

# Stepping on the gas

Falling spot LNG prices brighten up prospects of stressed power plants



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Falling spot prices of liquefied natural gas (LNG) make this an opportune time for revival of stressed gas-based power assets in the country. A proactive push from the government at this stage thus becomes the need of the hour.

As per the report of Parliamentary Committee on Energy, 14 GW of gas based capacity is stranded due to lack of domestic gas, of which 11 GW is operational and generating on an intermittent basis, resulting in low average plant load factor (PLF) of 24% as of fiscal 2019.

Of this 11 GW operational capacity, 2 GW is owned by the central sector and 2.7 GW by Gujarat (1.9 GW) and Delhi (0.75 GW), which can be supported by the central government or the respective state governments.

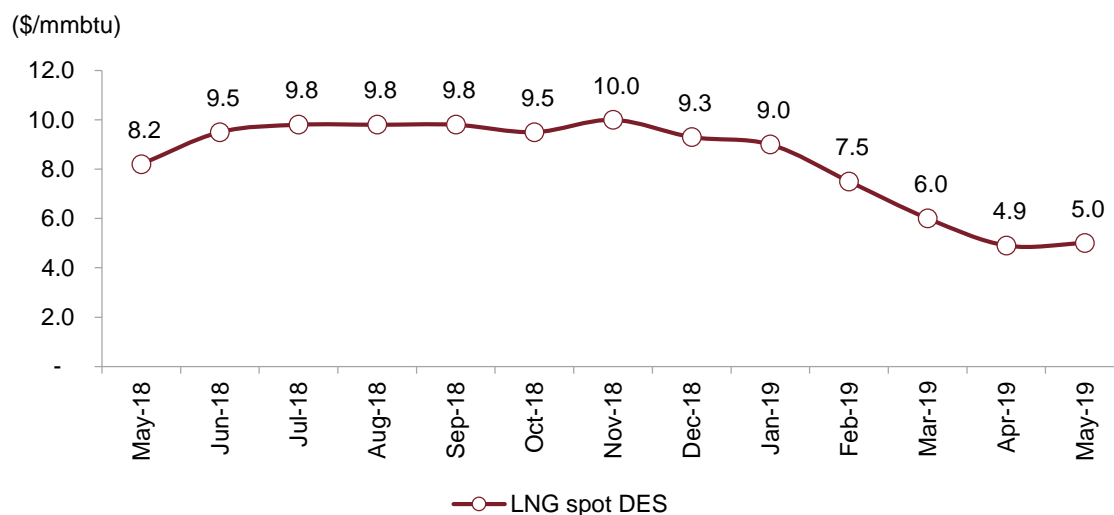
The remaining 6.6 GW capacity, which is in private hands, is in dire need of support, and can be revived using imported spot LNG.

## LNG prices have halved from recent peak

LNG prices are currently at \$5 per million metric British thermal unit (mmbtu), down from a peak of \$10 per mmbtu as recently as November 2018.

The decline has been due to increasing supply in global markets from newly commissioned projects in Australia and the US. Moreover, a few of the liquefaction capacities in US and Australia became operational in the last quarter of fiscal 2019, putting downward pressure on spot LNG prices.

