FINANSIA
FSS INTERNATIONAL INVESTMENT ADVISORY

# Thailand Energy & Utilities

## Europe at a loss, US with gains, Ukraine at war

- Russia's invasion of Ukraine sent prices for everything from bread to steel soaring, led by gas, oil, coal, aluminium, and wheat, as Russia is one of the top exporters.
- The spikes in energy prices, particularly gas and LNG, should be short-lived, potentially driving up Thailand's gas prices by 10% for SPPs in 2022.
- Top picks are PTTEP, BANPU, IVL as 1H22 winners and BGRIM as a 2H22 winner.

### "From Russia with losses" on energy price and inflation escalations

On 24 February 2022, Russia launched attacks on Ukrainian military installations in alleged support of the pro-Russian states of Donetsk and Luhansk. Europe stands to lose far more than the US from sanctions, in our view, given the EU's high energy reliance on Russia. LNG futures reacted the most to Russia's invasion, rising by over 10% to USD29-31/mmbtu for the near-dated futures from Mar-22 to Feb-23. As Russia is a top exporter of natural gas, crude oil, coal, metals, and wheat, the impact of Russia's invasion sent prices for everything from bread to steel soaring. Oil hit USD100/bbl and the prices of all substitutes for oil rose, including the German power price for Mar-22 by 31%, the ICE UK natural gas futures price by 15%, the European coal price for 2023 by 13%, and the Newcastle coal price by 24%. Global food inflation could be higher, likely triggering a faster and higher interest rate hike, as Russia and Ukraine are among the world's top wheat producers.

### The impact of energy disruptions from Russia's invasion likely to be short-lived

Russia's invasion of Ukraine should have a far smaller impact in the longer term, as the commodity crude oil futures market moved up lower than the rise in near-dated futures by 10% for the front month futures (Apr-22), rising by only 2-4% on average for the far-dated futures (Dec-22 onward). We believe this reflects the market's expectation of short-lived energy supply disruptions for the European market, based on a sufficient crude oil supply from OPEC+, excluding Russia, and higher LNG supplies from the US in 2H22.

### c10% higher gas price for SPPs from Russia's invasion of Ukraine

We think the impact of the gas price hike in 2022 will most severely affect the gross margins of SPPs, but should begin to subside by 2Q22, before dropping from USD11.6/mmbtu in 1Q22 to USD8.4/mmbtu in 4Q22. With 4.5mtpa of LNG imports in 2022 to be included in the pool gas price, we revise up our final gas price estimates for the gas sold to SPPs by 8-12% in 2Q-4Q22, based on our higher spot LNG price assumptions by 15-20% and LNG contract prices by USD1-2/mmbtu in 1Q-4Q22, to reflect the impact of the tighter gas supply in 1H22 before loosening in 2H22 when more US LNG exports should come on stream.

### Energy producers are clear 1H22 winners; SPPs are 2H22 "dark horse" finishers

We maintain our top picks in the Thai energy and utilities sectors despite the impact of Russia's invasion of Ukraine, with PTTEP, BANPU, IVL, and BGRIM as our top picks for both the gas price uptrend in 1H22 and the expected downtrend in 2H22. We think SPP companies BGRIM and GPSC should see margin recoveries on the projected gas price downtrend in 2H22 and endemic capacity growth and margin expansion in 2H22 onward.

**Suwat Sinsadok, CFA, FRM, ERP**
suwat.sin@fssia.com
+66 2611 3558

**Siriluck Pinthusoonthorn**
siriluck.pin@fssia.com
+66 2611 3562

## Europe at a loss, US with gains, Ukraine at war

On 24 February 2022, Russia finally "invaded" Ukraine's two pro-Russian states of Donetsk and Luhansk in the eastern part of Ukraine bordering Russia. The move follows the past two weeks' speculation and news that Russia was preparing to invade Ukraine. This issue has become the focus of intense geopolitical attention with mounting warnings of an all-out war after Russia built up its military presence along its borders while issuing demands that the North Atlantic Treaty Organisation (NATO) pull back from Eastern Europe and discard Ukraine's request to become a member of NATO.

