

2. Oil and gas security during the energy transition (OGSS No.19)

APERC Workshop

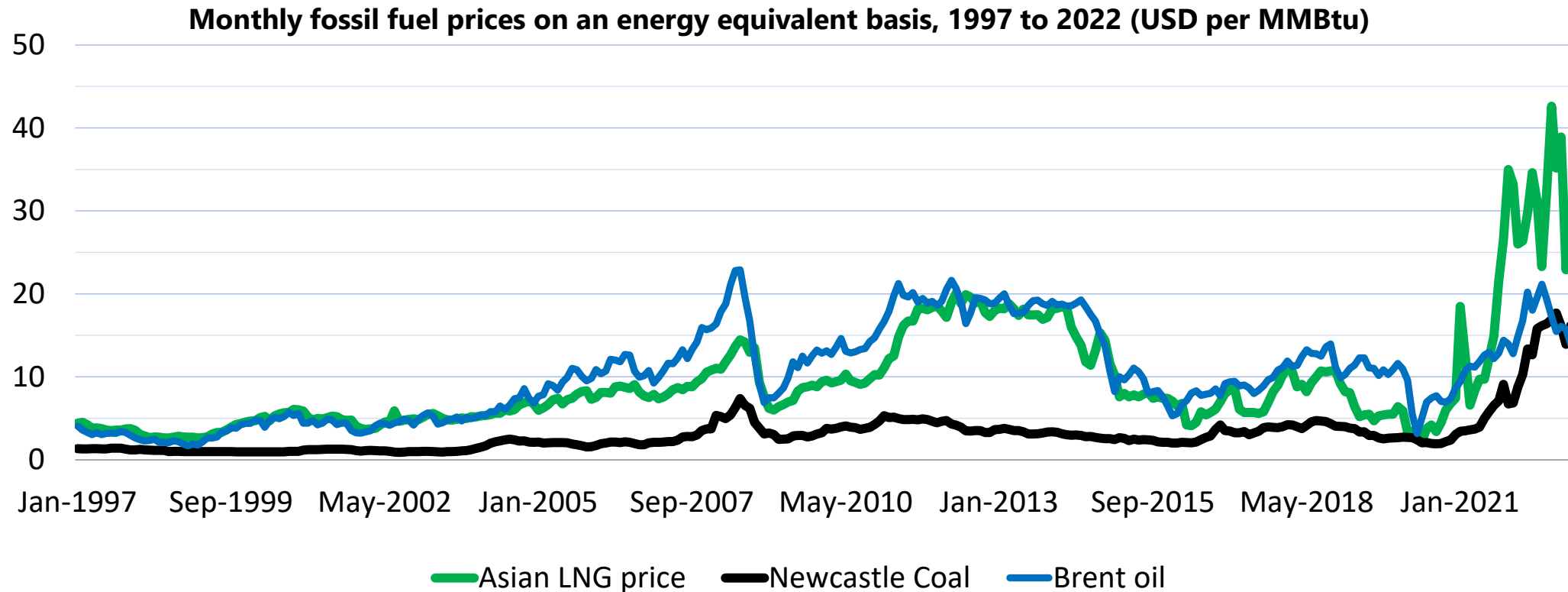
The 65th Meeting of APEC Energy Working Group (EWG65)
19 May 2023 (EDT) - Detroit, Michigan, US

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Emerging trends

Energy security is now at the center of energy policy discussions

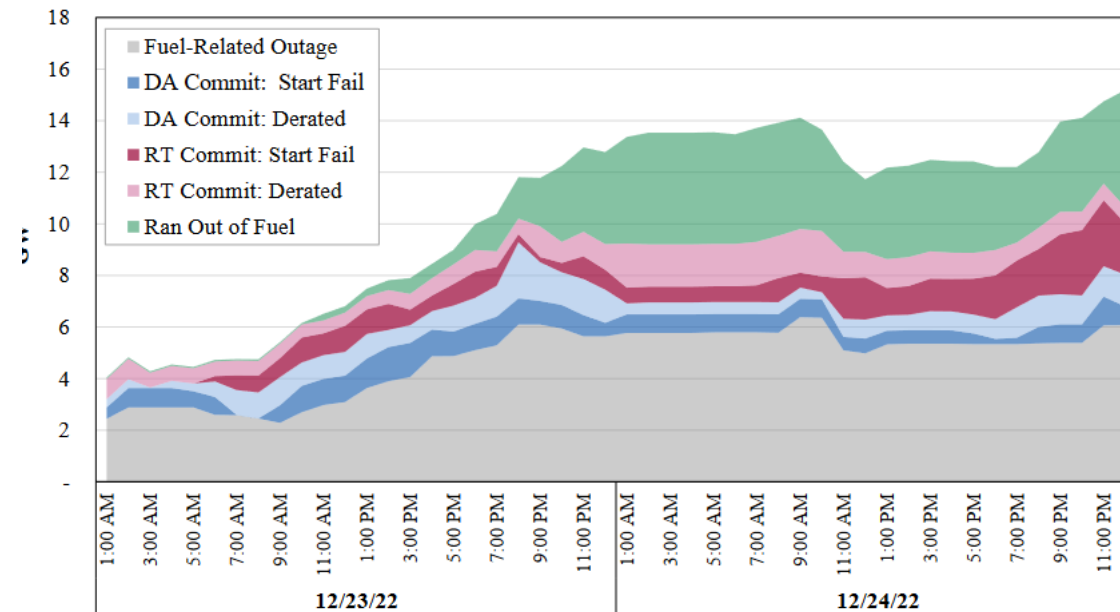


Source: IMF, JOGMEC, EIA, APERC analysis

- Pandemic recovery is prompting a rebound in energy demand
- Energy supply growth is constrained by several combining factors
- Russia-Ukrainian war is reorganizing energy supply chains

