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S&P Global
Energy

Europe CIS and Africa NGL Markets Long-Term Price Outlook

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Key implications: Europe, CIS, and Africa

- Dated Brent prices are lifted by an average of \$2/barrel over the next decade versus Q3, supporting non-OPEC supply growth – especially in the US – and reducing the need for additional OPEC volumes through 2035.
 - US production is expected to decline in 2027 and 2028 but rebounds quickly with firmer prices. Our forecast indicates greater resilience for US shale, with production plateauing around 14.0 million barrels per day (b/d) from 2031 to 2040 and now peaking at 14.3 million b/d in 2033.
 - Following recent OPEC announcements, we expect increased production this year, then stable output over the decade. As Chinese oil demand plateaus, global crude prices are expected to remain below \$70 through 2030, thereby limiting Permian supply growth.
- Our European gas price forecast for winter 2025 has been lowered as the market stays muted despite low storage levels.
 - The winter 2025 TTF price forecast has been lowered to €29.7/MWh, despite low storage levels, due to robust LNG and Norwegian supply, weak demand from mild weather, limited Asian competition for LNG, and reduced risk premiums.
 - The summer 2026 price forecast has been cut to €23.3/MWh, reflecting lower expected Chinese LNG demand and thus less competition for European LNG imports.
 - For winter 2026, the forecast is also revised down to €29.9/MWh, as higher LNG availability and strong storage levels are offset by anticipated recovery in global LNG demand, keeping prices similar to the previous winter.
 - European gas prices beyond 2027 will be highly sensitive to fluctuations in LNG supply and demand, with periods of oversupply leading to price drops below US costs, followed by gradual increases as demand catches up, all while Europe remains reliant on competitive LNG imports due to the absence of Russian pipeline gas.
- Our long-term price forecast for Northwest Europe LPG is now lower in the near term, and then higher in the long term. This reflects higher production from the US vis-à-vis weak demand. As the global LPG market becomes tighter in the long term, prices are expected to rise.
 - In the near term (2025–2027), LPG prices are expected to remain weak, driven primarily by robust US supply growth and soft global petrochemical demand. Higher gas-oil ratios in the Permian Basin continue to support strong NGL production. This supply strength—combined with lower crude prices and a cyclical downturn in the petrochemical sector—continues to put downward pressure on both propane and butane prices. Tariff issues are expected to be resolved and global trade to normalize, with Asia—being the main demand center—continuing to drive LPG pricing. Asian propane prices will remain closely linked to propylene prices and the economics of Propane Dehydrogenation (PDH) processes.
 - Long term, global LPG supply growth is expected to slow due to peaking oil and associated gas production, as well as lower refinery runs. At the same time, price-insensitive demand—particularly in the residential/commercial sector and in chemical applications such as PDHs—will continue to rise. As the supply–demand gap narrows, LPG availability as a price-sensitive chemical feedstock will tighten, likely pushing LPG-to-naphtha price ratios higher. The long-term LPG price outlook remains largely unchanged from the previous forecast.

Key drivers for European and global LPG prices

Ethane

- Ethane prices are mainly driven by demand fundamentals and typically align with local natural gas values when supply and infrastructure are sufficient, with transport and fractionation costs factored into the Mont Belvieu price.
- Natural gas sets the price floor for ethane. By early 2026, increasing LNG feedgas demand is expected to outpace Lower 48 production, resulting in higher gas and ethane prices and prompting some feedstock switching, which is expected to ease later in the year. Near-term price expectations remain broadly unchanged, with key risks including LNG project schedules, upstream supply, cracker economics, and Permian drilling activity.
- Waha price volatility affects ethane values due to the Permian Basin's dominance. As new gas takeaway capacity increases, Waha prices are expected to move closer to the Henry Hub. In the longer term, slower associated gas growth will increase reliance on dry gas, thereby raising the marginal supply cost and price floor for both natural gas and ethane. Growing ethane demand will draw supply from higher-cost or more distant sources, widening the spread between ethane and Henry Hub.
- US ethane exports are set to grow, supported by a global cost advantage. Temporary export licence requirements in 2025 reduced flows to China and increased ethane rejection, but exports have rebounded since their removal. These regulatory changes do not impact the long-term outlook, with the competitiveness of US ethane underpinning continued growth in global trade.
- After 2035, falling oil prices and rising gas prices will narrow the oil-to-gas price ratio, potentially reducing the attractiveness of new ethane-based steam crackers and limiting further investment. Propane cash-cost parity will remain the effective ceiling for ethane prices, with convergence towards parity expected by the mid-2040s.

LPG

- From 2025 to 2027, LPG prices are expected to remain weak due to strong US supply growth, higher gas-oil ratios in the Permian Basin, and subdued global petrochemical demand. This, alongside lower crude prices and a cyclical downturn in the sector, continues to pressure propane and butane prices.
- Earlier tariff introductions caused Asian LPG prices to fall below Middle East levels as more Middle East supply reached China via swaps. The situation improved with a 90-day pause, lifting Asian prices above those in the Middle East. Tariff issues are expected to be resolved, normalising global trade, with Asia remaining the key driver of LPG pricing. Asian propane prices will stay closely tied to propylene prices and PDH economics.
- Spot waterborne premiums have eased since late 2024 and are expected to remain low as new export capacity comes online in late 2025 and 2026, until utilisation increases. Freight rates are expected to remain volatile, influenced by geopolitical events, vessel re-routing, and ship availability.
- Over the long term, global LPG supply growth will slow due to peaking oil and associated gas output and lower refinery runs. However, price-insensitive demand—especially in residential/commercial and chemical sectors—will rise, narrowing the supply–demand gap and likely pushing LPG-to-naphtha price ratios higher. The long-term outlook for LPG prices remains unchanged.
- LPG and naphtha will continue to both compete and complement each other as chemical feedstocks, keeping their prices closely connected.
- As LPG is now a global commodity, regional price differentials are mainly determined by VLGC freight rates and related costs.
- The propane–butane price relationship will remain influenced by overlapping demand and interchangeability, particularly in residential/commercial cylinders and as ethylene feedstocks. Declining domestic butane demand, due to lower motor gasoline use, will increase export needs. Rising global demand for residential and commercial butane is expected to absorb the US surplus, making export dynamics crucial for long-term butane pricing.

T&F = all costs and expenses reasonably incurred in connection with the receipt, fractionation.

Global market environment

- **Dated Brent prices lifted \$2/b on average between 2027-2035:** We forecast that OPEC+ will pause production growth in 2026 and potentially implement modest reductions in response to elevated global inventory. Compared to our previous outlook, this provides modest price support, raising average Dated Brent by \$2/b (2027-2035) compared to Q3 2025. The price lift is expected to incentivize a US shale uptick during 2030-2033.
- **Total North American natural gas demand is expected to grow through 2032, mainly driven by the power sector and LNG exports, and then plateau through 2050.** Total demand is projected to increase from 2024 by 31 Bcf/d to 152 Bcf/d in 2032 and remain close to this level through 2050.
- **Naphtha crack-spread trends lower:** Long-term economics continue to be set by demand from the Asian petrochemicals sector, which requires additional on-purpose naphtha from refinery hydrocracker operations. There is no change to our naphtha demand and price this quarter.
- **Naphtha demand has been strongly challenged in the short term by the US shale boom and rising NGL production, incentivizing ethane cracker build-outs.** China (mainland) naphtha demand is bolstered by a new wave of cracker startups; however, near- to mid-term uncertainty over restarts remains at several Asian crackers due to economic closure. A casualty of the highly competitive environment has been Europe, with numerous assets either offline, idled, for sale, or shuttered. Approximately 5.4 Mt/y of steam cracker rationalization has been announced, with a base case assumption of around 7.5 Mt/y to be closed as more are under consideration. These closures will weigh on demand, but a more positive outlook is expected with growth picking up post-2028 2028

Global market environment (continued)

- **Global NGL supply is expected to peak around 2030–2035**, then slow dramatically due to the decline in oil-based associated gas production, particularly from US sources. In the long term, non-associated gas from the Middle East will be the dominant driver of new production.
- **Long-term NGL supply growth will be heavily dependent on associated gas from oil plays.** North America, particularly the Permian, Eagle Ford, and Bakken basins, has been the main source of NGL supply growth due to the processing of associated gas—natural gas produced alongside crude oil, and will continue to dominate through the mid-2030s.
- **Ethane prices remain anchored to natural gas, which sets the price floor.** By early 2026, rising LNG feedgas requirements are still expected to outpace Lower 48 production growth, which will lift both gas and ethane prices and prompt some level of feedstock switching before moderating later in the year. Near-term price expectations are broadly consistent with the previous outlook. Key risks to the ethane forecast continue to include LNG project timelines, upstream supply responses, cracker economics, and Permian drilling activity.
- **US ethane exports are expected to continue rising, supported by the sustained global feedstock cost advantage of US ethane.** The introduction of export license requirements in 2025 temporarily reduced flows to China and increased ethane rejection, but following the rescission of those requirements, exports have rebounded. These regulatory disruptions do not alter the long-term outlook: the structural competitiveness of US ethane continues to underpin persistent growth in global ethane trade.
- **Earlier this year, when tariffs were introduced, global prices adjusted, with Asian LPG prices remaining below Middle East prices as more Middle East barrels were sent to China through cargo swaps.** However, the situation later improved with a 90-day pause, which lifted Asian prices above those in the Middle East. Looking ahead, tariff issues are expected to be resolved, and global trade is expected to normalize, with Asia—being the main demand center—continuing to drive LPG pricing. Asian propane prices will remain closely linked to propylene prices and the economics of Propane Dehydrogenation (PDH) processes.
- **Long term, global LPG supply growth is expected to slow due to peaking oil and associated gas production, as well as lower refinery runs.** At the same time, price-insensitive demand—particularly in the residential/commercial sectors, as well as in chemical applications such as PDHs—will continue to rise. As the supply–demand gap narrows, LPG availability as a price-sensitive chemical feedstock will tighten, likely pushing LPG-to-naphtha price ratios higher. The long-term LPG price outlook remains largely unchanged from the previous forecast.

Key assumptions and risk factors for NGL price outlook

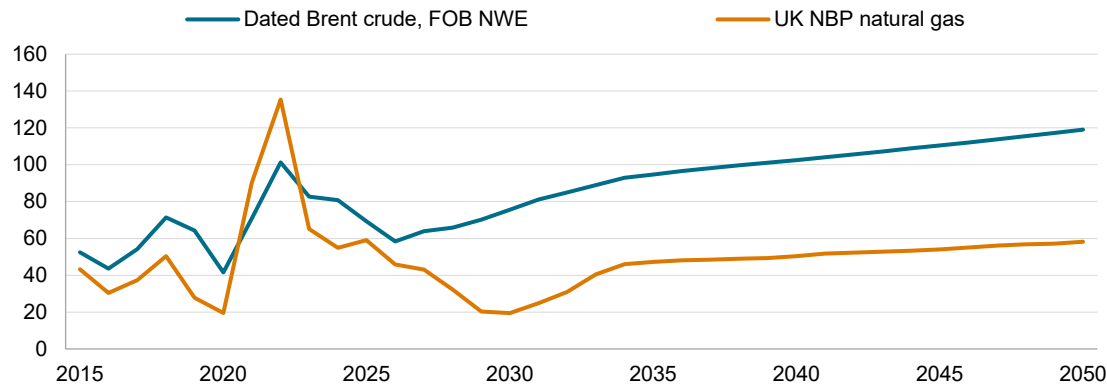
- This forecast incorporates S&P Global Energy analysis for 2025-2027 as presented in the **November Short-Term Outlook** updates for crude oil and refined products markets.
- **The long view. To project the oil and refined products markets forward 25 years, an assessment beyond the recent US election is necessary.** The second election of Donald Trump as the 47th US President is nonetheless part of a larger global trend towards national and labor interests and away from globalization and capitalism at any cost. This outlook accounts for the fundamental shifts occurring in the geopolitical, economic and national spheres.
- **Economic forecast is based on an average 2.5% global GDP through 2050 forecast.** Outlook assumes a modest increase in global tariff levels and a moderate reduction in global trade relative to history. A key assumption is a dramatic moderation of initially announced US “reciprocal” tariffs by the Trump administration on April 2, 2025. The mainland China-US trade relationship is forecast to remain in place with a marginal level of economic and trade “decoupling.”
- Our price forecasts are based on careful evaluations of possible changes in market conditions. All price outlooks are based on S&P Global Energy’s 2025 Annual Strategic Workbook (ASW) for refined products and NGL, which forecasts the fundamentals of supply and demand through the year 2050 and was released in September of 2025.
- Global NGL supply is expected to peak around 2030–2035, then slow dramatically due to the decline in oil-based associated gas production, particularly from US sources. In the long term, non-associated gas from the Middle East will be the dominant driver of new production.
- Global demand will see LPGs and natural gasoline decline from the 2030s, with ethane propping up the post-2035 outlook. Peak NGLs demand is expected in 2036, the same as in ASW 2024, although growth will be slightly stronger, with a CARG of 0.6% vs 0.4% in the previous outlook
- LPG as global balancer: Flexing between fuels and feedstocks, LPG’s role as a swing commodity grows in importance, with strong pull from Asian petrochemicals, but potentially driven longer term by African residential and commercial needs. Currently, naphtha is more competitive with naphtha in Asian and European cracking markets; however, naphtha will become more competitive over the longer term, transitioning from a discount to a structural premium as LPG markets tighten due to lower supply.
- Evolution of US supply will determine global NGL economics through the mid-2030s: The US remains the largest exporter of LPG and ethane globally, with exports expected to surpass 900,000 b/d of ethane and 70 MMt of LPG by the mid-2030s. Nearly all incremental US exports are destined for Asia, particularly mainland China, which has become the largest buyer of US ethane since 2023
- After 2035, declining oil prices as demand peaks and rising gas prices are expected to narrow the oil-to-gas price ratio. This could reduce the economic viability of ethane production and discourage investment in ethane crackers. Propane cash cost parity will act as a ceiling for ethane prices, with ethane projected to reach parity with propane by the mid-2040s
- LPG and naphtha are expected to continue competing and complementing each other in meeting the growing chemical feedstock requirements through the forecast period. This dynamic will consequently keep LPG and naphtha prices connected going forward.

Relationships to crude oil and natural gas

Crude oil and natural gas prices and LPG ratios in NWE

European benchmark crude oil and natural gas prices

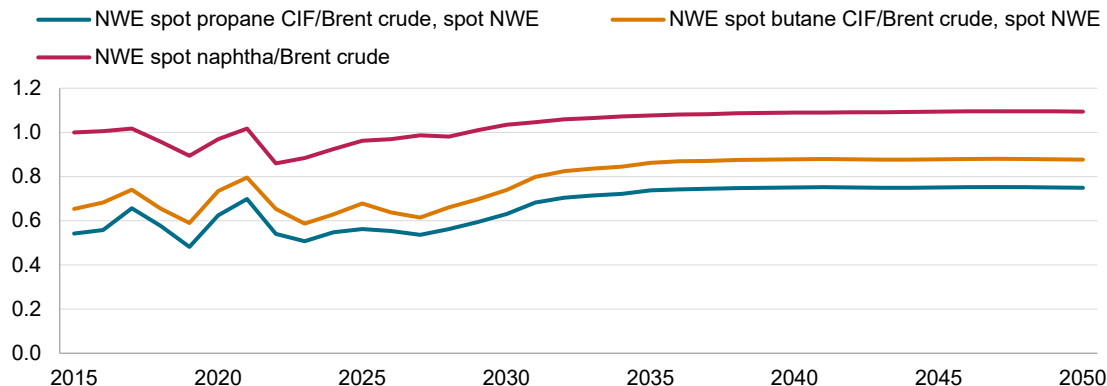
Current \$/boe



- By 2050, our base Dated Brent price is \$67, with most new-source production requiring less than \$70/b. Only about 10% needs above \$60/b, and the marginal barrel is expected to come from Deepwater Brazil, the US Gulf of Mexico, and higher-cost US tight oil. Following recent OPEC announcements, we expect increased production this year, then stable output over the decade. As Chinese oil demand plateaus, global crude prices should remain below \$70 through 2030 to limit Permian supply growth.
- Crude oil demand will ease from 84 million b/d in 2025 to 74 million b/d by 2050, supported by higher US crude runs and strong petrochemical demand. Non-OPEC+ crude peaks at 39.1 million b/d in 2029, then gradually declines, putting downward pressure on prices.
- OPEC+ output is projected to peak at 35.9 million b/d in 2026 and ease to 33.6 million b/d by 2035, with a likely strategic cut in 2027 to address oversupply and stabilize the market. Brent prices are expected to be volatile, bottoming at \$54.8/b in 2026, recovering to \$73.6/b by 2034, and softening again as demand weakens beyond 2034.

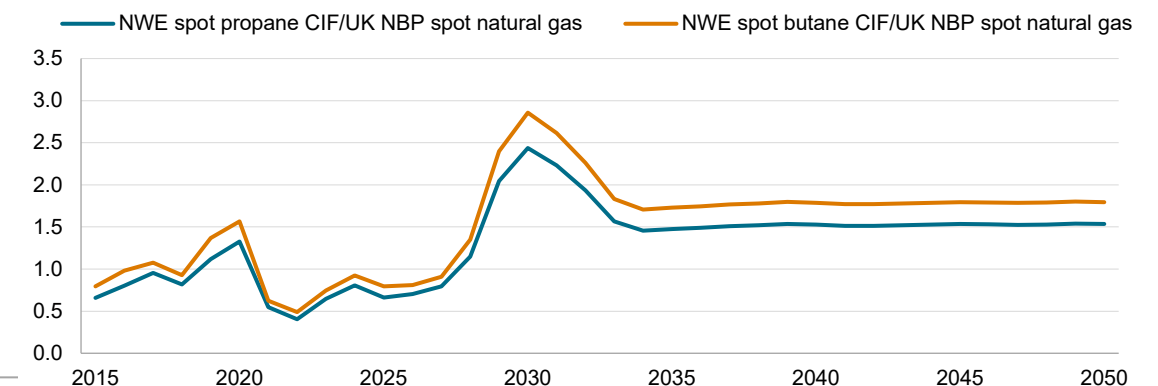
NWE LPG/Brent crude relationships

Ratio



NWE LPG/UK NBP natural gas relationships

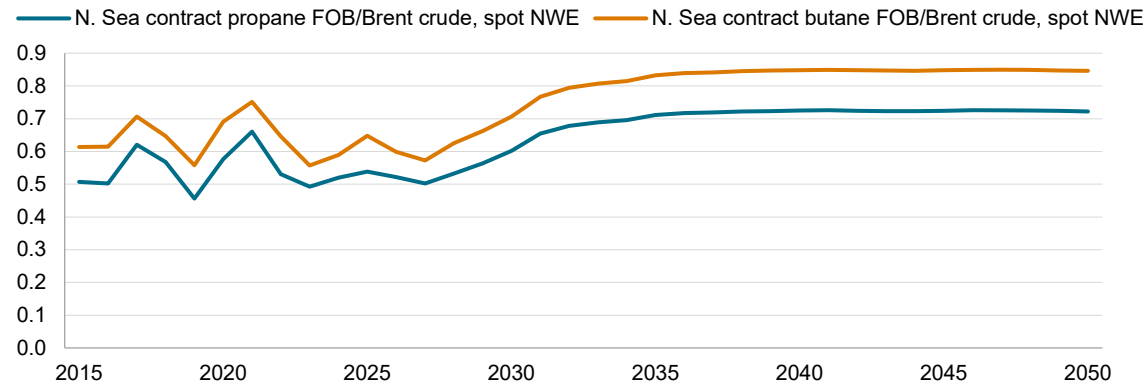
Ratio



North Sea crude oil and natural gas relationships with LPG

North Sea LPG/Brent crude relationships

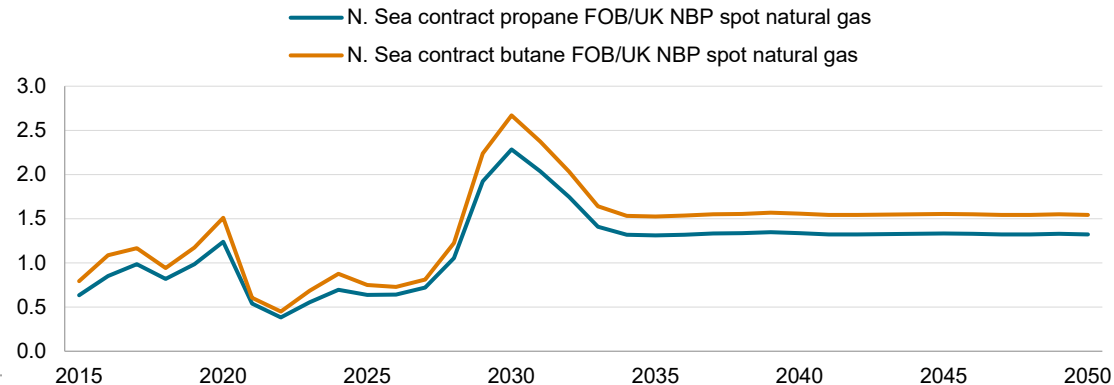
Ratio



- We anticipate that ratios will reach a long-term equilibrium by the early 2030s as less LPG needs to be absorbed in price-sensitive cracking, and market fundamentals shift towards affordability in developing market res/com as the primary price driver.
- Propane and butane ratios to crude have remained relative stable at around 50%-60% (respectively) over the past few years, after reaching a peak of 66% and 75% (respectively) in 2021. We expect those ratios to start increasing through the long term.
- Some volatility in ratios is possible in future years, but we expect that the trend will revert to a long-term range of 60-80%.