Buffering Western Europe and Russia, Ukraine has become a place of East-West conflagration. After the Soviet Union collapsed, NATO expanded eastward, eventually taking in most of the European nations that had been in the communist sphere. The Baltic republics of Lithuania, Latvia and Estonia, once parts of the Soviet Union, joined NATO, as did Poland, Romania and others, moving closer to directly border Russia.

The turning point came in 2008 when NATO indicated that it planned to admit Ukraine as a member, triggering Russia to move by 2014 to officially annex Crimea, a former part of Ukraine. Russia then fomented a separatist rebellion that took control of parts of the Donbas region of Ukraine in a war that still continues and has already killed over 13,000 people, according to the New York Times.

The increasing threat of NATO's military bases in Ukraine to Russia and the abundant natural resources of Donbas in eastern Ukraine eventually led Russia to take military action against Ukraine, deploying the similar strategy of ethnics-independence-vote to effectively annex the regions of eastern Ukraine to become a part of Russia in the end.

### Exhibit 1: Russian tanks moved into Ukraine's two separatist states


Source: The Times

### Exhibit 2: Shelling and missile strikes across Ukraine by Russia on 24 February 2022


Source: New York Times

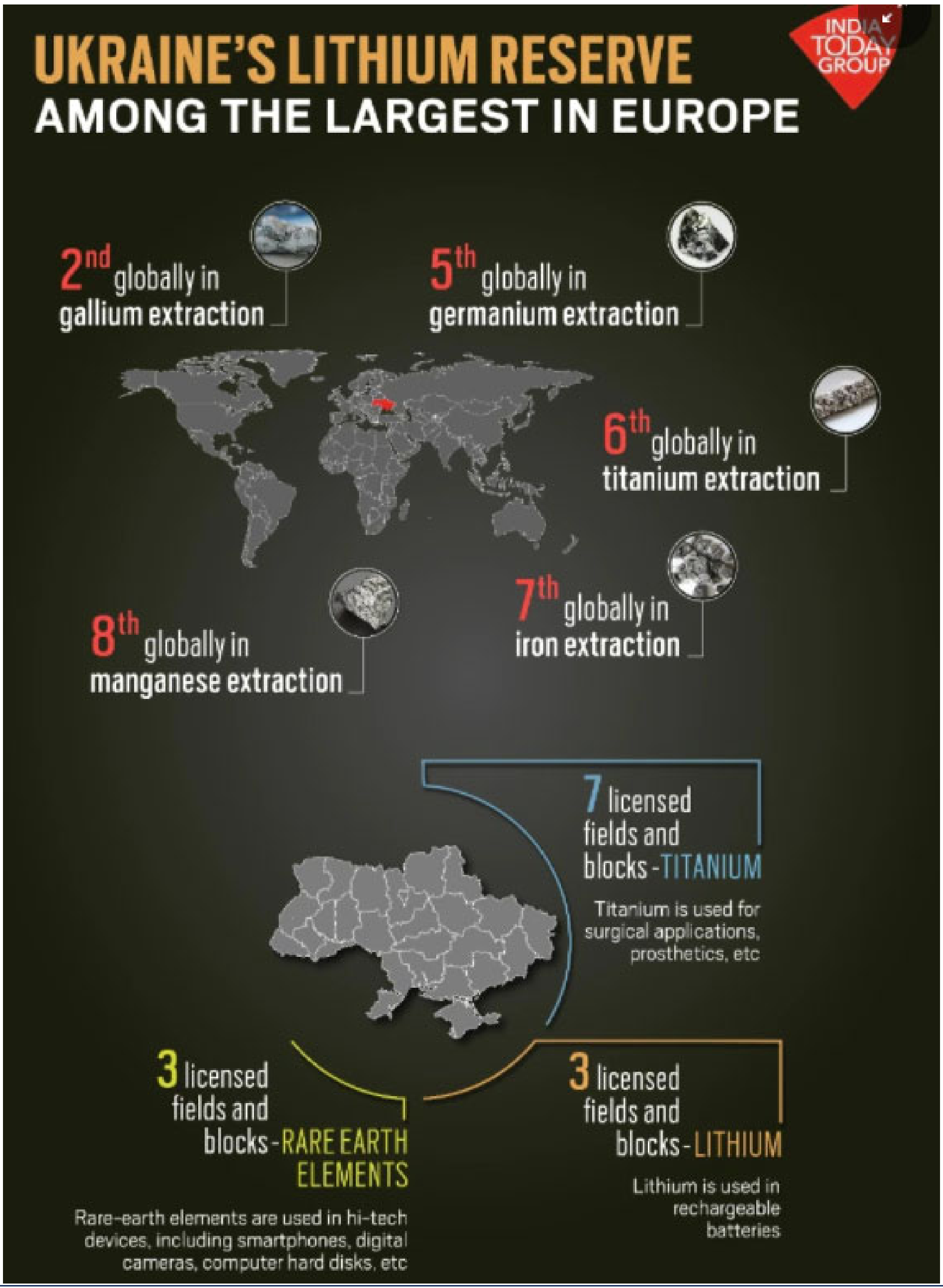
**War of politics vs war over resources**

