nationalgrid

Airports Commission Isle of Grain Feasibility Study

National Grid Submission

Summary

- National Grid is grateful for the opportunity to have previously submitted to the Airports Commission regarding our Liquefied Natural Gas (LNG) facility on the Isle of Grain. Our previous submission focused on the infrastructure and operation at our site.

- This submission will focus on clarifying Grain LNG's vital contribution to the UK's energy security of supply, our future plans for the site and the major difficulties and risks that would need to be considered very carefully if National Grid's site was asked to be relocated or decommissioned to make way for an airport. National Grid has invested £1.1billion in our LNG site over the last decade with plans for significant further investment in the next five years.

- As we have previously stated, National Grid is neutral on aviation policy but want to make the Commission fully aware of the nationally important energy assets and infrastructure at the Isle of Grain so that this can be fully considered as part of the Commission's feasibility study.

- We continue to believe that the proposals being put forward for a Thames Hub Airport at the Grain peninsula are incompatible with co-existing alongside our energy infrastructure located at our Isle of Grain site due to the Health and Safety Executive guidelines.

- National Grid's major terminal and storage facility is a site of critical UK infrastructure, with the capacity to supply up to 20% of the UK's gas demand. **Due to its strategic importance for the UK's security of energy supply we would ask that the Airports Commission gives serious consideration to this as part of their feasibility study.**

- Due to the reliance on such a facility for security and diversity of energy supply, we do not believe that it would be a credible option to decommission Grain LNG facility altogether without finding alternative additional capacity. We believe that otherwise, the diversity of the UK's security of supply would be at risk and it would significantly impact upon the country's future ability to import gas. National Grid is not aware of an alternative suitable site in Great Britain that Grain LNG could be relocated to.

Energy Security

National Grid's Liquefied Natural Gas importation terminal is a site of strategic national importance to the UK.

It is a site of critical UK infrastructure, which has the capacity to supply up to 20% of the UK's gas demand, vital for keeping homes warm and lights on, making the facility a key asset for UK energy resilience.

We anticipate therefore that the development of an airport on the Isle of Grain would have a significant impact on UK energy security and diversity.

Grain is the largest of the three UK LNG importation terminals and is in fact the largest in Europe. It has the capacity to manage up to 14.8 million tonnes of LNG per annum and it provides strategic gas storage of one million cubic metres which is enough to serve 3,000,000 UK domestic properties- a city the size of London- for 2 months (based on average UK household gas consumption of 15,000kWh/year).

The site itself spans 600 acres and consists of an importation terminal, 8 LNG tanks, 14 LNG vaporisers, 12 boil off compressors as well as a range of other equipment designed to manage onshore importation and vaporisation. Our Phase 2 and 3 LNG storage tanks are each large enough to encompass London's Royal Albert Hall. We receive major LNG ships with LNG supplies from countries across the world including Qatar, Trinidad, Australia and Egypt.

One of the unique and important features of our current location is proximity to London and centres of demand, as well as access to an existing high pressure National Transmission System infrastructure. Customers of Grain LNG benefit from the site's location in the south east of the country as this requires them to pay lower transmission costs as there is a high gas demand for gas close to the entry point into the National Transmission System. This makes the Grain facility particularly attractive to international customers wishing to sell gas into a UK market.

The international energy market is already uncertain, with the UK having to compete in a global LNG market, losing the ability to import gas to National Grid's Grain LNG terminal would potentially impact on our ability to attract global customers. If the capacity and ability to import up to 20% of the UK's gas supply was lost this would have a negative impact on UK's diversity and security of supply.

The United Kingdom is currently one the largest LNG markets in Europe. We anticipate that LNG will continue to be extremely important for the foreseeable future. The UK was self-sufficient in gas in 2000 but by 2011 over half our gas was imported, and in National Grid's Future Energy Scenarios imports are expected to remain close to this level through the next decade, rising to around 80% by 2030 in our Gone Green scenario[1].

National Grid's Grain LNG facility currently has long-term contracts in place with customers to import LNG up to 2029/2030. Our customers for Phase 1 (2005) are BP/Sonatrach, for Phase 2 (2008) Centrica, GDF Suez and Sonatrach and for Phase 3 (2010) Centrica, E.ON and Iberdrola.

