409	202,409
	£2,322,994	£2,532,503	£209,509	£2,322,994	£4,250,590	£1,927,597

Labour costs are £137.8k higher than the budget which is due to more activity on the installation of equipment than expected. The overspend will be offset by savings during the investigations phase of the project.

Other costs are lower than budget at present. This is due to phasing and they are expected to eventually exceed budget levels by £111.0k because of higher than expected costs for the gas shift and methanation equipment. This overspend will be met by the project contingency.

In summary, the project is expected to be delivered within budget.

BANK ACCOUNT

Bank statements have been provided to Ofgem. Due to the confidential nature of the project bank statements, they have not been included in this report.

SUCCESSFUL DELIVERY REWARD CRITERIA (SDRC)

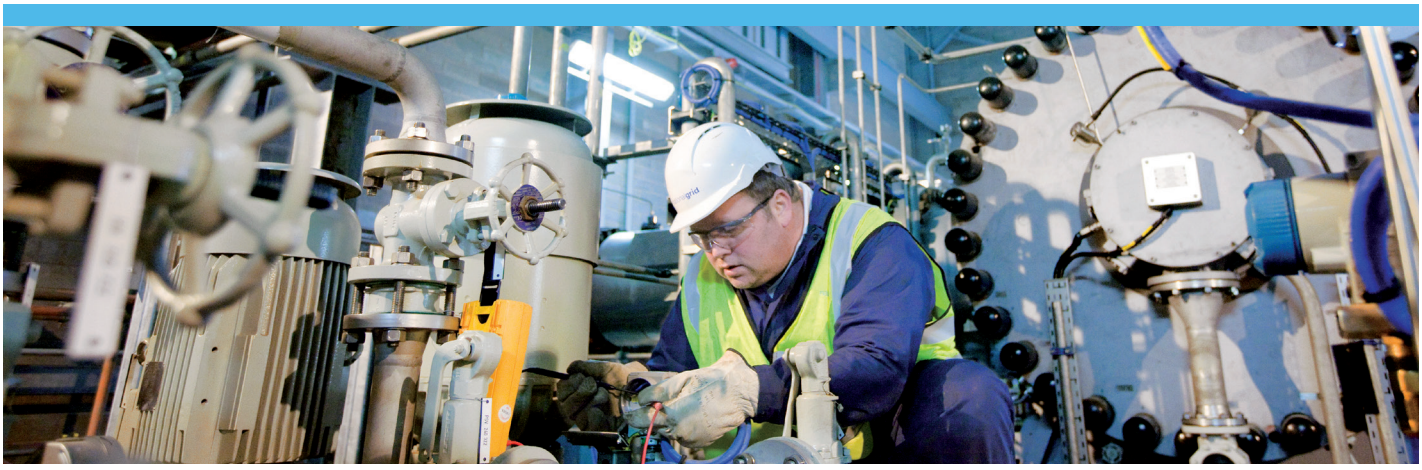
The first and second SDRC milestones were successfully delivered during the previous phase of the project.

As outlined in the previous report, since the original application there was a change in strategy with regard to delivery, installation, and commissioning of the plant and equipment. The combining and simplification of the equipment work packages allowed for much of the functional testing of equipment to be carried out at the suppliers' site prior to shipping to site, de-risking the overall project.

Therefore, much of the equipment was delivered to site functionally tested and cold commissioned, rather than requiring commissioning post installation. Consequently there has been a slight delay in the installation of equipment (3rd SDRC) and the commencement of integrated commissioning. We now anticipate that the 3rd SDRC will be achieved by the beginning of July.

Looking forward, the commissioning activity is already underway and should be completed over the next quarter. There is therefore likely to be a small delay compared with the original programme for completion of the full commissioning phase, which we now expect to be complete by September 2015, rather than 6th July 2015. The risk management afforded by the revised procurement approach is designed to expedite early operation. In this respect it is recognised that this is a research programme, and that certain elements may be challenging to bring into full operation, particularly the methanator. The extensive bench scale testing that we are carrying out with Catal is primarily looking to reduce risks in this area in order that we can commission and bring the process on-line at Swindon in a controlled and timely manner. The operational programme comprises of a testing and proving period up to 1st April 2016 followed by an extensive optimisation and investigative phase until the 28th February 2017. Therefore, the minor delay is not anticipated to lead to any impact on the overall delivery of the main development aims of the project, with over 18 months available for the operational phase of the programme.

Finally, there is one area where we are ahead of schedule; namely in the setting up of a Visitor Centre which is due for completion in late June, ahead of the scheduled SDRC date of 3rd August 2015. The visitor centre will allow us to undertake the very important role of demonstrating the plant in operation and explaining the vision of the project to key stakeholders.

