

Briefing · April 2024

Bullish Asian gas demand forecasts eroded by renewable surge

Key points:

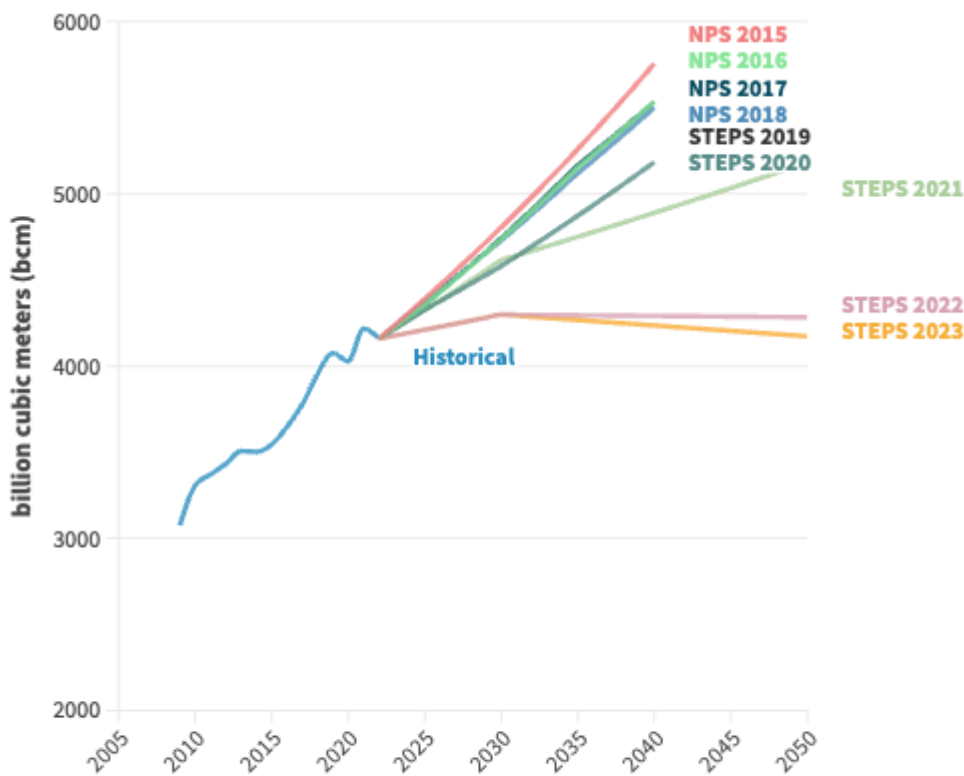
- Increased momentum in the energy transition has led the International Energy Agency to reduce its global gas demand forecast for 2040 by 1,500 billion cubic metres.
- Asia's projected 75% global LNG market dominance by 2050 faces a potential demand deficit amid cheaper renewables. China and India, expected to remain the frontrunners of gas demand until 2050, already benefit from lower solar costs compared to combined cycle gas turbines.
- Other determinants of Asian gas demand include the trend for major importing countries to reduce their reliance on LNG, financial challenges hampering gas infrastructure development, and price volatility making key gas consuming countries in Asia cautious about the long-term role of gas in their energy mix.
- Utility solar PV emerged as the cheapest power source in Asia Pacific in 2023, with levelised cost of electricity projected to plummet further by 2050, contrasting with gas prices remaining stagnant. Solar costs in APAC fell by 23% on average in 2023 alone.
- New gas demand is forecast to come from emerging Asian markets, driven by the power sector. As reductions in renewable costs outstrip gas and gain viability for energy security, policymakers face a crucial decision regarding their future energy systems.
- China dominates long-term gas demand. However, the country seeks energy independence as local experts advocate for a 40% cap on the LNG import rate to keep its energy self-dependence rate above 80%. Renewables are reshaping the energy mix, representing the largest year-on-year increase in consumption by source.
- Mature Asian markets Japan and South Korea, the second- and third-largest LNG importers in 2023, saw gas demand peak in the last decade. The two countries will turn to emerging Asian markets to offload excess supply.
- Price volatility remains an unpredictable factor for Asian gas demand forecasts, as LNG, especially purchases at spot market prices, are fiscally unsustainable for many emerging economies in the region.

