

Importation agility in an evolving market

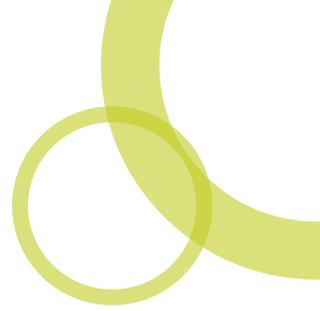
May 2019

nationalgrid

GrainLNG

Terminal of choice

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What we will cover

1. Grain LNG overview
2. An operational overview of the last 24 months
3. A run down of some of the challenges the market dynamics mean for LNG regas terminals
4. What this means for our business into the future

Grain LNG overview

Grain LNG Importation Terminal is the largest re-gasification terminal in Europe

The only terminal in the UK able to process the full global range of LNG

An Independent Operator with 6 international long term capacity holders:



centrica

bp



Fast, flexible, reliable

ability to swing from min to max within day

644 GWh/d capacity

~ 25% of UK's gas demand

1,000,000m³
of LNG storage

Independent operator

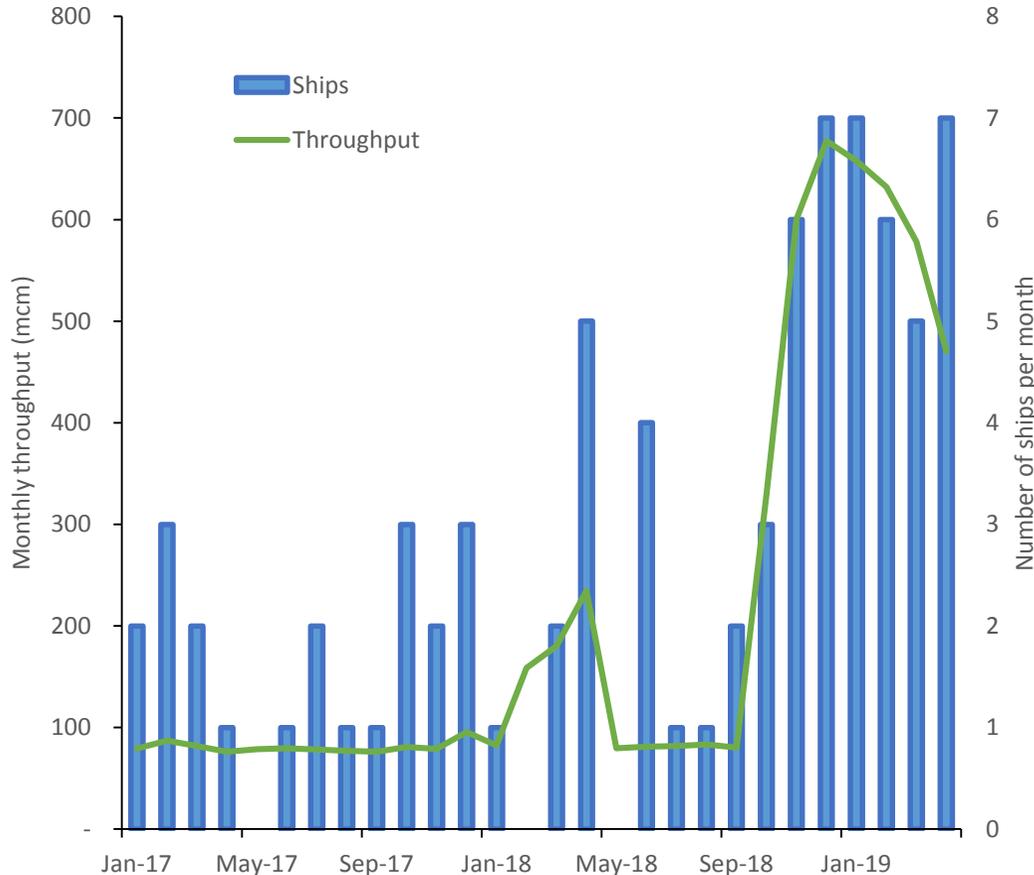
Multiple jetties

Operational overview of last 12 months

Significant change in utilisation seen in last 6 months as LNG supplies diverted to Europe