### Spot LNG prices unlikely to go back up in a hurry



Source: Industry reports, CRISIL Research

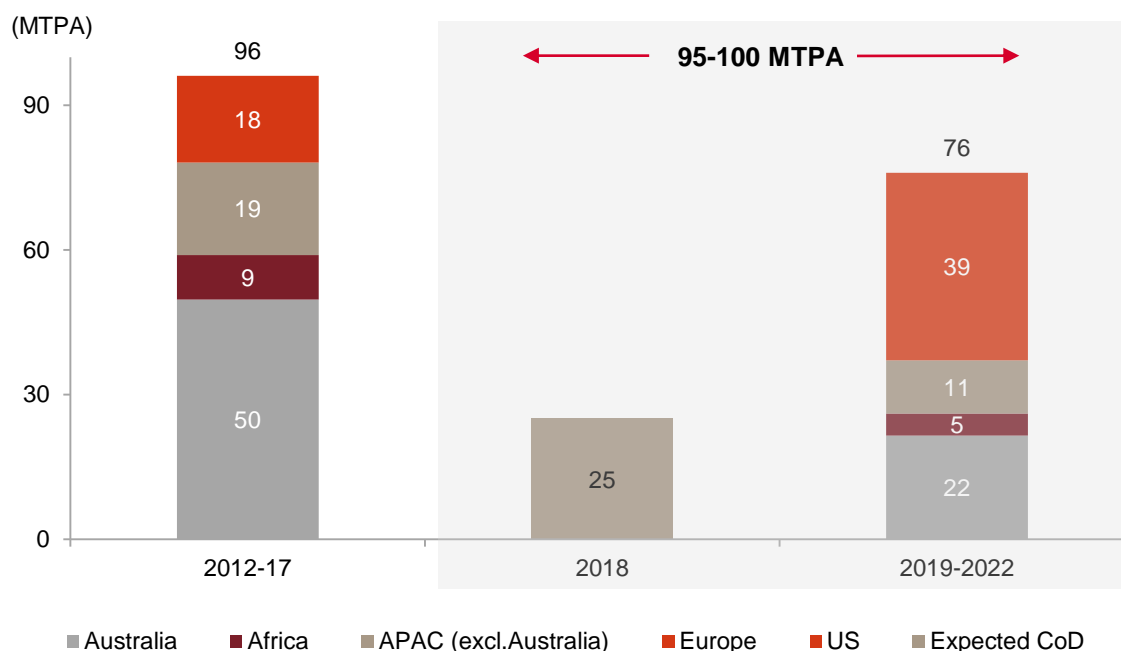
CRISIL expects spot LNG prices to trend lower in 2019, averaging \$5-6 per mmbtu. Beyond this year, prices could increase slightly to \$6-7 per mmbtu, as seasonal demand (winter season) improves.

Additionally, the government plans to waive off customs duty (2.57%) as well as bring natural gas under the Goods and Services Tax or GST regime (lower rate at 5% vs 15-20% VAT at present). This will reduce the delivered cost of

LNG further, reducing the cost of generation for power plants.

Over the next 4-5 years, the US and Australia are expected to commission 60 MTPA of LNG terminals. This is expected to shore up LNG supply, keeping prices under pressure at \$5-7 per mmbtu over the medium term.

**Upcoming global LNG capacities**



Source: Industry publications, CRISIL Research estimates

**The good augury for gas-based capacities is for all to see**

The key reason India has not used LNG extensively for power generation so far is the high cost involved. Higher prices of LNG made the power generated through this route far more expensive compared with conventional sources, deterring offtake by power distribution companies (discoms).

To make matters worse, the cost of power generation through renewable sources has dropped significantly in the last 3-4 years, posing stiff competition to gas-based power.

Thus, the recent plunge in prices makes power generation using spot LNG competitive vis-à-vis coal. Our analysis shows that if the 6.6 GW gas-based capacities operate at 50% level (i.e. supply power only during peak hours and grid balancing requirements), with spot LNG price at the present level of \$5 per mmbtu, the variable cost of generation would be Rs 4.30-4.50 per unit, which is competitive with coal-based power.

The additional power can be used by discoms as partial replacement of relatively costly short-term power and to meet the latent demand that was not being met by discoms due to high cost of power during peak hours, forcing them to make power cuts.

In fiscal 2019, major discoms accounted for 45-50% of the 145 billion units transacted in the short-term market. Additional generation of 28 billion units can be effectively used for partial replacement of short-term purchase by discoms at competitive rates.

