



Tech Talk: The trade in LNG

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Just before the Christmas break the United Kingdom was going through some concerns over natural gas supply. Stored gas levels were falling and the National Grid posted a “[Gas Balancing Alert](#)” for only the second time since they were instituted. But there is no more urgent talk of such a problem – what happened?

Well the answer is that rescue, in the form of Liquefied Natural Gas (LNG) tankers came trundling over the horizon. Just this week the UK opened [an expansion](#) of the terminal at the [Isle of Grain](#) that can now accommodate larger tankers, at the rate of 5 a week. LNG from the tankers to this terminal can now supply [up to 20% of the national need](#) for gas. But that is a little late for the past crisis (due to scheduling problems the first tanker won't dock until next week) so where did the LNG come from, and where did it go ashore?

LNG tankers arriving at the Island of Grains and at the LNG terminals at [Dragon](#) and [South Hook](#) fed additional supplies into the grid.

Flows of LNG were at a total 100 million cu m/d Tuesday after South Hook ramped up 10 million cu m/d to 55 million cu m/d, Dragon was at 15 million cu m/d and Isle of Grain contributed 30 million cu m/d to the system. That is a total increase of 25 million cu m/d on levels Monday. LNG is also going to be backed up by fresh deliveries in the next week, with UK port data showing three fresh LNG cargoes expected to berth at South Hook from Qatar in the next week, including the Umm Al Amad expected sometime Tuesday, the Mozah on December 23 and the Aamira on Boxing Day.

(The UK used [468 million cu.m.](#) on Monday Dec 20th).

There is a growing global trade in LNG, and while most of this is committed to long-term contracts there is sufficient flexibility in the system so that when, unexpectedly, a nation may run short or [a strike close a port](#), a tanker may be diverted. The South Hook terminal is 67.5% owned by [Qatar Petroleum](#), and is part of a supply net that takes LNG from the Qatargas 2 train, and sends it to the Welsh terminal where it is re-gasified and fed into the National Grid. Dragon, which is also at Milford Haven, is a smaller terminal, and came on line in [August 2009](#). The term “train” is used to describe a single processing line that produces LNG within an overall plant. Thus, for example, when BP expands its facility in Indonesia, the new plant will be called Train 2, to distinguish it from the existing line, which is [train 1](#).



LNG tanker at the [Dragon terminal](#)

Once natural gas is produced from a well it must [first be processed](#), and the [non-gas liquids](#) (NGLs) as well as water, carbon dioxide, and other contaminants removed so that a dry commercial gas can be sent on. Where the customer is not easily served by a pipeline (such as the case with gas from Qatar being supplied to the UK), the only viable option is to send the gas by ship. Given, however, that gas in its natural state is of low density, it is most practical to cool the gas down to the point where it liquefies. By lowering the temperature to -260 degF the gas turns into a liquid, and occupies [1/610th of the volume](#). This makes it much easier to store and transport, though it requires that the liquid be kept at that low temperature for the duration of the voyage.

Because the process involves three steps, liquefying the gas, transporting it in special tankers, and then feeding it through a re-gasification plant into a distribution network, the investment in each requires some assurance of a pre-existing market and agreement between the parties before the investments are made. Thus, for example, NTPC in India is now negotiating with Qatar on the supply of LNG in the future as insurance that, when a pipeline is laid from the [re-gasification plant at Kochi](#) to power plants at Kayamkulam, that a supply will be available for it. As with the Welsh plant, this can, to a degree, be assured by having [Qatar as one of the partners](#) in the project.

The parties likely agree, when making such a deal, to a fixed-price over a considerable time frame. South Korea, for example, is paying [roughly \\$10 per kcf](#), somewhat above the current rate, but it will have that price for 20-years. Such an agreement may, however, make it difficult for the buyer to initially find customers in the years when that is a high price, [as CNOOC found](#).

Qatar is the largest producer of LNG, having just announced a capacity for delivering [77 million tonnes](#) of the liquid a year, which it currently delivers to 23 countries. This trade has grown from nothing to its current level in 14 years, with production centered around the port of Ras Laffan. (A tonne of LNG converts into 1,460 cu m of NG, or 51,600 cu. ft).

There are seven separate plants (trains) at Ras Laffan with the last having come on stream [last February](#).

Ras Laffan 3 Train 7 is the fourth 7.8 million tons per year LNG plant brought online by

Qatar Petroleum and ExxonMobil joint ventures within the past 12 months. It matches the capacity of Ras Laffan 3 Train 6, one of the largest operating LNG production facilities in the world, inaugurated in October 2009. These mega facilities have sufficient scale to competitively reach markets around the globe. Qatar's giant North Field, which is estimated to contain in excess of 900 trillion cubic feet of natural gas, will supply both trains.

Once the gas is liquefied it is transferred to one of a fleet of ships. The earlier ones had the characteristic spheres on board, as shown above, and, for example, Train 1 at Qatar uses a fleet of 10 of these to carry LNG to Japan, with a round trip [taking a month](#). The [more recent fleet](#) is 80% larger and more efficient, this 32-vessel fleet carries LNG from Qatar trains 2, 3 and 4.

While there has been a growing market for LNG around the world, and re-gasification plants, such as those in Wales, are being developed in many countries (note the 23 countries that are customers to Qatar) the availability of LNG, with new facilities being planned in countries [such as Australia](#) likely means that there will be a continued relatively cheap supply available for a number of years. The consequences to the profitability of domestic production, such as shale gas in the USA, may become more questionable as a result.



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