Grain LNG Throughput

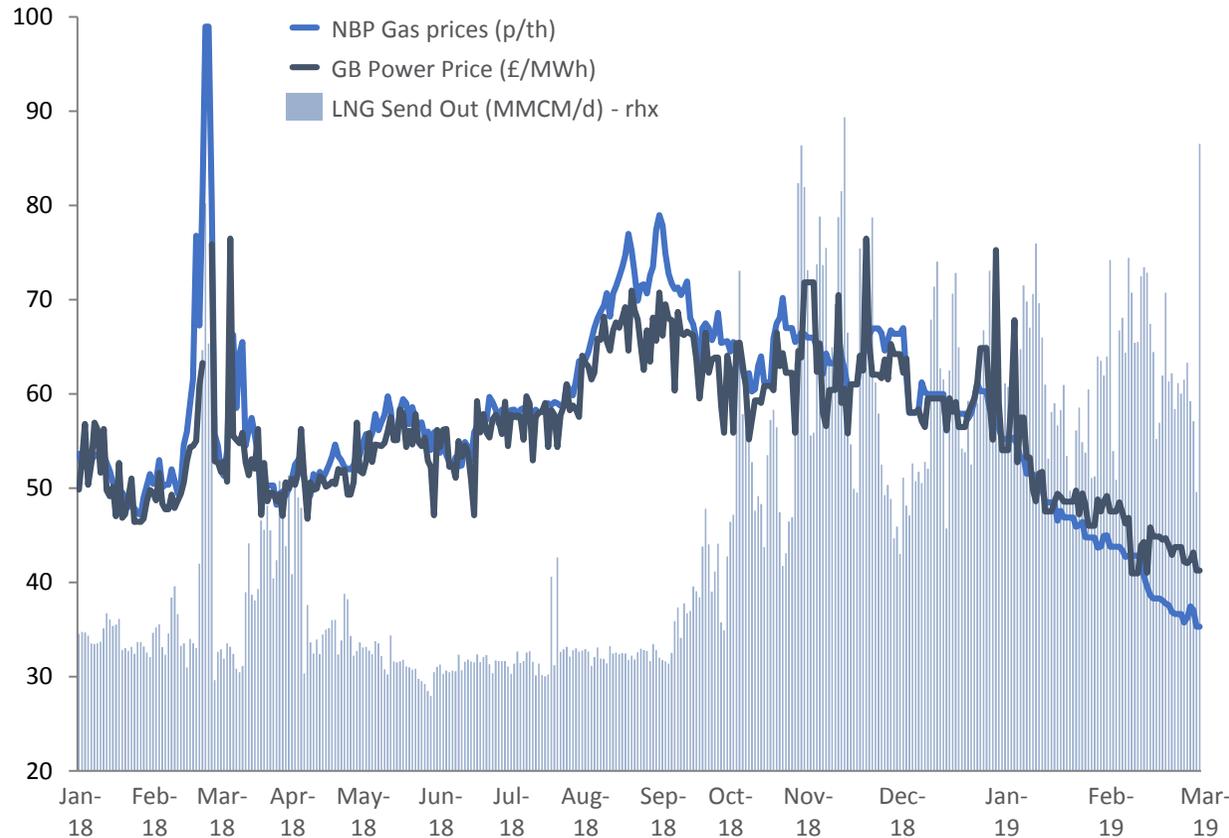


Source: Terminal data / Argus

- Utilisation change of 32.1% seen between summer and winter of 2018, ending a 3 year period of sustained minimum delivery
- Utilisation levels in winter 2018 not seen since 2012
- Total vessels seen in preceding 6 month period is 36 vessels rivalling our annual record of 66 vessels
- Total of 9 different cargo origins seen in Q1 2019

What has been the impact of increased supply?