Introduction

Gas demand forecasting is crucial for efficient planning of gas supply systems. International agencies, private sector forecasters, industry operators and governments develop forecasts to prepare to meet future energy needs, underpinned by their particular objectives.

Between 2015 and 2023, the International Energy Agency (IEA) lowered its 2040 base-case (STEPS)¹ gas demand forecast by over 1,500 billion cubic metres (bcm), aligning with the pace of the energy transition. These adjustments have been particularly significant in the last several years, with projected gas demand in 2050 falling 18% between its 2021 and 2023 forecast, which now expects gas demand to peak by 2030.

Figure 1: Evolution of IEA's gas demand forecast



Source: Zero Carbon Analytics Analysis, BNEF: Evolution of IEA's Fossil Fuel Demand forecast • NPS = New policies scenario, STEPS = Stated policies scenario. Last update: January 2024.



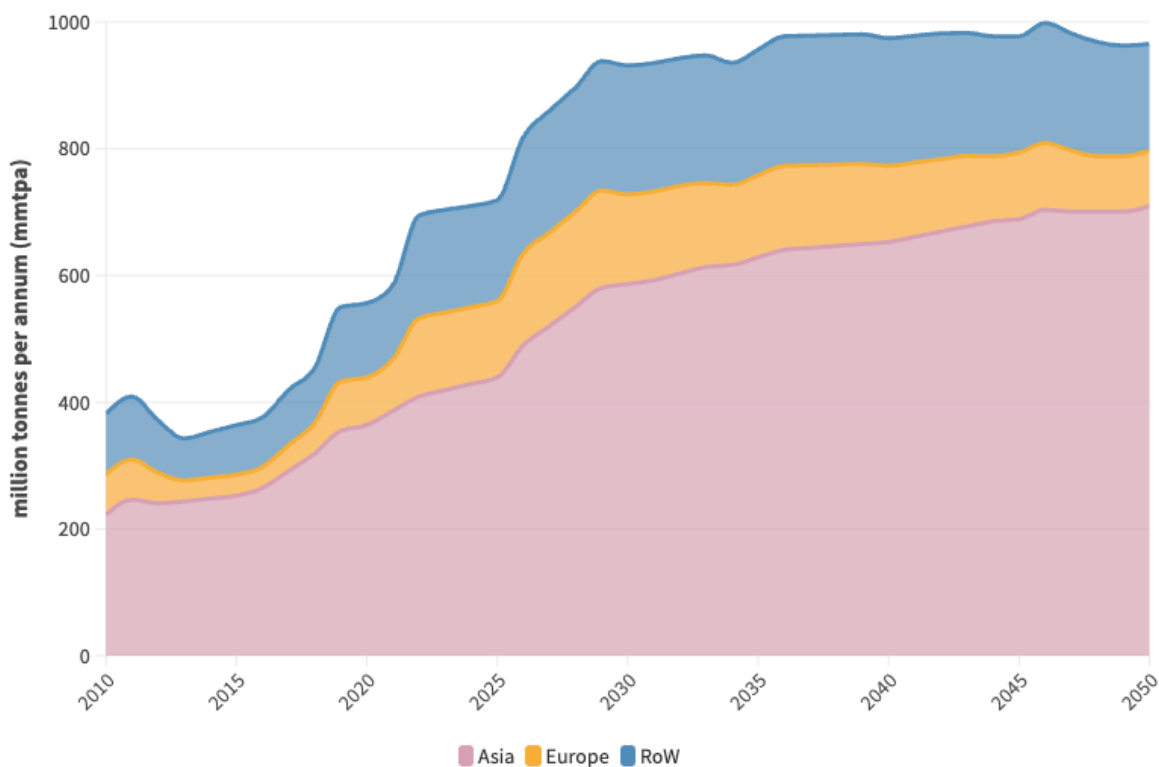
This is particularly relevant for Asia, which is expected to lead global gas consumption through 2050, generating some [75% of demand for liquified natural gas \(LNG\)](#)², but where