With the recent focus on security of gas supply caused by uncertainty in Europe, looking ahead it will be even more important that the UK retains its ability to bring gas into the market via a variety of routes including via National Grid's LNG terminal to ensure a diverse and secure energy supply.

We would recommend to the Airports Commission that serious consideration is given to the strategic importance of Grain LNG and its contribution to UK resilience and security of energy supply as part of your feasibility study for airport proposals on the Isle of Grain.

[1] http://www.nationalgrid.com/NR/rdonlyres/A3A03257-3CCC-40DD-99C8-500A149D997D/61591/UKFES2013FINAL1.pdf

We believe that it would not be a credible option to decommission the Grain LNG facility altogether without finding additional capacity. Due to the reliance on this facility and its ability to provide up to 20% of gas demand, the UK's diversity of energy security would potentially be at risk, and it would significantly impact upon the country's future ability to import gas.

Future Plans

National Grid has invested £1.1 billion in our LNG site over the last decade with plans for significant further investment in the next five years.

National Grid's LNG facility currently has long-term contacts in place with customers to import LNG up to 2029/2030. If we received signals from the market for demand beyond these customer contracts, there is potential for some of the newer assets of Phase 2 which began operation in 2008, and Phase 3, 2010, both of which equate to 80% of the site throughput, to be refurbished to operate considerably beyond 2030, alongside our proposed Phase 4 development.

Our plans for the next expansion phase are already well-advanced. We expect market appetite to develop a fourth phase at the Isle of Grain, increasing capacity to more than 25% of UK gas demand.

We expect that as demand for gas rises we anticipate that our current contracts with global customers to supply 350 BCM to will increase to secure a further 175 BCM of gas. National Grid already has planning permission and consents from the regulator to proceed with Phase 4. Other new market opportunities that are currently being considered are bulk re-loading, small scale LNG, trucked LNG and strategic storage.

Please see Appendix 1 and 2 for additional information. Appendix 1 shows in blue all the existing assets which became operational in phases from 2005 to 2010 and in green the assets which have planning permission and are being developed. This includes the second pipeline to transfer LNG from the jetties to the storage tanks, which is almost complete; the Road Tanker Loading Facility on which construction is programmed to start mid 2014; and the additional Phase 4 storage tank which is planned to be available to international customers from 2018. Appendix 2 shows in yellow the expansion plans for the site and includes a number of projects that are being discussed with the worldwide LNG market. They would bring both security of energy supply and commercial advantages to the UK.

Investment in infrastructure

National Grid has invested £1.1 billion in our LNG site over the last decade and we estimate that in the unlikely event that an alternative location could be found, then the rebuild costs of relocating our facility and connection to the National Transmission System would cost significantly more than this figure and would likely take 10 years to replicate.

The construction of the tanks are a major civil engineering project alone that would take approximately 40 months each to build, but this timeframe would be even longer if the planning consent process was factored in. The materials and specialist technologies required for the construction of LNG tanks are becoming increasingly expensive due to the pressures from the worldwide demand for LNG. The sourcing of the right people with the necessary expertise and engineering, construction and operational skills for an LNG facility would also need to be factored in.

Due to the specific requirements of the Isle of Grain LNG facility, we believe it would be extremely difficult to relocate this infrastructure. If a decision was taken to locate an airport on the Isle of Grain and there was a requirement that the critical infrastructure at Grain LNG must be relocated, then there are a number of considerations that must be taken into account.

In the late 1990's the Transco LNG Storage business identified that the UK was undergoing a rapid change in its gas supply and that the dynamics of the UK gas market would change considerably over the next decade as demand for natural gas increases and indigenous production declined. The UK would no longer be self-sufficient in natural gas and did not have any import facilities for LNG shipments and that the presence of an LNG import terminal would enhance the diversity of supply of gas into the UK.