Besides the military issue per se, Russia and the US and its allies are fighting in Ukraine for its abundant resources, in our view. The fight to lay claim to the abundant rare earth elements that Ukraine is immensely rich in is a reason to influence the country's political leanings toward Russia or Europe.

According to India Today, Ukraine is rich in the natural resources of oil, gas, coal, and a number of precious and rare metals. Hence, the conflict in Ukraine could potentially disrupt the global supply chains of these products.

**Oil and gas:** Ukraine today holds the second-biggest known gas reserves in Europe, excluding Russia's gas reserves in Asia, albeit largely untapped. When it comes to its natural gas, it has about 1.09 trillion cubic meters, which is an unimaginable amount, second only to Norway's known resources of 1.53 trillion cubic meters.

**Exhibit 3: Ukraine's lithium reserves are among the largest in Europe**




Source: India Today

**Strategic importance of Ukraine.** Ironically, Ukraine relies on gas imports as the Soviet Union started large-scale gas extraction in Siberia in the 1970s. So, much of the gas exploration and production has been transferred to Russia and, as a result of this, Ukraine's resources remain untapped.

Currently, Russia supplies between 40% to 50% of Europe's gas consumption through the Nord Stream 1 pipeline and the Ukrainian network. Germany is also a big customer of Russia's natural gas. Germany gets 55% of its natural gas from Russia. Most of the gas flows to Germany via pipelines in Ukraine, which earns the country significant transit fees, equivalent to USD7b annually, representing about 4% of Ukraine's GDP, according to the EIA.

While these enormous gas reserves remain untapped, the country is still a key to the gas transport from Russia to Europe. In 2019, Moscow and Kyiv signed a transit agreement that allows smooth transfer of Siberian gas to the EU through Ukraine's large gas transportation system, despite unilateral sanctions by the US. To feed the energy-hungry Europe, Russia initiated the Nord Stream 2 (NS2) gas pipeline to transport natural gas which would be reliable, affordable, and sustainable.

This also means that the US is nowhere near the gas race. But, Gazprom's NS2 pipeline through the Baltic Sea has already hit a major roadblock with the Russian President Putin recognising the breakaway regions of Ukraine, Donetsk and Luhansk, leading to the sanctions against Russia, including on NS2, which was set to commence its commercial operation date after its completion since 3Q21. The German Chancellor has halted certifying NS2 in the wake of the aggression.

**Coal supply disruption.** Russia's fight with Ukraine will doubtlessly have a spillover effect on the coal and electricity sector. In 2021, India imported coal to meet the domestic coal shortage from Russia and the invasion of Ukraine will likely lead to disruptions in the global coal supply chain.

**Precious and rare metals.** Besides natural gas, Ukraine is loaded with minerals like coal, iron, titanium, and other non-metallic raw materials, with large reserves of iron, titanium, and non-metallic raw materials.

Ukraine's natural resources are enormous, with exactly 5% of the earth's natural and mineral resources. Ores like titanium, iron, and non-metallic raw materials are major Ukrainian exports. In 2019, Ukraine was the fifth largest exporter of iron ore in the world and iron ore was the third most-exported product in Ukraine, according to the Ukrainian Geological Survey.