North Sea LPG/UK NBP natural gas relationships

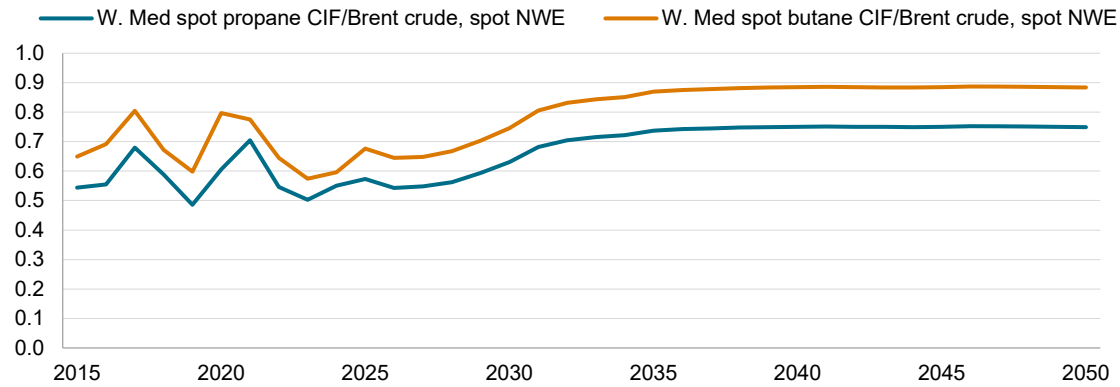
Ratio



Mediterranean and CIS LPG/crude oil relationships

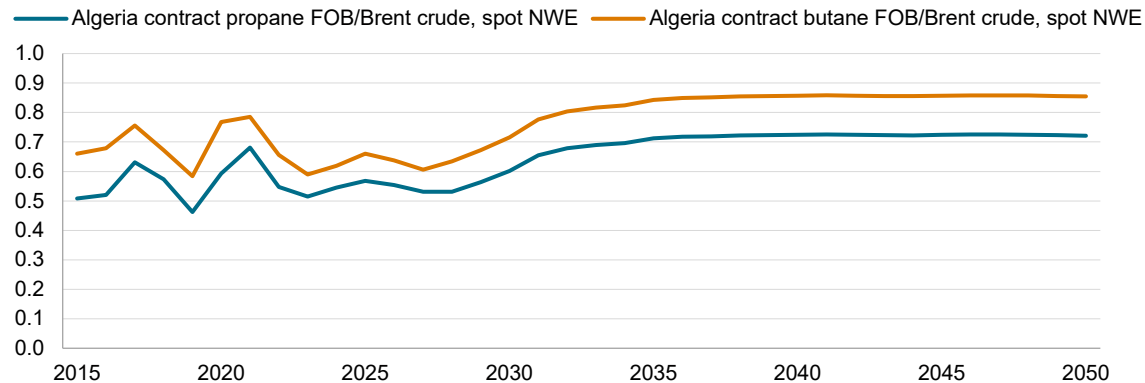
Western Mediterranean LPG/Brent crude relationships

Ratio



Algeria LPG/Brent crude relationships

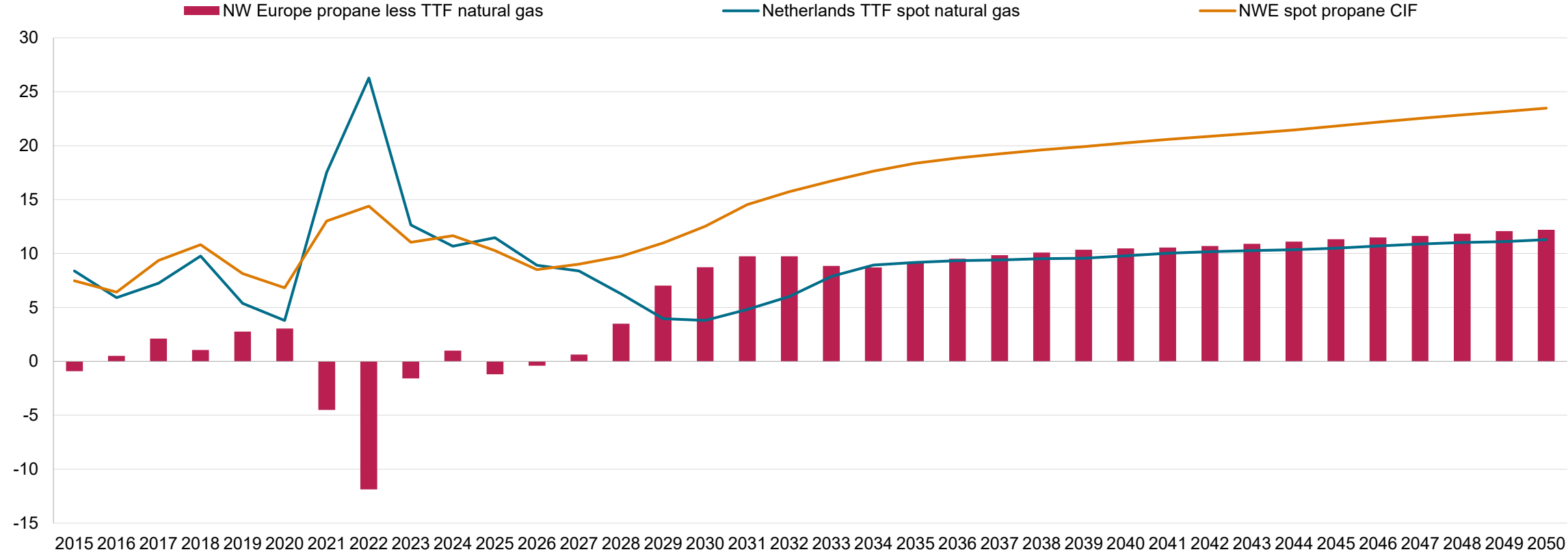
Ratio



As natural gas prices increased in 2021, propane became a more economical alternative for European refineries; the situation will reverse slowly

European natural gas vs. propane prices

Current \$/MMBtu

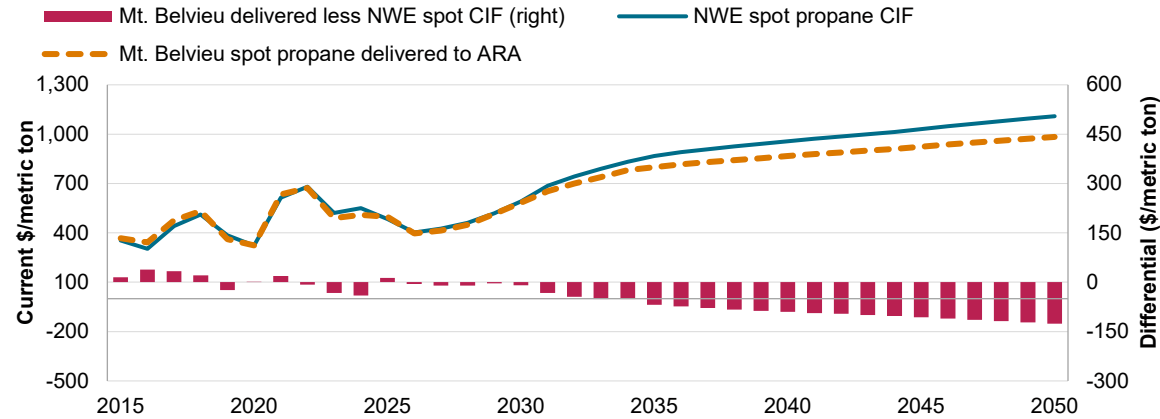


Data compiled Dec. 10, 2025.
 Source: S&P Global Energy.
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Benchmark prices and differentials

NWE: LPG prices and differentials

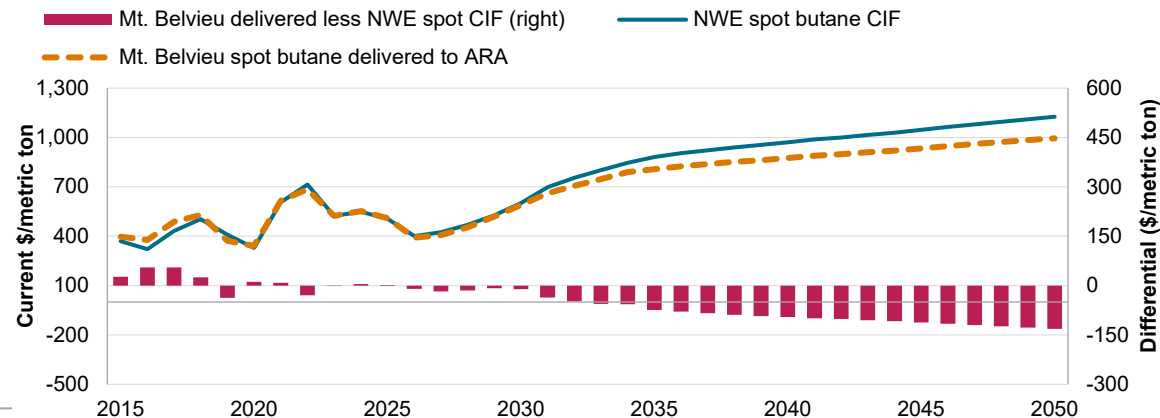
NWE propane prices and differential



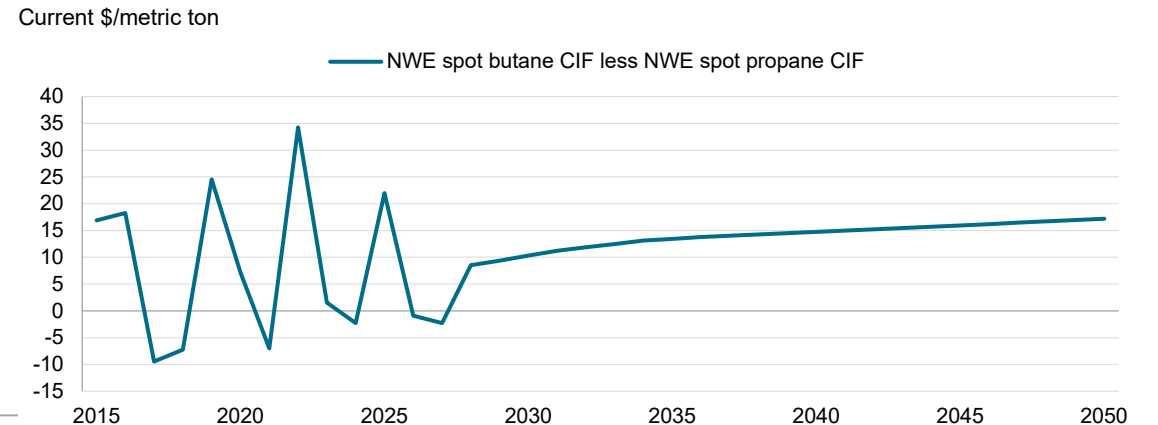
- We expect NWE LPG prices to continue to move mostly in line with crude oil.
- NWE LPG prices are now expected to be slightly lower in the near term, driven by lower demand
- We expect a smaller spread in the near term between Mount Belvieu and Northwest Europe for both propane and butane due to higher terminal fees.
- Our long-term views are unchanged.

LPG spot prices CIF in the ARA market in NWE are based on propane and butane coming into NWE from the North Sea, the United States, Algeria, and elsewhere.

NWE butane prices and differential

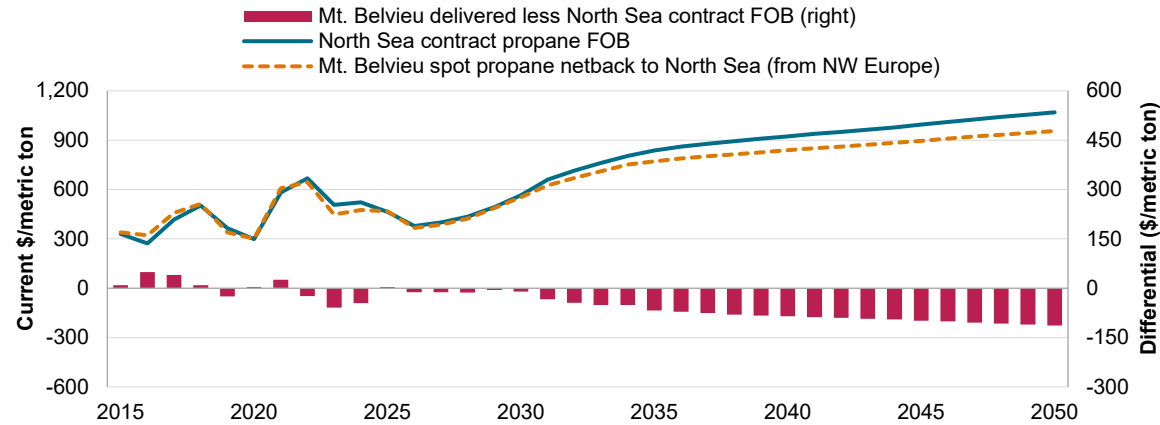


NWE butane-propane differential



North Sea: LPG prices and differentials

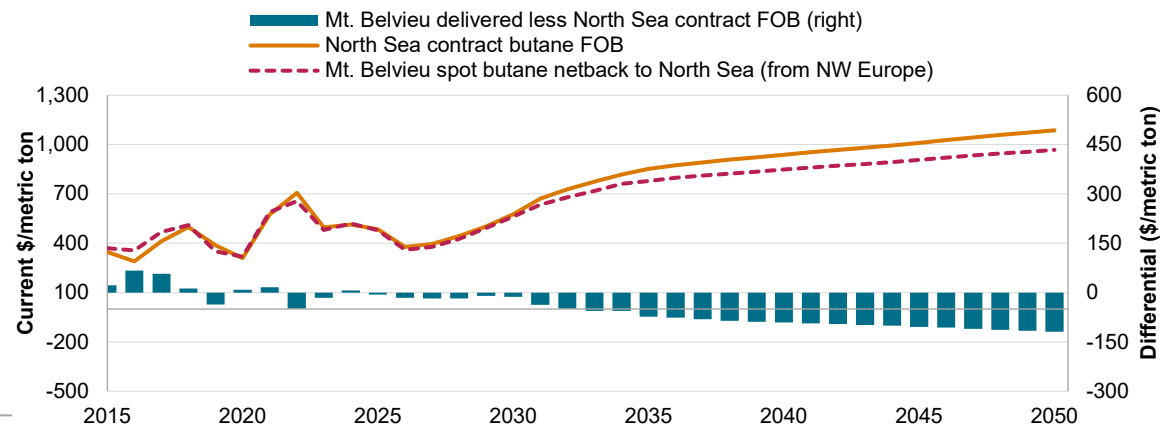
North Sea propane prices and differential



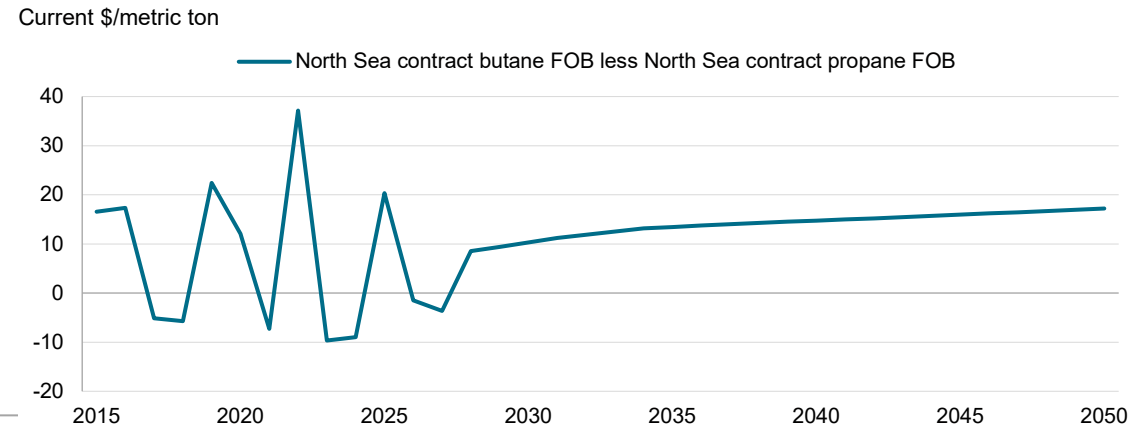
- NWE LPG prices are closely linked to Mont Belvieu prices.
 - Historically, North Sea volumes formed the largest portion of LPG in the NWE market.
 - Since 2021, as North Sea production declined and US production increased, the origin of NWE LPG liftings flipped, with the US now accounting for 50-60% of total.
 - Russian volumes have disappeared, and other regions now account for <5% of total liftings.
- North Sea prices will thus be set through competition with the US to supply European markets. As with NWE, we expect only small arbs to the US on a delivered basis.

North Sea contract LPG prices FOB are based on cargoes traded out of the North Sea terminals. Due to geographic proximity and the fact that it covers some of the same materials, North Sea contract propane and butane prices are very close to the NWE CIF prices.

North Sea butane prices and differential

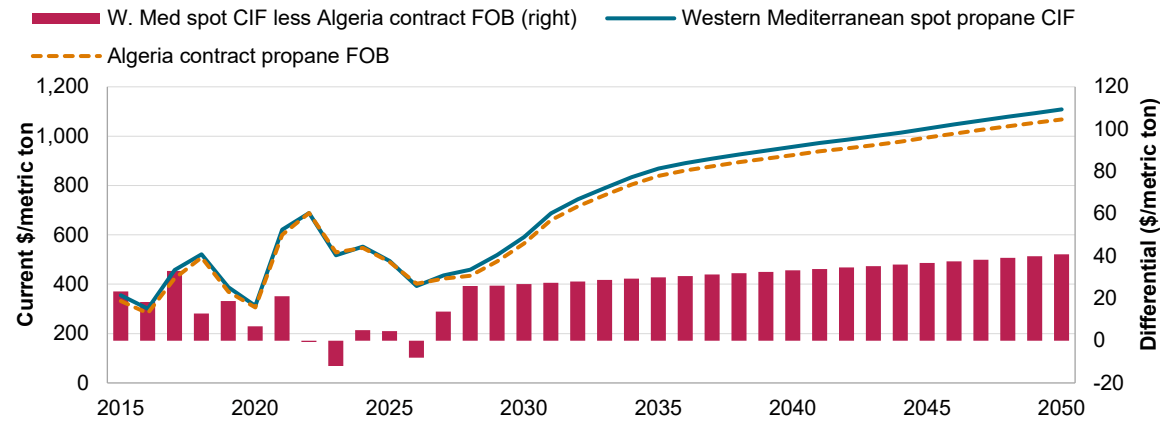


North Sea butane-propane differential



Mediterranean: LPG prices and differentials

Mediterranean propane prices and differentials

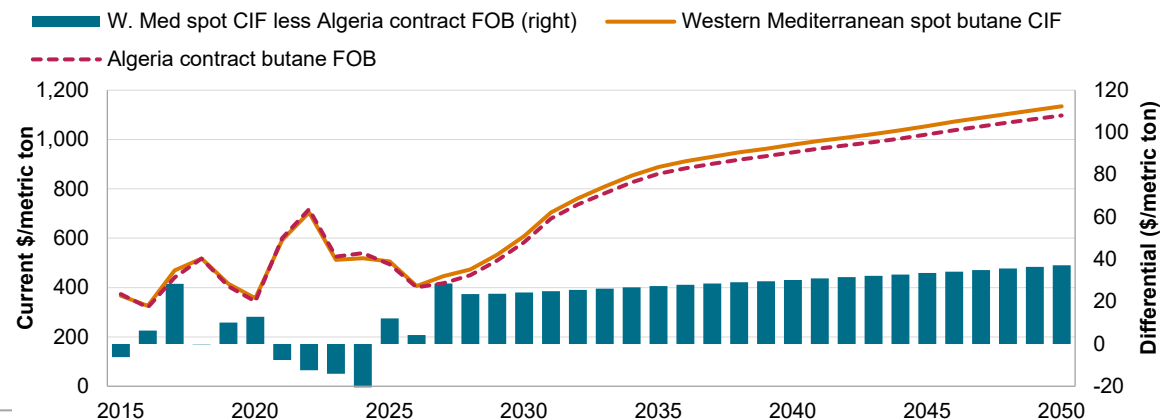


- Spot prices for propane and butane CIF in the Western Mediterranean at Lavera, France, are closely related to the Algerian contract prices. These relationships are expected to continue reflecting the cost of delivery.
- While there may be periods where this is not the case, we expect butane to retain a premium to propane over the long term as butane markets remain generally tighter than propane.

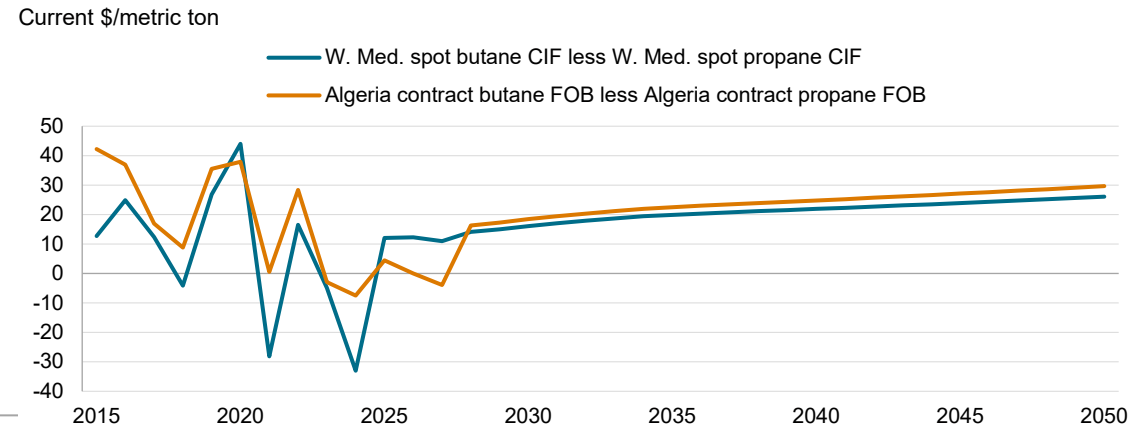
The Western Mediterranean prices are based on large cargoes from the North Sea, West Africa, and increasingly the United States.

In Algeria, the contract prices for propane and butane are set on a monthly basis, are posted after the Saudi Contract Price is released, and are set to keep Algerian LPG competitive in the Mediterranean market.

Mediterranean butane prices and differentials

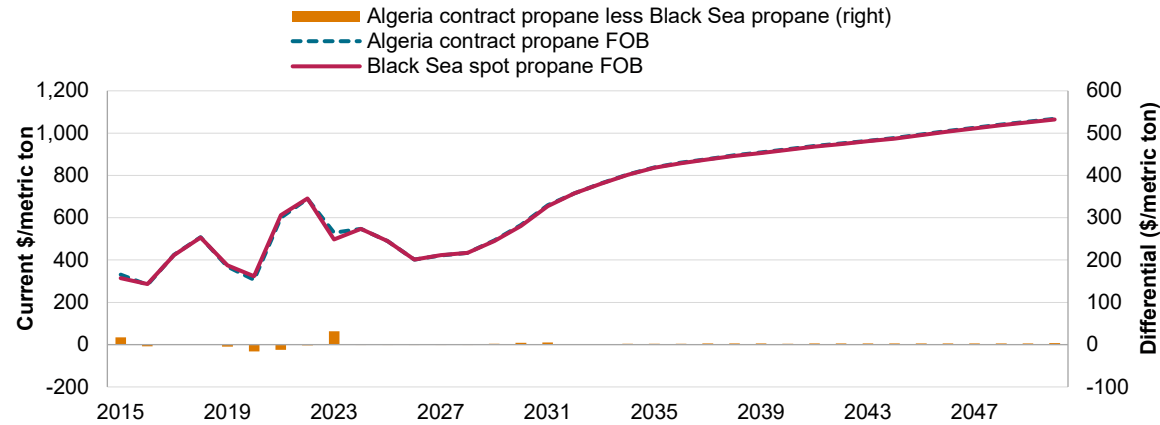


Mediterranean butane-propane differential



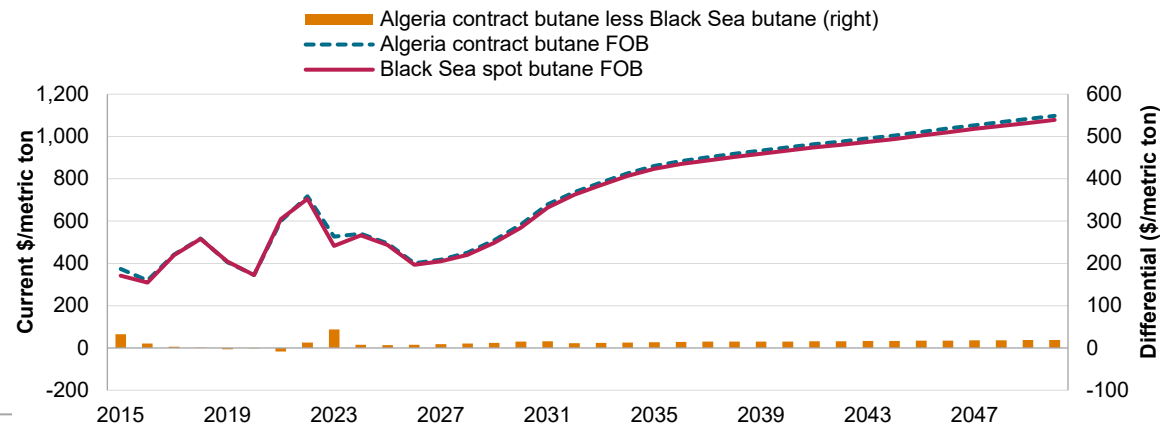
Black Sea: LPG prices and differentials

Black Sea propane

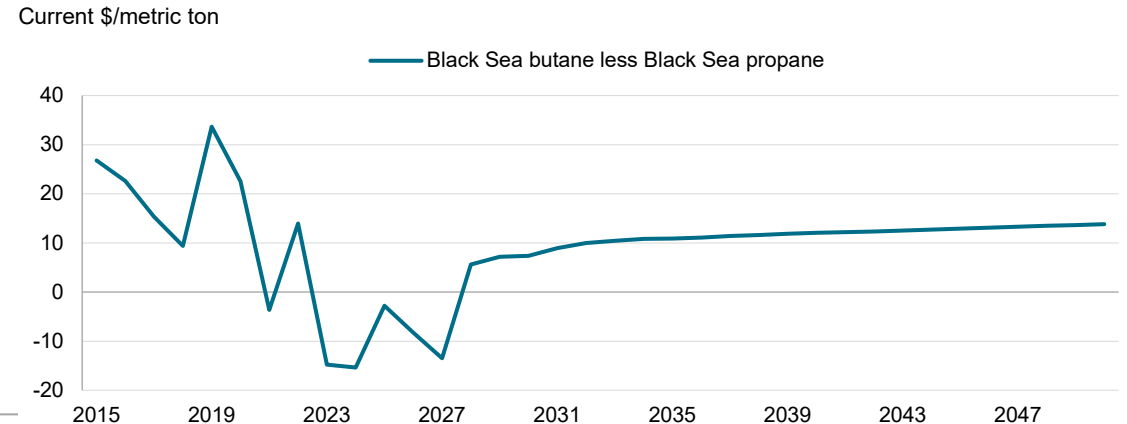


- Russia used to supply almost all LPG in the Black Sea; Supply has now diversified, with 90% of volumes coming from Turkey, Egypt, the US, Greece, and Georgia.
 - The top 5 suppliers to the Black Sea did not send any LPG to Black Sea ports prior to 2020.
 - The share of Russian LPG lifted at Black Sea ports declined sharply in recent years, with the exception of Turkey's Black Sea ports.
- We continue to see slightly lower prices for Black Sea LPG than for the Sonatrach CP and expect this dynamic to continue through the long term.