Strong correlation between LNG sendout increase and lower gas and power prices

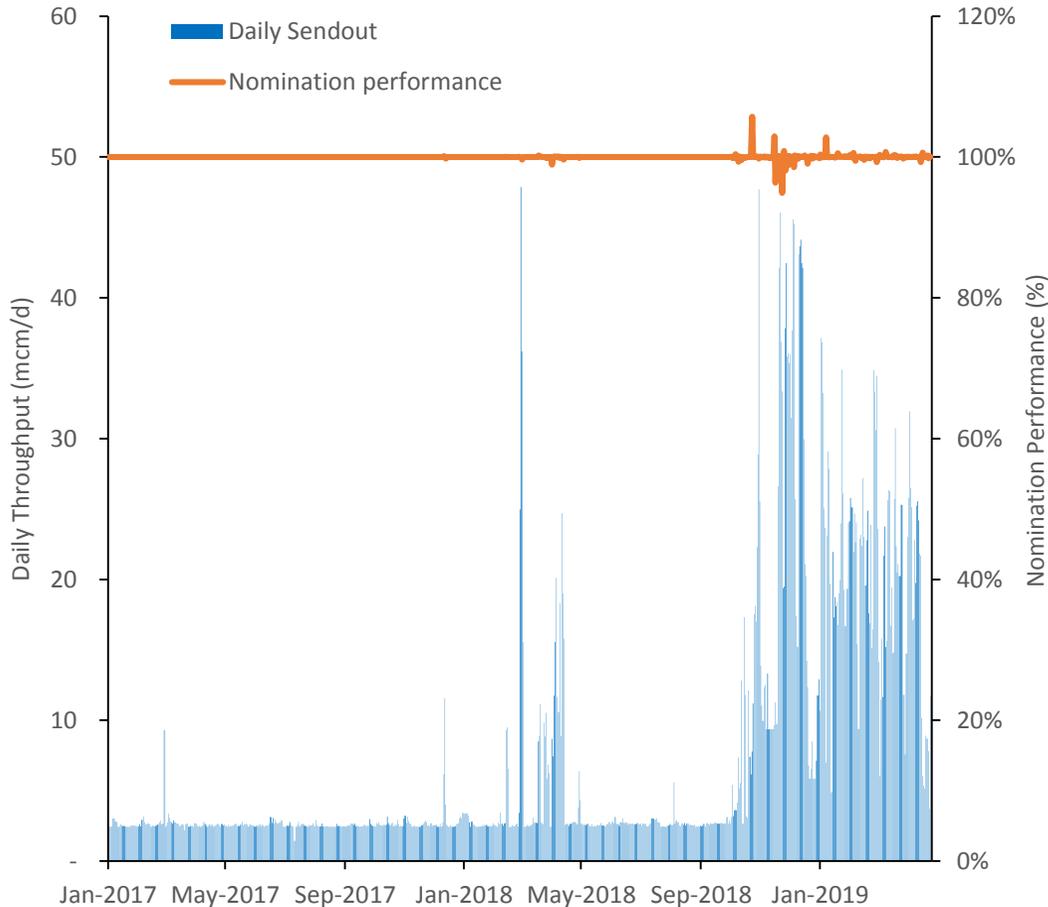


Source: ENTSOG / S&P Platts

- Gas prices have halved since a September peak of 80 p/th
- Summer 2019 prices dropped by 40% from mid Oct to March 29th (last trading day)
- Power prices have also reduced due to the high gas share in the generation mix