Titanium and lithium are two the most precious metals on the planet today. Lithium chemicals are a key component of EV batteries. Most automobile companies are looking at lithium reserves across the globe. The breakaway territories in the Donbas region are rich with natural resources and therefore make the area economically very viable for the future. The Donetsk and Dobra mines in the self-proclaimed independence area were up for grabs, and there has been stiff competition between Australia-listed European Lithium and the Chinese Chengxin Lithium – all wanting a foothold in the European lithium industry, according to the data published online by the Ukrainian Geological Survey.

**Independence declarations undermined Russia-Ukraine crisis.** On 20 February 2022, Donetsk and Luhansk declared the self-proclaimed "Donetsk People's Republic" (DPR) and the "Luhansk People Republic" (LPR) as independent countries, which one day later was endorsed by Russia. On 24 February 2022, Russia sent troops into these two breakaway states and began attacking a number of major cities in Ukraine.

**Exhibit 4: Maps of self-declared independent countries of DPR and LPR**


Source: Deutsche Welle

**Europe likely to be the biggest loser as well as Ukraine**

At stake for Europe is whether it can allow Mr. Putin to upend the security structure that has helped keep the peace on the continent since World War II. And with Europeans divided over how to respond to various forms of Russian aggression, the conflict has also laid bare the fractures within the European Union and NATO.

With the departure of Chancellor Angela Merkel, who grew up in the east, speaks fluent Russian, and had developed a good working relationship with Mr. Putin, Europe lost an invaluable interlocutor with Moscow. Her successor, Mr. Olaf Scholz, has been criticised for not taking a prominent role in the crisis.

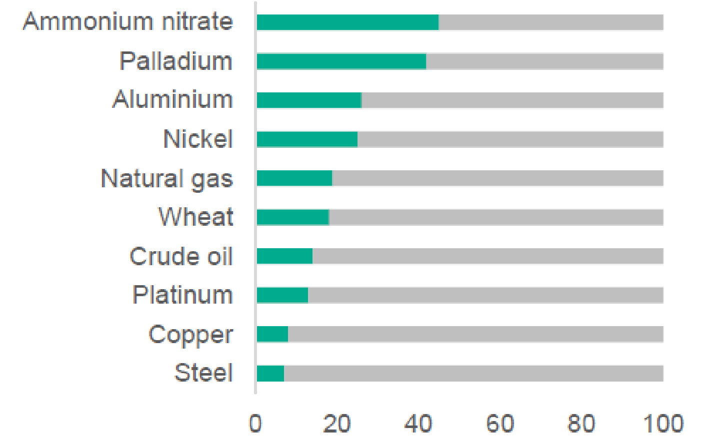
Europe has important trade ties with Russia, and would stand to lose far more than the US from sanctions imposed after a Russian invasion of Ukraine. It is also dependent on Russian gas supplies, a weakness that Mr. Putin has exploited in past disputes.

## A lose-lose scenario for Europe and Russia on Ukraine's invasion

**From Russia with loss?** Immediately after Russia's invasion of Ukraine on 24 February 2022, global commodity prices swiftly responded to the supply risks of gas, oil, and coal from Russia, as Russia is the world's top exporter of ammonium nitrate (fertiliser), palladium, aluminium, platinum, and nickel (batteries), and ranks top five in the world as an exporter of natural gas, crude oil, and coal. Over 60% of its national budget comes from the exports of hydrocarbons, and oil & gas accounts for nearly one-third of Russia's gross national product, according to the World Trade Organization (WTO).