Severe weather is exacerbating APEC's energy security challenges

Gas-Fired Generation Outages December 23 - 24, 2022



Source: MISO

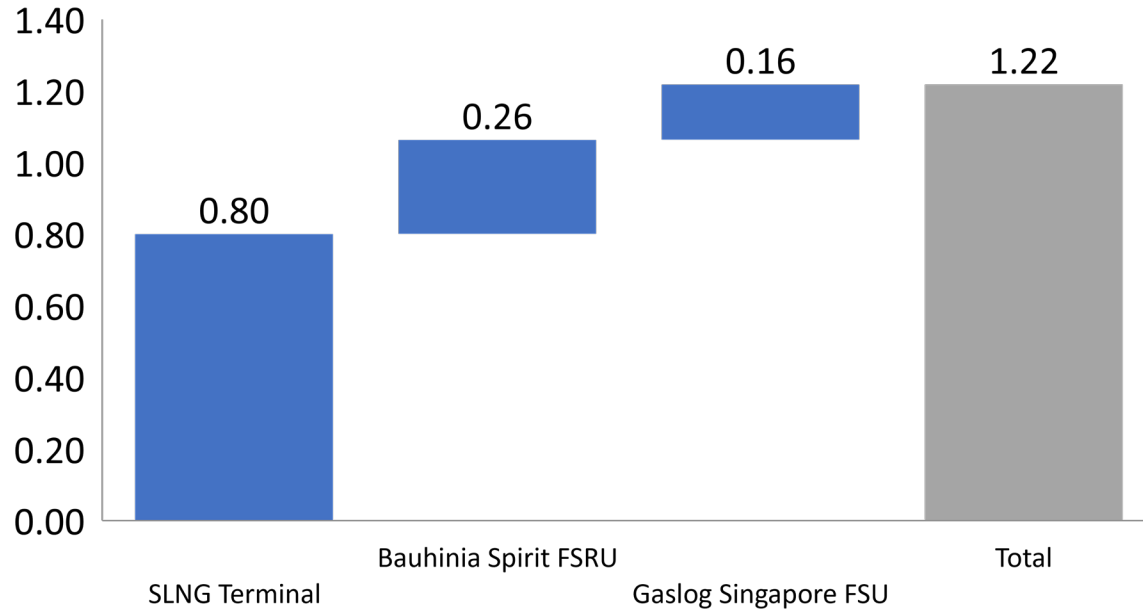
- Extreme temperatures elevate demand profiles while challenging fuel supply availability and reliability
- Storm surges disrupting just-in-time deliveries, damaging infrastructure
- Droughts reducing fuel and coolant availability

Governments are putting energy security into their own hands

- Prioritisation of domestic energy endowments for domestic use
 - Energy export bans: Indonesia's month-long coal export ban (January 2022)
 - Australia considering gas reservation
 - China increasing coal productive capacity to rely less on imports
- Securing the upstream through direct investments
 - Japan investing in LNG projects, and natural gas supply in the US
- Governments are rethinking their long-term energy plans to reduce reliance on oil and gas imports
 - Viet Nam shifting long-term power mix away from oil, gas and coal and towards renewables

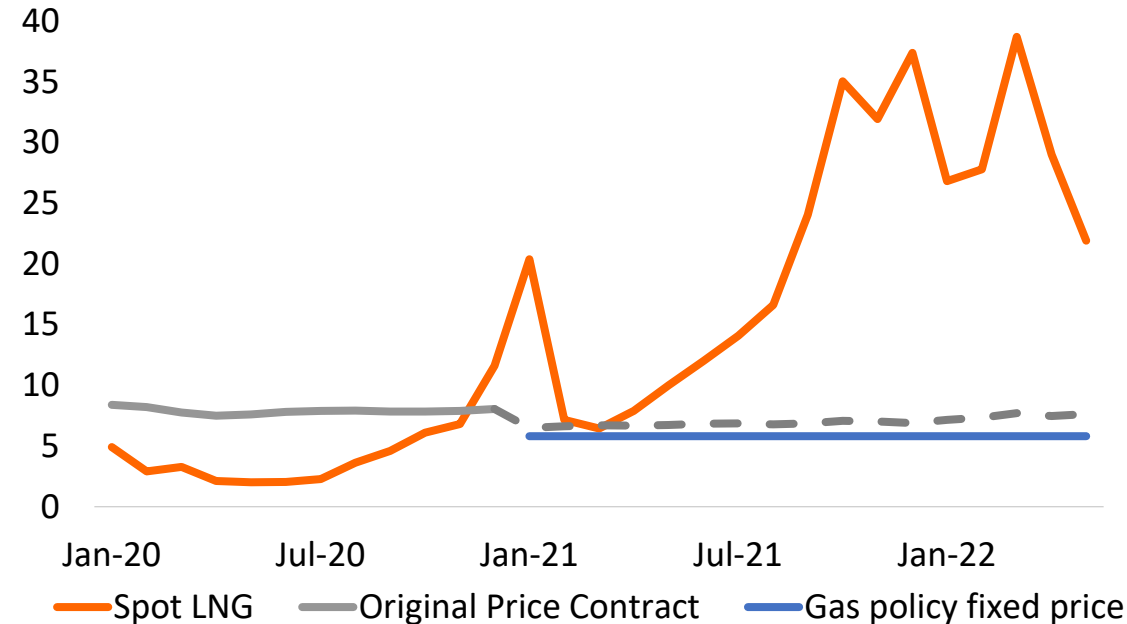
Governments are intervening in energy markets to improve affordability

Singapore LNG storage capacity (million m³)



Source: GIIGNL, Platts, EMA, APERC Analysis

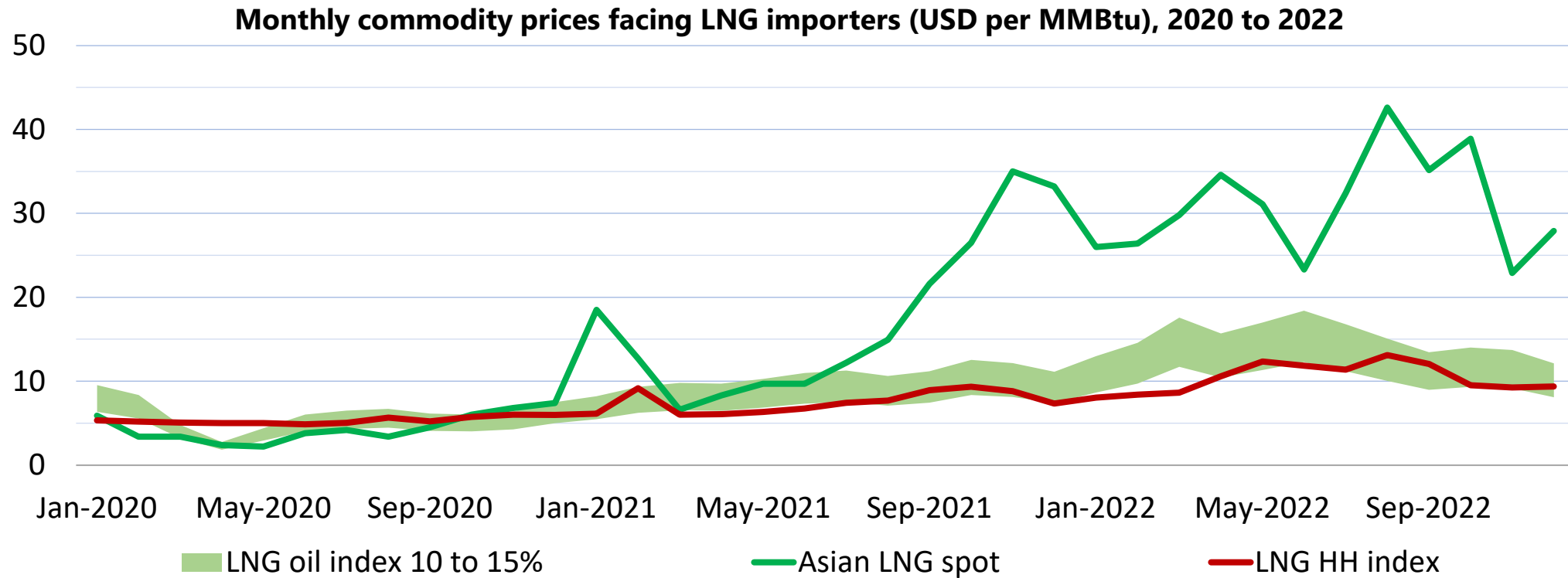
Monthly Indonesian gas price – with controls versus spot LNG prices, USD per MMBtu, January 2020 to May 2022



