Asia LNG Demand Assessment

Executive Summary of Report prepared for ANGEA

October 2024

Wood Mackenzie anticipates strong growth in Asian LNG demand and opines that lower US volumes will drive prices upwards thereby eroding gas demand in emerging Asia

Summary of Takeaways

Key Takeaways

1. Wood Mackenzie's view is for Asian LNG demand to increase from 270 mmtpa to 510 mmtpa during 2024-50, with a significant share of that demand growth coming from emerging Asian markets, supported by economic growth as well as lower LNG prices and despite substantial growth of renewables. Our forecasts for gas demand growth in these emerging Asian countries is anchored on adequate LNG supply availability keeping prices affordable, given these markets are price sensitive and oil indexed slopes >13-13.5%% are generally not affordable. We also note that our gas demand forecasts are higher than IEA's APS and STEPS scenarios, partly because of a less optimistic view on renewables development as we do foresee project implementation challenges in several countries

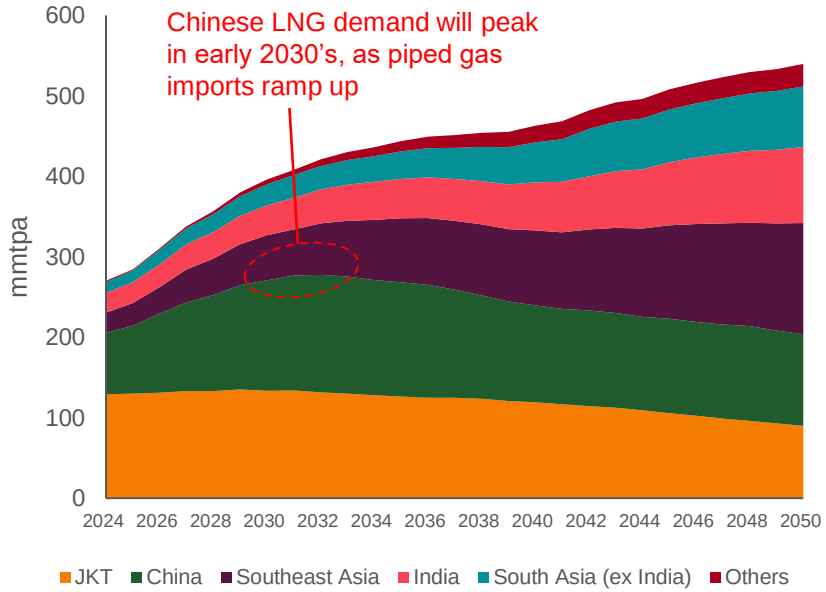
2. **US policy relating to the current pause on non-FTA approvals is partly guided by assumptions on higher renewables being built in Asia, based on IEA forecasts, but could prove detrimental and erode Asian gas demand by raising LNG prices:**
   - In 2023, ~20% of the global LNG supply of 410 mmtpa came from US projects and in our base case, where we currently assume that the pause on non-FTA approvals for US LNG projects will be relaxed in 2025, we expect that 1/3rd of the global LNG supply in 2035 will come from US projects
   - US supply has transformed LNG into a global and commoditised market. Delivered Henry Hub indexed LNG prices into Asia have also helped in keeping a check on oil indexed slopes in the region, as the buyers are comparing the delivered cost of US LNG into Asia while deciding the slopes that they are willing to pay for oil-indexed deals. Additionally, US LNG has been instrumental to help Europe balance the market as Russia has started to weaponize gas by curtailing pipeline EU exports
   - If new pre-FID LNG volumes from US were not going to be available anymore, buyers will lose the optionality to secure seemingly limitless LNG supply at competitive prices and would be left in the hands of limited other suppliers. This would happen a time when geopolitical tensions limit supply developments from other big resource holders, including Russia and East Africa. We opine this will provide upward pressure on prices
   - The break-even costs for many of the non-US projects, which will need to be developed in the absence of new pre-FID US LNG, are higher than the forecast delivered prices for Henry Hub indexed volumes from US into Asia. Thus, long-term contract prices in Asia will rise if the non-FTA pause is not lifted. Additionally, this will end up eroding gas demand, especially in the emerging Asian markets in South Asia and Southeast Asia, wherein countries will need to make a switch to coal and oil for affordability reasons, resulting in incremental GHG emissions

