Can natural gas still play the role of a transition fuel for India?

By Vinod Vijay Kumar

In the Union Budget 2023-24, INR 35,000 crore has been allocated to the Ministry of Petroleum and Natural Gas for achieving energy transition. A major part of this allocation could go into gas exploration and the setting up of gas infrastructure projects, details of which are yet to emerge.

India has been promoting natural gas as a transition fuel to reduce emissions before the complete switch to fossil-free energy, which is essential to meet the net-zero emissions goal by 2070. Natural gas is a cleaner fossil fuel compared to coal, and India has set a target to raise its share in the energy mix from the present 6.7% to 15% by 2030. India has been investing significantly in infrastructure projects such as gas pipelines, liquefied natural gas (LNG) import terminals, and compressed natural gas (CNG) stations to achieve this target.

However, with such huge investments, can natural gas continue to play the role of a transition fuel for India or will this lead to stranded assets in the future? There is no simple answer to this question. Let's look at some of the key reasons.

Imported gas is not economically viable

Domestic gas production in India has been on the decline because of limited reserves, and nearly 50% of the gas demand is (currently) being met by imported LNG. The increased dependence on LNG makes the national economy vulnerable to global price fluctuations and geopolitical issues. Nearly half of India's gas-based power plants are underutilised or idle because of high import prices. At present, gas is not economically competitive with coal and renewables in the power sector. In the fertiliser sector, urea prices are heavily subsidised by the Government to protect farmers from gas price fluctuations and ensure food security. Increased dependence on expensive imported LNG further increases the subsidy burden on the Government.

Diversifying energy sources

Considering India's energy security goals, efforts are needed to minimise the dependence on imported LNG. This could be achieved by augmenting domestic gas supply through diversifying energy sources. For example, investments in coal bed methane (CBM) and coal gasification technology allow effective utilisation of the abundant domestic coal reserves. India's first urea plant based on coal gasification technology at Talcher is being revamped and restarted. Once operational, it is expected to significantly reduce the LNG import bill. To encourage the industry towards adopting coal-based gasification technologies, the Government has approved a subsidy policy for urea produced via this route. This would significantly encourage the utilisation of domestic coal for urea production but at the cost of higher environmental impacts.

Among clean renewable energy technologies, biomass gasification is another promising option that can reduce dependence on LNG imports across the electricity and fertiliser sectors. Similarly, in the transportation sector, compressed biogas (CBG) produced from agricultural wastes has the potential to replace CNG under the Sustainable Alternative Towards Affordable Transportation (SATAT) scheme. The Union Budget 2023-24 has set aside INR 10,000 crore for setting up 200 CBG plants. The Finance Minister also announced that a 5% CBG sale mandate would be introduced soon for all gas marketing organisations to further boost the production of CBG.

Avoiding stranded assets

It would be best if gas infrastructure projects are planned in such a way that they can also be utilised for renewable energy or green hydrogen projects in the future. This would help avoid stranded infrastructure during India's transition towards cleaner energy sources.

Prospects and challenges of blending natural gas with green hydrogen using the existing gas infrastructure should be examined across the sectors. NTPC Limited has been working on blending 5% green hydrogen into the piped natural gas (PNG) network of Gujarat Gas Limited for meeting cooking demands. NTPC Limited also plans feasibility studies for co-firing hydrogen in gas-based power plants. Such projects will reduce emissions and accelerate the transition to cleaner sources of energy.

Similarly, prospects for utilising the gas infrastructure to complement renewable energy systems can be explored. For instance, in the power sector, natural gas is expected to play a critical role in balancing the grid. Renewable energy being intermittent in nature, gas-based power plants can be used for ensuring uninterrupted power supply and to meet the peak load electricity demand because of faster ramp-up rates.

Way forward

With growing import dependency and rising global gas prices, it is less likely that natural gas would continue to be a transition fuel for India. Therefore, increasing the share of gas to 15% by 2030 seems ambitious at present.

India should focus on diversifying its energy sources to achieve energy security and minimise dependence on expensive imported LNG. The reliance on gas should be a stopgap until renewable energy and other clean energy alternatives, including green hydrogen, become cost-effective. Moving forward, the transition towards renewable fuels will be aided by rising global gas prices and should be viewed as an opportunity driver towards accelerating the energy transition to renewables.

[This piece was written exclusively for ETEnergyworld by Vinod Vijay Kumar. He works in the Climate, Environment and Sustainability sector at the Center for Study of Science, Technology and Policy (CSTEP), a research-based think tank]