A heightened activity of throughput

Increased utilisation still has high day to day variability in nominations



Source: Terminal data

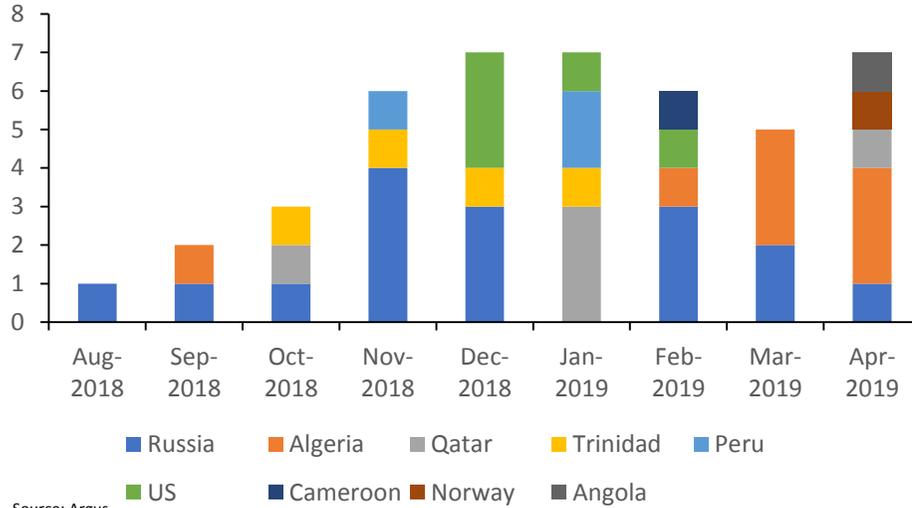
- Biggest daily change of 300 GWh/d*, and up to 6 nomination changes within day** in the last half year
- Average nomination performance for winter 2018 between 99.85% and 100.15%
- Operational readiness through use of plant simulator for shift training and emergency response
- Extensive storage with flexibility for customers to remain responsive to pricing signals and swing nomination profiles
- Two network entries meaning low minimum delivery levels achievable

* Seen on the 10th December 2019

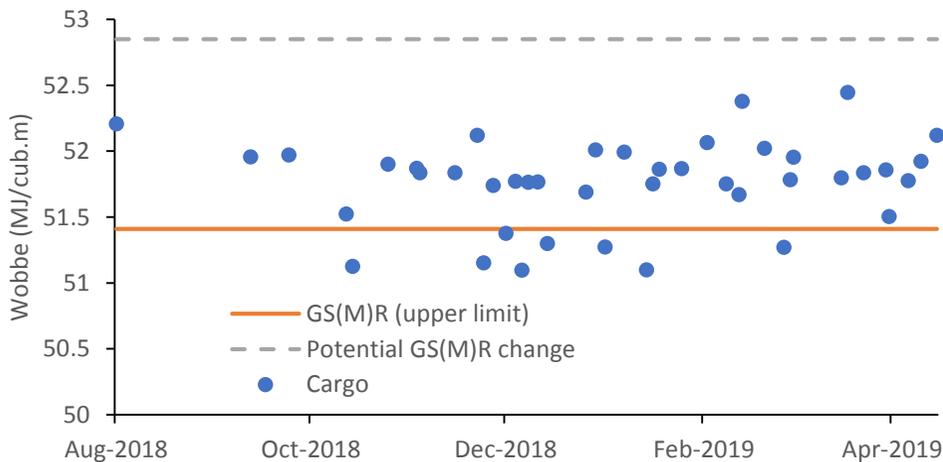
** Seen on the 9th October 2018

Variability of shipping and load ports

Increased activity brings different load ports and therefore different LNG quality



