NGN 2014/15 Network Innovation Competition
Optimising the Transportation of Shale and Other Unconventional Gases in the UK
ISP Questions – April 24th 2014

1. The Methods are not described clearly enough to allow us to assess the submission against the criteria set out in the governance document. Please provide further clarity on the Method(s).

   The project will be aimed at developing an economic model, a decision-tool, a simulation model and a UK framework for Shale Gas transportation. The project will therefore be focussed on generating and testing solutions to the problem of optimising the transportation of shale gas against a range of factors financial, economic, social and environmental.

   The project will consequently be based on activities focussed on generating and testing Solutions to the Problem and therefore classed as Development (TRL 4-6) under the categorisation set out within the NIC guidance document.

   The following activities will comprise the method:

   1. Develop & Agree Criterion and requirement for new processes and decision making: A comprehensive review of existing processes & protocols for connecting and transporting unconventional gas to the gas infrastructure and the economic and carbon impact of these processes. Agreement on key requirements/criterion for new processes and decision making.
   2. Development & modification of industry processes: Based on above develop requirements and criterion, modify or develop industry processes, practices and commercial arrangements. Commercial processes and industry protocols will be amended to manage the different points of gas intake which are likely in the new model. This amendment will analyse the impact of a change in gas intake from the NTS, resulting from connection of shale and other unconventional gas into the GDN.
   3. Development of model and prototype: Development of a prototype economic model and decision making tool which evaluates the various transportation and connection options and the economic impact of these options (Financial and Carbon footprint impacts).
   4. Demonstration and testing of the above processes, model and prototype: At this stage we will put the above processes, models and prototype to test through simulated industry scenarios. This stage will demonstrate both the processes and models developed but also the results of subjecting them to simulated industry scenarios. These results will be reviewed by industry participants to guide further refinement of the processes and models.

2. Please provide further information on how the project meets the innovative criterion (i) under the innovative and unproven business case section? Why, in the absence of this project, wouldn't distribution connection be possible?

The starting point for this project is not that without the development outlined within its scope that connection of shale gas would not be possible. Instead the project is aimed at addressing the problem that in the absence of detailed modelling and forward thinking, it is likely that the opportunities to identify most efficient combination of transportation and use of gas from the field presented by the large scale development of new sources of gas would be missed.

The proposed scope of this project includes a range of issues that have not previously been addressed due to the uncertainties surrounding the development of shale gas. To date development has focussed almost exclusively on the technical, legal and regulatory issues surrounding the extraction/production of shale gas. The issues surrounding the identification of the optimal use of current transportation networks and the efficient development of the new infrastructure have yet to be addressed.

The efficient development of unconventional gas has a key role to play in facilitating the UK's transition to a low carbon economy. The full 'business case' for the large scale of development of shale gas cannot be completed without this key issues surrounding efficient transportation being fully addressed.

The development of large scale unconventional sources of gas also presents opportunities to address a range of additional issues including:

- extending access to the wider energy market
- reducing fuel poverty
- facilitating connection of other low carbon sources of energy
- carbon reduction
- facilitating a transition to a low carbon economy

Including these additional factors within the consideration of how to optimise the development of the gas transportation network presents a new approach to addressing this issue which can deliver a range of wider benefits to the UK economy. The project will challenge and propose new and alternative commercial, technical and operational cross industry processes.

The benefits of this project if successful will accrue directly to users of the UK gas transportation networks and the wider economy. Without NIC funding to stimulate the development of solutions to the stated problems a project that attempts to consider a more holistic approach to development of new infrastructure will not be brought forward.

3. In the environmental benefits to consumers section (p4), you state that "moving consumers away from more carbon intensive heating fuel in non-gas areas will provide environmental benefits to consumers" and "the project could facilitate an opportunity for "off-grid" properties to gain connections to the gas network". Can you please elaborate on these points and explain how this would not currently be possible for off-grid consumers without this project?

The development of large scale sources of unconventional gas will require the development of new transportation infrastructure to facilitate the connection of the new production facilities and provision of a route to market. The development of the existing and new gas transportation infrastructure provides a significant opportunity to exploit both economies of scale and of scope to:

- Increase the capacity available for other alternative sources of gas (including low carbon sources of gas) to connect to the transportation network
- significantly reduce the unit cost of extending gas networks into non-gas areas
- reduce the costs of addressing fuel poverty through greater access to the gas networks

Taking advantage of these new opportunities will significantly increase the economic viability of extending these networks into these areas when compared to current arrangements. Schemes of this nature are currently not economically viable and the availability of transportation infrastructure in large geographical areas is constraining the development of these initiatives and are not taking place under current arrangements.

Communities that currently do not have access to gas will be using higher carbon intensive sources of energy, facing higher energy bills and experiencing a higher incidence of fuel poverty. Leveraging the economies of scale and scope presented by the development of new transportation infrastructure will provide benefits in each of these key areas that are not currently possible to achieve.

4. As you know, under the 'Project Partners and external resourcing/funding' criterion, you are required to provide evidence of the processes that have been followed and the rationale for selecting **BOTH** (i) **participants** and (ii) **ideas** for the project.

   NGN and its partners have been following the development of the debate surrounding unconventional sources of gas over a period of time and discussing potential connection opportunities for new sources of gas with new producers.

   It has become increasingly apparent over this time that through this time that the focus of the debate has lingered on issues surrounding production with limited consideration of the requirement of transportation infrastructure development with producers having limited information, knowledge or understanding of the potential options available to them for connection and transportation of their gas.

   With this in mind, over this period NGN have been formulating ideas and plans to address what we perceive to be the key issues and risk that the current position presents for the gas industry and the wider UK economy.

   NGN are currently working with Enzen on a number of projects across the business and they have been as the principal partner for this project based on a number of criteria:

- their experience and knowledge of the UK Gas sector
- well recognised credentials in this industry and a track record of project management and delivery of leading edge gas transportation systems and analysis tools
- their ability to bring in shale gas best practices from the United States with Performance Directional Services, LLC (PDS), an engineering services company in the oil and gas sector, and offering customized engineering solutions to elevate shale gas/oil and is part of the Enzen group.
- established links and effective partnerships with key UK universities in development of analysis techniques and tools.

In addition NGN are continuing to work on identifying additional partners have expertise in this subject area if the project and discussing with them their involvement in the project longer term.