**Power tariffs and discoms' average power purchase costs (as of fiscal 2019)**

Discovered tariffs in scheme for procurement of aggregated thermal power from coal-based plants	Gas-based power using spot LNG	Average power purchase cost for discoms (estimated)
Rs. 4.41 per kWh	Rs. 4.30-4.50 per kWh	Rs 4.20- 4.40 per kWh

Source: Industry publications, CRISIL Research estimates

Phase II of aggregated thermal power procurement from coal-based power plants, concluded recently, saw discovered tariffs of Rs 4.41 per kWh, which can be matched by gas-based power plants using spot LNG even without subsidy on variable cost basis. Gas-based power being cleaner than other thermal sources must be promoted and prioritised over other fuels.

## Govt keen to script revival of gas-based assets

The government had introduced a scheme in 2015 to provide imported LNG to power plants at subsidised tariffs, through competitive bidding.

However, the plants were unable to utilise the allocated quantity of gas due to issues such as the discovered tariffs being lower than the cost of generation, non-cooperation of some states in providing exemptions in taxes and duties, and the reluctance of states to buy high-priced gas-based power. Given this, the scheme was discontinued just two years later.

The result – most gas-based capacities remain stranded or are operating at very low utilisation rates. Lack of availability of domestic gas (which is priced competitively) and high cost of imported regasified LNG (RLNG) constrained the ability of these plants to generate and sell power, thus turning them into stressed assets.

To address the situation and increase the share of gas-based power in the total energy mix – as part of the shift towards cleaner fuels – the government now plans to revive these capacities.

Going by the recommendations of the parliamentary committee, the scheme for supplying imported RLNG and subsidising tariffs for these plants could well be reintroduced.

Along with this, improving gas transportation infrastructure, including commissioning of terminals and pipeline projects, can help boost LNG supply to these plants. In fact, Ennore and Mundra terminals were commissioned in fiscal 2019 and are expected to be operational towards the end of the current fiscal.

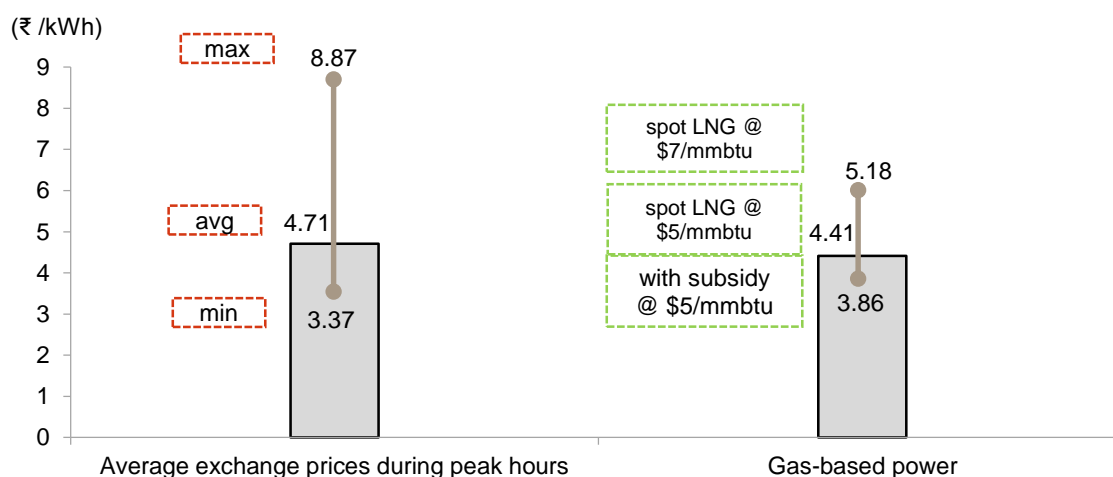
## Gas-based capacities can support short-term peak requirements...

Gas-based power plants are best suited for operation during peak hours due to their quick start-up and ramp-up/down characteristics.

In fiscal 2019, peak power demand at the all-India level increased 8% on-year to 177 GW from 164 GW in 2018. This, coupled with rising renewable penetration – which is an infirm source of energy with wide fluctuations in generation – necessitates grid balancing through operationalisation of peaker plants like gas or hydro.