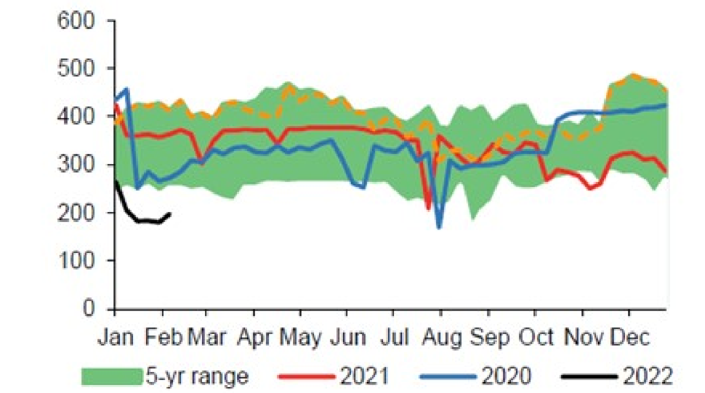
If Russia stopped sending just the gas that goes through Ukraine, it would take the equivalent of about 1.27 shiploads of additional LNG per day to replace that supply, based on the US Energy Information Administration (EIA)'s forecast. But Russia's invasion of Ukraine now places Europe's gas supply from Russia in danger, and Russia may not be able to reroute some of that gas through other pipelines, including the stalled USD11b NS2 as a result of sanctions that could hurt Russia's finances.

### Exhibit 5: Share of Russia's global exports in 2019-21 (%)




Sources: WTO; Russian Trade Ministry; BNP Paribas

### Exhibit 6: Russian gas exports below a five-year band (mmscfd)

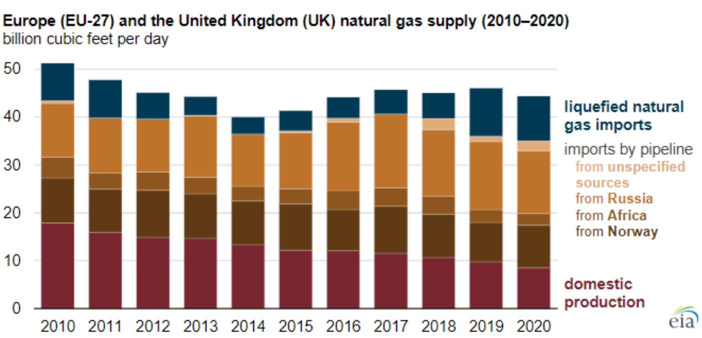



Sources: Bloomberg; BNP Paribas

**Europe at a loss, US gains, Ukraine at war.** Europe imports natural gas via both pipeline and LNG, supplying over 80% of the gas supply to the countries of the EU (EU-27) and the UK as of 2020. The gas imports via pipeline accounted for 74% of total gas imported in 2020 and LNG accounted for only 26% in 2020.

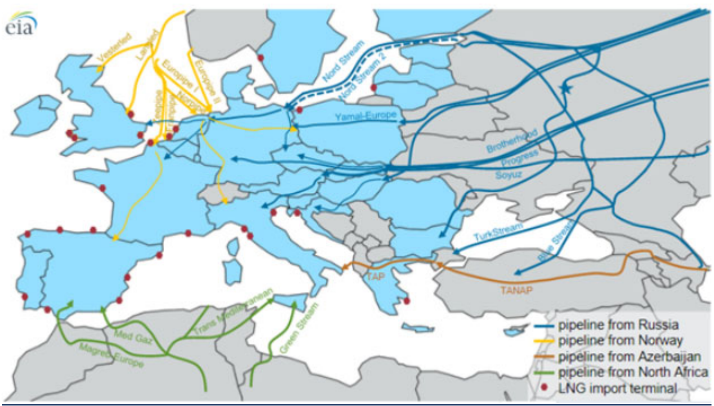
Pipeline imports of natural gas into the region come from Russia, Norway, North Africa, and Azerbaijan. Pipeline imports originating in Russia – the largest supplier in the region – grew from about 11b cubic feet per day (bcfd) in 2010 to more than 13 bcfd in 2020 (a low consumption year due to Covid-19 related impacts).

### Exhibit 7: Europe relies primarily on imports to meet its natural gas needs




Source: EIA

### Exhibit 8: Major natural gas delivery routes into European market




Source: EIA

**Only LNG imports could fill up Russia's gas gap.** Although gas production has been developed in a number of European countries, the gas supply from EU producers has been insignificant as a result of the natural depletions of most gas fields.