Source: Wood Mackenzie

Asia is the key region for global LNG demand growth; its trajectory is shaped by China till mid-2030s, whilst South and Southeast Asia drive growth in the longer term

Asia LNG Demand Outlook

Asia LNG Demand by Region



Key Commentary

Asia is home to the largest growing LNG regions in the world and demand is expected to almost double from ~270 mmtpa in 2024 to reach ~510 mmtpa by 2050

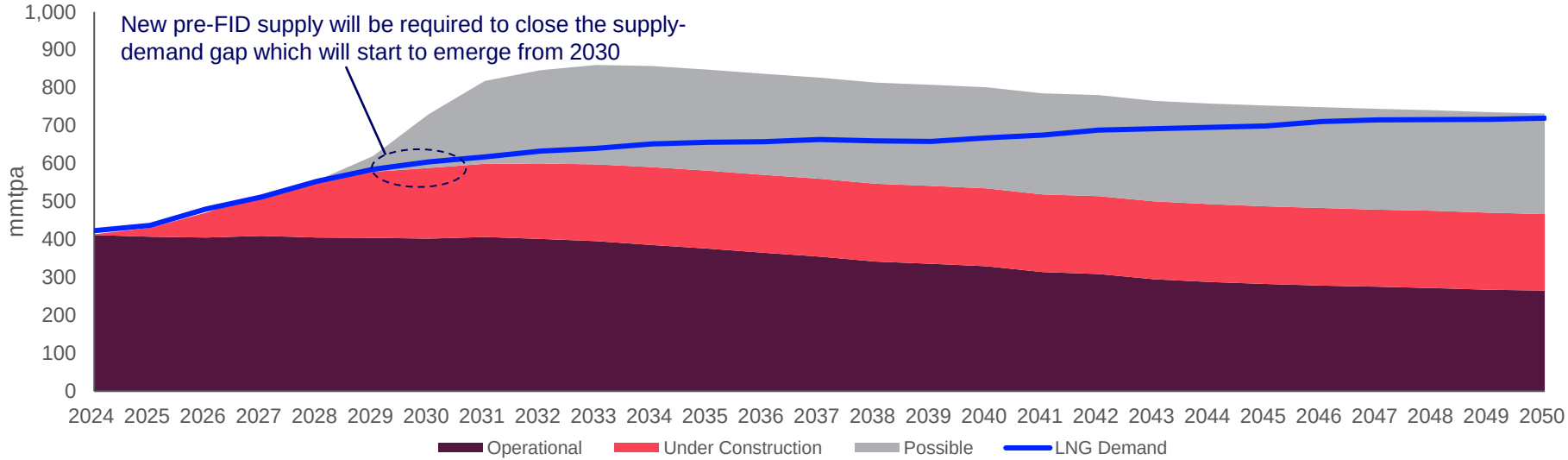
- **Chinese** LNG demand will grow rapidly from 76 mmtpa in 2024 to peak at 150 mmtpa by 2032 before declining thereafter to 115 mmtpa by 2050. In the short to medium term, the expansion of total gas demand and limited incremental pipeline gas imports will drive LNG demand. However, a combination of slowing demand growth in 2030s and the start-up of new pipeline import projects (Power of Siberia 2 and Line D) will limit LNG demand
- **Emerging Asia (Southeast and South Asia)** LNG demand will increase rapidly in the 2030s as gas demand grows while production from legacy fields depletes. Moreover, to unlock latent LNG demand in the 2020s, the region needs to expand gas infrastructure and reflect LNG import costs in gas pricing – both of which are currently being evaluated by policy makers and is likely to yield results in the next decade. It is also worth pointing that these markets are extremely price sensitive and have typically switched to coal and oil when LNG prices rise and hence affordable prices are key to realising this demand growth

Note: South Asia (ex India) includes Pakistan, Bangladesh and Sri Lanka. Southeast Asia includes Indonesia, Malaysia, Myanmar, Philippines, Singapore, Thailand, and Vietnam.