Currently, discoms are meeting most of their peak power requirement through bidding-based short-term contracts, with discovered tariffs of Rs 5-6 per unit. Gas-based power from the stranded plants can be a better way of meeting peak demand for some of these discoms.

**Peak exchange prices vs gas power**



Note: Subsidised price is calculated by waiving off customs duty, taxes and margins.

Source: IEX, CEA, CRISIL Research

Hence, regulators must encourage discoms to prioritise gas-based power over short-term arrangements through exchanges or traders. Also, some of the gas-based plants can be used as spinning reserves to manage grid operations efficiently.

**...and also meet environmental needs**

Environmental concerns over higher dependence on coal-based power – which is more polluting – can be partly addressed through increased utilisation of relatively clean gas-based power.

Carbon dioxide emissions of a typical natural gas-based power plant is 50-60% lower than a coal-based power plant of similar capacity.

This fits into the government’s overall plan to move towards cleaner sources of fuel.

**Subsidy support needed for partial recovery of fixed costs**

The parliamentary committee has recommended using a part of the National Clean Energy Fund (NCEF), created for promotion of clean energy technologies, for reviving gas-based power generation.

As per our analysis, at the present level of spot LNG prices of \$5 per mmbtu, plants would be able to generate power at Rs 4.30-4.50 per unit on variable basis, which is comparable to prices of power from other conventional sources

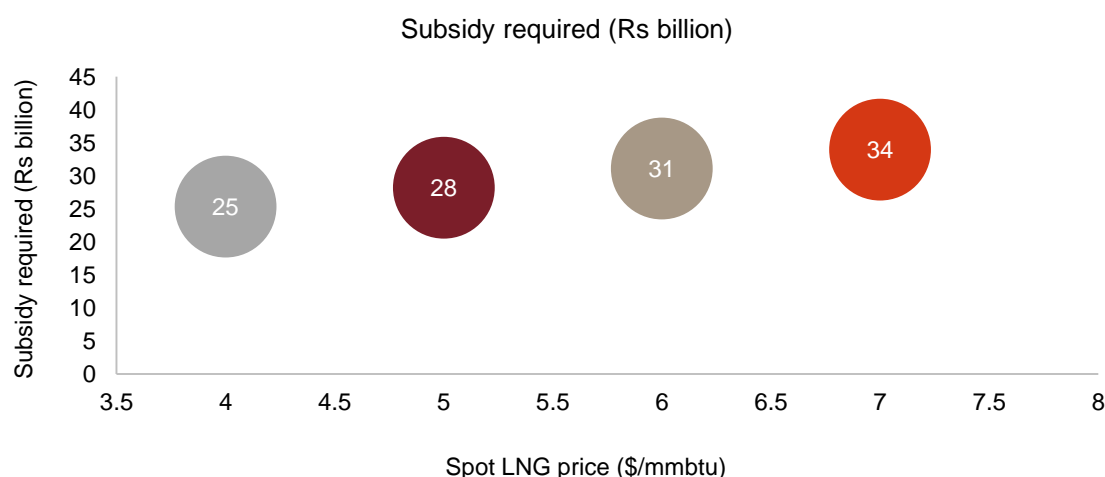
such as coal. To meet this, no subsidy support is required.

However, taking into account a fixed cost recovery of Rs 0.95 per unit – without any return on equity – required to service their debt obligations, the tariff would work out to Rs 5.25-5.45 per unit.

Thus, even at lower LNG prices, subsidy support in terms of exemption on taxes and duties on imported spot LNG is required to bring down the composite (fixed + variable) cost of generation on a par or below those of other conventional sources. Indeed, this alone can ensure offtake of this power by discoms.

To bring down the composite tariff to Rs 4.30-4.50 per unit, the subsidy requirement works out to Rs 28 billion per annum with plants operating at 50% utilisation. Moreover, this subsidy requirement may vary based on spot LNG prices and can range between Rs 25 billion and Rs 34 billion for spot LNG price, ranging from \$4 per mmbtu to \$7 per mmbtu, respectively.

