Japanese market liberalization to impact LNG trade

Special report
April 2017
For over two decades Japanese power and gas liberalization programs have promised much, but delivered little – not so now. Larger, integrated players are expected to emerge, wielding substantial power when negotiating LNG supply deals. They will demand much greater external flexibility in order to succeed in their newly competitive domestic markets. Japan accounts for just over a third of all LNG imports worldwide, so this promises change not just at home, but for the global LNG market as a whole.

Full liberalization of the Japanese electricity retail market will be a year old April 1, at which point full liberalization of the gas retail market will also come into force. That real change is occurring now is a legacy of the 2011 Fukushima nuclear disaster, which altered both government and popular attitudes towards the gas and power sectors.

Japan was forced to substitute lost nuclear output with LNG bought at high prices in a tightening market, but its use proved far less than optimal because of inefficiencies in the country’s gas and electricity transmission systems, which were organized on a regional basis, dominated by local monopolies.

The ability of the ten vertically-integrated electric power companies (EPCOs) to respond to the crisis was undermined by the lack of an effective national transmission system, with limited connections between the regions served by the different companies. A notable shortcoming was the meager 1.2 GW of frequency conversion capacity linking the 60 Hz western and 50 Hz eastern transmission systems, which contain 160 GW and 130 GW of generating capacity, respectively.

To address these issues, the Organization for Cross-regional Coordination of Transmission Operators (OCCTO) was created to centrally coordinate electricity sector planning. Its remit includes ensuring adequate cross-regional transmission capacity and, if necessary, bidding out any new generation plant needed to maintain security of supply. In addition, the Electricity and Gas Market Surveillance Commission was set up under the Ministry of Economy, Trade and Industry (METI) in September 2015 to regulate the electricity sector and then subsequently the gas sector.

As a result, Japan’s traditional self-regulation has become a thing of the past.

Fukushima also caused rapidly rising energy prices. Average residential prices rose 27% and industrial prices 37.4% between 2010 and 2015. The additional cost of LNG, coal, and oil needed to compensate for the lack of nuclear output was largely passed through to customers, as were the burgeoning costs of the very generous Feed-in Tariffs offered for renewable energy projects, especially solar PV. This served not only to renew the government’s commitment to liberalize the country’s energy retail markets, but created greater consumer support for the policy.

Government determination

At the government level, there now appears to be a much greater determination to push liberalization through, with less emphasis than in the past on seeking consensus with the EPCOs and relying on them to implement reforms on a voluntary basis. In this respect, the 2011 crisis was a wake-up call.

Many potential new entrants to the market in the 2000s, such as some of the local trading houses, were diffident about entering, if it meant sacrificing longstanding relationships with the EPCOs, while the EPCOs themselves were reluctant to cross regional supply boundaries and compete with each other. Moreover, those new players who did enter the market in the 2000s were hamstrung by factors including a lack of access to generating plant and fuels, or other sources of power.

The Japan Electric Power Exchange was established in 2003 to help remedy the problem, but the voluntary private exchange has to date played only a marginal role in the market, accounting for just 0.8% of total retail market sales in 2011, with the figure rising to 1.8% in 2015.

However, many of these cultural and economic obstacles to market entry have been reduced, with new entrants now often acting through joint ventures that bring together complementary assets and expertise such as fuel supply, trading knowledge or customer bases.

For instance, Marubeni Power Retail agreed in late 2015 to tie up with the LPG supplier Eneos and, in early 2017, with the internet company Rakuten. In 2016, Marubeni, which started retailing power to large users in the early 2000s, owned about 470 MW of private generating capacity in Japan and has said that it is targeting a 5% retail market share by 2020.