Source: Wood Mackenzie

The LNG supply surge during 2026-28 will balance the market during the second half of this decade but new projects will be required to meet demand from 2030

Global LNG Supply-Demand Balance



- 200 mmtpa of under-construction LNG supply capacity will come to market by end of this decade, despite some delays included in our forecast to planned project schedules but tightness in global supply chains and labour shortages could result in the risk of additional construction slippages
- Beginning 2030, a supply-demand gap starts to open but there are several potential projects, including in US Gulf Coast, Qatar as well as other countries and FLNG opportunities, that could get developed to meet this gap

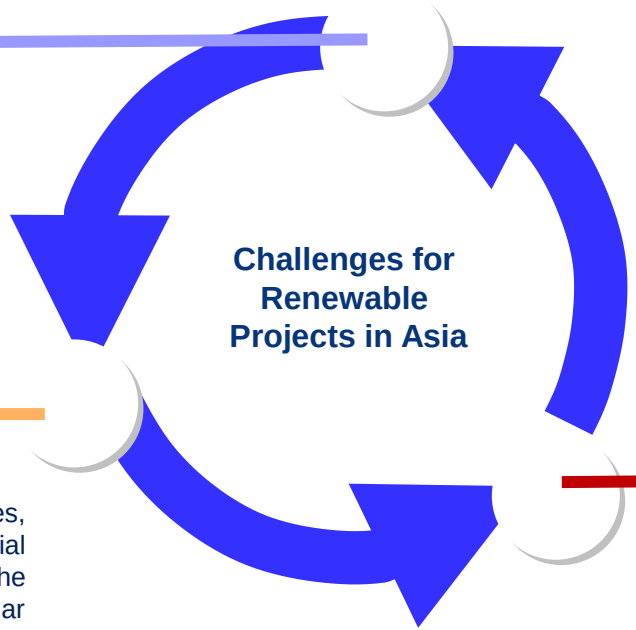
Wood Mackenzie

Source: Wood Mackenzie

Our view of lower renewables, in comparison to IEA, is driven by several project implementation challenges that we currently foresee for project developments in the region

Challenges for Renewables Projects in Asia

1. Grid challenges
Lack of battery storage at commercially attractive prices, is hindering the ability of power transmission grids to integrate intermittent generation from renewables. Power curtailment when grids face a surge of renewables is reducing investor returns and negatively impacting new projects e.g. several foreign investors have exited Vietnam recently



2. Land acquisition and lack of regulations
Land acquisition remains an issue in many of the Asian countries (e.g. India, Thailand) and some countries lack a comprehensive policy framework for developing renewable energy projects

3. Unattractive tariff regime
Power tariffs in several countries, especially for residential and commercial sectors, are subsidised. This impacts the attractiveness to build distributed solar projects when such tariffs are ended

There are also other country specific challenges. For example, Bangladesh is densely populated and developing projects close to demand centres in Dhaka can be challenging. Also, some countries (e.g., Thailand, Indonesia) have limited onshore wind potential due to low wind speeds

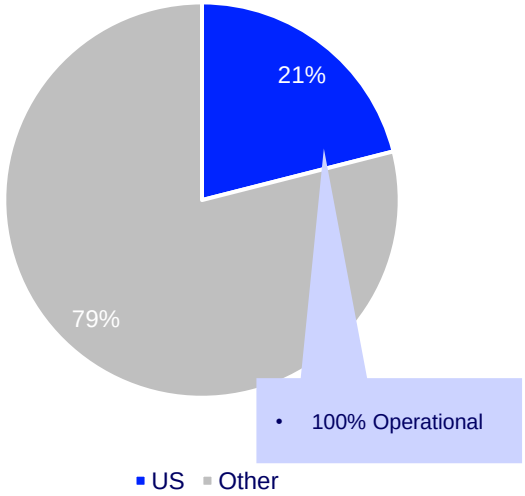
Source: Wood Mackenzie

We forecast that the global LNG market will be increasingly supplied by US LNG over the coming years, but the current non-FTA pause could limit/delay the potential