Black Sea butane



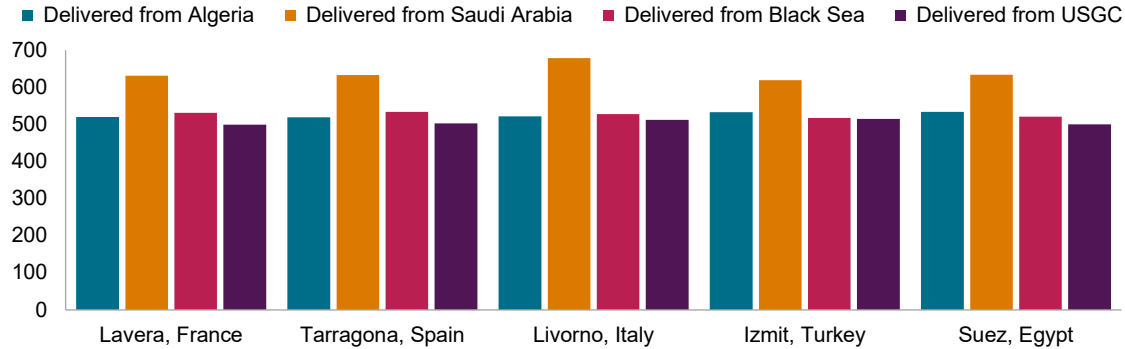
Black Sea butane-propane differential



Mediterranean: Delivered propane and butane price comparison

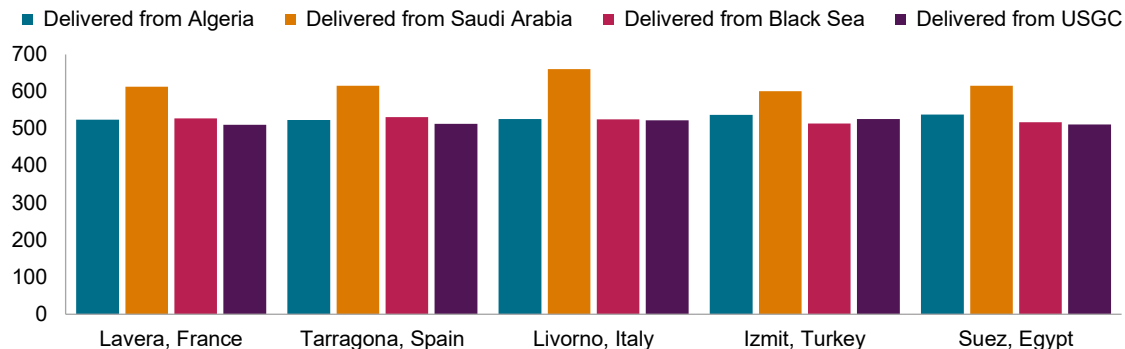
Mediterranean delivered price comparison: Propane from Algeria, Saudi Arabia, Black Sea, and US Gulf Coast (2025)

Current \$/metric ton



Mediterranean delivered price comparison: Butane from Algeria, Saudi Arabia, Black Sea, and US Gulf Coast (2025)

Current \$/metric ton



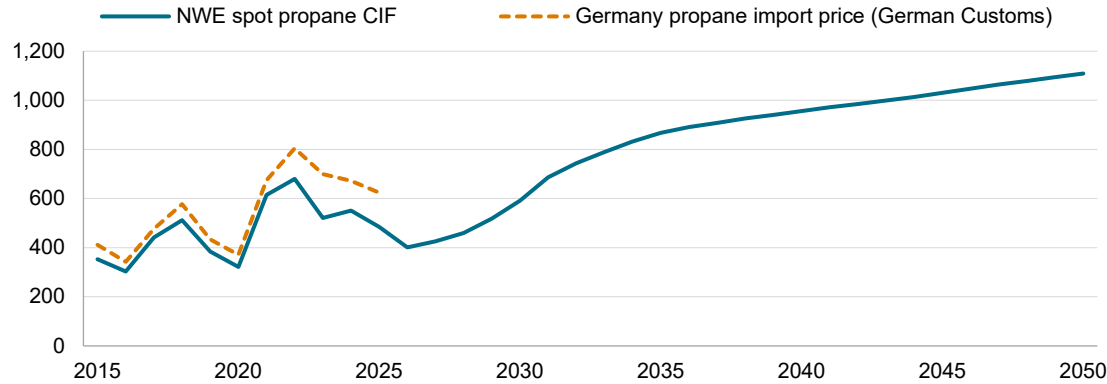
- The delivered price of Saudi LPG remains the highest in the Med region, with the US being the most competitive. This has largely kept Middle Eastern LPG out of the Mediterranean.
- Propane and butane from the Black Sea have historically been priced cheaper than Algeria on a delivered basis throughout the Mediterranean, particularly in Eastern Mediterranean markets. It is priced to capture nearby markets including Turkey and Greece.
- At the onset of the invasion of Ukraine, Black Sea volumes became slightly more expensive. However, the market has now returned to historical trends with Black Sea volumes being priced lower than Algeria (and certainly lower than Saudi Arabia).
- In years past, Algeria was the cheapest source of propane and butane throughout most of the Med. However, while Algerian LPG continues to flow into the Eastern Med, Black Sea prices have come down to levels just below Algerian prices.
- Turkey regularly imports LPG from Algeria and the United States to supplement supply from Russia and Kazakhstan via the Black Sea. Russian volumes into Turkey have increased as buyers take advantage of lower prices, and more importantly, as the country serves as a hub for other destinations in the Mediterranean, Africa, and Asia.

Europe

Germany: LPG prices

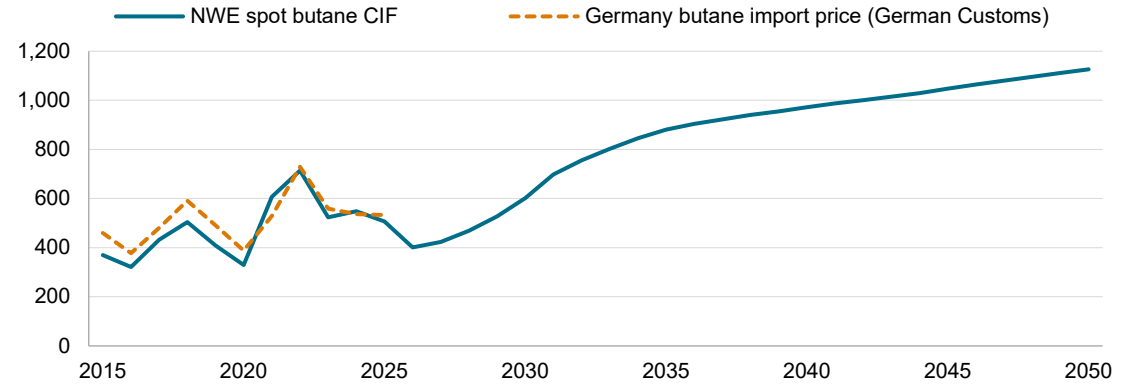
Germany propane prices

Current \$/metric ton



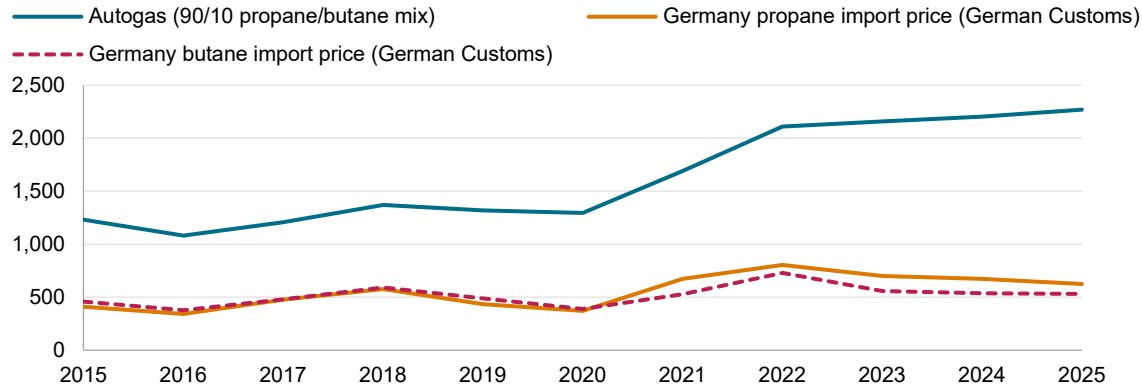
Germany butane prices

Current \$/metric ton



Germany retail LPG prices

Current \$/metric ton



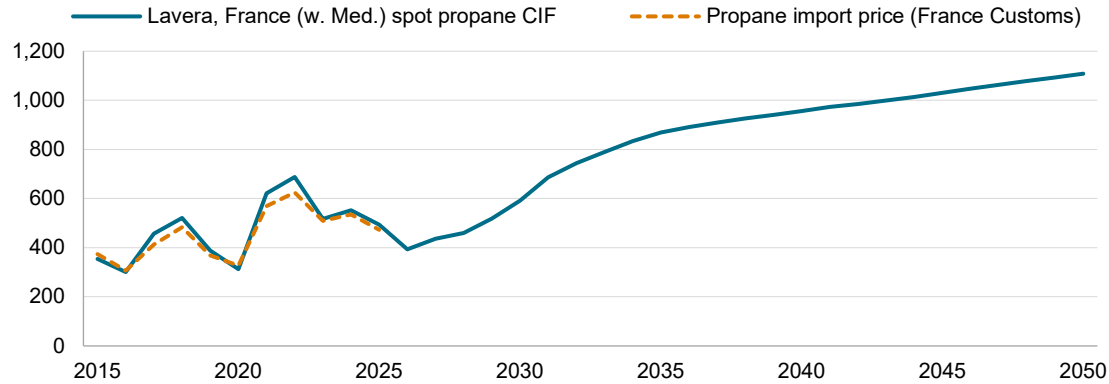
- German propane and butane import prices track the NWE prices very closely, with a small premium for transportation inland mainly via barge.
- Germany imports most of its LPG from the North Sea and other sources including the United States via import terminals in the Netherlands and Belgium. It also receives smaller volumes of Russian LPG by ship. Russian rail supply to Germany is smaller than it was in the past but still occurs at times.

Autogas in Germany is 90% propane, 10% butane.
Autogas prices are based on import prices plus taxes and margins and so tend to move nearly in line with import prices.

France: LPG prices

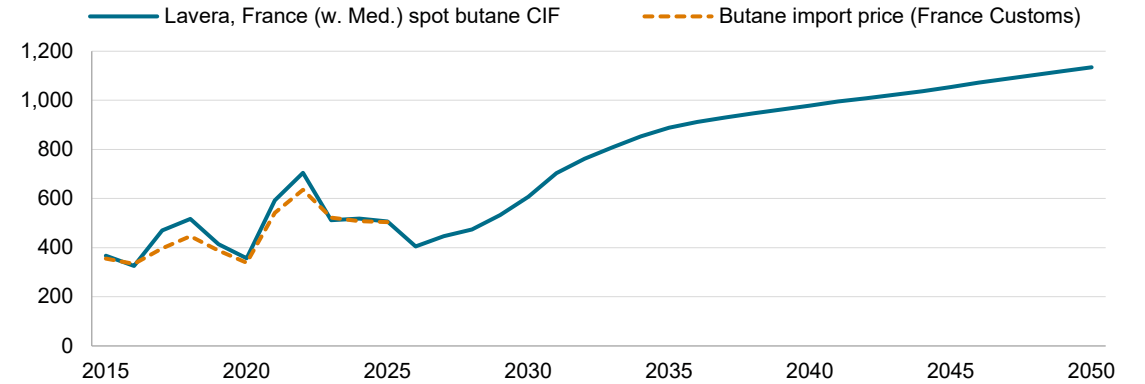
France propane prices

Current \$/metric ton



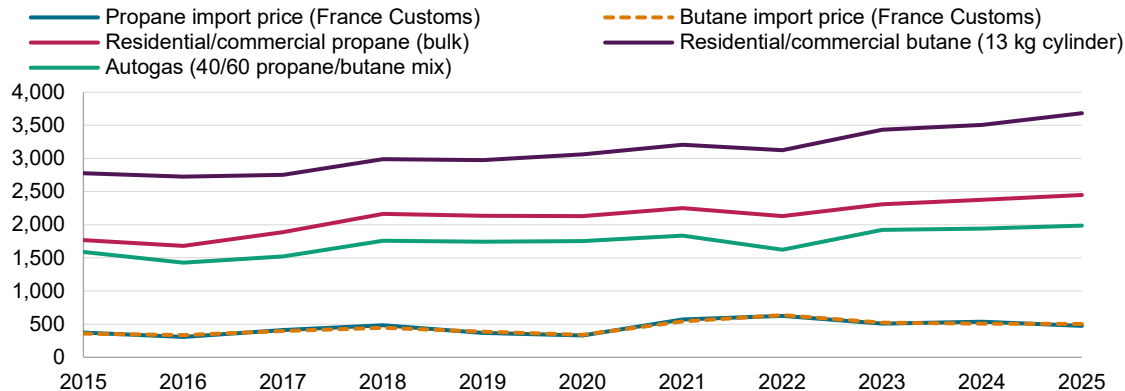
France butane prices

Current \$/metric ton



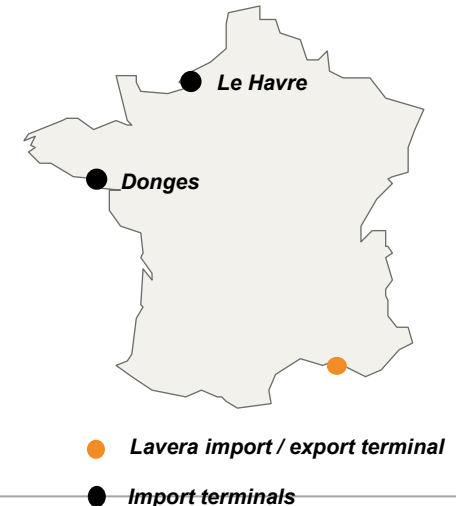
France retail LPG prices

Current \$/metric ton



- France imports LPG at the Le Havre, Donges and Lavera terminals and also exports propane and butane from Lavera to regional markets such as Italy and Spain.
- Autogas prices are lower than other retail LPG prices in France, mainly owing to differences in taxation.

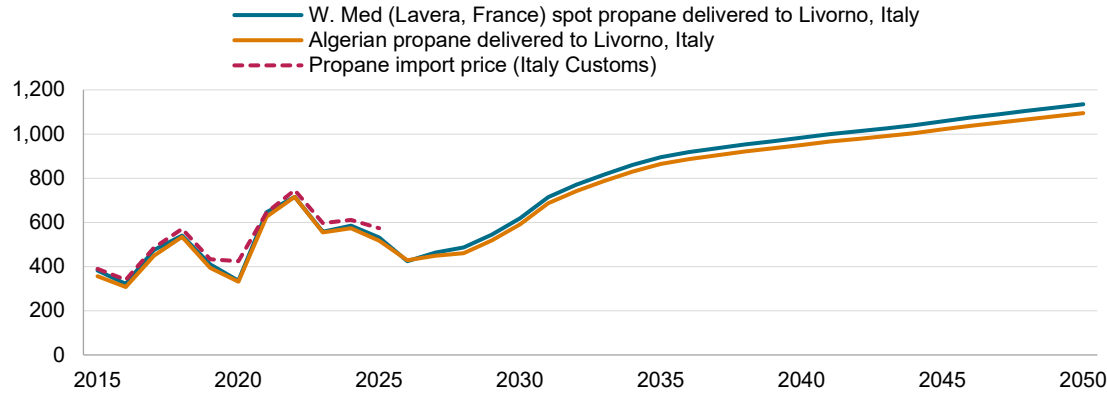
Autogas in France is 40% propane, 60% butane.
Butane is sold in 13 kg cylinders for residential use, and propane is available in bulk to residential/commercial and industrial users.



Italy: LPG prices

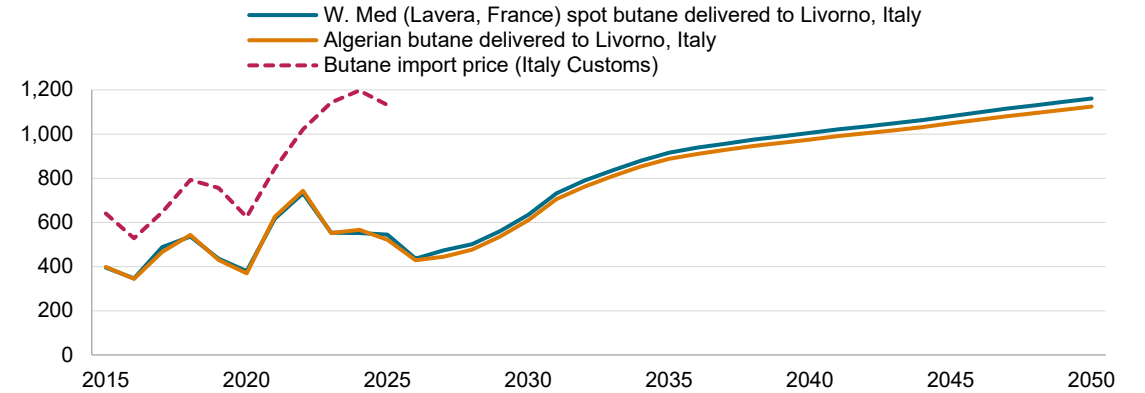
Italy propane prices

Current \$/metric ton



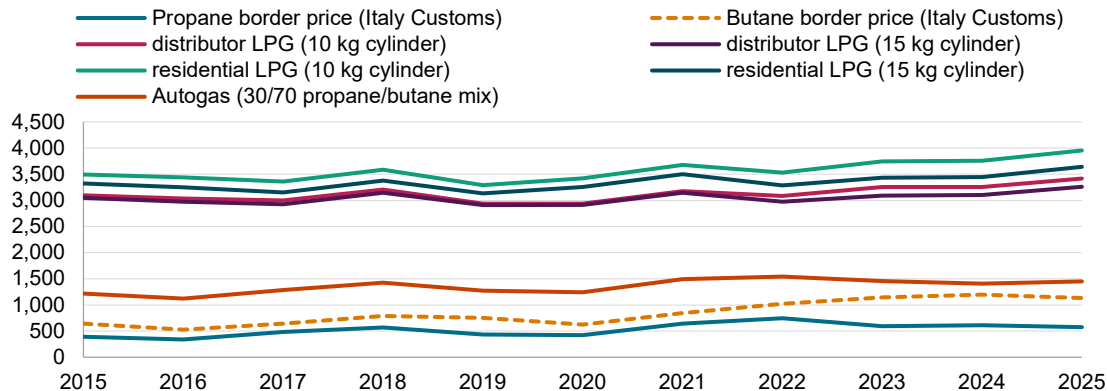
Italy butane prices

Current \$/metric ton



Italy intermediate and retail LPG prices

Current \$/metric ton



- Italy imports propane mainly from Algeria, France, and Egypt. Butane comes from a wider variety of sources.
- Propane import prices align closely with the delivered prices from the Western Mediterranean (Lavera, France) and Algeria.
- Butane prices do not track these two marker prices as closely since import volumes are very small and come both by sea and overland (e.g. from Austria and Croatia) in small increments.



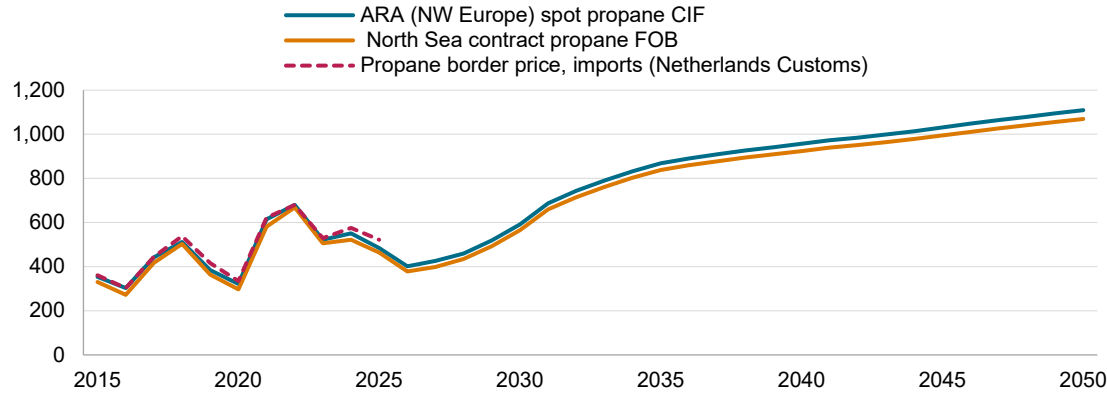
Autogas in Italy is 30% propane, 70% butane.

Retail LPG prices are for the city of Trent in northern Italy. Prices in other cities will vary due to transportation costs and other factors.

Netherlands: LPG prices

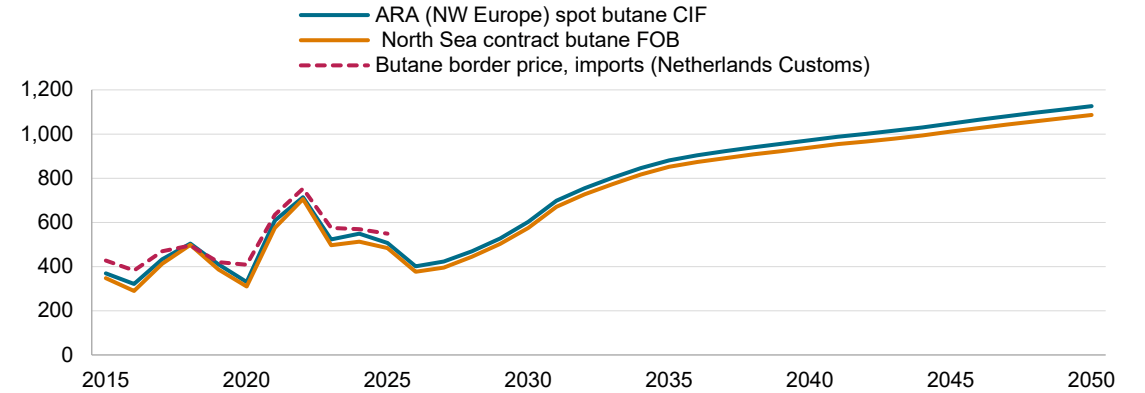
Netherlands propane prices

Current \$/metric ton



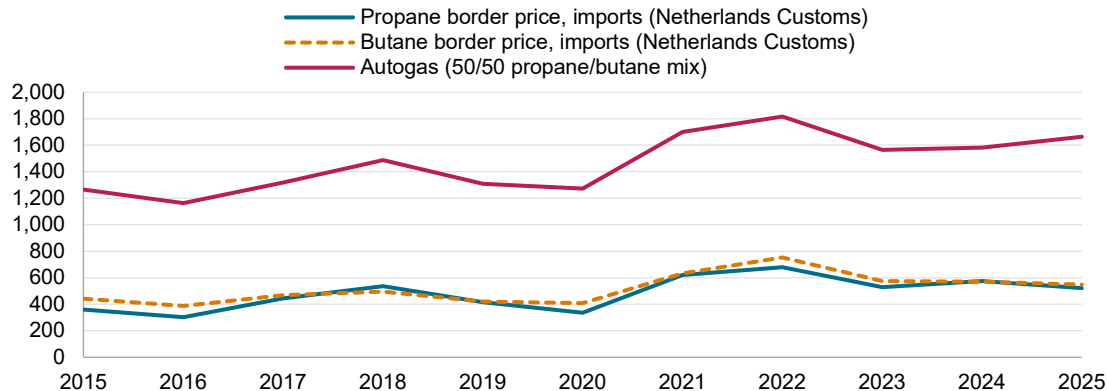
Netherlands butane prices

Current \$/metric ton



Netherlands autogas prices

Current \$/metric ton



- The Netherlands has a very small res/com market that uses propane. Most of the country uses natural gas for res/com fuel.
- The Netherlands also has a small Autogas market, but demand has declined during the past decade.
- The largest LPG market is chemicals, and demand is very price sensitive and reacts quickly to international price movements.