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GROSS LNG VOLUMES CONTRACTED TO JAPAN*

<table>
<thead>
<tr>
<th>Year</th>
<th>USA</th>
<th>Russia</th>
<th>Qatar</th>
<th>Portfolio</th>
<th>Papua New Guinea</th>
<th>Abu Dhabi</th>
<th>Oman</th>
<th>Japan</th>
<th>Indonesia</th>
<th>Brunei</th>
<th>Malaysia</th>
<th>Australia</th>
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<td>20</td>
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<td>5</td>
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<tr>
<td>2012</td>
<td>70</td>
<td>25</td>
<td>12</td>
<td>6</td>
<td>4</td>
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<td>2</td>
<td>0</td>
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<td>8</td>
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<td>4</td>
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<td></td>
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<tr>
<td>2016</td>
<td>90</td>
<td>35</td>
<td>18</td>
<td>10</td>
<td>6</td>
<td>5</td>
<td>4</td>
<td>0</td>
<td>0</td>
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<tr>
<td>2018</td>
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<td>20</td>
<td>12</td>
<td>7</td>
<td>6</td>
<td>5</td>
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<td>14</td>
<td>8</td>
<td>7</td>
<td>6</td>
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</tbody>
</table>

*Data does not net out volumes sold to non-Japanese counterparts
Source: Platts Analytics’ Eclipse Energy
Meanwhile, Tokyo Gas, which has already secured over 0.6 million electricity customers, is targeting 2.2 million by 2020. This would equate to about 10% of the Tokyo Electric Power Company's (TEPCO) customer base at April 2016.

**Market cross-over**

One reason why gas companies are keen to enter the electricity market is the threat to their own core business, following full deregulation of the Yen 2.4 trillion ($21.3 billion) retail gas market from April 1 this year. This is the last stage in a process which saw medium to large gas users – accounting for 63% of total gas sales – becoming contestable in four separate tranches between 1995 and 2007.

Switching suppliers in the gas market has been more extensive than in retail electricity markets (see Box). In March 2010, some 13.5% of retail gas was supplied by new entrants. The figure fell to 11.7% in the financial year ending March 2015, but this reflected the much increased gas use for electricity generation over the intervening period, rather than a fall in absolute sales.

Entrants into the market have included upstream oil and gas companies and oil refiners, who are expected to increase their activities with full retail liberalization. But much of the competition to the 206 incumbent gas suppliers will come from the EPCOs, especially those with their own LNG importing facilities. Notably, TEPCO has tied up with the Nippon Gas Company to target the liberalized gas market from July 2017.

Tepco has already supplanted Tokyo Gas as the supplier of 0.275 million mt/year of LNG to Nippon Gas for its existing 0.32 million gas customers. Following deregulation, Nippon Gas is reported to be planning a 10% price cut to win some 0.18 million Tokyo Gas customers by April 2018 and is targeting a total of 1 million retail gas customers by April 2020.

**Internal impact – industry consolidation**

The fact that much of the activity involves former gas and electric monopolies operating in the same region is hardly surprising, given the potential for leveraging existing customer bases. It also reflects the fact that, as with the EPCOs, links between the gas utilities’ transmission systems are limited and incomplete, with significant gaps in Japan's gas pipeline infrastructure.

There is strong government pressure to fill the gaps and create a countrywide pipeline system that can facilitate the development of a national gas market. There is also the expectation that this will accelerate consolidation in the industry, with Tokyo Gas among the companies anticipating that a small number of very large integrated gas, electricity and fuel procurement and supply businesses will emerge from the process.

This is not to say that the former gas and power monopolies will be replaced by integrated energy monopolies. The government has mandated at least internal separation of companies’ natural monopoly activities such as transmission from their competitive procurement, production and retailing operations – by 2020 for power and 2022 for gas. But the process is likely to result in a much smaller number of more substantial players.

Retail market liberalization is in itself unlikely to have a significant impact on national power and gas demand growth or lead to changes in fuel shares, but it will reinforce other trends favoring flexibility of supply and new procurement models. The liberalization of the gas and power retail markets could see the emergence of a much smaller group of very large Japanese LNG buyers and traders, who would exercise considerable sway in the international market.