US LNG Share of Global LNG Supply

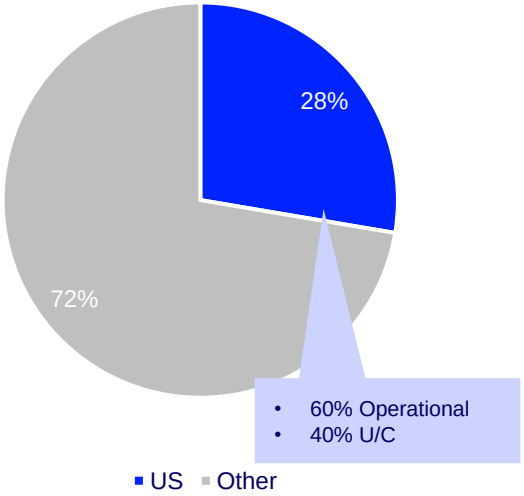
% US LNG of Global LNG in 2023

Global LNG: 408 mmtpa



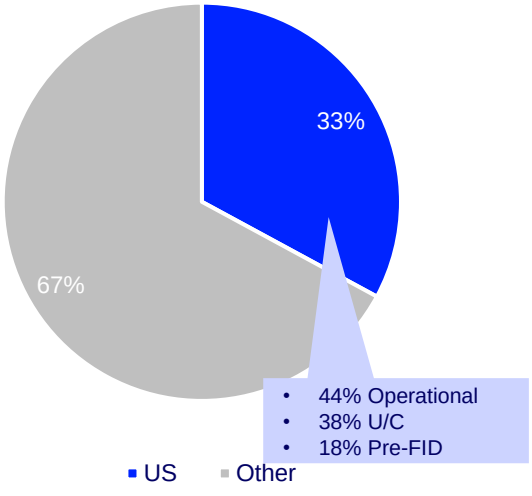
% US LNG of Global LNG in 2028

Global LNG: 560 mmtpa



% US LNG of Global LNG in 2035

Global LNG: 648 mmtpa



Source: Wood Mackenzie

The LNG market will be fundamentally different in the absence of new pre-FID LNG from the US

Implications of limited pre-FID US LNG projects

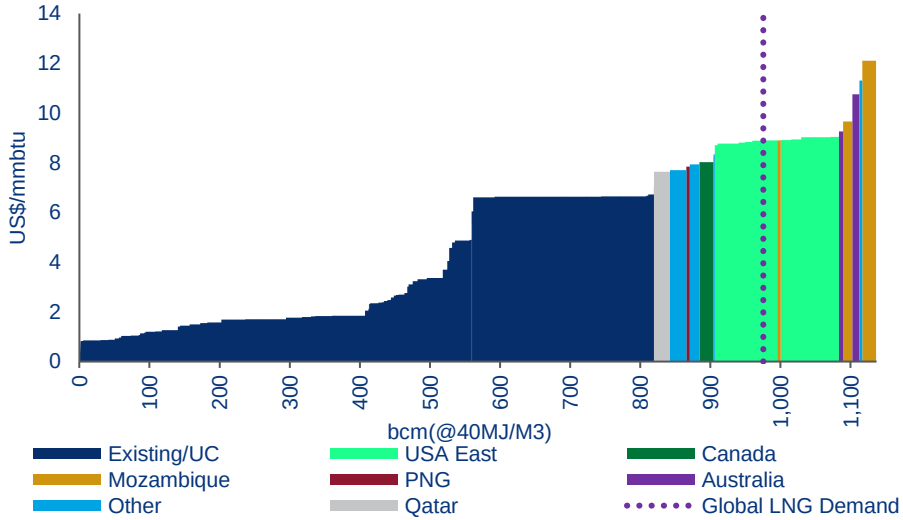
Particulars	Details
Buyers will have to face a market without the potential to develop the most flexible source of supply	US LNG has transformed the LNG market into a more global and commoditised market. Abundant resources, genuine competition amongst US LNG developers, and destination flexibility provide buyers with a unique and cost competitive option to secure LNG. It also ensures the market has the potential to develop much additional LNG supply at a relatively fixed and competitive cost. If that was not going to be available anymore, buyers will lose the optionality to secure seemingly limitless LNG supply at competitive prices and would be left in the hands of limited other suppliers. This would happen a time when geopolitical tensions limit supply developments from other big resource holders, including Russia and East Africa.
Increase in oil-indexation levels	Delivered HH indexed prices into Asia have supported in keeping a check on oil indexed slopes in the region. However, in the absence of US LNG, it is likely that the slopes will go beyond the levels affordable in many of the emerging Asian (South Asia and Southeast Asia) markets, thereby resulting in demand destruction This will result in consumers in emerging Asian markets switching to coal or oil and also result in higher emissions, thereby delaying the net zero targets for many countries
European security of supply	US LNG has been instrumental to help EU balance the market as Russia has started to weaponize gas curtailing pipeline EU exports. EU does have ambitious targets to reduce gas demand in the long term, but progress is slow, beyond renewable investments in the power sector, and there is increased consensus that gas demand will have more longevity than what policy makers hope for. US LNG imports will remain vital for a balanced EU gas market, also considering that pipeline imports from Algeria and Norway are set to decline substantially post 2030. EU continues to depend on Russian imports for 15% of its supply, once pipeline and LNG imports are considered. Lack of additional US LNG developments risk EU having to depend on Russian LNG for the foreseeable future