Source: MEMR, IMF, APERC Analysis

- Governments participate in or guide LNG supply procurement; Singapore is chartering stand-by FSU, FSRU capacity
- More regulation to wholesale and retail electricity markets
- Price caps for wholesale natural gas and coal (to in turn reduce power prices) in Australia
- Regulators mandating the weatherproofing of energy supply chains in the US (with questionable effectiveness)
- SPR releases to put a ceiling on crude prices
- Subsidies

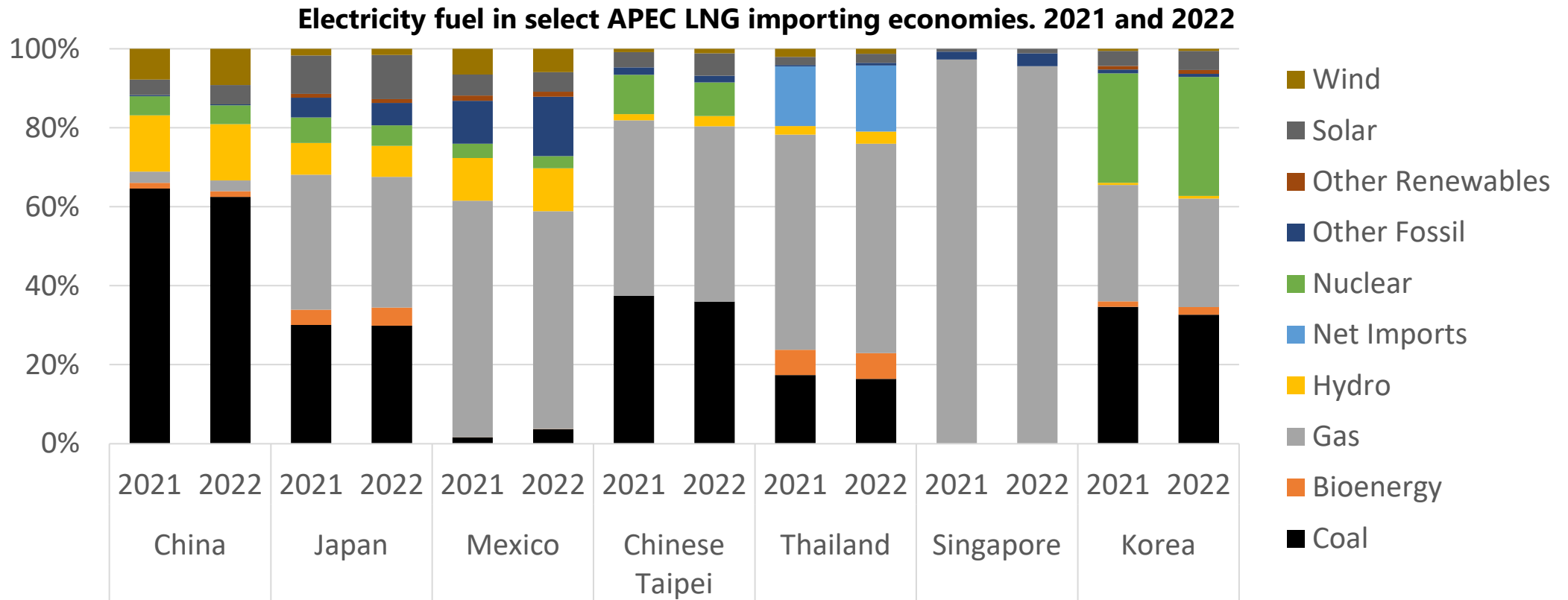
Long-term LNG contracts are insulating some from high spot prices



Source: JOGMEC, IMF, EIA, APERC analysis

- Long-term contracts are insulating incumbent importers from elevated, volatile spot prices
- China's short-term contract flexibility, lower demand enabled it to balance global LNG markets in 2022