**External impacts – new pricing power**

Securing additional LNG should not prove difficult over the next few years if forecasts that global LNG capacity will outstrip demand growth from 2017 to about 2022 prove accurate. The volume of LNG in contracts already signed by Japanese importers may in any case outweigh extra demand over the period, since contracted volumes are projected to continue rising until 2020.
Beyond that, the locked-in volumes will fall as contracts for over 30 million mt/year of LNG expire between 2020 and 2025. At that stage the key issues will include not only securing new supplies, but securing them with the new price and delivery terms that the importers and METI are seeking. In contrast to being a monopoly able to pass on higher fuel costs without challenge, competition for gas customers in the domestic market puts pressure on importers to seek more flexible supply options and pricing.

Japanese LNG has traditionally been bought under long-term take-or-pay contracts linked on a lagged basis to oil prices through the Japan Customs-cleared Crude price (JCC), and with strict destination clauses that prevent its onward sale. However, the country’s importers and METI have become increasingly dissatisfied with these rigid arrangements, which helped push the cost of the 85 million mt or so of LNG imported in 2015 to almost $47 billion.

The position is changing. Post-2011, Japan bought large quantities of LNG on a spot basis, while recent purchases of US shale gas-based LNG include more flexible and market-reflective pricing, volume and delivery terms.

Meanwhile, destination clauses are under threat from a different direction. The Japan Fair Trade Commission has launched an investigation into whether the clauses violate Japanese competition law. If the Commission formally objects to the arrangements, the renegotiation of existing contracts may be required.

At the same time, METI is pushing for enhanced LNG price discovery and the development of an LNG trading hub in Japan. These moves dovetail with its push to develop a fully interconnected national gas transmission system and secure improved third-party access to LNG terminals at home.

Low growth prospects

One of the key issues facing the Japanese electricity business is the very limited potential for growth in demand. That, in turn, will have an impact on gas demand since the electricity sector accounts for up to 70% of total gas use.

The limited growth in electricity demand is expected to result from factors including a mature economy, declining population and emphasis on energy conservation, with per capita electricity demand having dropped from 8.4 MWh in 2007 to 7.6 MWh in 2014. In 2015, electricity generation totaled 1,009 TWh, down from the peak of 1,153 TWh in 2007, and, in financial year 2030, it is officially projected to reach only 1,065 TWh.

Within what is pretty much a zero sum game, the future consumption of fossil fuels, and especially LNG, will thus depend on what happens to currently shuttered nuclear

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**Switching in Japan’s liberalized retail electricity sector**

April 1 marks the first anniversary of the full liberalization of Japan’s retail electricity market. By February, more than 2.57 million customers had switched provider according to the Organization for Cross-regional Coordination of Transmission Operators, the state agency set up in April 2015, which collates the statistics.

The switchers represent 4.1% of the customers of the ten vertically-integrated electric power companies (EPCOs), which formerly operated as regional monopolies. By far the largest number who changed supplier – 1.44 million – were previously served by the Tokyo Electric Power Company. TEPCO also lost the largest share of its customer base – 6.3% – of any of the EPCOs.

Customers are now being wooed by a large number of retail electricity suppliers. Some 400 are listed by the Agency for Natural Resources and Energy, which comes under the Ministry of Economy, Trade and Industry (METI).

While not all are active, they comprise a wide range of businesses, which often operate through joint ventures and include telecommunications, cable and internet companies, general retailers, trading houses, and many of the country’s 200 or so gas companies. The largest single new supplier is the Tokyo Gas Company, which said end-January that it had secured 0.64 million electricity customers.

Unsurprisingly, lower tariffs appear to have been the main motive for changing supplier, with a 10% reduction in price seen as the tipping point at which many customers choose to switch. However, the saving on electricity bills is not the only motive, with many of the new suppliers bundling power sales with other products such as gas, broadband, telephony or cable services, or offering incentives such as company loyalty points.