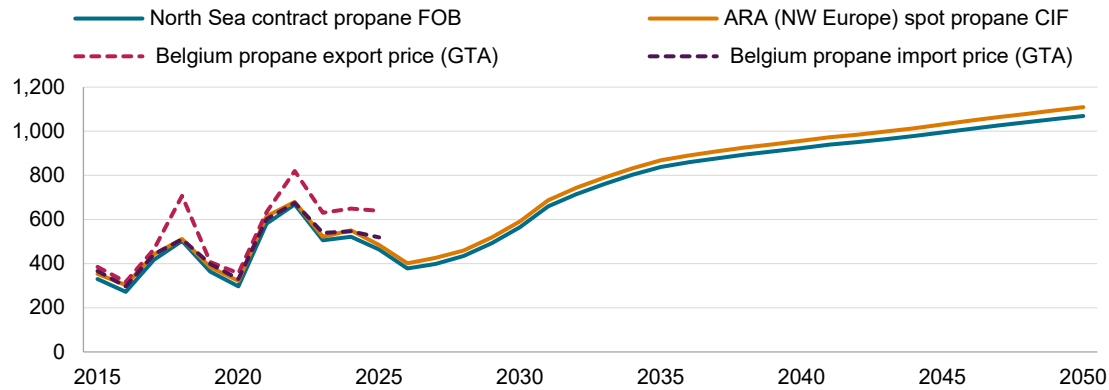


Autogas in the Netherlands is 50% propane, 50% butane.

Belgium: LPG prices

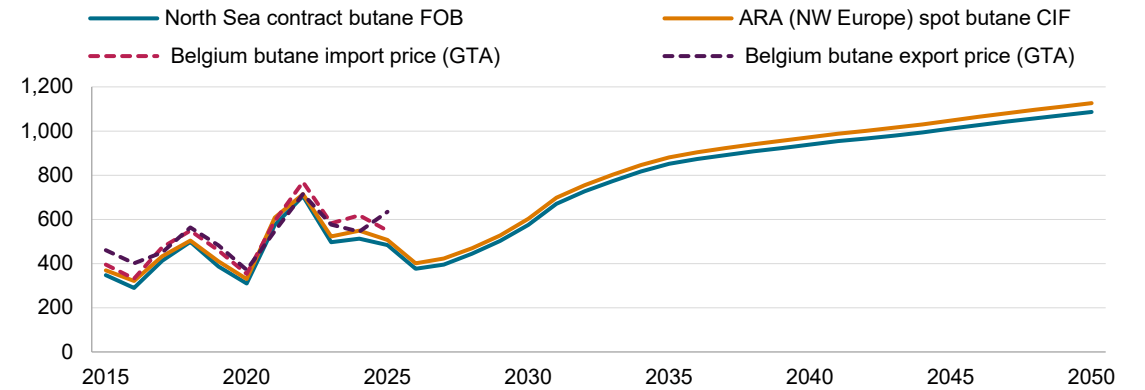
Belgium propane prices

Current \$/metric ton



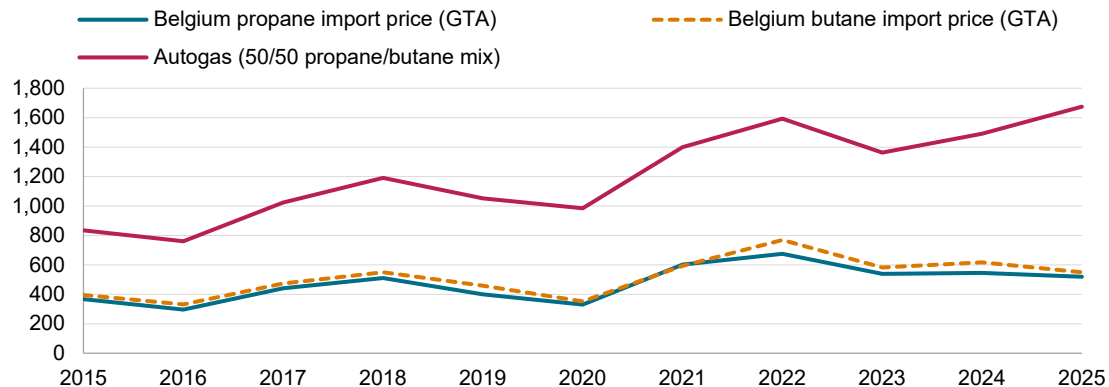
Belgium butane prices

Current \$/metric ton

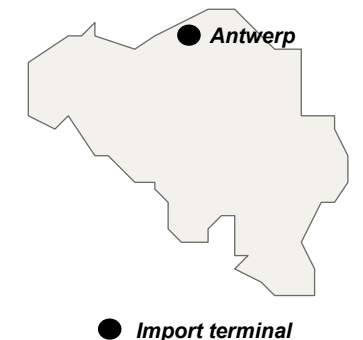


Belgium retail LPG prices

Current \$/metric ton



- Belgium's propane import and export prices are closely related to the NWE prices. Butane border prices do not always track the large cargo published prices, likely owing to a higher percentage of small ships.
- Autogas in Belgium was historically inexpensive relative to the wholesale price. The gross margin increased in 2018-20 but prices remain low by regional standards. Price changes have had little impact on demand, which remains small.

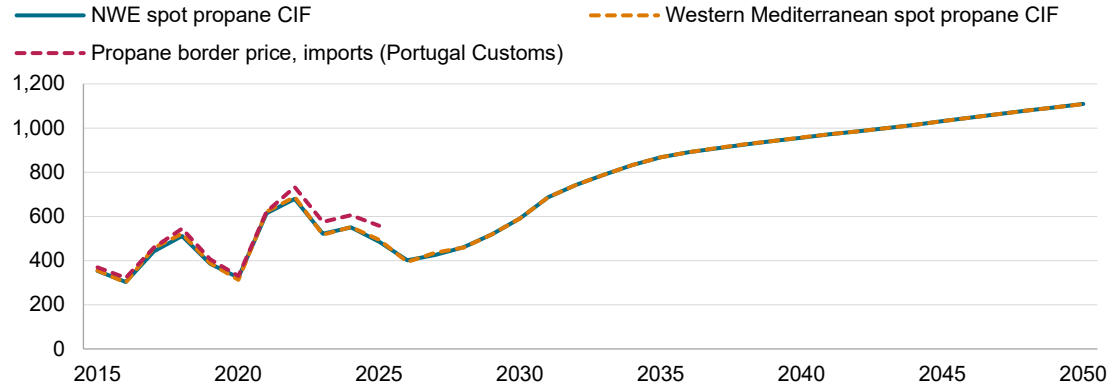


Autogas in Belgium is 60% propane, 40% butane.

Portugal: LPG prices

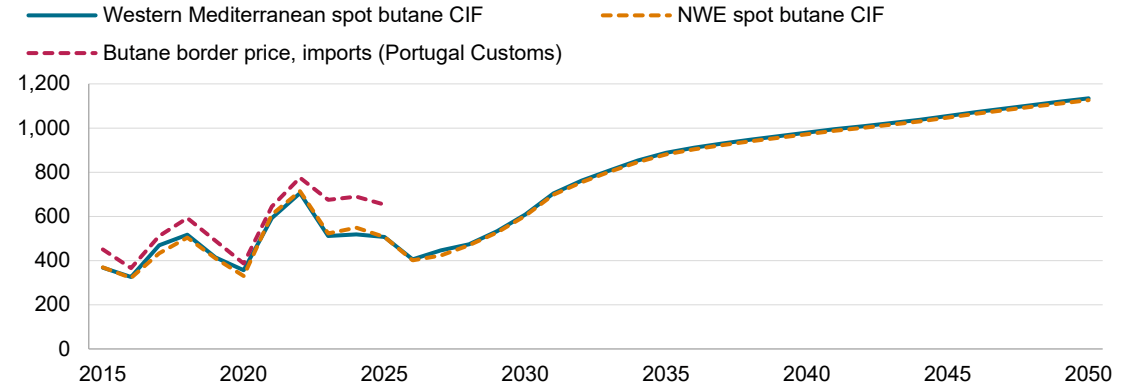
Portugal propane prices

Current \$/metric ton



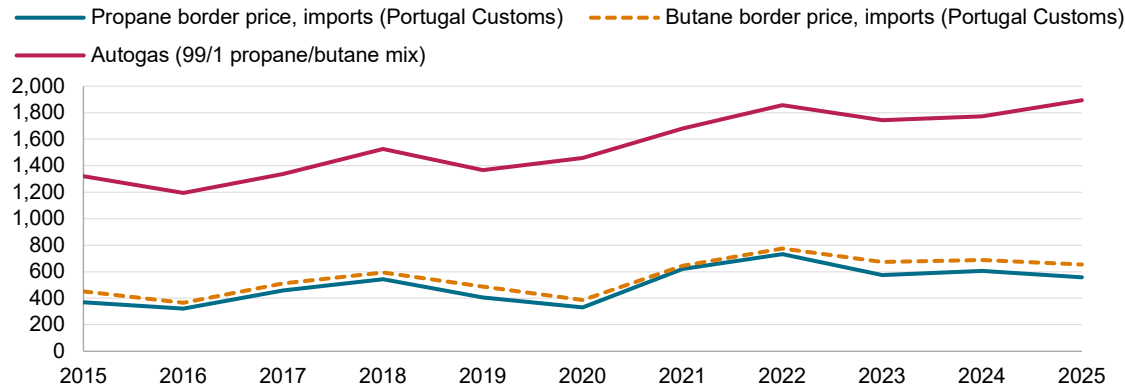
Portugal butane prices

Current \$/metric ton



Portugal retail LPG prices

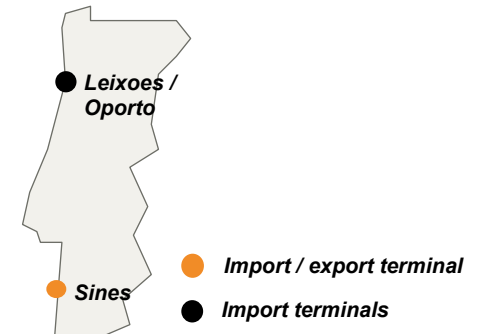
Current \$/metric ton



- Propane import prices track prices in NW Europe and the Western Mediterranean very closely.
- Butane imports are much smaller, so Portugal sometimes must pay a premium over regional marker prices to import overland or on small ships.

Autogas in Portugal is 99% propane.

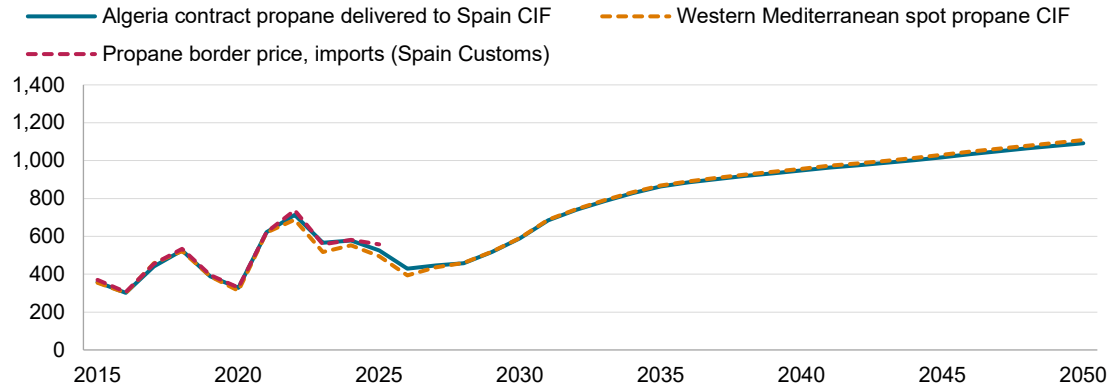
Autogas prices are based on import prices plus taxes and margins, and so tend to move nearly in line with propane import prices.



Spain: LPG prices

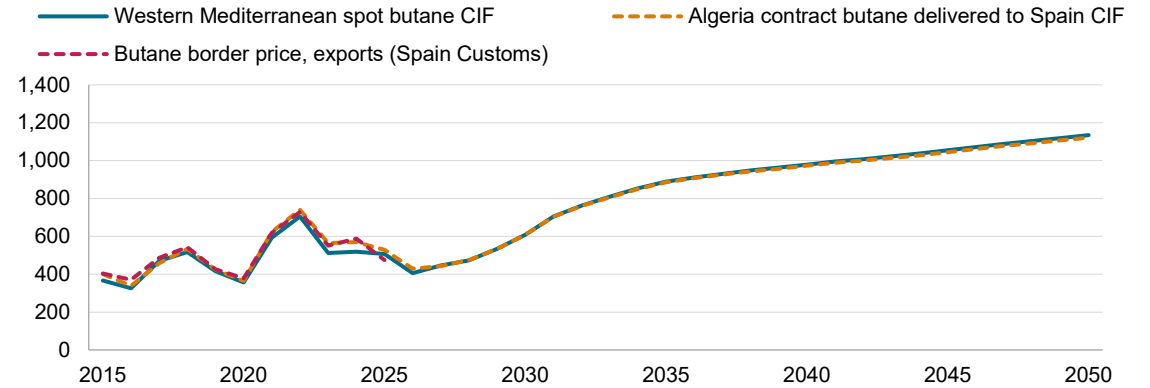
Spain propane prices

Current \$/metric ton



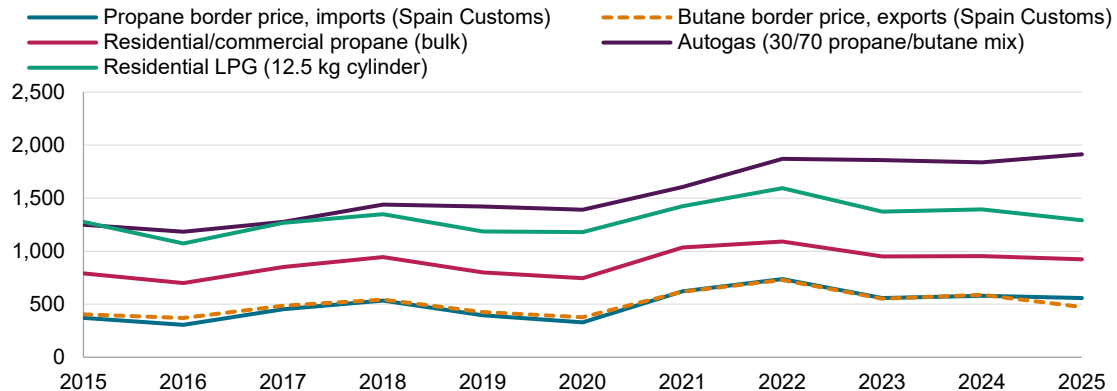
Spain butane prices

Current \$/metric ton



Spain retail LPG prices

Current \$/metric ton



- The border price of propane imported into Spain correlates very closely with the delivered cost of Algerian contract propane, as well as the Western Mediterranean price (at Lavera, France, close by to the main Spanish import terminals).
- Spain is a net exporter of butane (mainly to Morocco), and prices correlate closely with Algerian prices.



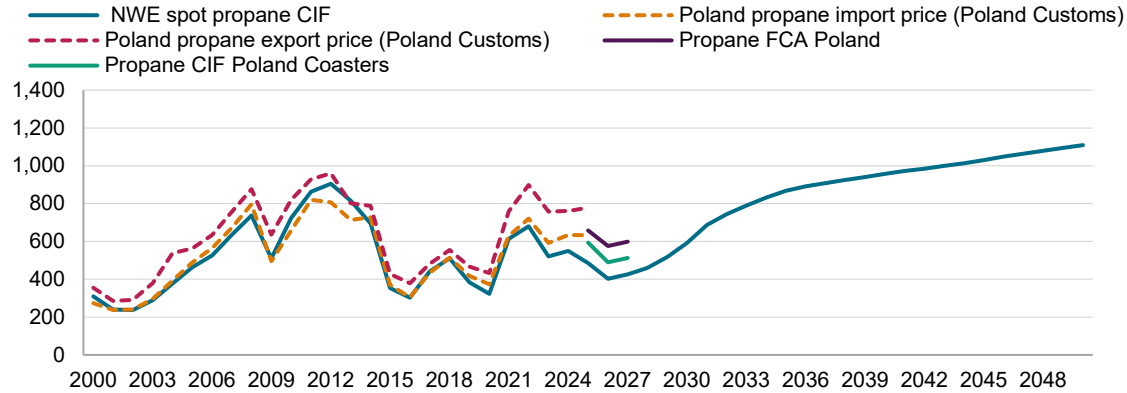
Autogas in Spain is 30% propane, 70% butane.

Retail LPG prices are set by the government in accordance with a formula that references Consumer Price Index, Gasoil prices, and changes in LPG demand.

Poland: LPG prices

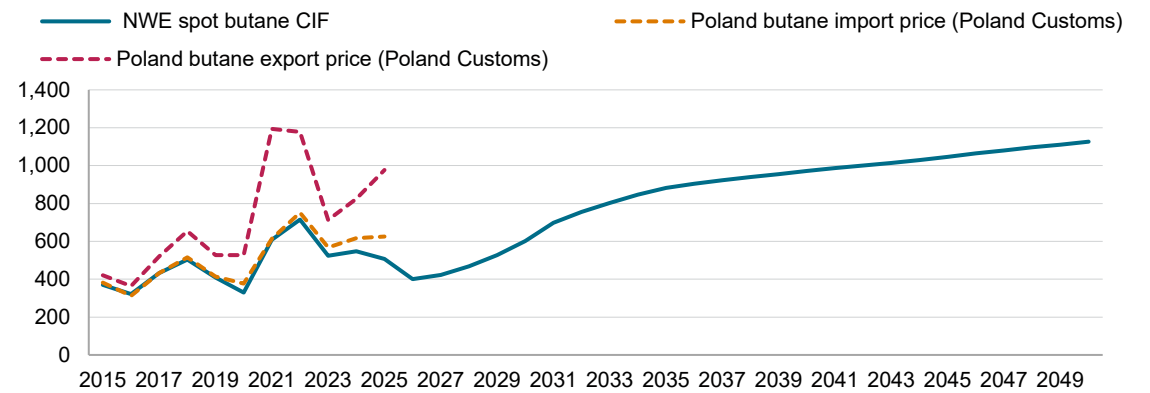
Poland propane prices

Current \$/metric ton



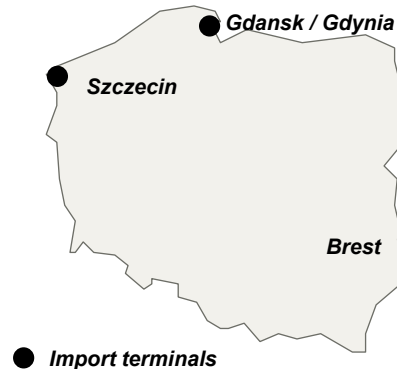
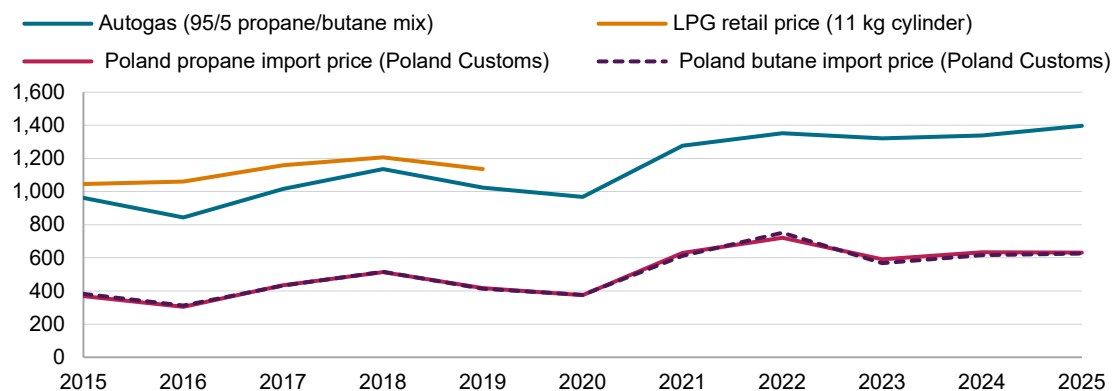
Poland butane and propane-butane mix prices

Current \$/metric ton



Poland retail LPG prices

Current \$/metric ton



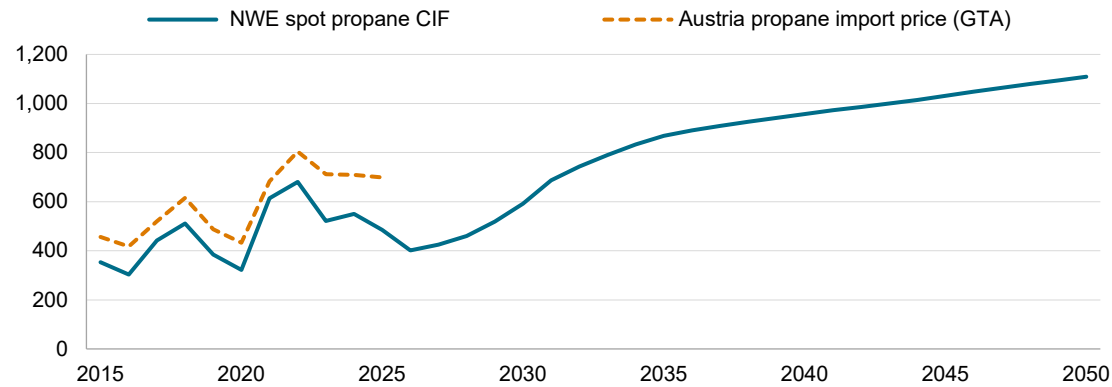
- Polish propane prices closely track those in Northwest Europe.
- Following EU sanctions on Russian LPG—which previously accounted for the majority of Poland's imports—buyers have shifted to sourcing from Northwest Europe and the United States.

Autogas prices are based on import prices plus taxes and margins, and so tend to move nearly in line with import prices. LPG is typically sold in 11 kg cylinders.

Austria: LPG prices

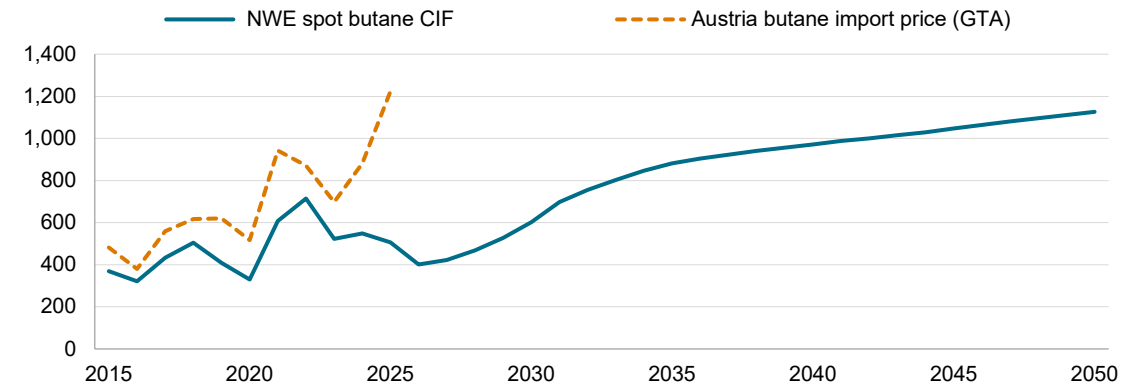
Austria propane prices

Current \$/metric ton



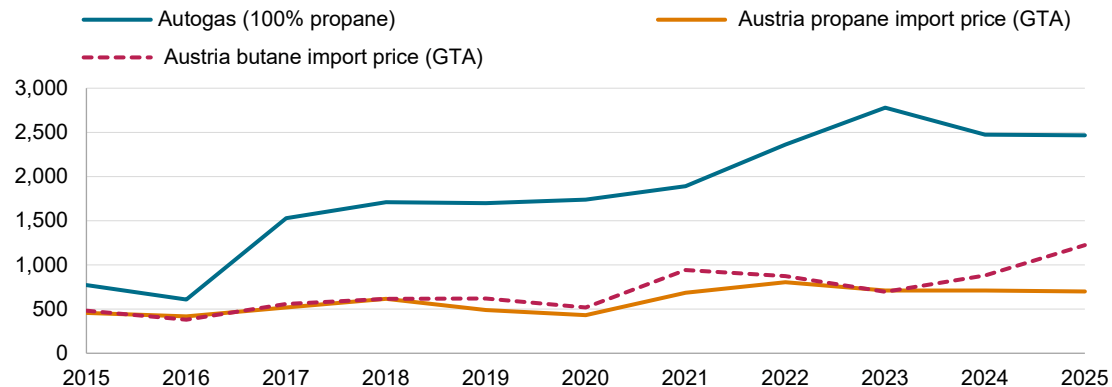
Austria butane prices

Current \$/metric ton



Austria retail LPG prices

Current \$/metric ton



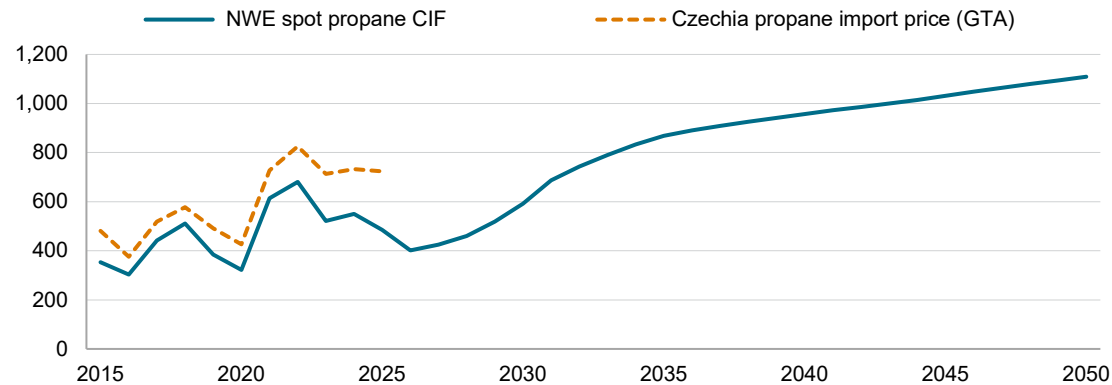
- Import prices in Austria reflect the cost of transport from its main sources – mainly NWE via Germany.
- Because the distance is longer from NWE, the premium over NWE is relatively consistent.
- Because the butane market is smaller, the relationship between Austrian border prices and regional marker prices is less regular for butane.
- Autogas prices have moved mostly in line with import prices. The premium over wholesale prices at the pump was lower in Austria than many other European countries, but since 2018 the differential has risen to a point where it is similar to other countries in the region. Consumption remains small relative to gasoline/diesel.