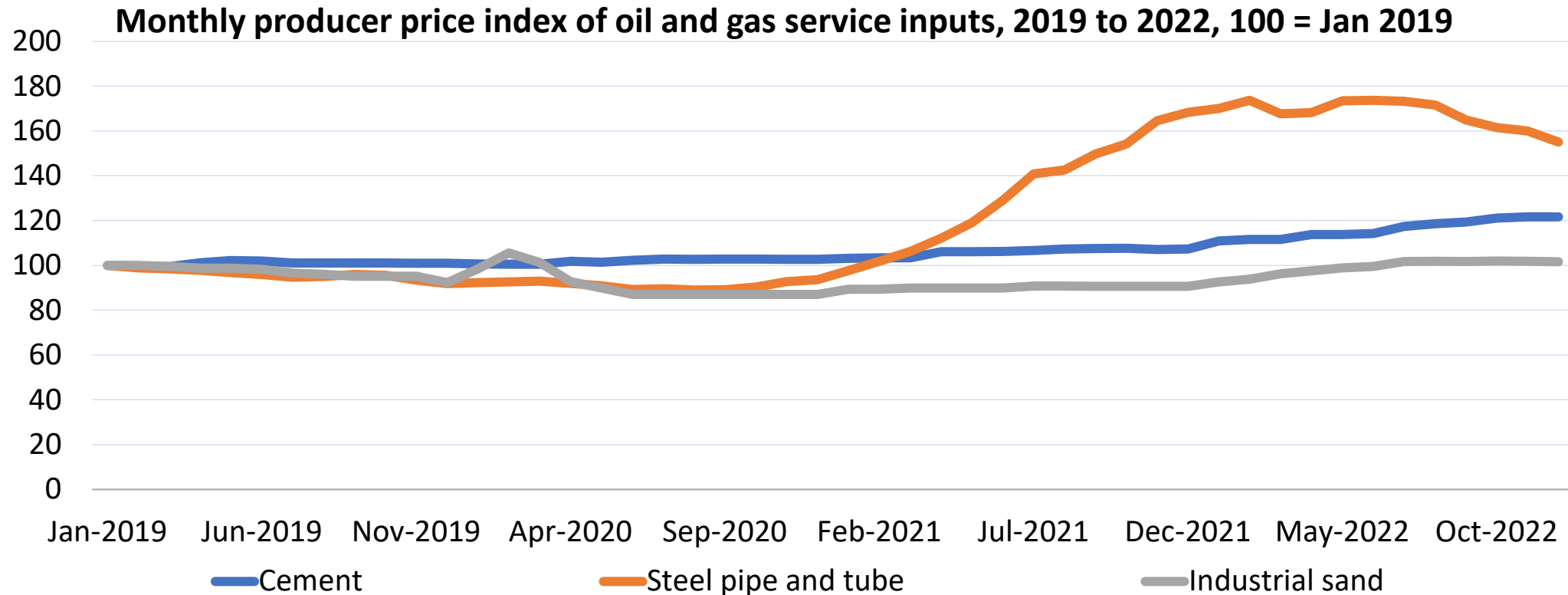
Short-term fuel switching away from gas is difficult in practice



Source: EMBER

- Technological capacity limits current fuel switching
- Sophistication, redundancy and replacement increases fuel switching ability, but do not emerge overnight
- Government policy can also play a role in limiting fuel switching (for example, coal-to-gas switching targets)

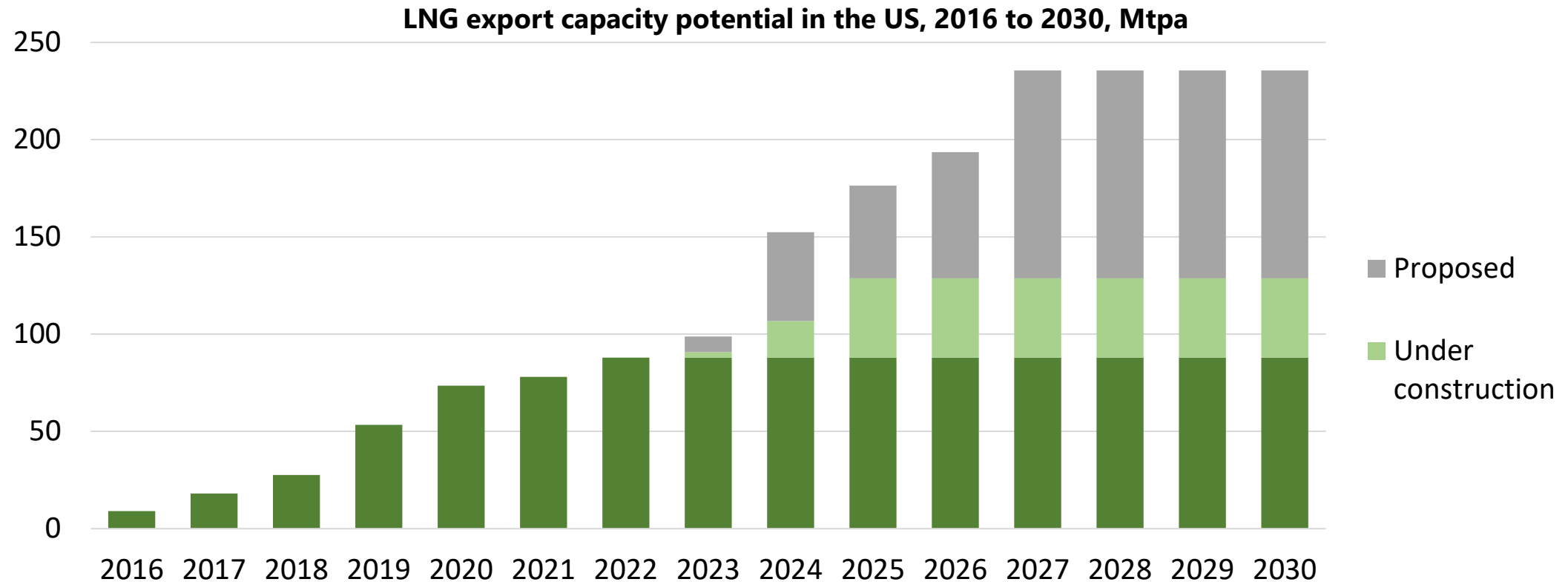
Binding supply constraints suggest a return to the boom-bust oil cycle



Source: BLS

- Capital discipline, labor shortages, input constraints limiting supply growth, shifting the marginal supplier out of APEC
- A decade of demand growth and inelastic supply could spell the return of the boom-bust oil cycle