At this time the Transco LNG Storage undertook a detailed assessment of specific locational requirements for a large LNG import facility and the Isle of Grain plant was determined as the most appropriate site for a number of reasons:

- 200,000m^3 of storage which was comparable in scale to many of the world's import terminals at that time, with space to expand and develop additional storage.
- British Gas (the predecessor parent company of Transco LNG) owned the land surrounding the plant
- Design work already undertaken to develop an LNG import terminal on this site
- Ideal location as the site is remote but within 50km of London so less distance and cost to transport gas to consumers
- Natural deep water berth and Port Authority experienced with managing large vessels
- Existing high pressure connection into the UK's gas transportation system

Other factors that were required in the siting of Grain LNG which make it an ideal location for importation and storage are:

A deep water, sheltered berth

- Navigable depths of a minimum of 13 -15 metres
- Channel width of five times the width of the ship (approximately 280 metres)
- Turning areas with a minimum diameter of two to three times the ships length (approximately 690 to 1035 metres)
- Sheltered from excessive wave forces
- Sufficient length so the distance between the outermost mooring dolphins is greater than the ships length (approximately 345 metres). The two jetties at Grain occupy a total water frontage of 788 metres.

- Space for other passing ships and the implementation of a traffic separation scheme on approach routes for many miles.
- Anchorage facilities at the port entrance and inshore for the safe segregation of LNG carriers and to provide lay-by facilities in case at the last minute the berth is unavailable.

Location and land

- Low centre of population with a limited number of neighbours. Consultation zones are set by the Health and Safety Executive. This would be considered in applying for a Hazardous Substance Consent for a new LNG importation terminal.
- Minimum available land area. The Grain LNG terminal spans 600 acres.
- Land should be next to the deep water berth or additional suitable land will be required to construct an above ground LNG importation pipeline.
- The ability to expand on the same site to create more capacity for importation of gas into the UK energy market.

Connection to the National Transmission System

- Ensuring access to the National Transmission System (NTS) would need to be taken into account to avoid major, long-term and costly connection work.
- If the facility were to be located further away from centres of energy demand- such as London and the South East- and the NTS, some of our customers would be likely to bear higher charges in order to send out and receive their gas via the NTS. They would also potentially bear a share of the cost of any new high pressure transmission pipeline that may need to be commissioned. We believe that this would be an incredibly unattractive proposition for our customers. NTS Shippers have booked Long Term NTS Entry Capacity at Isle of Grain so this would need further consideration.

We are not aware of another such suitable site is available in the UK which meets all of these requirements. As such, we believe it would be extremely difficult to relocate our existing LNG facility at the Isle of Grain.

BritNed Interconnector

At the Isle of Grain we also have the landing point for the BritNed electricity interconnector that provides a link between England and the Netherlands.

Interconnection has many benefits to security of supply, economic operation and the integration of intermittent renewable generation on the system. Increased interconnectivity between European regions is essential for connecting the areas of high renewable electricity generation capability to the areas of demand and facilitating the management of generation variability. As the UK strives to deliver a low carbon economy interconnectors will play a key role in balancing offshore and onshore wind farms.

If a decision was taken to locate an airport on the Isle of Grain and there was a requirement that key electricity energy infrastructure which links the UK with the Netherlands must be relocated there are a number of considerations that must be taken into account.

- It is anticipated the lead time for the build of a brand new convertor station for BritNed would be around five years to allow for planning, tendering, procurement and construction.
- A site for a brand new convertor would need to be found near to the existing one to avoid the need to relay the entire length of 260km subsea cable. The current location was chosen for its access to the 400kV electricity transmission network as well as the cable route length between UK and the Netherlands being kept as short as practicable. It is envisaged that a short section would be laid from the new converter station and joined to the existing cable. However, this would involve the interconnector being unavailable for a minimum of 3 to 6 months while this work was undertaken. In addition the site would need to have the ability to connect into the National Grid 400 kV transmission system.