¹ The Stated Policies Scenario (STEPS) reflects the current policy settings based on sector-by-sector and country-by-country assessment of energy-related policies that are in place as of the end of August 2023.

² Liquified natural gas (LNG) is natural gas that has been reduced to a liquid state through a process of cooling.

the [falling costs of renewables](#) alongside rising [energy security concerns](#) have prompted many countries to reconsider their future energy mix.

Figure 2: Global LNG demand by region, 2010-2050



Source: Wood Mackenzie LNG Tool Q2 2023 • Data extracted using WebPlotDigitizer, which produces estimated data based on published graphs.



Underlying factors in key Asian markets may be overlooked by industry forecasters

Gas demand trajectories vary widely due to regional and temporal differences in the transition away from fossil fuels. Factors to consider when assessing the accuracy of gas demand forecasts include:

- The trend for major importing countries to reduce their reliance on LNG;
- Financial challenges hampering gas infrastructure development;
- Price volatility making key gas consuming countries in Asia cautious about the long-term role of gas in their energy mix; and
- Reduced competitiveness with alternative energy sources, including renewables, which have seen prices fall considerably over recent years, a trend set to continue.

Demand shifts to emerging markets

The primary target for gas demand until 2040 has shifted from [mature to emerging Asian markets](#). Forecasters cite factors such as [coal-to-gas fuel switching](#) in key emerging

markets to support this view of rising demand dynamics. However, there is a risk that narratives of overall regional demand growth overlook the concurrent fall in Japan and South Korea, the second- and third-largest Asian LNG importers in 2023. Japan's LNG demand alone is forecast to drop by [one third of 2019 levels](#) by 2030 if government targets are met.

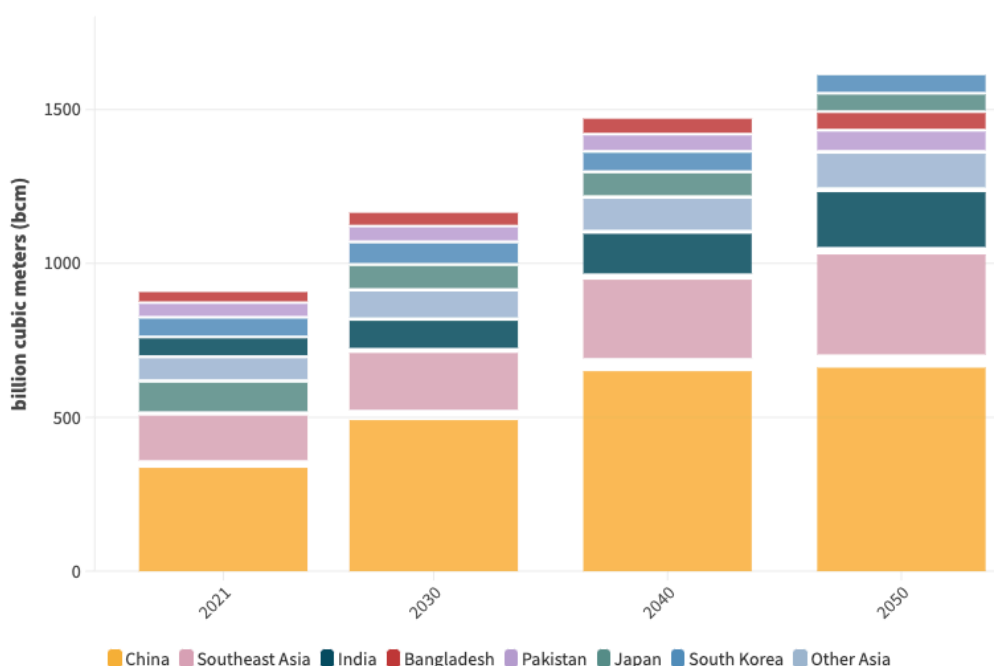
The two countries will look to emerging LNG markets in South and Southeast Asia to offload excess gas supply, meeting rising demand in emerging Asia as domestic gas reserves in these countries decline, but not necessarily contributing to an absolute rise in consumption across Asia at the level expected by many forecasts