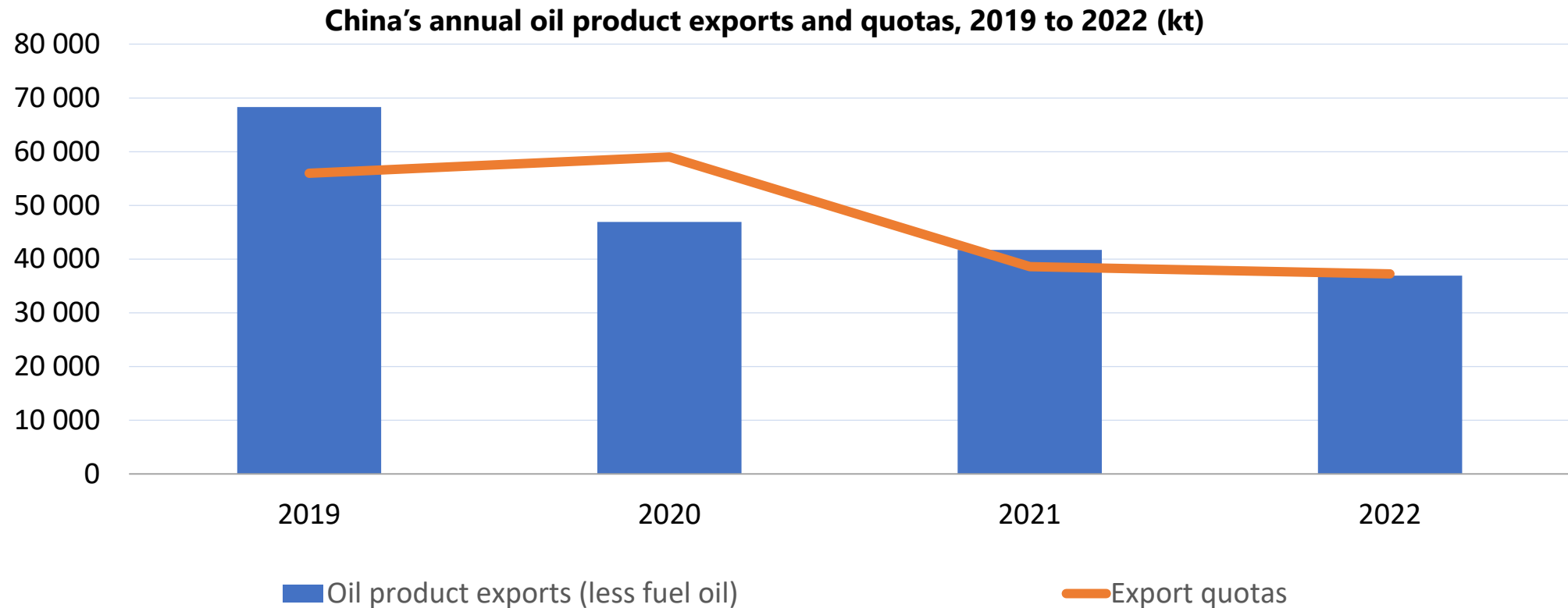
Infrastructure constraints could limit supply growth



Source: EIA

- Growing interest in US LNG exports as Europe shifts away from Russian pipeline exports
- However, infrastructure and capital constraints could limit the supply to these new LNG facilities

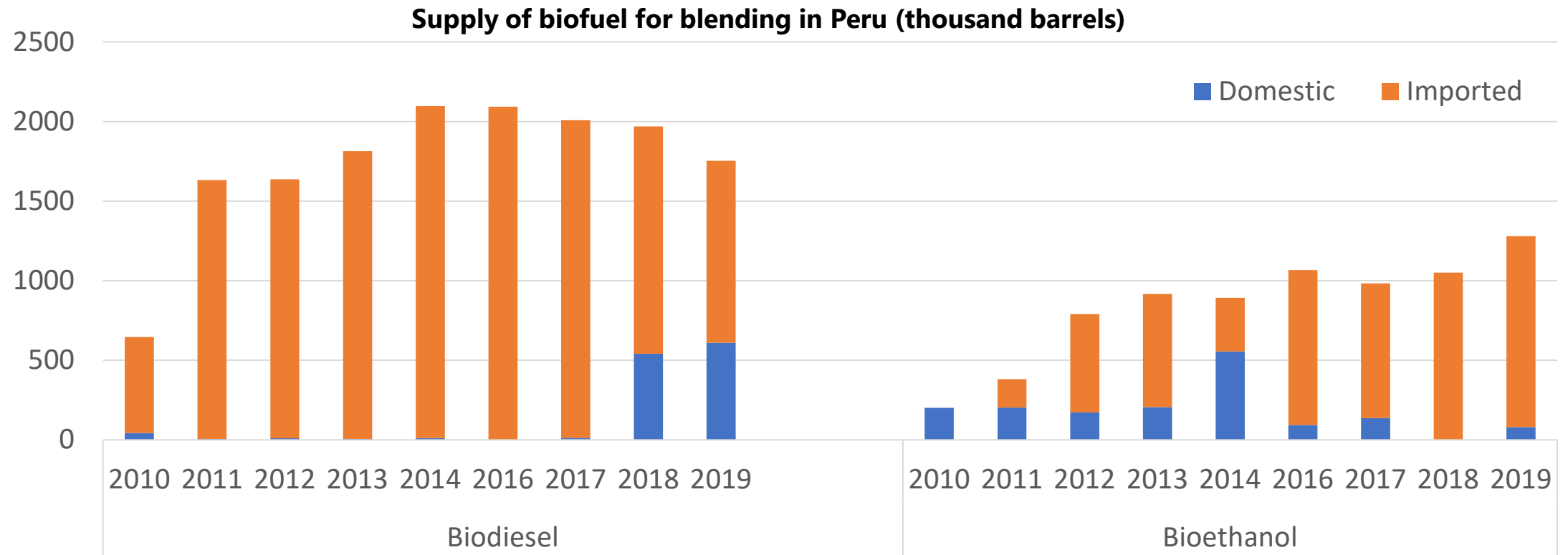
Refinery product constraints creating availability, affordability concerns



Source: Platts, Reuters, EGEDA, APERC Analysis

- China's export quotas curbing supply
- Phasedown of Russian oil product exports
- Capacity reductions due to retirements, unexpected damages and bioconversions