**Snapshot of sensitivity of subsidy requirement to spot LNG prices**



Source: Industry publications, CRISIL Research

Financial support in terms of subsidised RLNG supply will be needed for 3-4 years, during which domestic gas availability is expected to improve, given government push through several interventions.

CRISIL Research believes domestic natural gas production has bottomed out and will log 2.8-3.0% CAGR over the next five years to 103-105 million metric standard cubic metre per day (mmscmd).

ONGC is expected to account for a major share of the incremental output, with the commencement of production from marginal fields in the eastern offshore regions, such as S2AB and G-1, as well as new development projects in the western offshore areas such as the Daman and South Bassein fields. In addition, the anticipated commissioning of fields in Krishna Godavari (KG) D5 block in fiscal 2021 is expected to support natural gas production further.

Private players like Reliance Industries and BP Plc, too, have recently announced incremental investment in their KG basin assets to shore up domestic natural gas output.

Once domestic gas availability improves, gas can be allotted to plants which were not getting it due to shortage.

As per the parliamentary committee’s report, the government has collected Rs 864.4 billion as clean energy cess on coal between fiscals 2011 and 2018. Of this, only Rs 296.5 billion has actually been transferred to the NCEF and Rs 159 billion spent on financing various clean energy projects. The remaining can be utilised for financial support to



gas-based power plants over the next four years.

The measures being contemplated by the government – waiving custom duty (2.57%) on natural gas as well as bringing it under GST at 5% (against earlier VAT varying across states from 5-20%) – will further reduce the cost of power from gas-based stations by 40-50 paise per unit. This would bring down the subsidy requirement to 15 billion per annum.

## Support needed to extend coverage to all 6.6 GW stressed plants

Of the 6.6 GW stranded capacity, 3.7 GW is located just in Andhra Pradesh and lacks pipeline connectivity for LNG supply. Capacities in Gujarat (1.9 GW) and Maharashtra (0.39 GW), on the other hand, can be supplied directly from gas terminals in Gujarat as transport infrastructure is already in place in these states.

This calls for appointment of an aggregator, such as GAIL, for procurement and supply of gas to power plants as domestic gas production improves, going forward. Plants not connected through RLNG pipelines can be supplied through swapping arrangement by the aggregator.

### Private stranded capacity at a glance

State	Stranded operational capacity (MW)	Pipeline connectivity
Delhi	108	Yes
Gujarat	1,883	Yes
Andhra Pradesh	3,744	No
Uttarakhand	450	Yes
Maharashtra	388	Yes
<b>Total</b>	<b>6,572</b>	

Source: Central Electricity Authority (CEA), CRISIL Research

Also, the price differential between contracted and spot LNG could limit offtake of contracted LNG by power plants, as it would push up the cost of generation and reduce offtake by discoms. However, with a coordinator like GAIL blending the contracted and spot LNG and selling at an attractive price to keep the cost of generation competitive, capacities can operate at higher PLFs, benefitting all stakeholders.

## Share of gas-based power to rise 5.5%, LNG demand by 15.77 mmscmd

In fiscal 2019, gas based power generation accounted for 3.8% of total electricity generated in India.

Operationalisation of stranded capacity of 6.6 GW through supply of imported RLNG at 50% utilisation will generate an additional 29 billion units annually, further increasing the share of gas-based power to 5.5% in coming years.

At the same time, incremental LNG requirement would be 15.77 mmscmd for these plants, leading to a rise in the share of natural gas in India's total energy mix from 6.2% in 2018 to 6.8-7% in coming years. Though this is lower than the government's target of 15%, it is a right step in that direction.



The proposed scheme to allocate spot LNG with subsidy support from NCEF to stranded plants, with a target PLF of 50% without tariff-based competitive bidding, is expected to garner good response from players.

Revenue thus generated by the players can be utilised to meet debt obligations and address the stressed assets situation in the sector. This will help increase penetration of gas at a competitive price as well as its importance in a broader move towards cleaner fuels.

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