Autogas in Austria is 100% propane.

Czechia: LPG prices

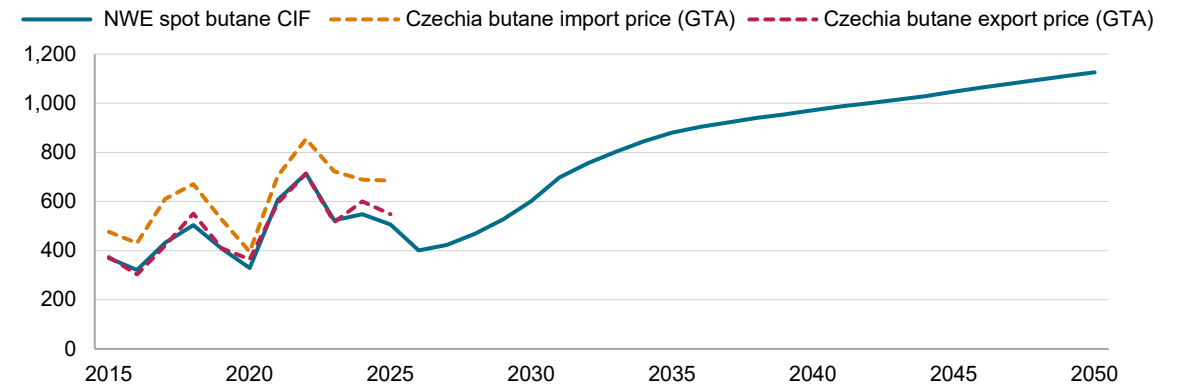
Czechia propane prices

Current \$/metric ton



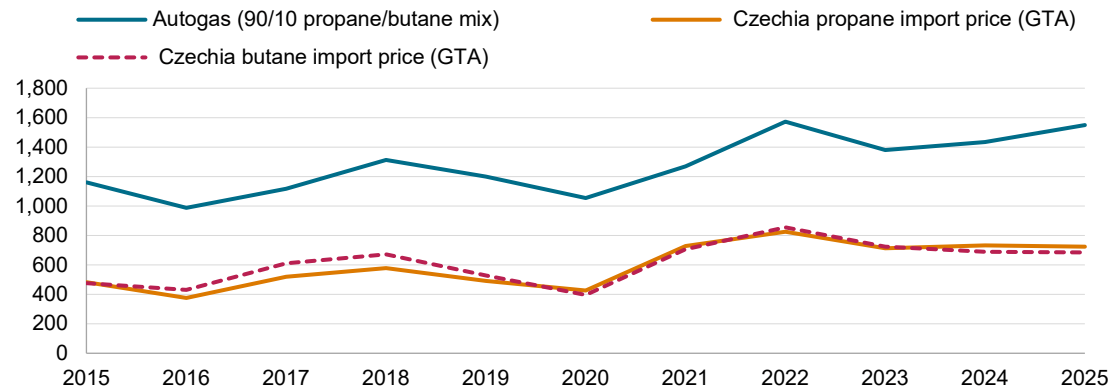
Czechia butane and propane-butane mix prices

Current \$/metric ton



Czechia retail LPG prices

Current \$/metric ton



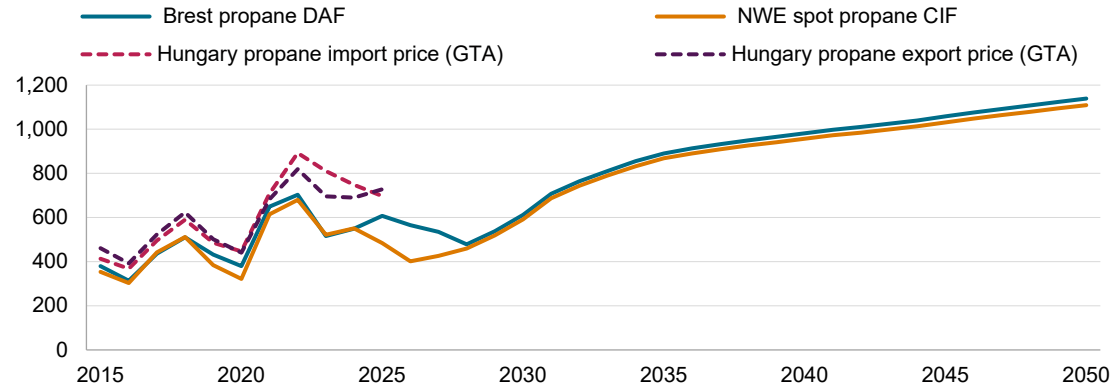
- Import prices in Czechia reflect the cost of transport from Northwest Europe, where most imports come from since the war in Ukraine and subsequent EU sanctions.
- Because the butane market is smaller and switches between imports and exports, the relationship between Czech border prices and regional market prices is less regular for butane.
- Autogas prices have moved mostly in line with import prices.

Autogas in Czechia is 90% propane.

Hungary: LPG prices

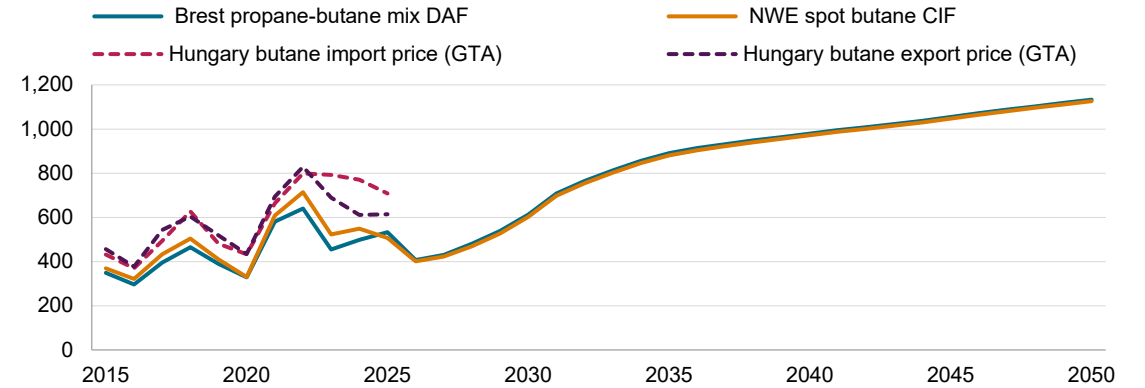
Hungary propane prices

Current \$/metric ton



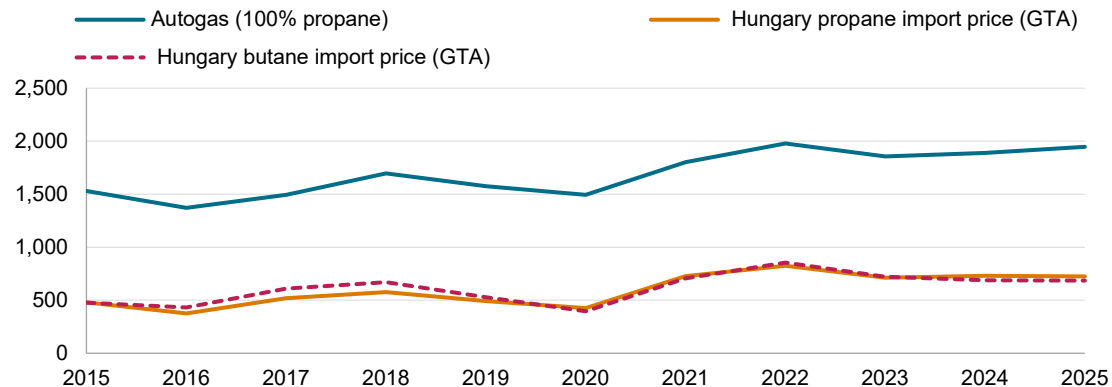
Hungary butane and propane-butane mix prices

Current \$/metric ton



Hungary retail LPG prices

Current \$/metric ton



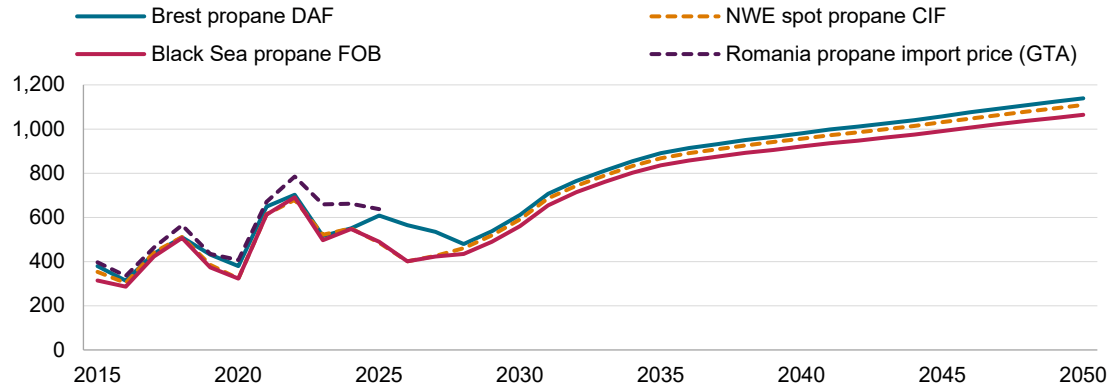
- Import prices in Hungary reflect the cost of transport from its sources – mainly the CIS.
- Because Hungary’s butane trade is smaller than propane, the relationship between border prices and regional market prices is less regular.
- Autogas gross margins are fairly stable on an annual basis, though the market remains very small.

Autogas in Hungary is 100% propane.

Romania: LPG prices

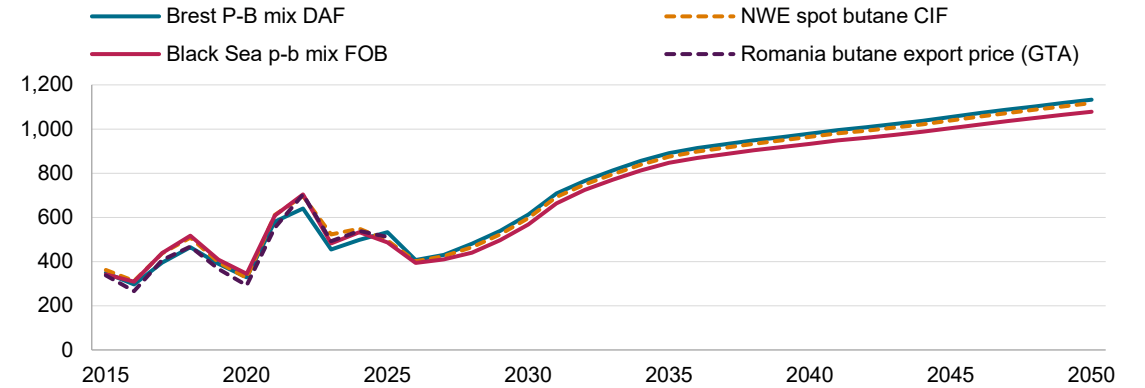
Romania propane prices

Current \$/metric ton



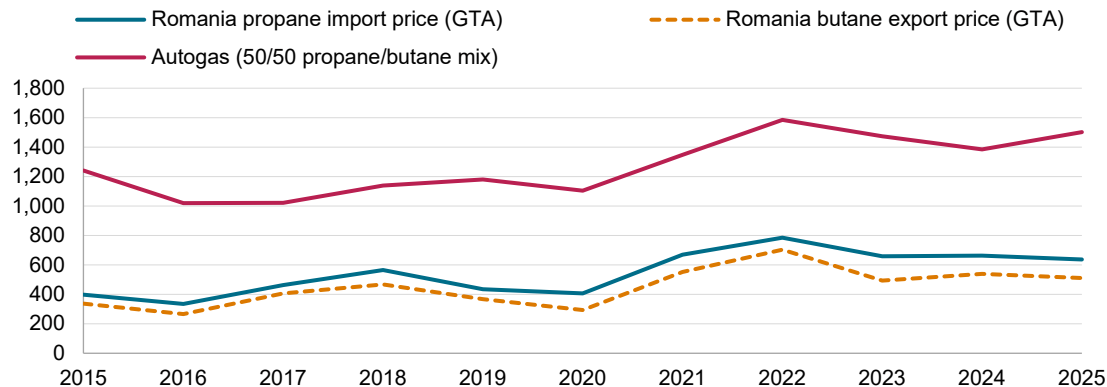
Romania butane prices

Current \$/metric ton



Romania border and autogas LPG prices

Current \$/metric ton



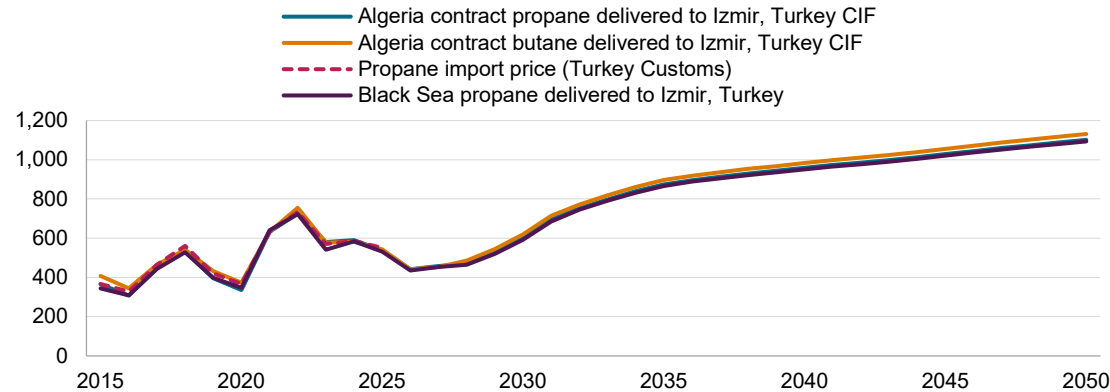
- Romania's propane import prices move nearly in line with prices in the Black Sea, with a small premium reflecting the cost of transportation.
- Likewise, butane export prices are also close to the Black Sea prices, since that is the main alternative for most buyers in the Eastern Med and inland Southeast Europe.
- Autogas prices in Romania declined steadily until early 2017, even after import prices began to rise again. This reflects tighter government control over retail pricing than in some other European markets. Autogas prices rose relative to border prices in 2019 and have stayed high since.

Autogas in Romania is 50% propane, 50% butane.

Turkey: LPG prices

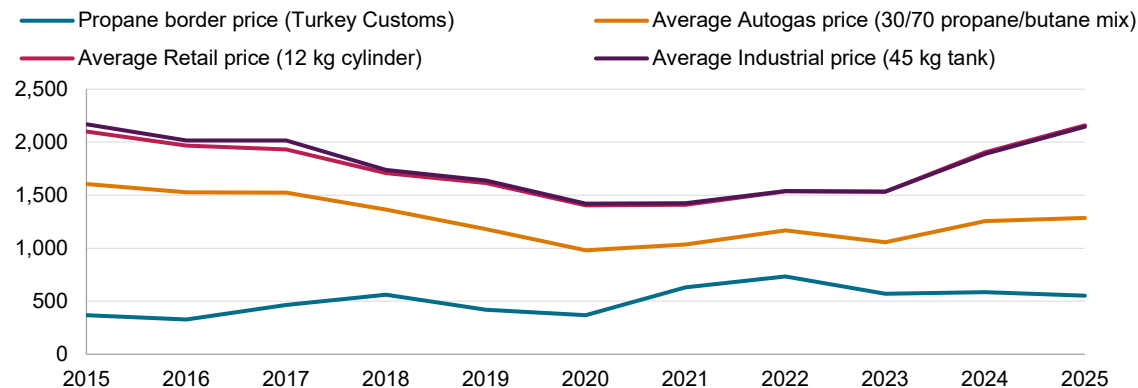
Turkey propane and butane prices

Current \$/metric ton



Turkey average retail LPG prices

Current \$/metric ton



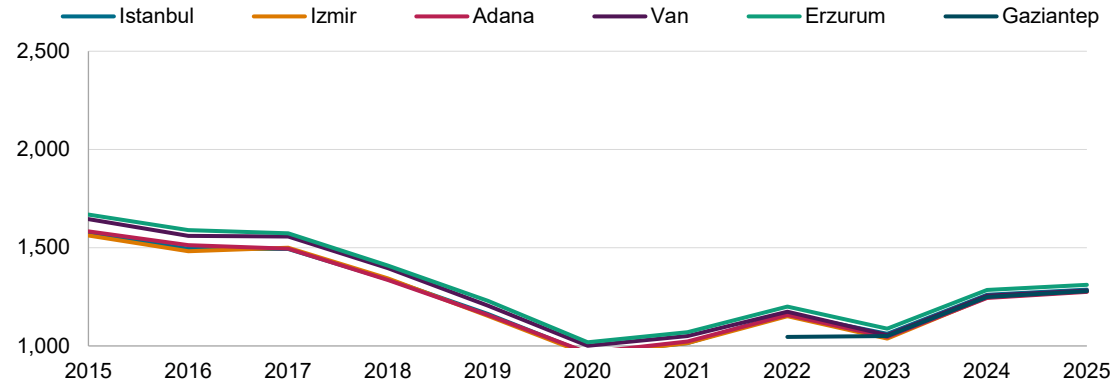
- Turkish propane import prices correlate very closely with the delivered price of Algerian and Black Sea contract propane. Butane border prices are not available for Turkey.
- Autogas, bulk, and cylinder LPG prices are directly linked to international prices, but margins are regulated. In 2018 depreciation of the lira was borne mainly by importers and distributors, who buy in dollar terms but were not able to raise prices in lira – retail prices trended lower in dollar terms.
- Retail prices continued falling in 2019 and 2020 as well, but declines were mostly in line with the wholesale market; border prices reflected the same trajectory. Now prices are mostly moving together.
- Turkey has the largest Autogas market in the region (nearly twice as large as Poland, and three times as large as Russia) as a result of strong policy support, extensive refueling infrastructure, and a price advantage at the pump over gasoline and diesel created by a favorable tax structure.

Retail prices are reported by Aygaz, the largest distributor in Turkey, with Autogas, residential, commercial, and industrial LPG sales throughout Turkey. Turkish Autogas is 30% propane, 70% butane.

Turkey: Regional retail LPG prices

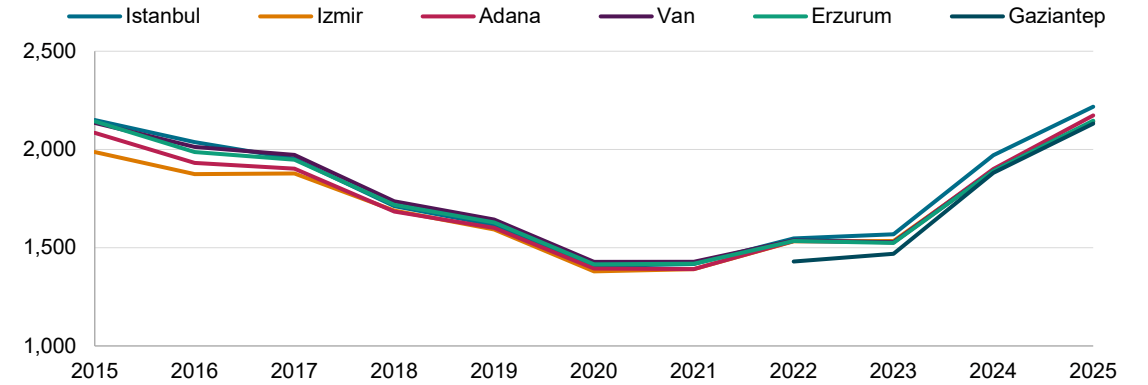
Turkey autogas prices in selected cities

Current \$/metric ton



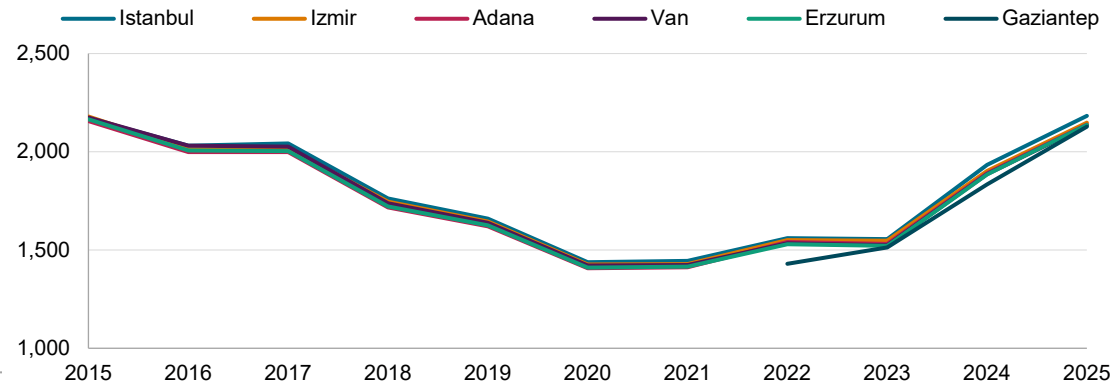
Turkey residential LPG prices in selected cities (12 kg cylinder)

Current \$/metric ton



Turkey industrial LPG prices in selected cities (45 kg bulk)

Current \$/metric ton

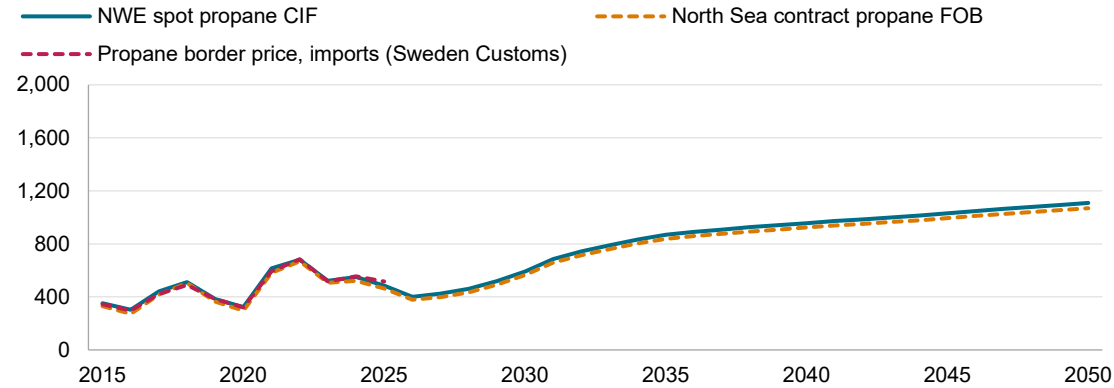


Residential/commercial LPG in Turkey is typically sold in 12 kg cylinders.
Industrial LPG is sold in bulk, and prices are quoted in 45 kg increments.