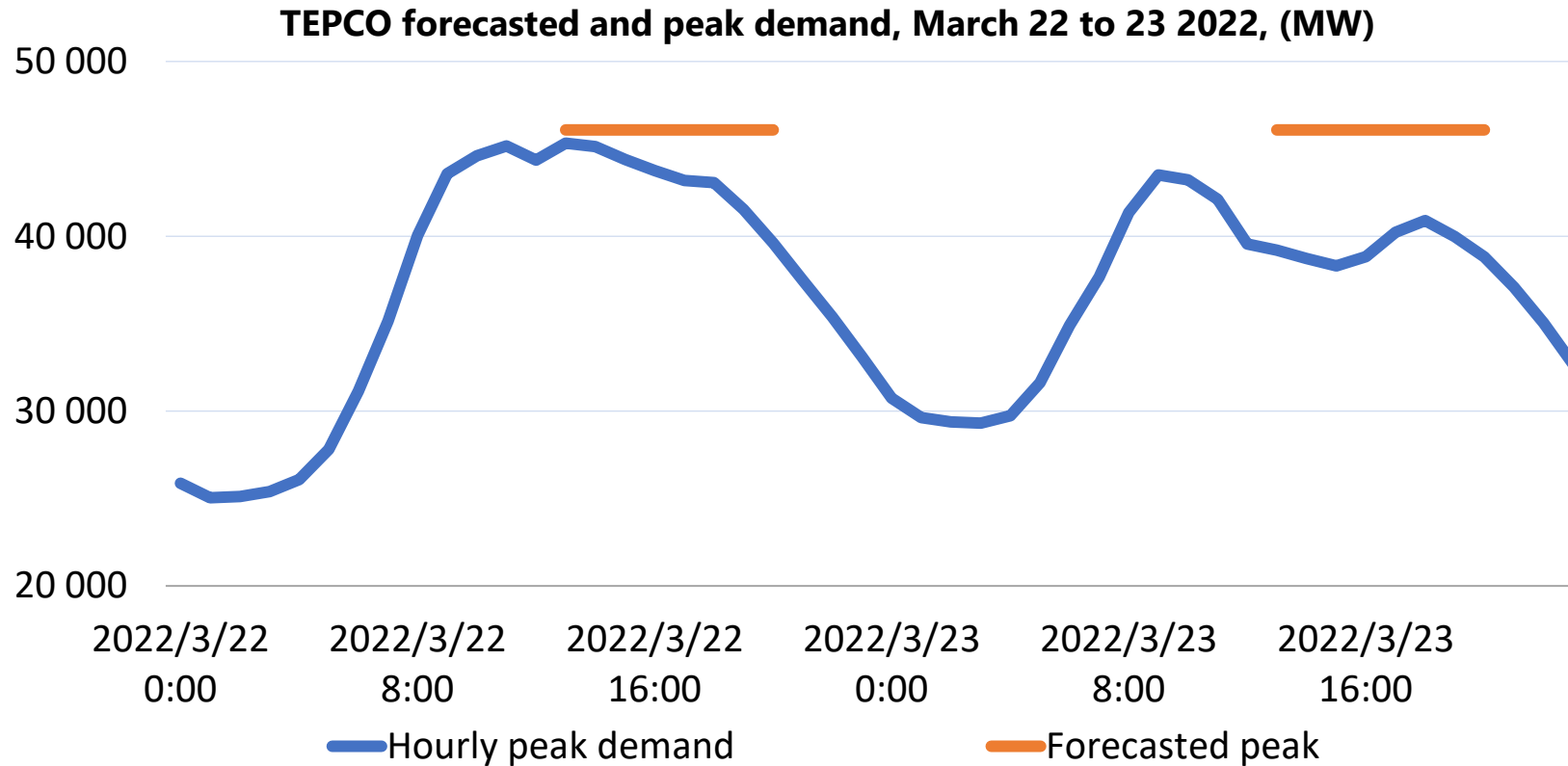
Biofuel mandates are alone insufficient for improving energy security



Source: EGEDA, Reuters, Platts

- Mandates may be substituting oil security concerns with biofuel security concerns

Emergency response programs are effective at ensuring energy security



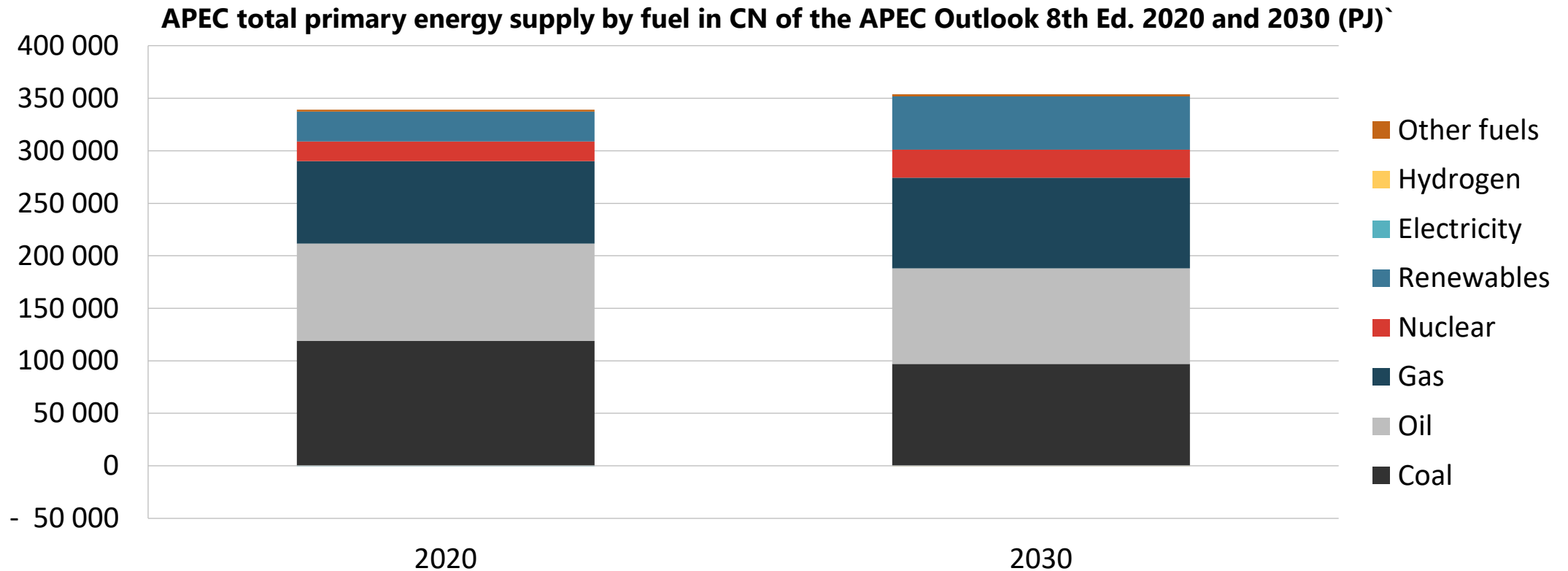
Source: TEPCO, Grid Monitor, APERC analysis

- Emergency response measures are very effective at ensuring energy security, including grid reliability
- Japan's effective emergency response could be a blueprint for others to imitate at the gas and electric retail level

Short-term actions are improving energy security, but these have limits

- Plenty of examples of short-term actions throughout APEC that are helping the region navigate acute oil and gas supply disruptions
- Households, businesses, suppliers, and governments are collectively mitigating the economic impacts
- However, constraints could limit these short-term responses going forward