Source: Wood Mackenzie

Our modelling suggests that delays to the US projects driven by non-FTA approvals will increase the reliance on less cost competitive projects to meet demand

Implications in 2035 from delays to US LNG projects that are currently awaiting non-FTA approval

Delivered LNG costs curve to Japan (2035) – Base Case



Delivered LNG costs curve to Japan (2035) – Non-FTA Sensitivity

The gap left from US LNG will potentially be filled from projects in Mozambique, PNG and Australia

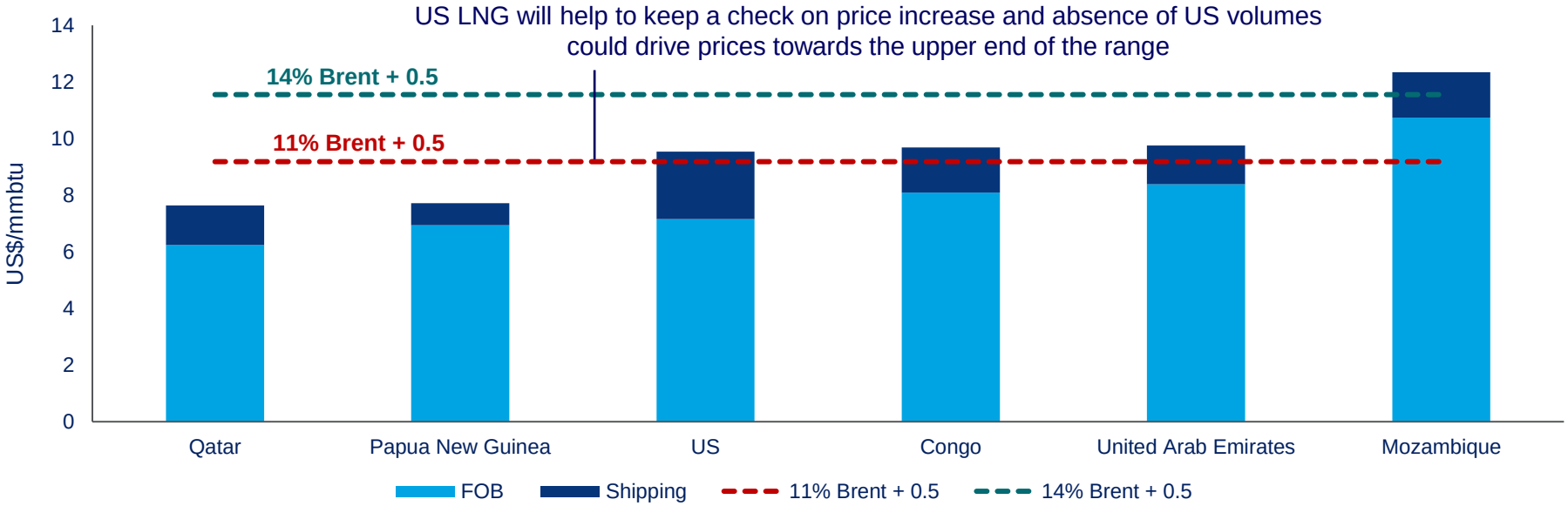
Russia could also develop some projects if technology hurdles are overcome

Charts shows the delivered DES cost to Japan for LNG projects versus capacity. Short Run Marginal Cost is used for post-FID projects, Long Run Marginal Cost is used for pre-FID projects.