Sweden: LPG prices

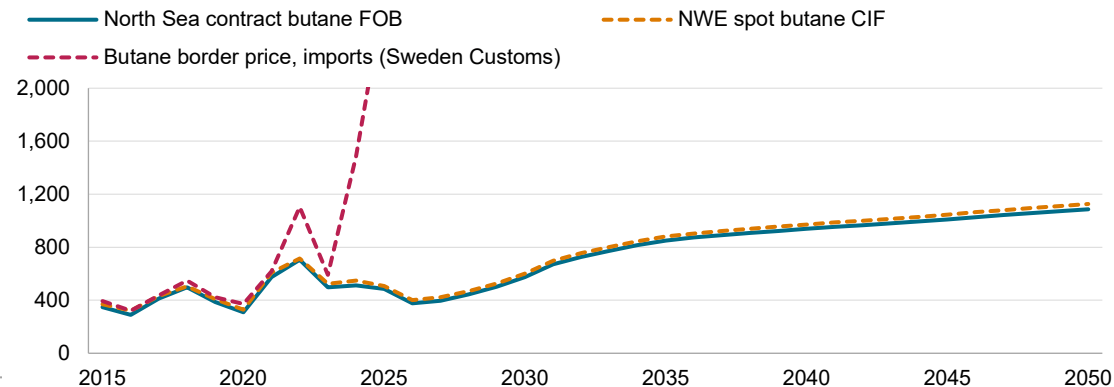
Sweden propane prices

Current \$/metric ton

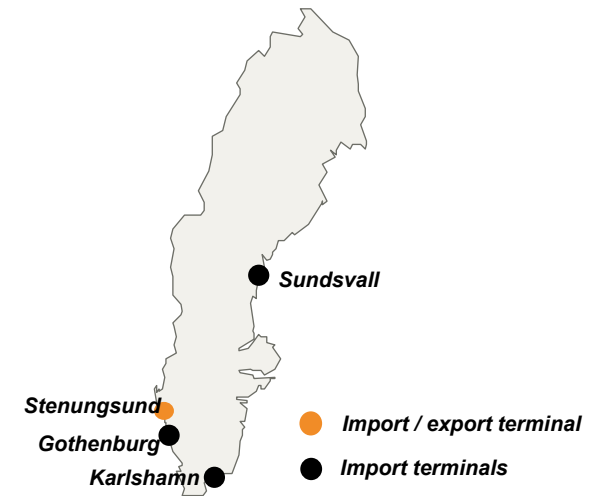


Sweden butane prices

Current \$/metric ton



- Propane and butane import prices in Sweden track regional marker prices very closely, as would be expected given the very short distance from both the North Sea export terminals and the ARA market.

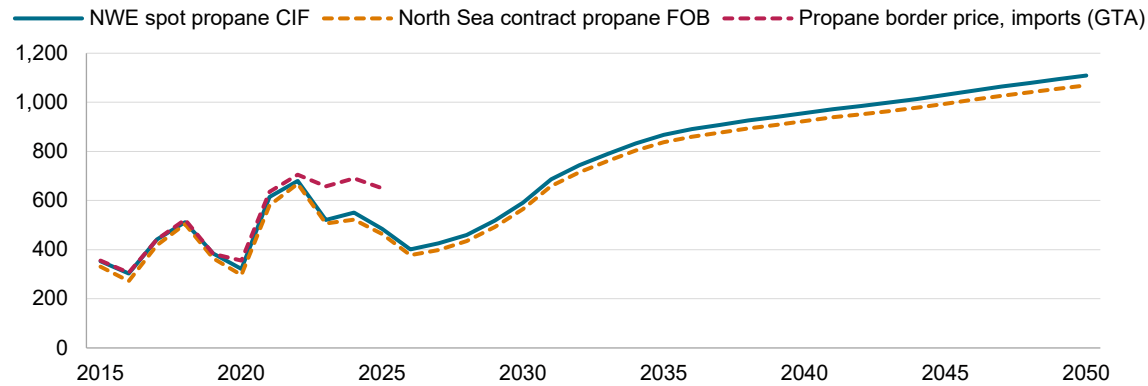


The residential/commercial and industrial markets in Sweden are quite small, and there is not a significant Autogas market, so there is not a consistent and reliable source for intermediate or retail prices in the country.

Finland: LPG prices

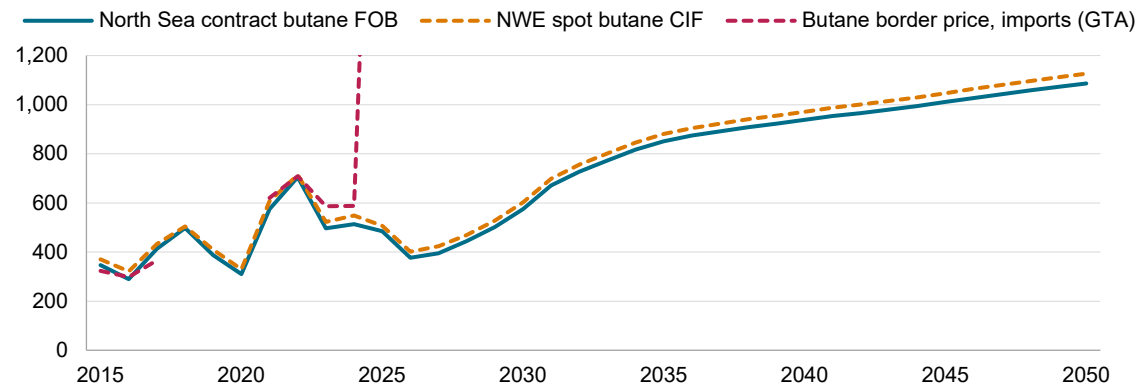
Finland propane prices

Current \$/metric ton



Finland butane prices

Current \$/metric ton



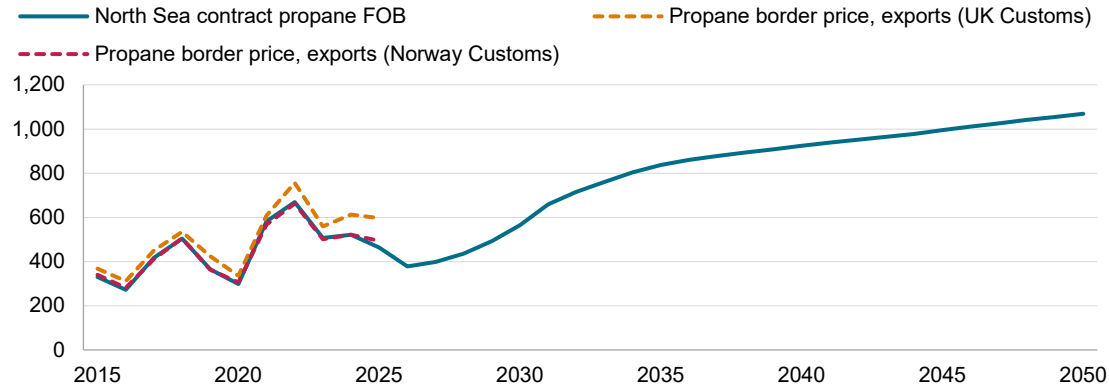
- Propane import prices in Finland track regional marker prices very closely, as would be expected given the very short distance from both the North Sea export terminals and the ARA market.



North Sea: Norway and UK LPG prices

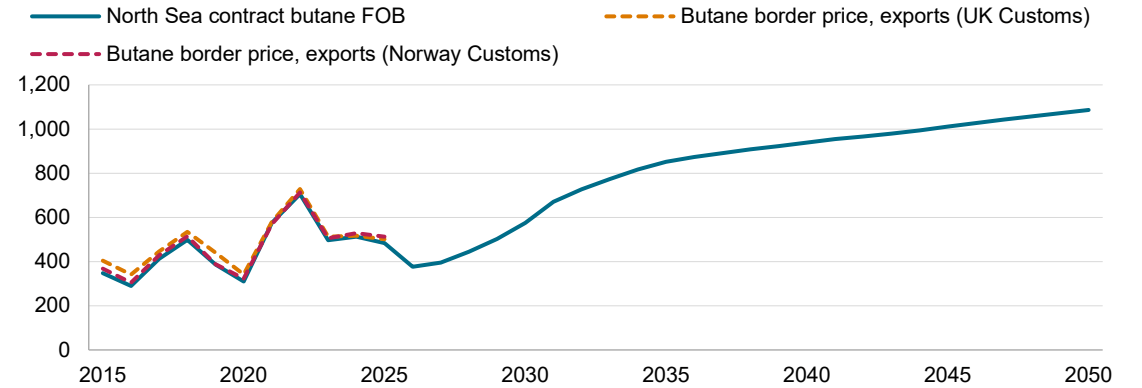
UK and Norway propane prices

Current \$/metric ton



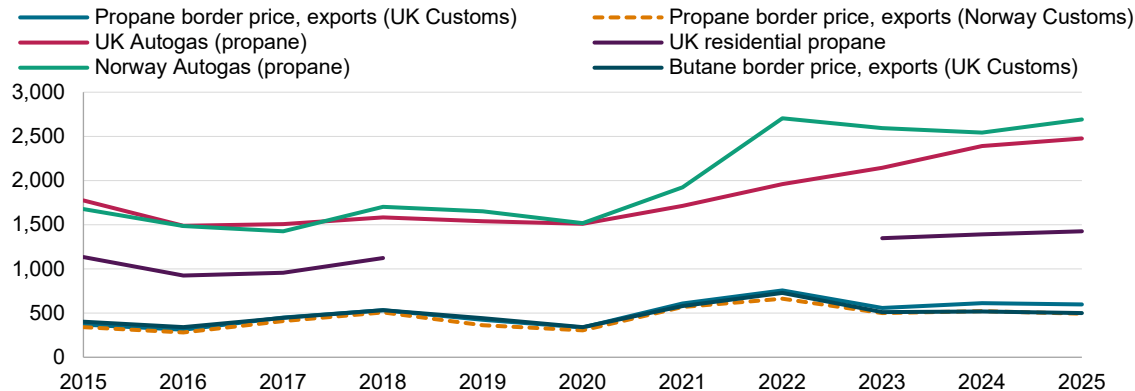
UK and Norway butane prices

Current \$/metric ton



UK and Norway autogas and residential propane prices

Current \$/metric ton



- Norway and UK propane and butane border prices align closely with North Sea contract prices.
- The UK has a small but stable demand for propane in res/com and industry (mainly ceramics). These sectors are mainly fueled by natural gas.
- Norway uses LPG primarily in chemicals but also has a small Autogas sector.

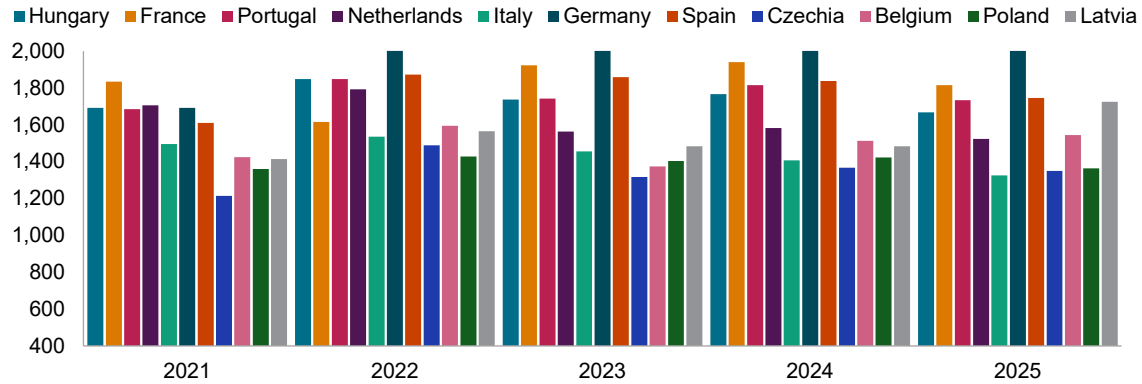
The UK and Norway Autogas sectors both use 100% propane.
*The Sullom Voe terminal in the UK stopped exporting LPG in 2010.

European Union Autogas

European Union: Autogas prices in select countries

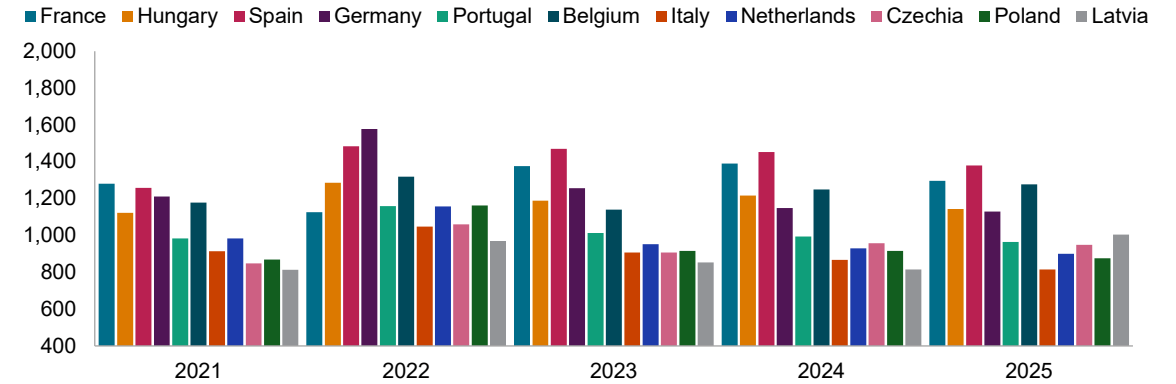
Autogas prices in select countries in the EU—with taxes

Current \$/metric ton



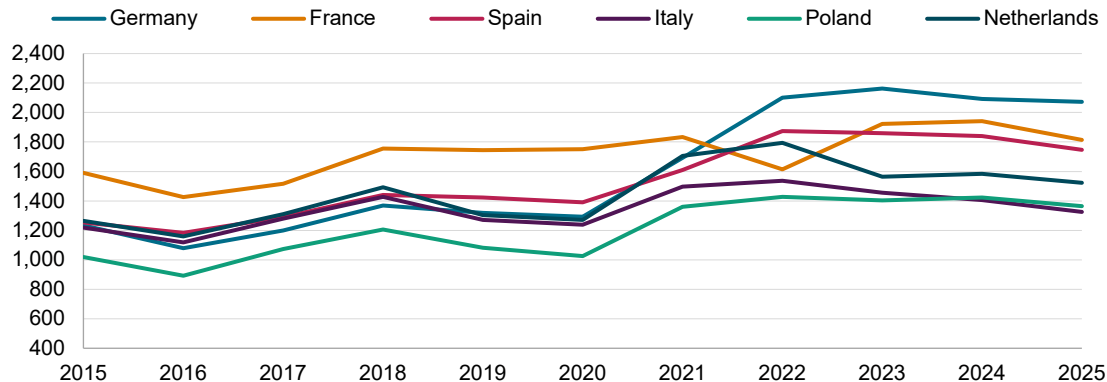
Autogas prices in select countries in the EU—without taxes

Current \$/metric ton



Autogas prices in select countries in the EU—with taxes

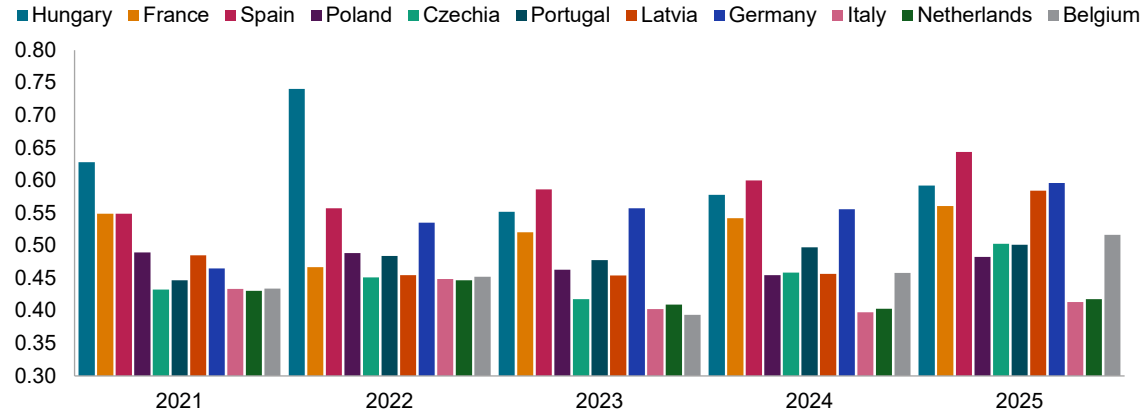
Current \$/metric ton



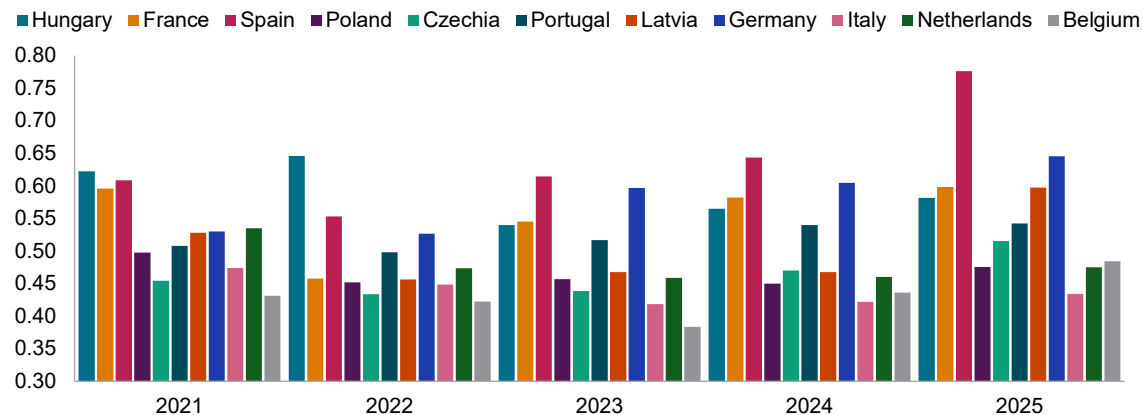
- After consistently falling through 2020, Autogas prices in Europe have increased along with global crude oil and refined product prices. There remains significant variation among EU member states in the price of Autogas at the pump (including all taxes).
- In 2020, prices ranged from just under \$1,000/ton in Belgium to about \$1,750/ton in France. By 2022, the spread between Autogas prices throughout Europe increased significantly, now ranging between \$1,360-2,200/ton, partly driven by varying policies to control inflation via tax relief.
- Price variances are partly due to differences in taxes (value-added tax plus excise) in each country. Italy and Poland, for example, reduced Autogas taxes in 2022 by almost 50% relative to 2021. Others, like France, Belgium, and Czechia, increased taxes by 12-21% in that same period.
- However, the prices without taxes vary nearly as much between different countries as the final pump prices, indicating that differences in wholesale prices and margins are more significant factors than taxes in explaining the variation.

European Union: Autogas ratios to gasoline and diesel in select countries

Autogas ratio to gasoline prices in select EU countries



Autogas ratio to diesel prices in select EU countries



- Autogas competes with liquid fuels (and other alternatives such as CNG) in the European transportation market. The number of refueling stations and size of the Autogas-capable automobile fleet varies greatly from country to country.
- Larger markets include Italy and Poland (Turkey is outside the EU and so is not included in these data), and in both countries Autogas is priced favorably relative to gasoline and diesel.
- The competitiveness of Autogas relative to gasoline and diesel reached historical levels in 2022. While LPG prices increased somewhat since late 2021, they did not increase near as much as gasoline and diesel prices.
- While this trend was evident across most of the continent, there were some exceptions, such as what happened in Turkey in the summer, when gasoline and diesel prices fell much more than LPG, leading to a considerable drop in demand for Autogas.
- Generally, Autogas needs to be priced at about 60% of the price of diesel or below on a per liter basis to compete successfully and build a sustainable market. This is due both to Autogas' lower heating value per liter and the relative lack of refueling infrastructure and vehicle choices.
- Consumers need to be given enough incentive in terms of fuel cost savings to overcome the perceived inconvenience of switching to Autogas beyond its traditional markets.
- In many European markets, Autogas is effectively subsidized through favorable taxation (relative to gasoline and diesel). This results in ratios to diesel that have been under 0.6 since 2011 in a variety of markets across the continent, including Belgium, the Netherlands, Germany, Spain, Portugal, Italy, Czechia, Poland, and Latvia.

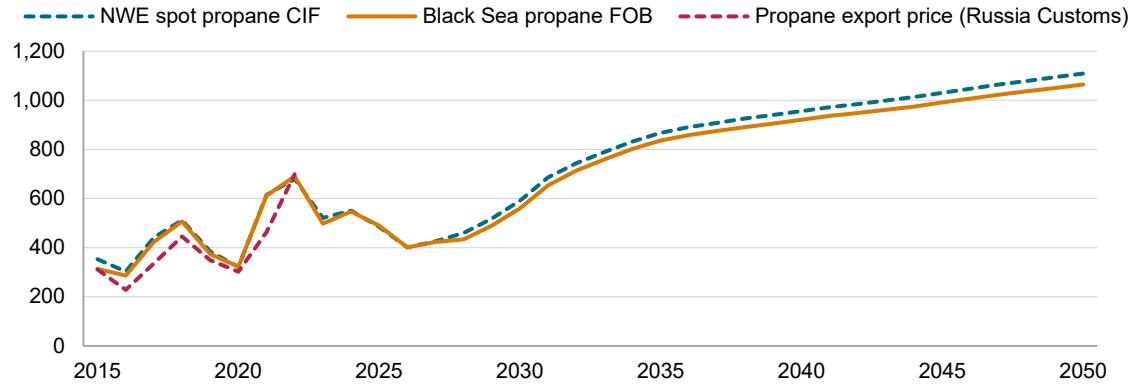
All comparisons are calculated in terms of Euros per liter.
For time series going back to 2005, see Excel data tables.

CIS

Russia: LPG prices

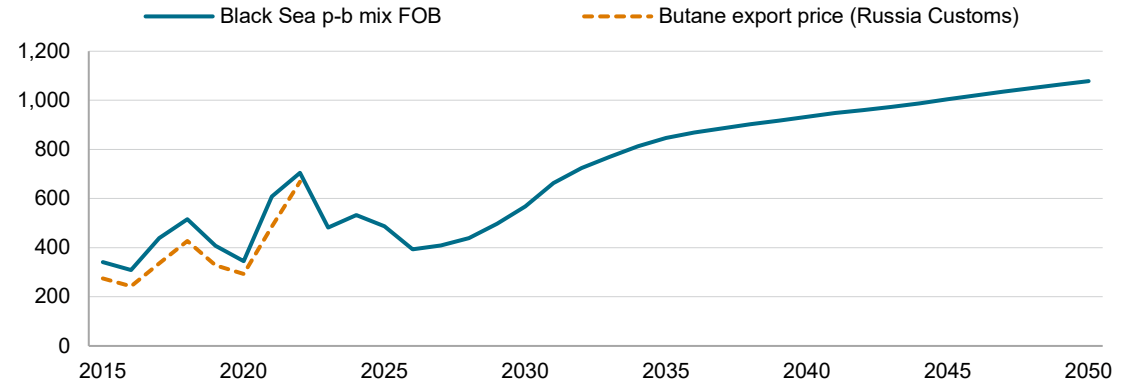
Russia propane prices

Current \$/metric ton



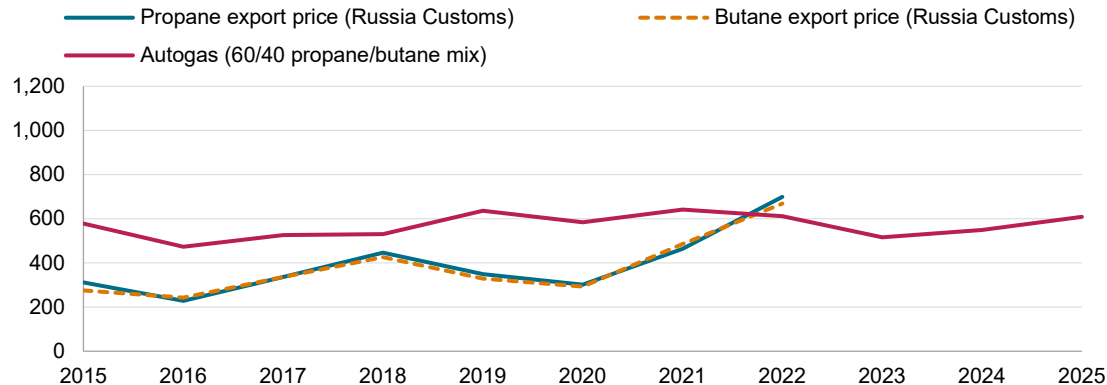
Russia butane prices

Current \$/metric ton



Russia export and autogas LPG prices

Current \$/metric ton



- Russia is the largest producer of LPG in the CIS, with most recovered from associated natural gas.
- Autogas is a significant end-use market for LPG in Russia, and Autogas is priced very cheap relative to other markets (and competing fuels).
- Black Sea prices are normally closer to Russian border prices, since these represent direct exports from Russia.
- With the EU ban on Russian LPG imports Eastern European prices have moved from Brest to a premium over Northwest Europe to account for transport.

