

Gas Network Innovation Competition Full Submission
Supplementary Answer Form

Project: Commercial BioSNG Demonstration Plant

Tick if this answer has been provided verbally: ☐

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| Project code | NGGDGN02/1 | Question Number | 21 | | | | | | | | | | | | |
| Question date | 8/9/15 | Answer date | 11/9/15 | | | | | | | | | | | | |
| Submission section question relates to | Section 4g) Robust methodology/ready to implement | | | | | | | | | | | | | | |
| Topic | Project Plan | | | | | | | | | | | | | | |
| Question | Please can you clarify the stage gates in your project plan? It would also be helpful to understand the expected spending by each stage gate. | | | | | | | | | | | | | | |
| Notes on question | | | | | | | | | | | | | | | |
| Answer | <p>The Project Partners take a risk based approach to Project Management to ensure that commitment to expenditure is only made once risks have been evaluated and appropriate mitigation is in place.</p> <p>The Project plan, summarised in the Gantt Chart in Appendix 5b of the submission, incorporates seven stage gates (SG's). These are explained in the following table.</p> <table border="1"><tr><td>SG1</td><td>Planning Permission Obtained</td><td>Planning permission may include conditions which must be reflected in the design.</td></tr><tr><td>SG2</td><td>Environment Permit Obtained</td><td>The environmental permit may include conditions which must be reflected in the design.</td></tr><tr><td>SG3</td><td>Completion of Hazops</td><td>An externally facilitated hazard and operability study will be held and will include recommendations that must be addressed in the design.</td></tr><tr><td>SG4</td><td>Long Lead Time Cost</td><td>The detailed design and initial results of</td></tr></table> | | | SG1 | Planning Permission Obtained | Planning permission may include conditions which must be reflected in the design. | SG2 | Environment Permit Obtained | The environmental permit may include conditions which must be reflected in the design. | SG3 | Completion of Hazops | An externally facilitated hazard and operability study will be held and will include recommendations that must be addressed in the design. | SG4 | Long Lead Time Cost | The detailed design and initial results of |
| SG1 | Planning Permission Obtained | Planning permission may include conditions which must be reflected in the design. | | | | | | | | | | | | | |
| SG2 | Environment Permit Obtained | The environmental permit may include conditions which must be reflected in the design. | | | | | | | | | | | | | |
| SG3 | Completion of Hazops | An externally facilitated hazard and operability study will be held and will include recommendations that must be addressed in the design. | | | | | | | | | | | | | |
| SG4 | Long Lead Time Cost | The detailed design and initial results of | | | | | | | | | | | | | |

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| | Plan Complete | the package procurement process will allow the cost plan to be updated to provide an improved estimate of Project cost. |
| SG5 | WID Compliance Plan Complete | The environment permit will include specific conditions on emissions to air that must be met. The Department for Transport requires a report explaining how the plant will meet those requirements. |
| SG6 | Final Cost Plan Complete | Further responses to the package procurement activity will allow a final estimate of project cost. |
| SG7 | Detailed GHG Analysis Complete | The Department for Transport require a report setting out the GHG saving of the fuel produced by the facility compared to fossil diesel. |

These SG's can be split into three groups.

Obtaining consents, completing the detailed design and addressing issues identified in the Hazop (SG1-3) will allow orders to be placed for detailed design work on long lead time equipment such as the gasifier, plasma converter, syngas compressor and methanation equipment. The planned expenditure to achieve SG1-3 is £1.5m and the target date for completion is April 2016.

The results of this detailed package design work will allow the overall design to be updated and a more accurate estimate of the total costs of the project (SG4). In addition, the DfT require a report at this stage explaining how the plant will meet Waste Incineration Directive (WID) requirements (SG5). Completion of SG4 and SG5 allows firm orders to be placed for long lead time items. The planned cumulative project expenditure to achieve SG4-5 is £3.1m (i.e. £1.6m additional expenditure from the previous stage gate) and the target date for completion is July 2016.

The final results of the plant procurement exercise and further updates to the design will result in the final project cost plan (SG6). The DfT also require a report setting out the GHG savings that will be achieved by the plant at this point (SG7). Completion of SG6 and SG7 allows orders to be placed for the balance of plant and for on-site construction to commence. The planned cumulative project expenditure to achieve SG6-7 is £4.7m (£1.6m incremental expenditure from SG5) and the target date for completion is September 2016.

A cumulative project expenditure at each Stage Gate will represent the fully committed cost of the Project.

The overall programme has been designed to enable the learning from the BioSNG Pilot Plant to continue to inform the design of the Commercial Demonstrator throughout the Project. For example, pilot plant results will be used to define the specification of the gas compositions at the battery limits of the methanation package expected to be provided by Amec Foster Wheeler. This is therefore an input to SG6.

Ultimately the success of the demonstration plant itself is a stage gate for investment in a full scale commercial plant.

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| | <p>The Project Plan has been developed by the Project Partners together with Otto Simon Ltd, a respected project delivery organisation. It has been reviewed comprehensively by Ricardo and E4Tech, respected engineering consultants. National Grid believes it offers a robust and cost effective route to delivering the Project.</p> |
| Attachments | |