Any proportional rises in the region's largest economies - [China and India](#), the first and third largest by GDP in 2022 - will equate to enormous regional growth in absolute terms, notwithstanding falling demand in mature markets.

China and India will remain the frontrunners for LNG use under current demand scenarios . Despite this, there are signals that China's gas demand may not be as high as some anticipate given the government's focus on energy security. With a potential policy [capping LNG dependence at 40%](#), and the country aiming to keep its [energy self-dependence rate above 80%](#), China is building its shift towards renewable energy. Since 2015, [natural gas generation has remained flat at around 3%](#), while coal dropped and [renewables nearly quadrupled](#) to 16%. In India, gas demand is growing, but is uncompetitive with coal in the power sector, which will be a limiting factor until this dynamic changes.

While gas use in the power sector faces headwinds, industrial demand in China and India is also likely to remain robust. This is especially true for sectors that already use gas as a feedstock, such as [fertilisers in India](#). The growth for gas in industry is not projected to be as strong as the power sector, but its trajectory will likewise depend on the changing dynamics of the cost of different energy technologies.

Figure 3: Asia natural gas demand by country, 2021-2050 (bcm)



Source: Gas Exporting Countries Forum (GECF) Secretariat GGM • Data extracted using WebPlotDigitizer, which produces estimated data based on published graphs.



LNG infrastructure is needed to meet forecasted demand

The majority of Asian gas demand is in the form of LNG, and most countries are net importers, with the notable exceptions of Malaysia and Indonesia, according to Bloomberg.

New growth in LNG demand is being attributed to emerging economies, notably Southeast Asian entrants, historically not major LNG consumers. This speculative demand is expected to feed the power sector as these countries experience economic growth until the mid-century.

However, this demand may not materialise. Regulatory hurdles and delays in countries such as the [Philippines](#) and [Vietnam](#) have meant that projected demand has so far [not been met](#), while in Taiwan, persistent terminal delays as well as financial difficulties may limit a rapid increase in LNG imports. Importantly, if the price does not meet the competitive threshold in these countries, LNG will no longer be competitive.

In light of these realities, some industry forecasts – mainly originating from Western markets and key LNG suppliers – are scaling back medium-term demand projections. Notably, [Shell slashed its global LNG demand expectation for 2040 by up to 11%](#) compared to [previous forecasts](#).

Price competition is a key determinant of gas demand

Industry players expect the [power sector](#) will be the primary sector driving gas demand. However, it is important to question whether [LNG will be competitive for baseload power generation](#) compared to other energy sources.

Especially as domestic reserves are depleted and reliance on LNG rises, there is a looming risk that gas will not remain cost-competitive with cheaper, locally abundant energy sources. This could lead to backsliding to more dependence on coal in some countries, such as India where coal represented [55% of energy consumption in 2022](#), but conversely could also see a stronger uptake in [wind and solar](#). Here, India is targeting around [50% of power generation from non-fossil fuel sources](#) by 2030.

The IEA attributes the [gas demand destruction](#) behind its falling forecasts to the rise of renewable energy as a power generation source and to improved energy efficiency, particularly in mature markets. Solar costs in APAC fell by 23% on average in 2023 alone, helping to drive expansion. Wood Mackenzie likewise found that [utility solar PV was the cheapest source of power](#) in the Asia Pacific in 2023.