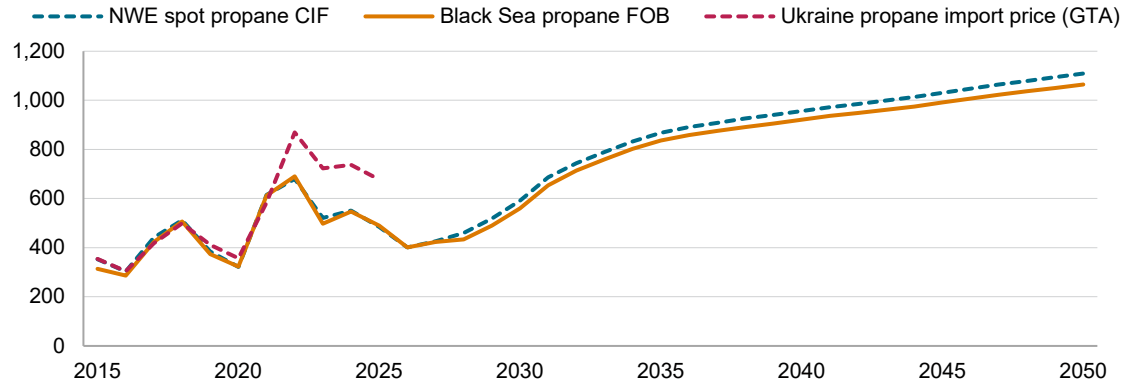


Russian Autogas is 60% propane, 40% butane.

Ukraine: LPG prices

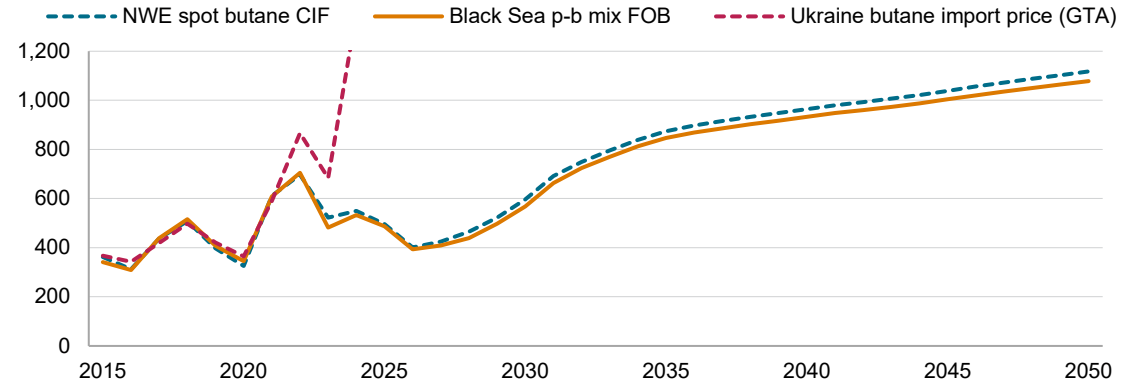
Ukraine propane prices

Current \$/metric ton



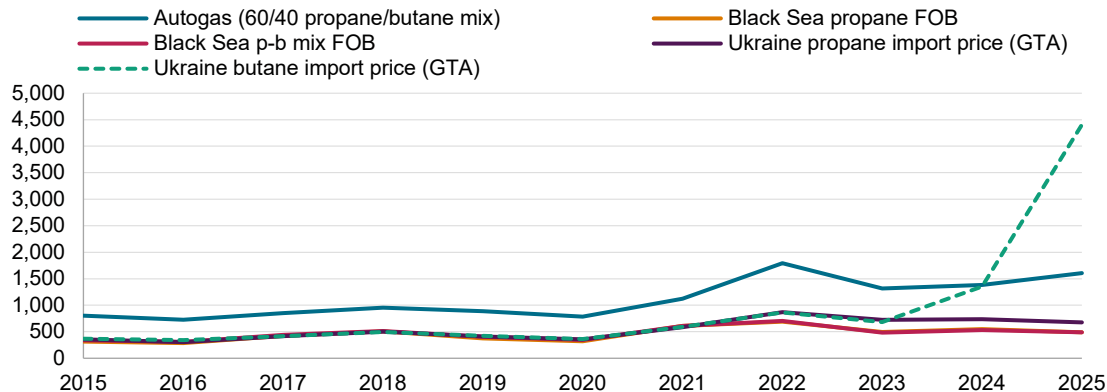
Ukraine butane prices

Current \$/metric ton

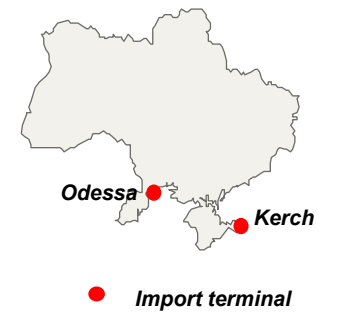


Ukraine LPG prices

Current \$/metric ton



- Ukraine's propane and butane import prices used to track the Brest price.
- Imports are now mostly via rail and through Black Sea ports from Eastern Europe, the Mediterranean, and the US.
- Export terminals have been reconfigured as import terminals to reflect the realities of supply in the region.
- Lower global LPG prices, as well as improved supply infrastructure have helped reduce Ukraine retail prices.

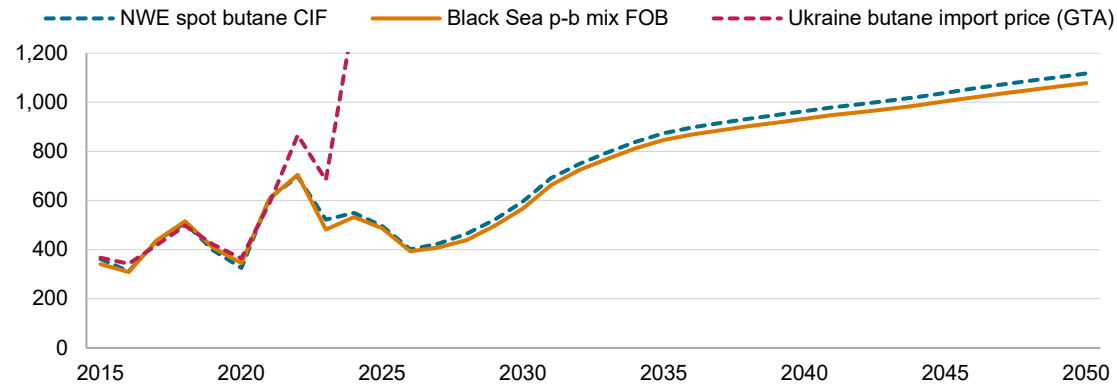


Autogas in Ukraine is 60% propane, 40% butane.

Kazakhstan: LPG prices

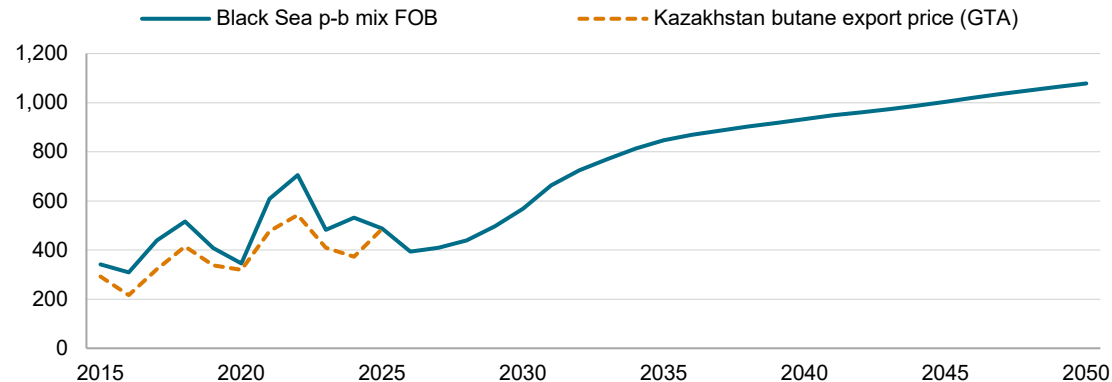
Ukraine butane prices

Current \$/metric ton

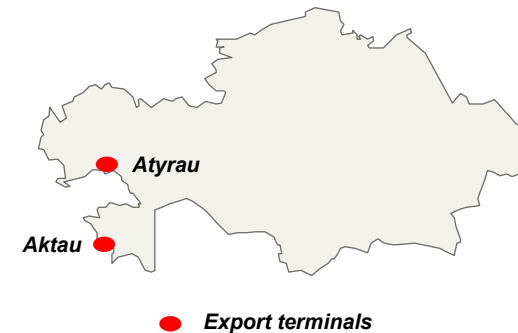


Kazakhstan butane prices

Current \$/metric ton



- Kazakhstan is the second largest producer of LPG in the CIS, behind Russia.
- Kazakhstan's border prices for both propane and butane tend to track the Black Sea prices, though with a discount that reflects the transport cost through Russia to reach the Black Sea ports from which a large portion of Kazakh LPG reaches its end markets.
- Despite the fact that Kazakhstan is landlocked and must export via Russia, it reports exports directly to the destination markets.

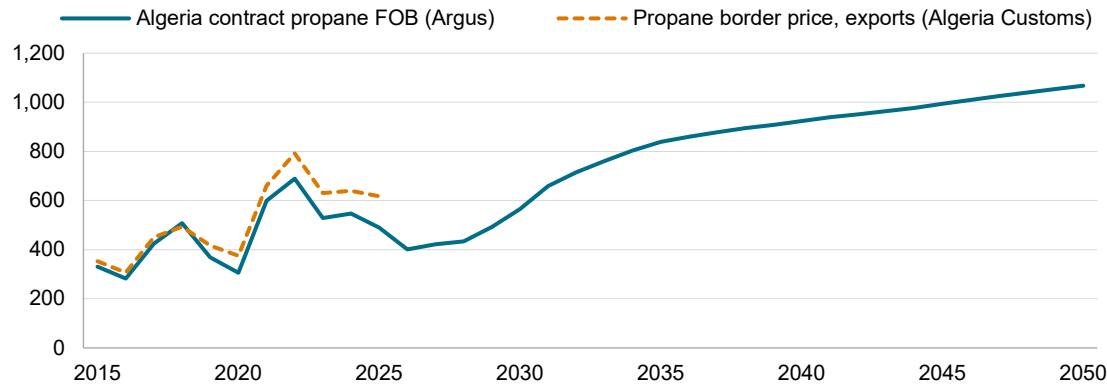


Africa

Algeria: LPG prices

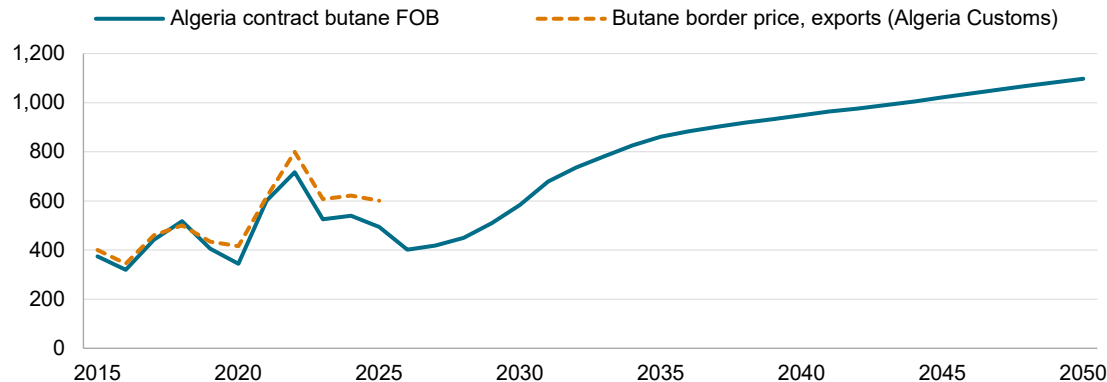
Algeria propane prices

Current \$/metric ton



Algeria butane prices

Current \$/metric ton



- Algerian contract propane and butane prices historically have been very close on an annual basis to the annual average export prices from Customs. With stable production since 2016, Sonatrach has been able to sell most of its volumes at its posted contract price rather than resorting to spot sales. This keeps the differential between border prices and contract prices very small.
- Going forward we do not expect another period of rapid supply growth, so most exports should continue to be at the contract price through the long term.
- The prevalence of VLGC cargoes from the US in the Eastern Med puts an upside limit on Algerian pricing that is still somewhat further below the Saudi CP than Sonatrach might otherwise be able to achieve (without US competition).

The Algerian domestic LPG market and exports are dominated by the country's national oil company, Sonatrach.

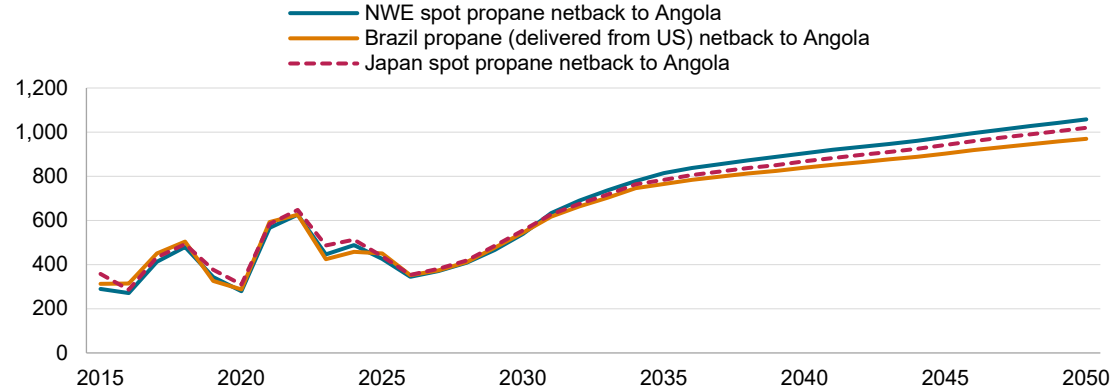
Algerian Contract prices for propane and butane are set by Sonatrach on a monthly basis and posted after the Saudi Contract Price is released. They are set to keep Algerian LPG competitive in the Mediterranean market.

The published contract price is for large cargoes on a contract basis. Sonatrach also sells some spot cargoes and exports some LPG on smaller ships.

Angola and Nigeria: LPG netback prices

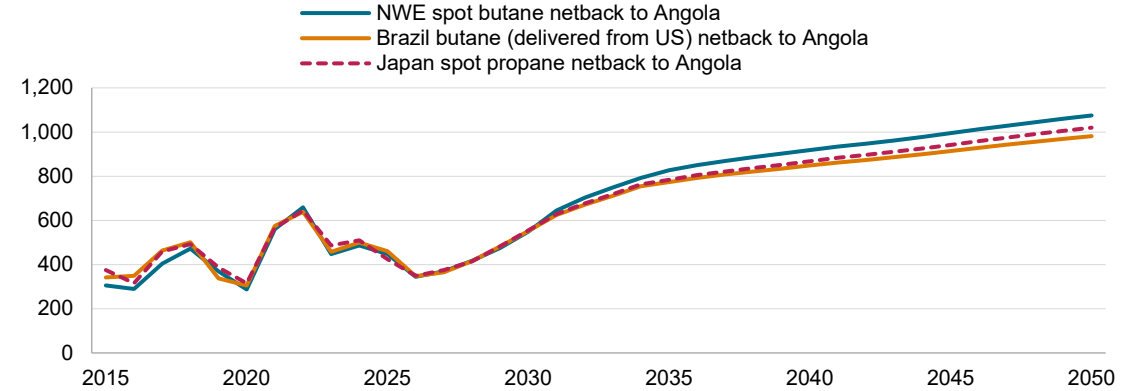
Angola propane netback prices to Europe, Latin America, and Asia

Current \$/metric ton



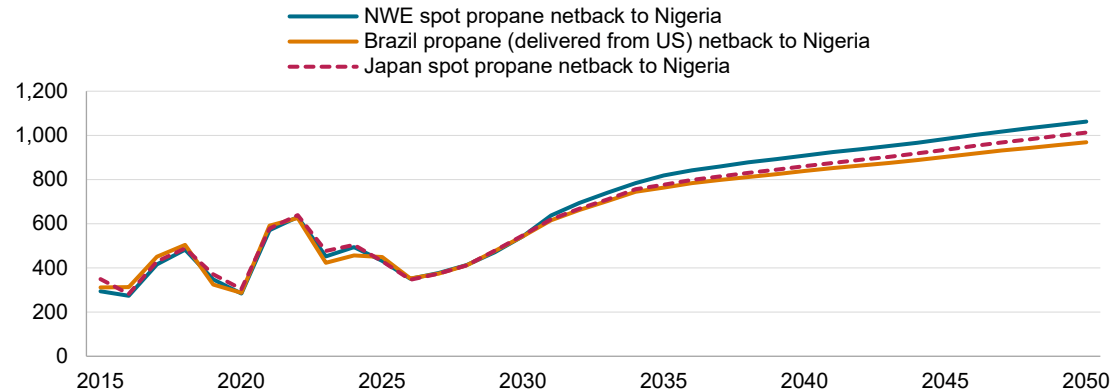
Angola butane netback prices to Europe, Latin America, and Asia

Current \$/metric ton



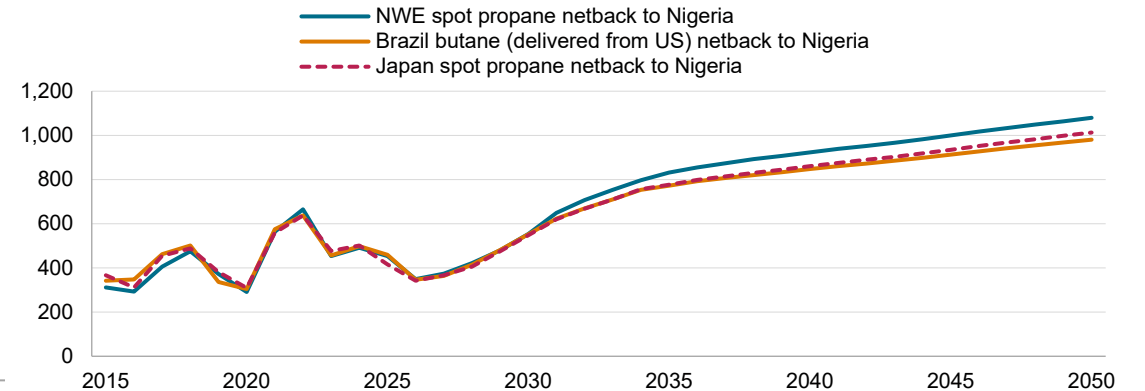
Nigeria propane netback prices to Europe, Latin America, and Asia

Current \$/metric ton



Nigeria butane netback prices to Europe, Latin America, and Asia

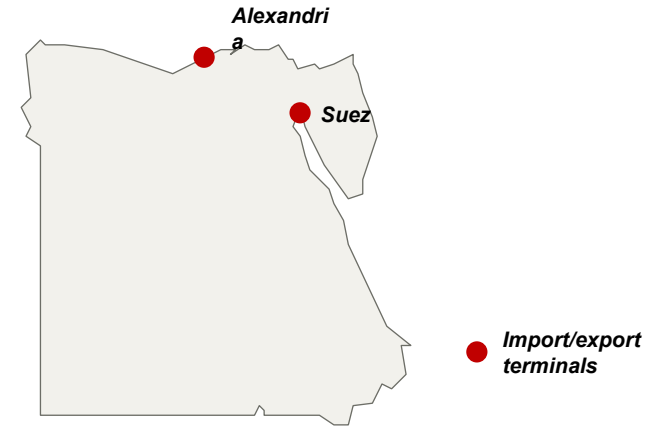
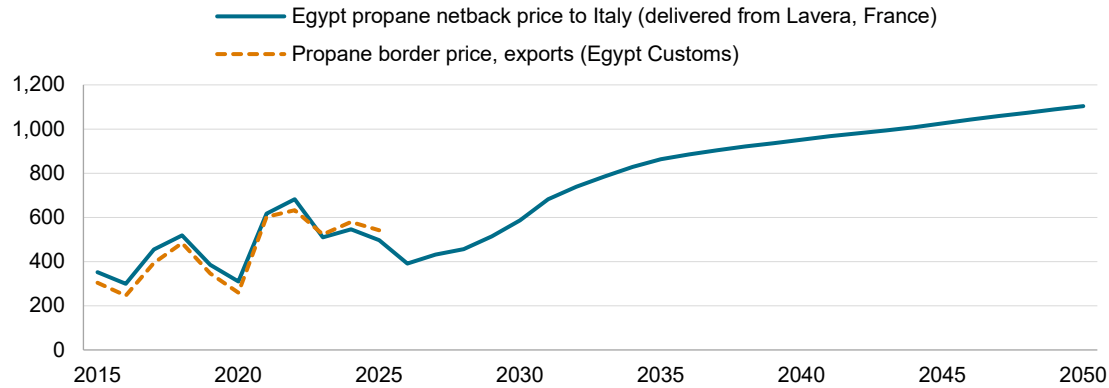
Current \$/metric ton



Egypt: LPG prices

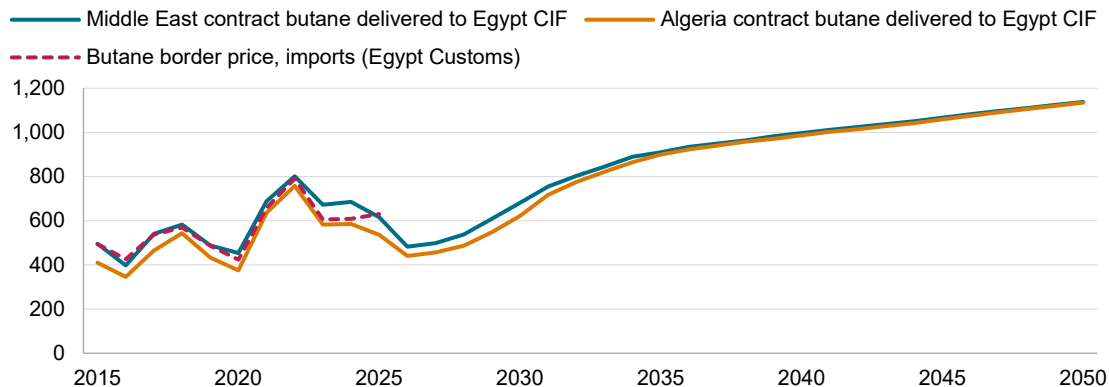
Egypt propane export prices

Current \$/metric ton



Egypt butane import prices

Current \$/metric ton



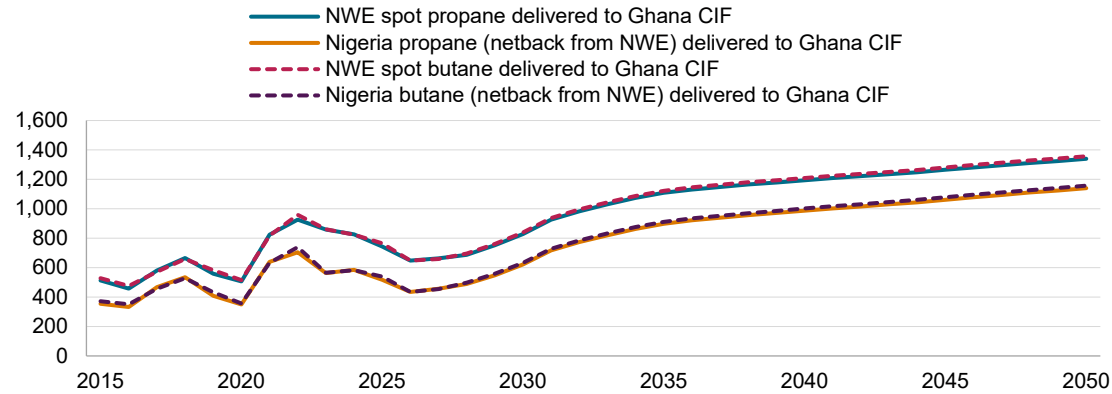
- The Egyptian domestic market has been long propane and short butane for the past decade, and so Egypt exports only propane, mainly to Italy.
- Egypt imports butane, mainly from Saudi Arabia and Algeria.
- Border prices for imported butane correlate most closely with the delivered price of Algerian butane.

Egypt uses only butane in its res/com LPG sector, which accounts for most domestic LPG demand (there is some propane used in ethylene production).

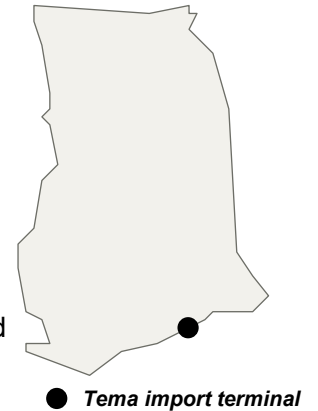
Ghana: LPG prices

Ghana delivered prices of propane and butane

Current \$/metric ton



- In 2015 Ghana took advantage of lower import prices to eliminate subsidies and institute net taxation. The result is that retail prices have dropped, but not by as much as border prices.
- Ghana now produces LPG offshore in addition to its refinery production but has not reported prices since mid-2015 so the impact of increased domestic supply is unclear.
- Ghana is upgrading its port infrastructure in line with the construction of a 400 MW power plant to be fueled at least initially by LPG. The first phase is now online, and imports have increased substantially.