Source: Wood Mackenzie

LT LNG prices are likely to trend upwards if the non-FTA pause continues and higher prices will end up eroding demand in emerging Asian markets

Price implication from delays to US projects due to non-FTA pause



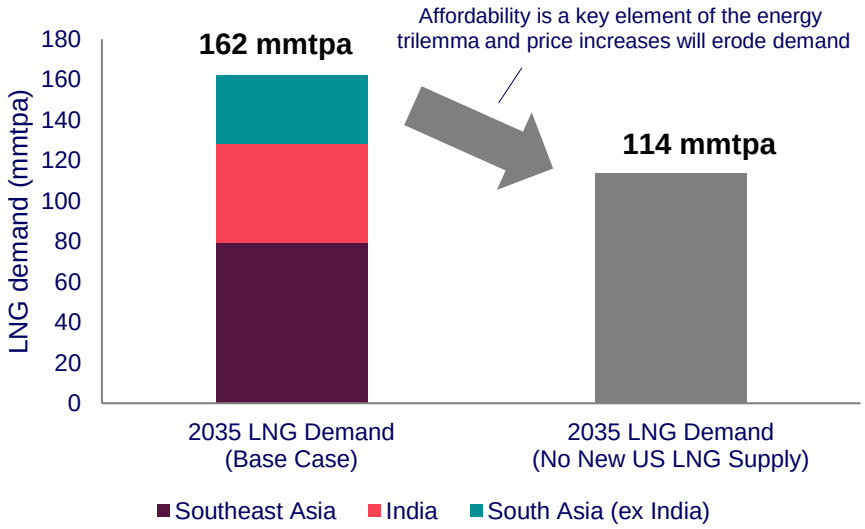
Notes:
1) The charts shows DES cost into NE Asia and references the following projects: Qatar: North Field West and North Field South Project, PNG: Papua Project, US: US LNG 2.5 Toll Fee Project, Congo: Marine XII Project, UAE: Ruwais (Abu Dhabi) Project, Mozambique: Area 1 Project
2) The costs of integrated projects are discounted at 12%. Segmented projects – at a 10% discount rate for LNG plant, and a 15% discount rate for upstream. Taxes are included. US Upstream assumption = 115% X Henry Hub (US$4.05/mmbtu). Shipping costs are based on the 174k m3 SSGI

Source: Wood Mackenzie

As an example, if rising prices erode ~30% demand in emerging Asia in 2035, coal consumption could increase by 95 million tons

The increase of coal consumption will lead to ~100 million tons incremental CO2 emissions

Emerging Asia LNG Demand (2035)



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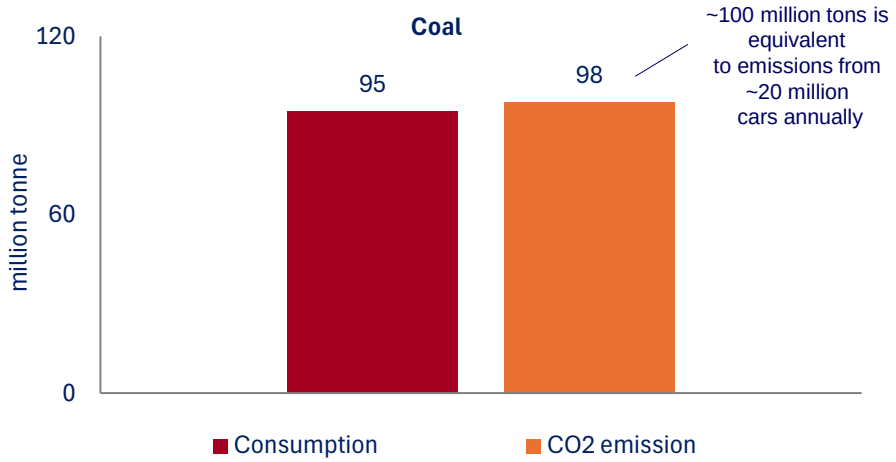
Incremental Coal Consumption and incremental CO2 emission (2035) if rising prices erode ~30% demand



Note: The incremental coal consumption is estimated based on 30% of 2035 LNG demand 100% displaced by coal. CO_2 emission are estimated using IEA CO_2 Factors for Coal (95.92 kg CO2/ mmbtu). Coal currently accounts for ~65% of the total emissions in Asia

Source: Wood Mackenzie

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