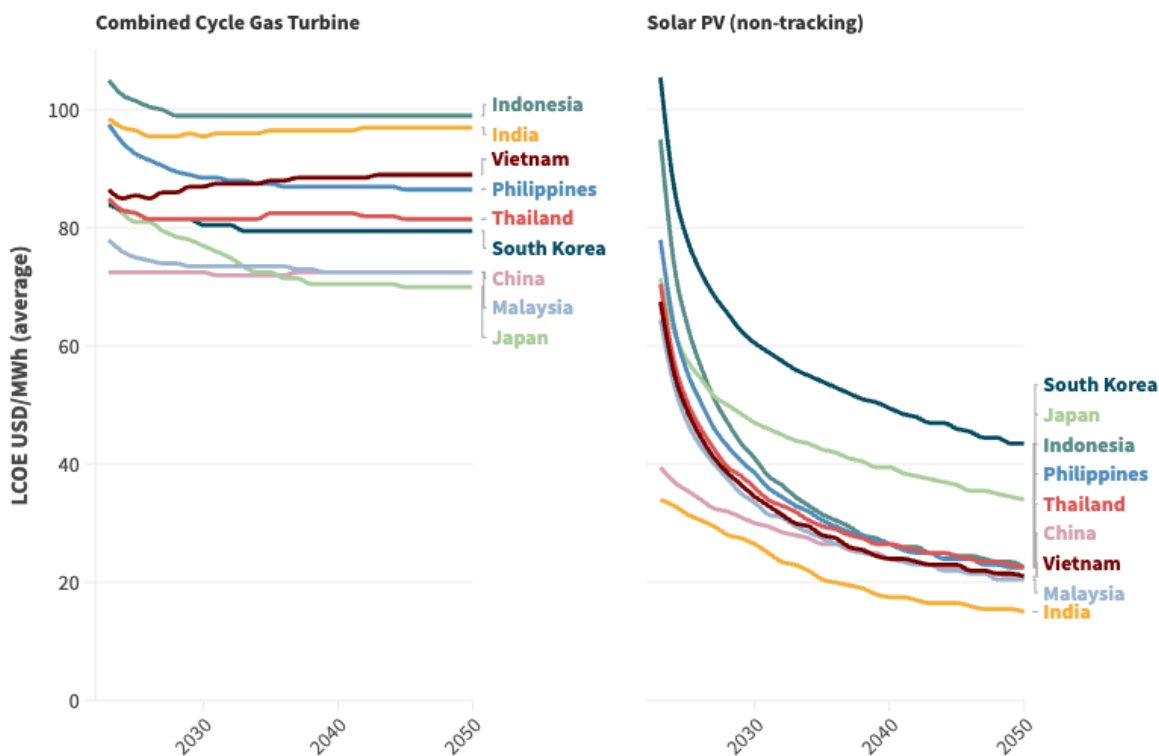
The dynamics of levelised cost of electricity (LCOE)³, a standardised cost metric for power generation over a project's lifetime, is changing as technology develops. The LCOE of renewables is rapidly coming down, which will affect their cost competitiveness to gas over the forecast period.

China and India, anticipated to be the two largest contributors to gas demand until 2050, currently boast [lower LCOE for solar than for combined cycle gas turbines](#). In the second half of 2023, China's lowest LCOE for solar PV was [USD 31 /megawatt hour \(MWh\)](#),

³ The LCOE is the long-term offtake price that a developer needs to recoup all project costs (capex, opex, tax, financing) and hit the investment target (cost of equity). [Cost estimates from market researcher BNEF reflect recently financed projects; we model LCOEs assuming financing in 2023](#).

compared to USD 72 /MWh for gas. In India, the lowest LCOE for solar PV was USD 26 /MWh, compared to USD 86 /MWh for gas. Solar LCOE across Asia is projected to plummet further by 2050, contrasting with gas prices remaining stagnant.