Oil and gas demand will likely remain robust this decade

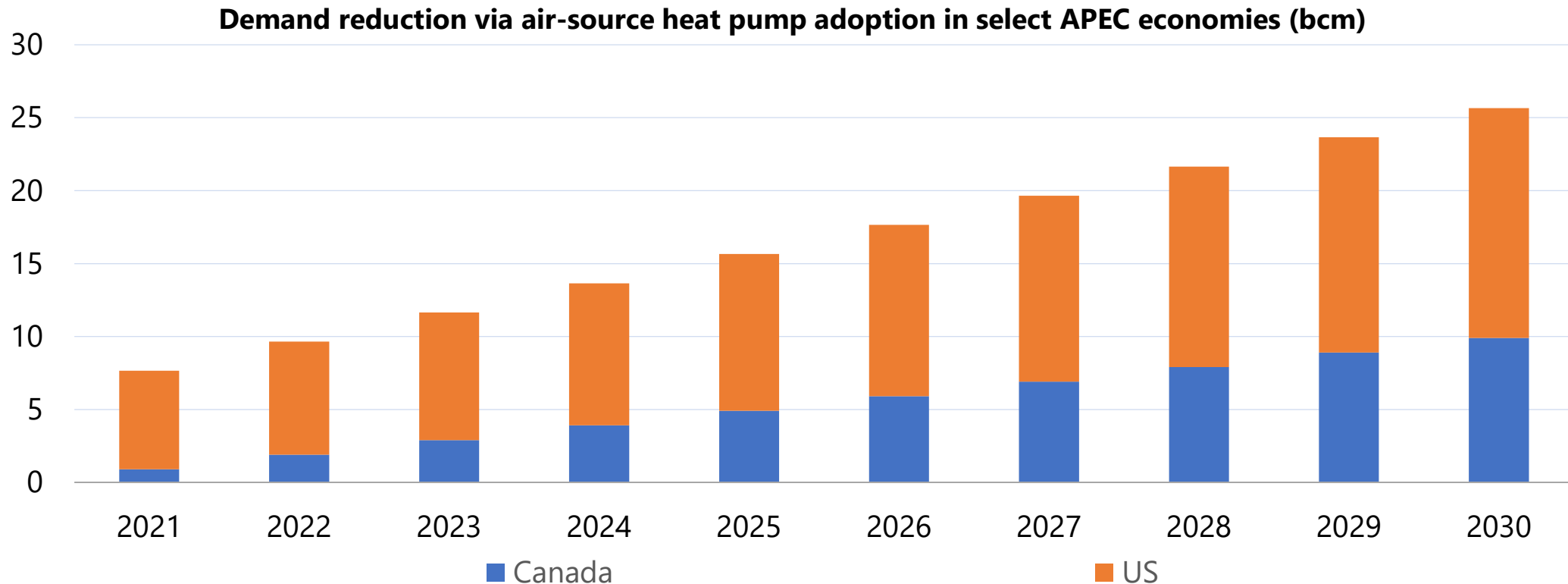


Source: APERC

- In CN, gas supply requirements will grow a tenth, oil supply fall slightly
- Despite higher production, oil and gas import dependence will remain elevated and even grow in SEA
- Supply disruptions will continue to pose a risk to some APEC economies

Recommendations to improve energy security during this energy transition

Actions to improve energy security for oil and gas users



Source: OEE (2022a, 2022b, 2022c), Nature, Carbon Brief, APERC analysis

- Invest in electrification, efficiency to reduce import dependence
- Consider investments in redundancy, sophistication and replacement
- Develop short-term demand response programs at the retail level
- Diversify long-term energy and power plans

Actions to increase oil and gas supply

US weekly frac fleet count

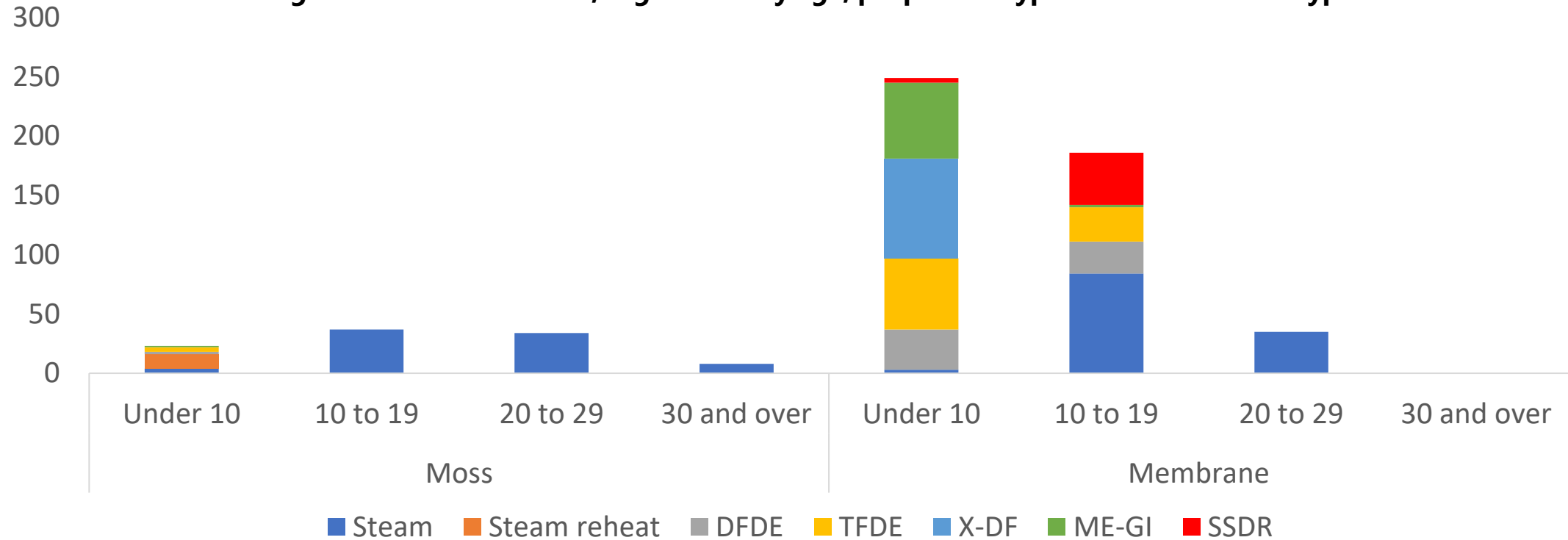


Source: Primary Vision

- Alleviate shale service bottlenecks: invest in productive capacity, eliminate tariffs and research labor bottlenecks
- Simplify the permitting process and frontload investments in methane, flaring and emission reductions
- Commit to replenishing SPR storage volumes to reduce demand-side uncertainty during the transition
- Winterise the entire gas supply chain of producer-exporters