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LEARNING OUTCOMES

The key learning outcomes over this period have been:

THE IMPORTANCE OF A ROADMAP TO COMMERCIALISATION

The key learning outcome over this period has been the need to develop the roadmap towards commercialisation. The pilot project is vital to demonstrate the technology and to undertake extensive experimental trials cost effectively to refine and optimise the process, using currently available syngas.

To enable commercial deployment it is clear that an intermediary full chain project will be required. This will need to be around a hundred times larger than the pilot plant such that the final scale up is a factor of ten. To provide the necessary confidence for investors, it is also important that the plant can operate under the same conditions that a commercial plant would need to be run. This requires not only full time operation over a substantial period in excess of 12 months, but also taking feedstock under typical commercial arrangements and delivery of gas to commercial customers.

Over this period, the team has been exploring means by which to address this learning outcome and identified that the DfT Advanced Biofuels Competition provides a vehicle to deliver this, being designed to facilitate projects of exactly the scale identified, operating under the conditions required.

THE IMPORTANCE OF A WELL ORGANISED INSTALLATION PROGRAMME

A second learning outcome from work undertaken in this reporting period has been the importance of a well organised installation programme to deliver this in a timely and safe manner. Whilst this is a pilot plant, it is still a substantial facility, requiring careful management of interfaces between package providers, mechanical, electrical and control engineers. A timelapse sequence over the full installation period has been taken, which will be available on the website, demonstrating the scale and complexity of the system. A revised programme was drawn up at the beginning of the period and through careful management, the facility has been constructed according to this schedule and delivered against it.

THE IMPORTANCE OF GOOD QUALITY DATA

This period has been dominated by the engineering and delivery of the plant and equipment. However, there has been continued activity relating to the fundamental processes to inform the forthcoming experimental activities on the pilot plant.

Through ongoing lab-scale work key parameters have been refined in order to inform both the process modelling as well as the planned experimental programme. This has required collaboration with third parties. Here it is clear that well structured programmes are required to achieve the outcomes required, particularly when work is undertaken remotely. This process has informed the experimental planning for the pilot plant during the latter part of 2015 and 2016.

THE IMPORTANCE OF PROJECT COMMUNICATION

It has been recognised that in order to raise the general awareness level of the BioSNG project, including showcasing the technical capabilities and commercial opportunities it presents, there is the requirement for a structured approach to dissemination and marketing promotion. In response to this, **National Grid has provided some additional funding, over and above what was required by the NIC project**, to facilitate the promotion of BioSNG. Recent activities have included speaking engagements and attendance at a number of key industry events such as the UK Energy from Waste Conference, Regatec 2015 (the International Conference on Renewable Energy Gas Technology) and the 2015 World Gas Conference in Paris. Other key areas identified, which are currently being progressed are:

BRANDING: BioSNG promotion must reflect a friendly and approachable brand that delivers credibility and confidence, as well as tiered levels of communication for varying degrees of understanding across the key audiences. The partners, supported by experts, have developed this through a branding programme including a workshop, and a

dynamic new brand concept 'gogreengas' has be developed.

gogreengas

WEBSITE: A clear web presence for the project is a vital tool for communication, with engaging information, well presented. Whilst there is a website for the project hosted by National Grid, it has been recognised that the benefits of the project can be made more widely accessible through a new dedicated website under the branding developed. In preparation for this, the domain www.gogreengas.com has been secured.

VISITOR CENTRE: This has always been part of the project, but it has recently been recognised as being particularly important. The partners believe that it shouldn't simply be an 'engineering' exercise, but that it needs to be dynamic, attractive and accessible for the stakeholders. The team's marketing expertise has informed delivery of this element of the project.

In summary, the lessons relating to communications are continuing to be learnt and acted upon to ensure that the benefits associated with the project are understood by the right audiences. This is vital to facilitate deployment of the technology and to deliver the cost effective carbon savings that follow.

INTELLECTUAL PROPERTY RIGHTS (IPR)

The IPR situation is unchanged from the last reporting period.

RISK MANAGEMENT

A comprehensive live risk register has been drawn up which allows for the regular monitoring of a range of technical commercial and project management risks, as identified by the project partners.

The approach taken, allows for potential issues to be identified and mitigated at an early stage. The risk register has been subdivided according to the main project tasks and a number of additional (internal) deliverables have been incorporated to permit a more responsive means of managing the project risks. A description of the how the risk register has been drawn-up and a copy of the full risk register is given in Appendix 1.