Figure 4: Average LCOE forecast for gas vs solar PV in Asia 2023-2050



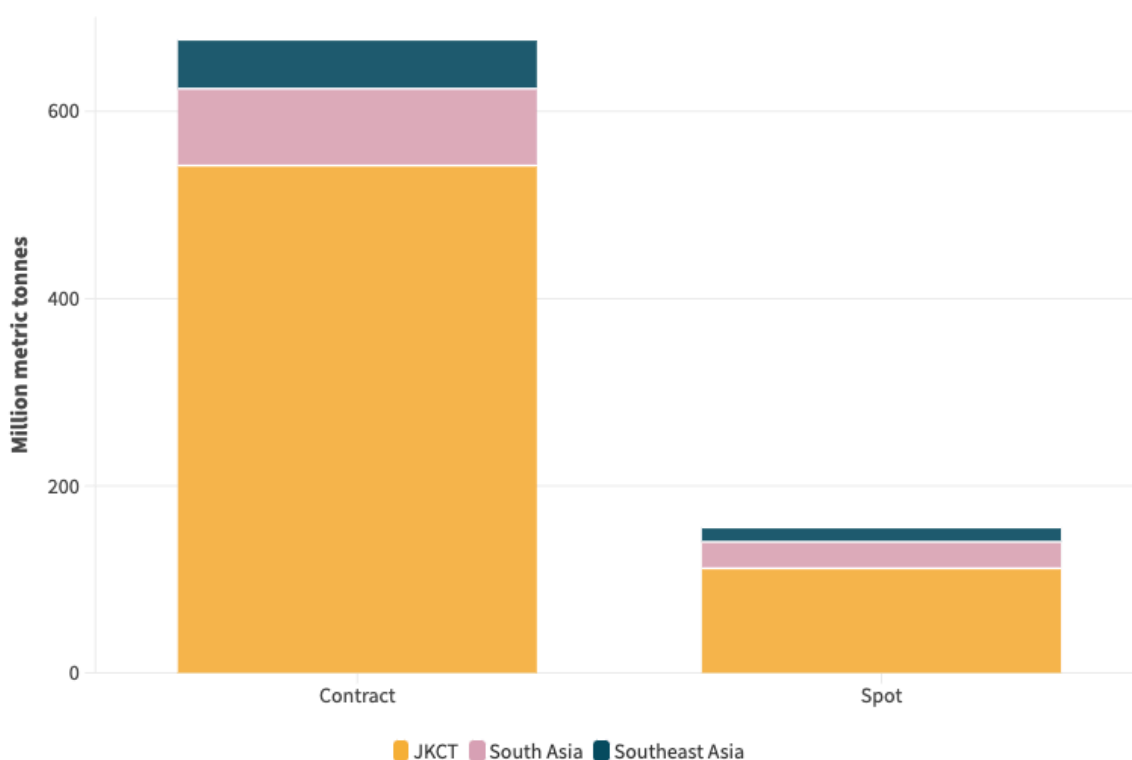
Source: Zero Carbon Analytics Analysis, BNEF LCOE Comparison and Visualisation • Based on prices as of 2H 2023, average taken between the high and low level LCOE values.



Even without considering alternatives, reliance on LNG imports, especially for [price-sensitive](#) markets, has prompted a number of governments in the region to consider energy security when designing their future energy mix.

[China](#) and [India](#) have signed a slew of long-term LNG contracts in a bid to secure energy supplies. Although contracts dominate LNG trade flows in Asia, [price-sensitive LNG buyers](#) such as China, India and parts of Southeast Asia will continue to grapple with fluctuating prices on the market-driven spot market, which account for around 23% of gas sales. Late or missed shipments can also severely impact local energy supply.