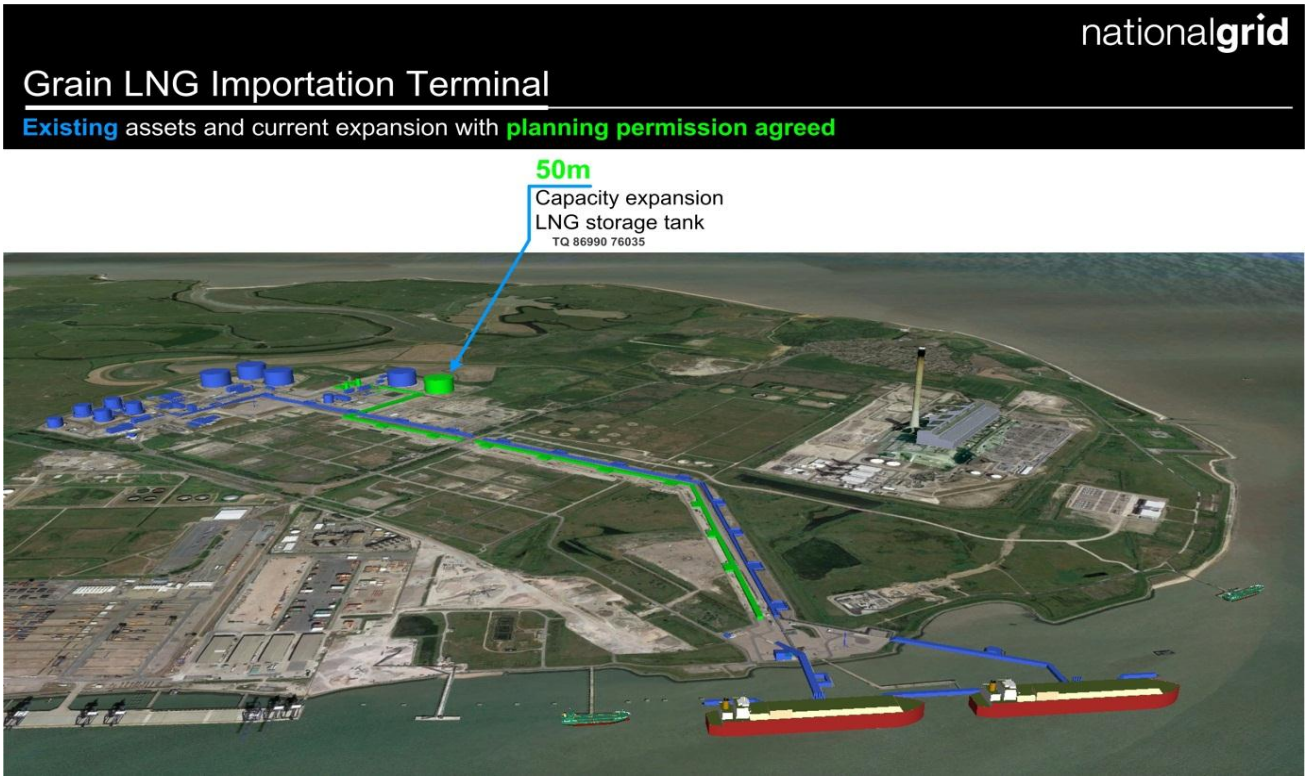
  Depending on the land take needed, and subject to a number of requirements including a review of site security, the convertor station for the BritNed interconnector may potentially be able to co-exist alongside an airport at the Isle of Grain.

About National Grid

- National Grid owns and manages the grids to which many different energy sources are connected. We manage the electricity and gas transmission system in the UK and gas distribution in some parts of England, delivering gas to 11 million homes, businesses and schools. That puts us at a vital position at the centre of the energy system. We connect everything up.
- We are at the heart of one of the greatest challenges facing our society; supporting the creation of new sustainable energy solutions for the future and developing an energy system that can underpin our economic prosperity in the 21st century. We are committed to providing and protecting secure, affordable and low-carbon energy for future generations.
- In the course of the next decade over £110 billion of investment will be made across the energy sector. National Grid will play a key role in delivering new transmission infrastructure and we are making significant investments in infrastructure across our networks – keeping the lights on and gas flowing.

Appendix

Appendix 1- Existing assets at Grain LNG Importation Terminal and current expansion with planning permission agreed



Appendix 2- Future developments at Grain LNG Importation Terminal