Actions to increase LNG supply, mitigate disruptions

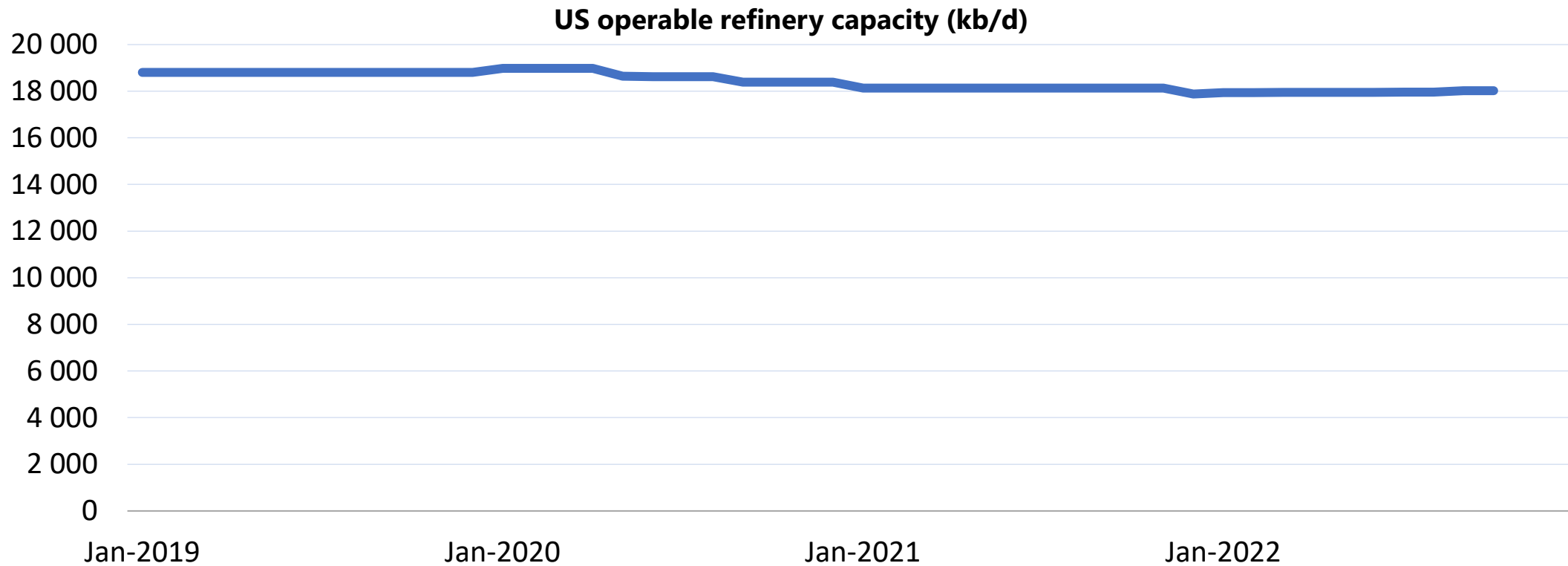
Active global LNG carrier fleet, segmented by age, propulsion type and containment type



Source: IGU, GIIGNL, APERC analysis

- Sign long-term contracts, invest in upstream LNG supply chain, and pool collectively bids
- Enable LNG reloading at all import terminals
- Expand LNG storage tanks
- Invest in the resiliency of the LNG shipping supply chains

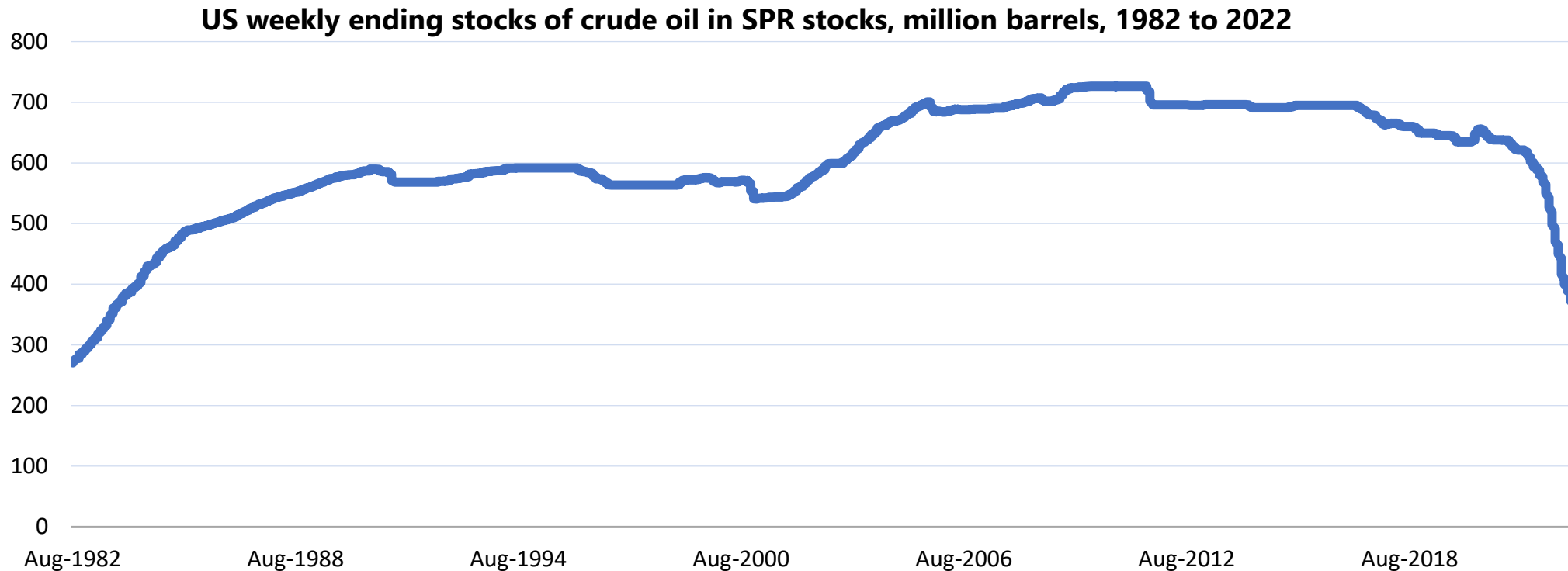
Actions to increase oil product and liquids supply



Source: EIA

- Consider extending refinery lifetimes
- Ensure that bioconversions do not result in net capacity declines
- Make bioblending mandates conditional on parallel supply increases

Increasing mitigation capacity for crude oil, oil products



Source: EIA

- Develop an operationalization roadmap for joint-stockpiling of oil and oil products in APEC subregions
- Invest in stockpiling, SPRs to mitigate just-in-time disruptions to oil and oil product supply
- Replenish stockpiles at low price levels

Discussion

Thank you.

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