Whether switching will continue at the same level is a moot point. There was optimism that a large percentage of customers would move following a November 2015 survey, which found that 80% of consumers would consider switching supplier. But the headline number picked up from the online survey of 1,000 people included consumers with very different commitments to changing supplier.

A mere 2.8% of respondents said they would switch immediately, a further 20.9% planned to switch once they had seen how the market was working, and the remaining 56.3% said only that they might consider switching at some stage. A 4.1% switch in less than a year thus appears reasonable, especially given Japan’s track record in the area.

The Yen 8 trillion ($71 billion) of sales to residential and small business consumers up for grabs represents only 38% of overall electricity sales. The remaining 62% of the market, comprising sales to large and medium users, worth Yen 10 trillion ($89 billion) a year, has been contestable since 2005 or earlier. But, by 2015, a decade after medium-sized users were allowed to choose their supplier and 15 years after large customers were first allowed to switch, only 6.8% of the then contestable market had changed supplier.

Part of the reason for such muted interest was the relatively low tariff reductions then offered, with switchers seeing an average 5% fall in their power bills often combined with onerous conditions on, for instance, time of use. Many of the current offers promise higher tariff reductions and fewer conditions, making switching more attractive now than in the past.

**ELECTRICITY CUSTOMER SWITCHES TO FEB-2017**

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**Source:** OCCTO
plants and investment in renewable energy capacity. LNG and coal are forecast to account for 27% and 26%, respectively, of total output in FY2030, well down from the 2015 levels of 39.2% and 34%. But the fall will depend on nuclear output rising to 20-22% and renewables to 22-24% of total output.

Following the 2011 Fukushima disaster all nuclear reactors were closed for a period, with only three units at Sendai and Ikata having since reopened. There are proposals to reopen many of the 39 remaining viable reactors, but the timing and indeed likelihood of reactor restarts is unclear and will be determined as much by political as economic considerations. On past precedent this suggests that nuclear output could fall well short of the FY2030 target of 20-22%, or 213-234 TWh, of total output, implying the need for higher fossil fuel and especially LNG use.

The role of renewables
Future renewable energy supply is also uncertain. Following the Fukushima disaster proposals from renewable developers were encouraged by very generous FITs of up to Yen 42/kWh ($0.37/kWh). A large amount of plant was approved, almost all of it involving solar PV capacity. Since then over 40 GW of renewable plant has been commissioned.

However, more than 50 GW of capacity, again mainly comprising solar PV projects, was approved without a deadline for completion and remains to be built. There have been allegations that some developers with agreed FITs held projects back as the FITs became ever more attractive as solar PV costs fell. Conversely, in some areas, implementation of projects has been delayed by EPCOs since the amount of agreed capacity exceeds local needs, while the transmission capacity to deliver the power to other regions is lacking.

Delays to construction are not without benefit to the government and consumers since the financial burden of FITs has been mounting. The FIT subsidy was Yen 1.3 trillion in FY2015 and is estimated to have risen to Yen 2.3 trillion ($20.4 billion) in FY2016. And while FITs have been reduced in more recent projects, the burden could reach up to Yen 4 trillion in FY2030.

This led to legislation in June 2016 which included a deadline of April 1 for the backlog of approved solar projects to have a firm implementation plan, including a grid connection agreement and operation date, or face cancellation. It also stipulated that new renewable capacity would be sought only through competitive auctions, the first of which is planned for October, with caps on the amount and type of capacity sought and the FIT offered.

As with prospective nuclear output, the 7%, or 75 TWh, of total output projected to come from solar in FY2030 may turn out to be too high. That would in turn cast doubt on the overall renewable share of 22-24%. There are also limits to further efficiency gains in energy use and fuel savings from more efficient power plant technology. Japan’s requirement for LNG imports may thus exceed the official projection of about 60 million mt in FY2030, which is just over two-thirds of consumption in 2015.