Figure 5: Spot and contract LNG trade flows Jan 2021 - Feb 2024



Source: Zero Carbon Analytics analysis, BNEF: LNG Spot-Contract Trade Flow Playbook • JKCT stands for Japan, South Korea, mainland China and Taiwan.



LNG spot market prices are only cost competitive under a certain threshold, determined by market dynamics in each country. In India, the energy ministry puts [this threshold at USD 11/million British thermal units \(mmBtu\)](#). In 2023, [Asian LNG spot market prices averaged USD 17.68 /mmBtu](#), above the competitive threshold for India and most other South and Southeast Asian countries, which led to power cuts and blackouts in the region. In August 2022, the spot price shot up to [USD 70 /mmBtu](#), an empirical example of how LNG is fiscally unsustainable in regional emerging markets.

Even long-term LNG deals do not guarantee protection for emerging Asian countries such as Pakistan, due to unfavourable terms being exploited. [Bloomberg](#) revealed that despite a contract being signed during the 2022 energy crisis, cancelled deliveries forced Pakistan to buy LNG on the spot market, resulting in factory closures and increased poverty. Investing in renewable energy offers sovereignty within energy systems and mitigates climate impacts such as [extreme heat](#) and [pollution](#) in these nations.

Country-level look at demand trajectories

This analysis examined 12 significant Asian countries across East, Southeast and South Asia, with a view to gain insights into the gas landscape across the entire region. In 2022, these 12 countries accounted for just under [770 bcm of gas consumption](#), representing about 90% of total gas consumption in Asia.

Table 1: Key gas indicators and trajectory for 12 Asian markets

Country	Global gas demand rank 2023	Global LNG importer rank 2023	2024 Total gas demand bcm*	Net zero target	Gas demand trajectory
China	3	1	306.60	2060	China is expected to be the biggest driver of industrial gas demand growth. However, the falling cost of renewables and LNG import policies could dampen this growth.
Japan	7	2	102.00	2050	The share of total electricity supplied by LNG is expected to decline as renewables and nuclear reactors come back on-line.
India	13	4	61.60	2070	India's growth curve means that gas demand will surge in industry. Coal is still the linchpin of India's energy mix.
Thailand	15	11	54.80	2065	Thailand has a robust gas value chain that supplies all sectors so will continue to see steady LNG growth.
South Korea	16	3	53.00	2050	LNG demand is predicted to fall as baseload capacity from renewables comes on board as well as nuclear.
Pakistan	18	14	48.00	N/A	Pakistan is a price-sensitive country that has depleting domestic gas reserves. As LNG reliance grows, expenditure may not be sustainable in the long term.
Malaysia	25	22	39.50	2050	The resource-rich country must decide between increasing LNG dependence or renewables due to declining gas reserves.
Indonesia	26	18	38.60	2060	Indonesia has been the largest gas producer in Southeast Asia for the past two decades. The share of gas is expected to gradually fall in the energy mix as renewable deployment increases.
Bangladesh	31	16	31.30	N/A	As domestic reserves dwindle and reliance on gas power persists, LNG imports in the energy mix are expected to rise.
Taiwan	36	5	22.00	2050	Taiwan plans to add more LNG capacity, having exceeded 100% regasification utilisation rate in 2022, and intends to phase out nuclear power.
Vietnam	52	49	8.40	2050	In 2023, Vietnam joined the ranks of LNG importers. Despite targets to boost gas for power generation, its share has been declining, while renewables have more than doubled. A lack of power purchase agreements and renewable competition could limit gas demand growth.
Philippines	65	36	3.60	N/A	The Philippines recorded its first LNG import in 2023 and could increase its reliance on LNG in the power sector as domestic gas reserves continue to decline.

Source: LNG importer rank from the Bloomberg terminal, Gas consumption rank and consumption from Global Firepower • Data presented is through 2024. The gas demand trajectory column is ZCA analysis based on a mixture of government targets/industry forecasts