The main activity over the last six months has been in the procurement, installation and the start of commissioning of the equipment for the BioSNG facility. The following describes the most relevant recent risks that have been identified and are being managed:

CAPITAL EXPENDITURE RISKS

Control of capital spend continues to be closely monitored and following the value engineering exercise is now in-line with the overall budget. There have been some relatively minor additional costs resulting from required changes identified in the recent Hazop study which are not expected to significantly impact the overall Capex spend.

The committed budget remains as originally anticipated, although the spend profile of the project to date is somewhat behind budget caused by cash-flow associated with capital equipment, due to better commercial terms being negotiated with suppliers as well as slight delays with specific equipment. A secondary factor reflects the large and lumpy nature of the payments where a delay in any large payment at the end of a claim period will lead to a significant deviation from the forecast expenditure. It is expected that expenditure will come fully into line with budget over the next 6 monthly reporting period, as final payments on capital equipment are made.

SAFETY MANAGEMENT RISKS

As reported in the previous report, a value engineering exercise was carried out to simplify and reduce capital costs of the facility. A comprehensive Hazop study was undertaken in February/March using an independent expert to address the current design and also consider potential issues associated with start-up and shut-down of the facility.

The BioSNG facility imposes a new set of stringent safety management requirements on APP who are responsible for the plant operation and maintenance. A safety review was commissioned by an independent consultant to identify the training and competency requirements that must be in place prior to the operation of the BioSNG plant. The recommendations of this review have since been implemented by APP.

PROGRAMME TIMING RISK

Looking forward, the commissioning activity is already underway and should be completed over the next quarter. There is likely to be a small delay compared with the original programme for completion of the full commissioning phase. The risk management afforded by the revised procurement approach is designed to expedite early operation. In this respect it is recognised that this is a research programme, and that certain elements may be challenging to bring into full operation, particularly the methanator. The extensive bench scale testing that we are carrying out with Catal is primarily looking to reduce risks in this area in order that we can commission and bring the process on-line at Swindon in a controlled and timely manner. The operational programme comprises a testing and proving period up to 1st April 2016 followed by an extensive optimisation and investigative phase until the 28th February 2017. The minor delay is not anticipated to impact the overall delivery of the main development aims of the project, with over 18 months available for the operational phase of the programme.

ACCURACY ASSURANCE STATEMENT

This report has been prepared in accordance with the Gas Network Innovation Competition Governance Document published by Ofgem. The project has been subject to review and challenge by the National Grid Gas Distribution Project Manager and signed off by Damien Hawke, NGGD Network Design Manager, who is Project Sponsor for this NIC project.

Damien Hawke has confirmed that the processes in place and steps taken to prepare this Project Progress Report are sufficiently robust, and that the information provided is accurate and complete.

ABOUT THE PARTNER ORGANISATIONS

NATIONAL GRID GAS DISTRIBUTION

connects people to the energy they use and delivers it safely, reliably and affordably to around 11 million customers in Britain. Each year we replace around 1,000 miles of gas mains and we connect 20,000 new customers to the network. We also run the UK's gas emergency service, responding to calls on our 0800 111 999 number 24 hours a day.

To find out more about this project and other Gas Distribution Innovation projects, please contact **Darren White**:

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The project website can be accessed at:
http://www.nationalgrid.com/biosng

ADVANCED PLASMA POWER (APP)

is a world leader in advanced waste to energy and fuels technology. APP is revolutionising the way in which we treat waste sustainably by maximising the value derived from it as a source of materials and energy while minimising its impact on the environment. APP has developed the Gasplasma® process, a clean, modular and scalable advanced waste to energy and fuels technology which delivers high efficiencies whilst minimising visual and environmental impact.

The Gasplasma® process is an innovative combination of two well-established technologies – gasification and plasma treatment, both of which have decades of proven commercial operation.

To find out more about Advanced Plasma Power, please contact **Kate Colclough**:

kate.colclough@app-uk.com

www.advancedplasmapower.com

PROGRESSIVE ENERGY

is an established independent UK clean energy company focusing on project development and implementation. It comprises a team of highly experienced energy professionals providing the skill sets necessary to undertake all aspects of the development and implementation of energy projects. Progressive Energys was formed in 1998 to commercialise key energy conversion technologies developed in the CEGB including coal gasification, waste to energy, and biomass conversion. Members of the team have also been instrumental in developing best practice in waste resource utilisation through both the establishment of the UK's first commercial MBT facility, and development of energy from waste projects.

To find out more about Progressive Energy please contact **Chris Manson-Whitton:**

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www.progressive-energy.com