Source: Argus

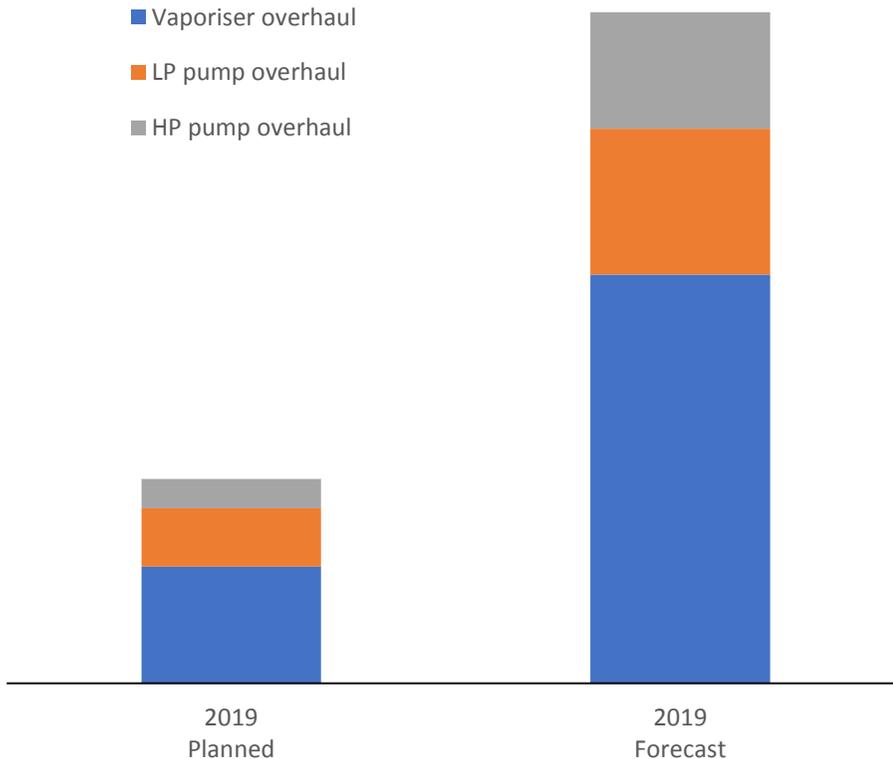


- Variability of load ports brings quality variation which needs to be managed to GS(M)R by blending with nitrogen
- Congestion management eased by having two operational jetties and ability to manage all vessels up to Q-Max size
- New ships to the terminal bring new crews and continued requirement for alignment of operational interfaces

Source: Terminal data

Plant operation and maintenance

Sustained utilisation has put pressure on the asset maintenance strategy



Source: Terminal data

- Transition during minimum delivery operation to refocus maintenance strategy and approach:
 - Jobs brought in house and consolidated
 - Move away from time based maintenance to condition based and hours run maintenance
- Strategy proved good during 'Beast from the East' event in 2018.
- However, sustained utilisation through winter of 2018 has meant:
 - Forecast maintenance plan significantly different to planned due to hours run
 - Internal resources tied up on ship traffic and the need to flex service contracts

Evolving service offering

Market evolution brings demand from customers for new services in addition to core offering

REGASIFICATION

- Primary service & main revenue generator
- Capacity is sold 'bundled' & consists of berthing slots, storage & regasification capacity
- Highly flexible service – customers control storage and send out (within operational parameters)

LARGE SCALE RELOADS

- New service introduced in 2015
- Allows capacity customers to reload their LNG & move to higher priced market
- Provides enhanced flexibility and optimisation opportunities

TRUCK LOADING

- Launched late 2015
- Allows capacity holders to sell their LNG to new markets
- Grain charges a slot fee for each loading operation
- Has introduced new customers to Grain – Road Tanker Operators

BREAK BULK MARINE (2021/22)

- New service planned for 2021/22
- Cater for smaller ships from 1,000m³ up to 20,000m³
- Provides further opportunities for our capacity holders to sell their LNG

TRANSHIPMENT

- New service being developed
- Accommodate changing market demand for transhipment
- Provides opportunity for boil off gas to be monetised for customers

GLNG open for business

Capacity opportunity from 2025

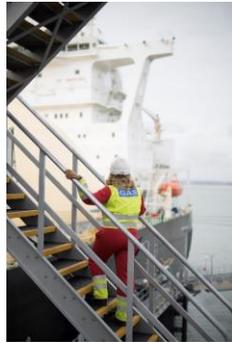
Existing + new build

- Subject to interest, Grain is able to offer the following capacity to the market by 2025:
 - Up to 350 GWh/d redelivery capacity (approx 8.3mtpa LNG)
 - 390,000m³ tank space
 - 100+ berthing slots
- The capacity offered is a combination of existing capacity and new build:
 - Grain's Phase 1 contracts come to an end in 2025 and the capacity will be re-offered to the market
 - In addition, Grain has planning permission to build an additional tank
 - This element of the offering could be completed earlier than 2025 if required

Benefits

- Opportunity to offer cost effective capacity to the market
- Use of existing assets will significantly lower the cost
- At least 140 GWh/d of associated pipeline (NTS) capacity already in existence:
 - Some reinforcement of the pipeline may be necessary dependent on amount of redelivery capacity sold
- Phase 1 capacity already exists – minimising risk of delays or performance issues
- Potential to develop capacity contracts that meet market requirements (e.g. shorter term commitments)
- Enhanced services could be offered via optimisation of existing assets, e.g:
 - Faster unloading/reloading rates
 - Additional delivery capacity

Questions



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