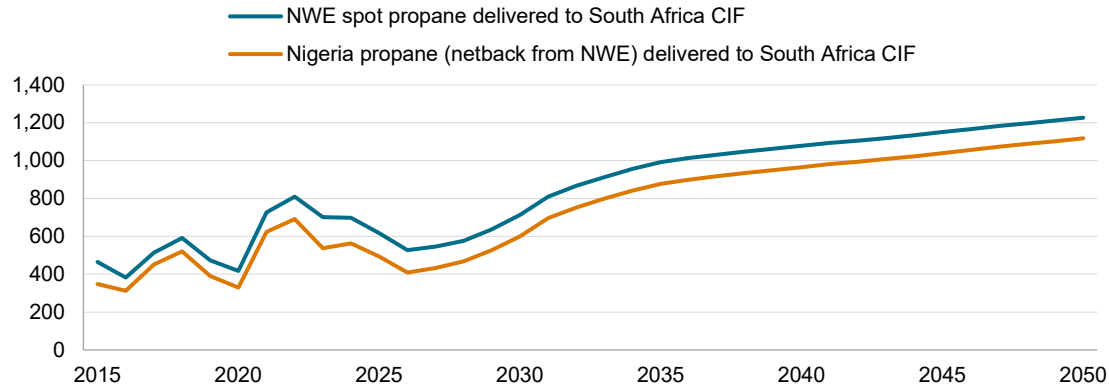


LPG in Ghana is subsidized by the government, and sold both as Autogas and in cylinders, for the same price.

South Africa: LPG prices

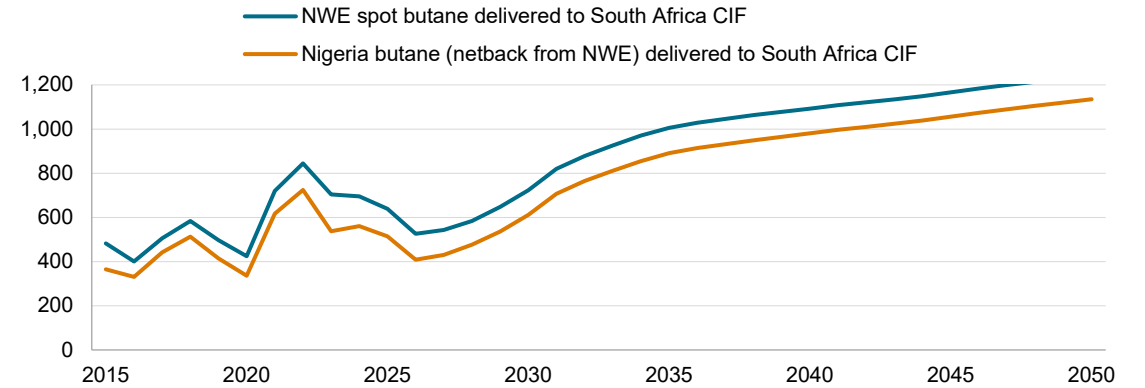
South Africa delivered prices of propane

Current \$/metric ton



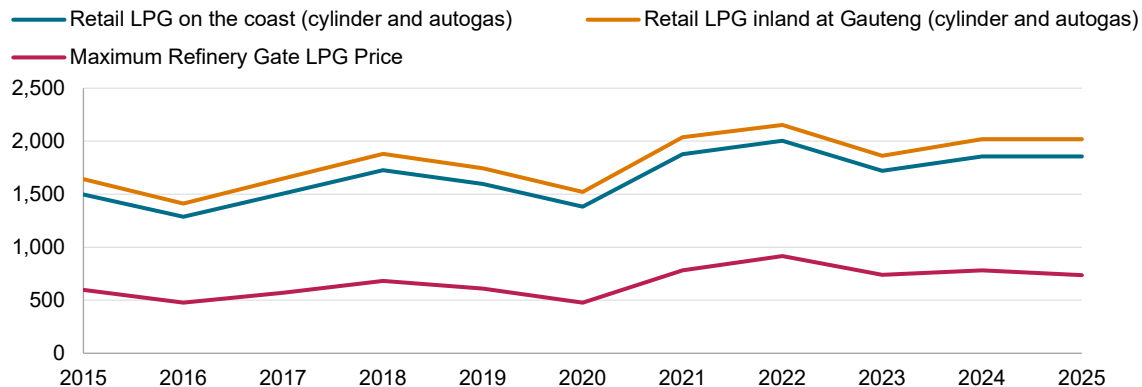
South Africa delivered prices of butane

Current \$/metric ton



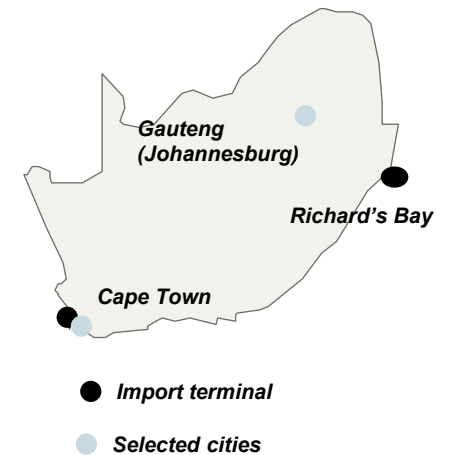
South Africa wholesale and retail LPG prices

Current \$/metric ton



- South African wholesale (Maximum Refinery Gate Price) and retail prices (Maximum Retail Price) have been disconnected from the trajectory of global benchmark prices for some years.

- Market players have expressed concern about the need to review the formula for calculating these prices.
- Retail prices are determined by adding transport costs, taxes, and wholesale and retail margins to the import price.

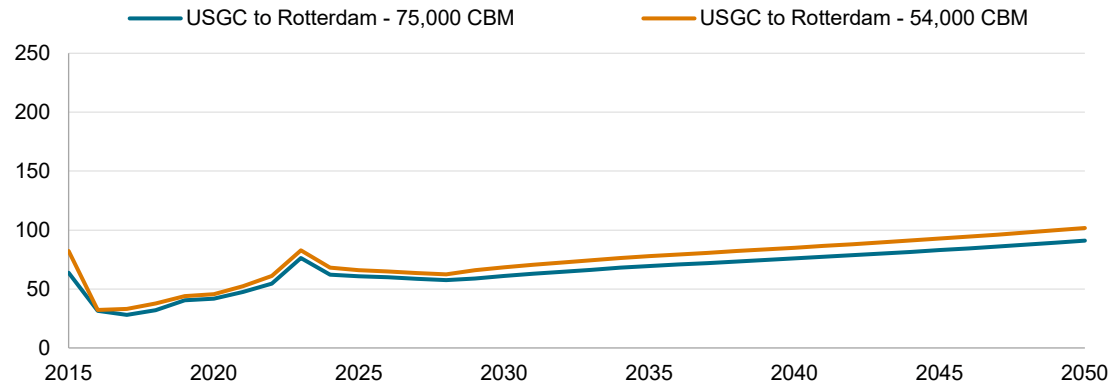


LPG freight

LPG freight rates: NWE and North Sea

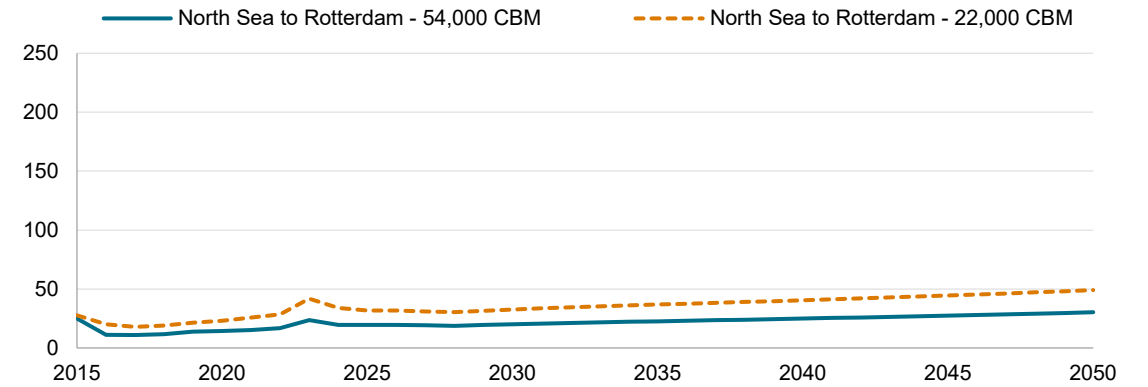
Waterborne contract freight costs from USGC to Northwest Europe

Current \$/metric ton



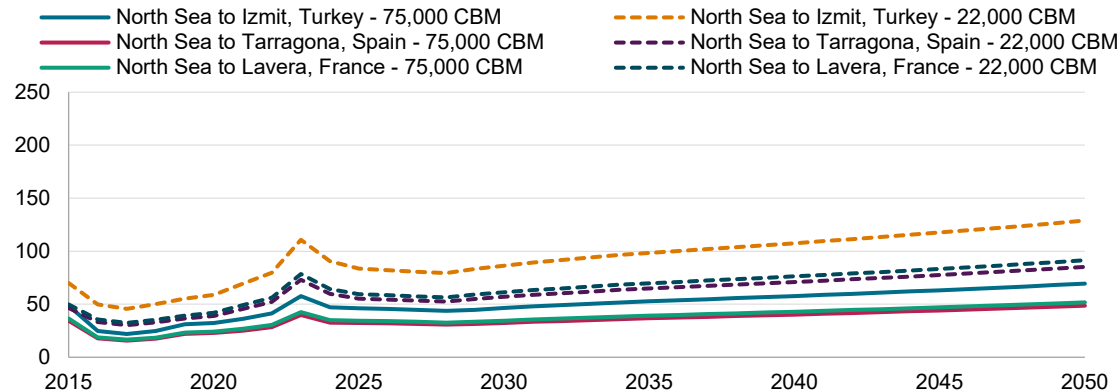
Waterborne contract freight costs from North Sea to NWE

Current \$/metric ton



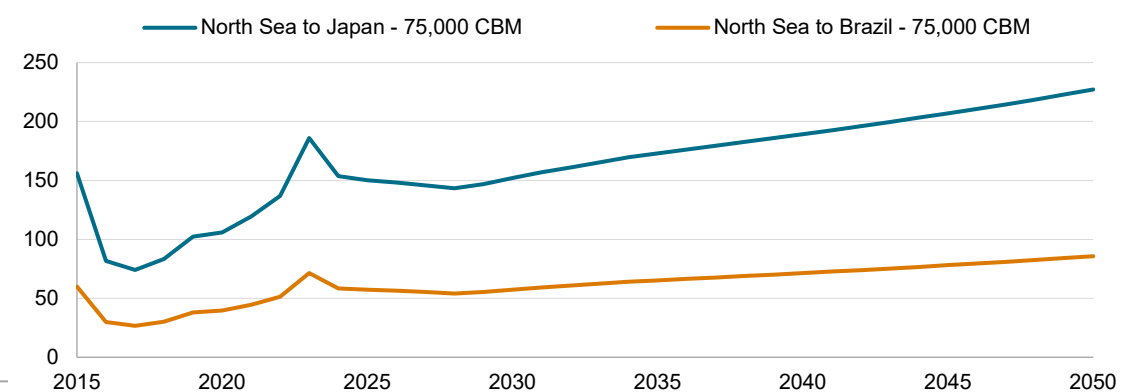
Waterborne contract freight costs from North Sea to Mediterranean

Current \$/metric ton



Waterborne contract freight costs from North Sea to Japan and Brazil

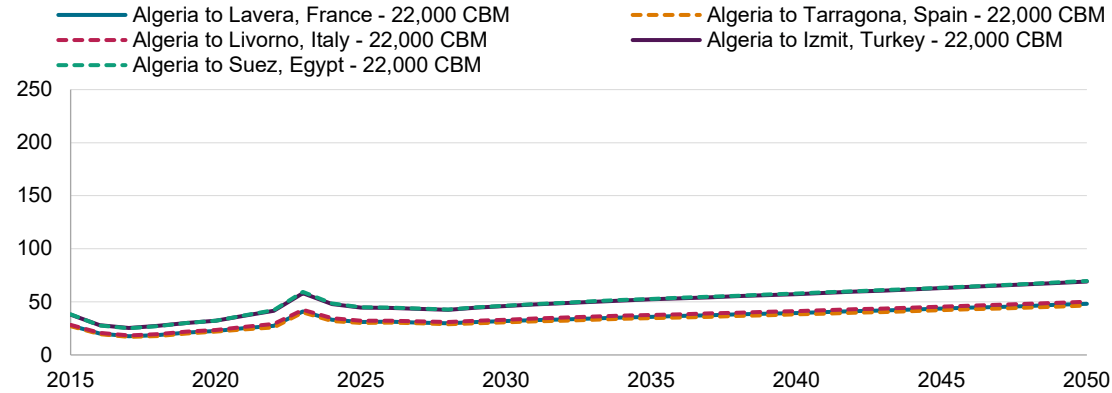
Current \$/metric ton



LPG freight rates: Mediterranean

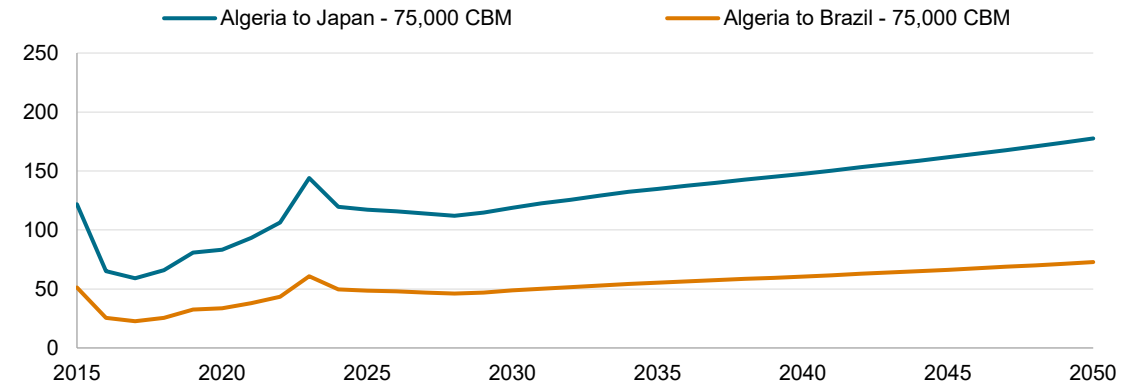
Waterborne contract freight costs from Algeria to Mediterranean

Current \$/metric ton



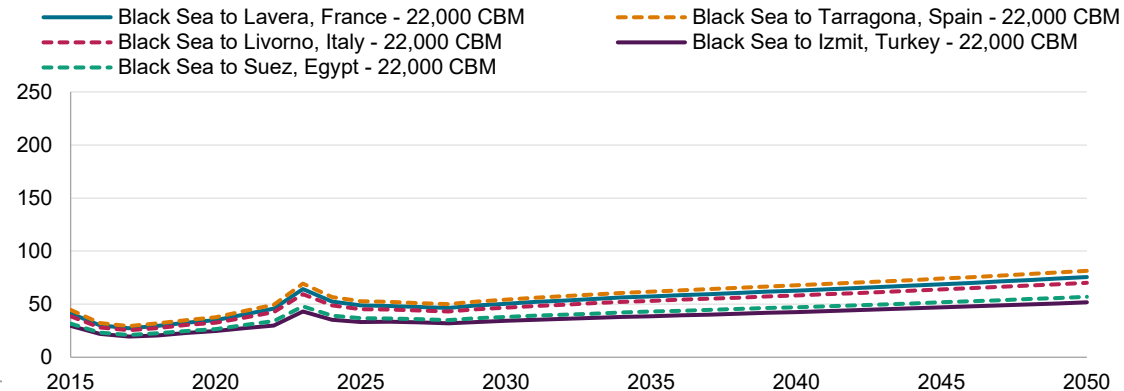
Waterborne contract freight costs from Algeria to Japan and Brazil

Current \$/metric ton



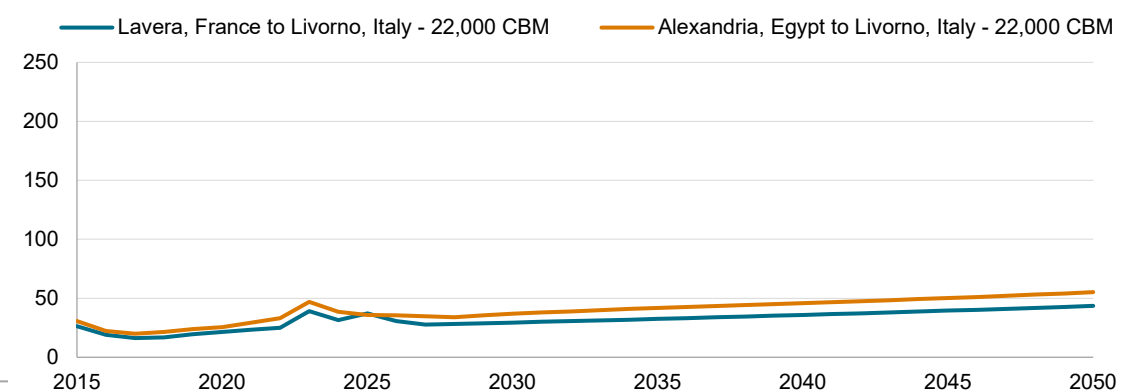
Waterborne contract freight costs from Black Sea to Mediterranean

Current \$/metric ton



Waterborne contract freight costs from Egypt and France to Italy

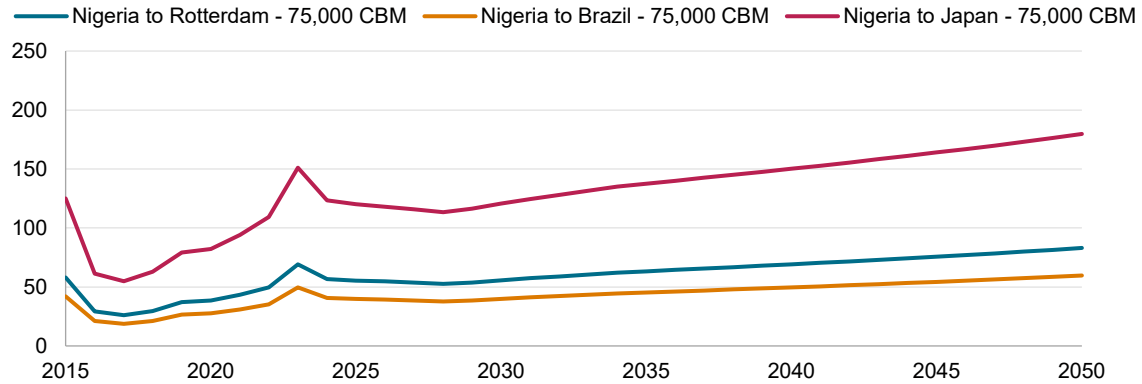
Current \$/metric ton



LPG freight rates: West Africa and South Africa

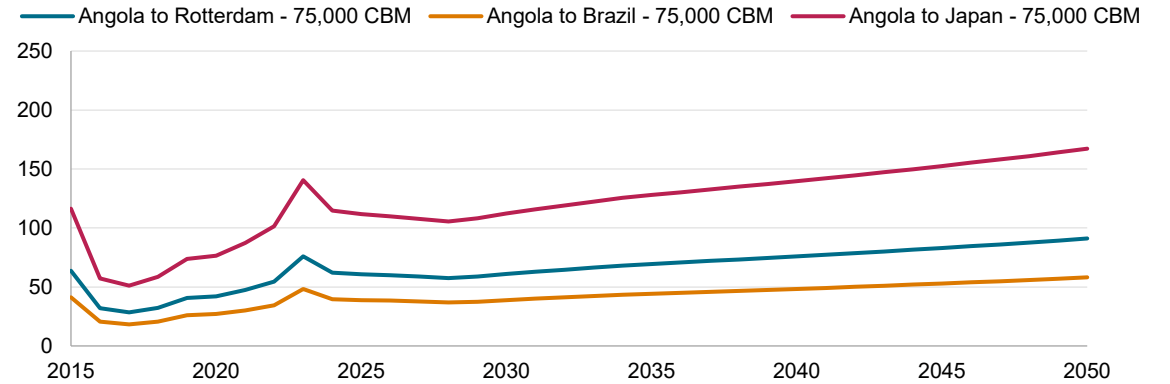
Waterborne contract freight costs from Nigeria

Current \$/metric ton



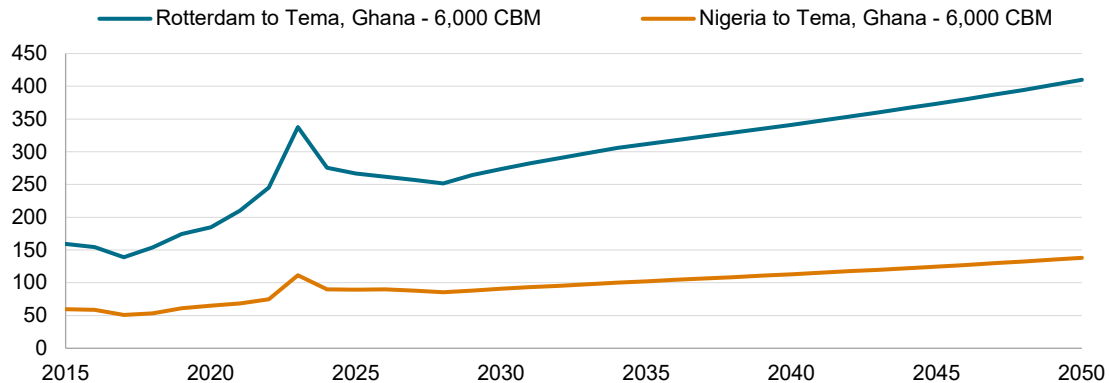
Waterborne contract freight costs from Angola

Current \$/metric ton



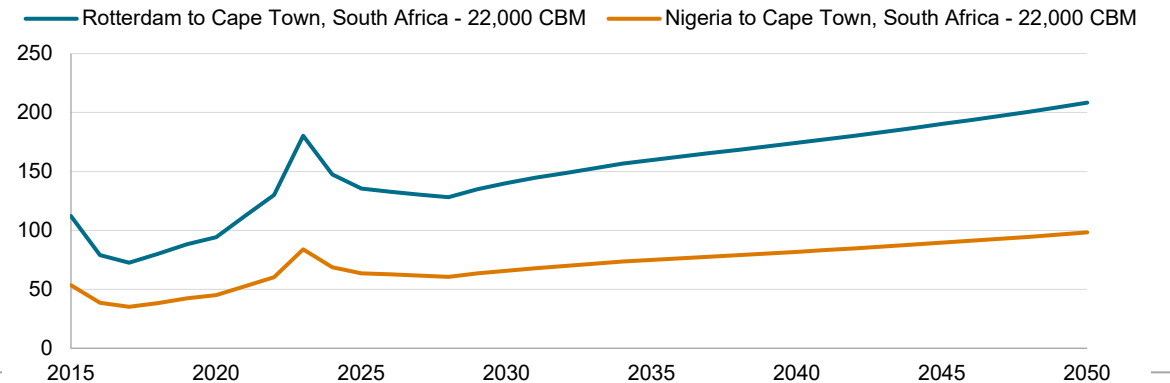
Waterborne contract freight costs to Ghana

Current \$/metric ton



Waterborne contract freight costs to South Africa

Current \$/metric ton



Appendix: Glossary

Abbreviations and acronyms

ARA	Amsterdam, Rotterdam, and Antwerp
bbl	Barrel
b/d	Barrels per day
boe	Barrel of oil equivalent
CEPSA	Compañía Española de Petróleos, S.A.U. (Spanish Petroleum Company)
CIF	Cost, insurance, and freight
DAF	Delivered at frontier
Eurostat	European Commission statistical database
FOB	Free on board
France MESDE	Ministry of Ecology, Sustainable Development and Energy
LNG	Liquefied natural gas
LPG	Liquefied petroleum gas
NWE	Northwest Europe
NBP	United Kingdom National Balancing Point – natural gas trading hub
OPIS	Oil Price Information Service
Sonatrach	Algeria's national oil and gas company
\$/metric ton	US dollars per metric ton (1,000 kg)
\$/MMBtu	US dollars per million British thermal units
\$/boe	US dollars per barrel of oil equivalent

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