**Norway is still far away.** Despite the construction of new pipelines, imports from Norway averaged around 9 bcfd between 2010 and 2020, as development of new fields in the Barents Sea section of the Norwegian offshore continental shelf was insufficient to offset declines from mature fields in the North Sea.

**Regional suppliers saw natural depletions.** Regional production has played a smaller role in supplying European natural gas needs over the past decade. From 2010 through 2020, natural gas production in the EU-27 countries and the UK declined by more than 50%, from 18bcfd in 2010 to 9bcfd in 2020. This decline is the result of resource depletion as well as initiatives to fully phase out natural gas production in the region.

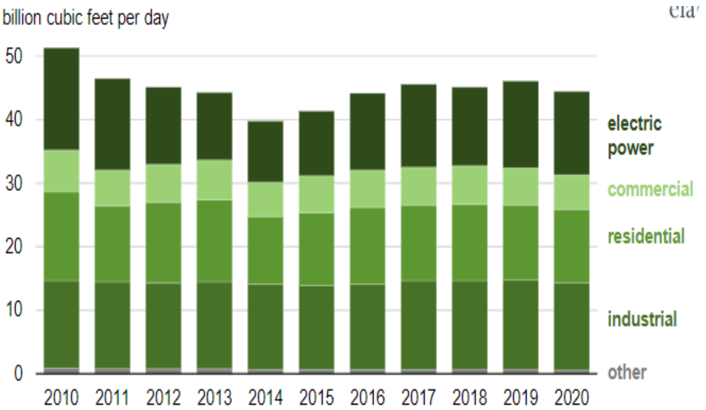
**European gas demand, led by the industrial sector, remains strong in the post-Covid-19 era.** While European regional natural gas demand fell rapidly between 2010 and 2014, it has stabilised during the five-year period from 2016 to 2020 at approximately 45bcfd. Natural gas consumed by the European industrial sector, where fuel switching is difficult, remained nearly unchanged, averaging 13.7bcfd in 2010-20. Energy efficiency measures and electrification reduced residential and commercial sector natural gas consumption to an average of 17bcfd in 2020.

Natural gas consumption in the electric power sector fell the most between 2010 and 2014 as a result of increasing penetration of renewable energy in electricity generation. Starting in 2016, consumption of natural gas in Europe's electric power sector increased as a result of the systematic retirement of coal-fired power plants across Europe and the retirement of nuclear power plants in Germany in particular.

Although LNG imports made up about 26% of all natural gas imports, they provided about 20% of all of the natural gas supplied to the EU-27 countries and the UK in 2020. LNG imports tend to fluctuate from year to year, from as low as 3.6bcfd in 2014 to as high as 10.1bcfd in 2019, depending on global natural gas prices, demand driven by cold weather, and the availability of pipeline supplies.

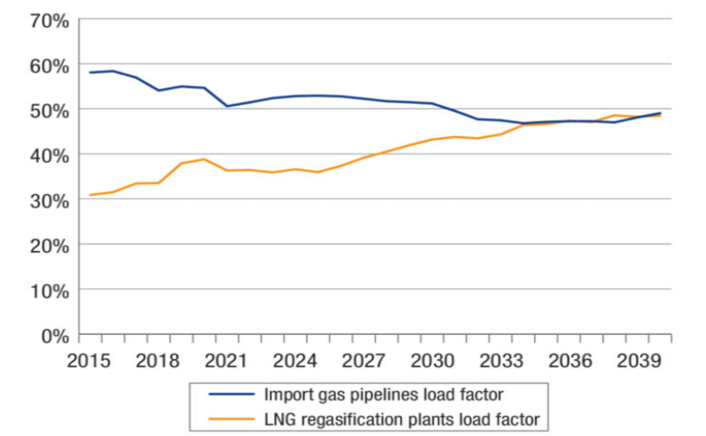
Most LNG delivered to Europe is supplied through long-term contracts. However, growing volumes of flexible LNG supplies, primarily from the US, contributed to the notable increases in LNG imports to Europe from 2019 to 2021.

**Exhibit 9: Europe (EU-27) and UK natural gas demand by sector (2010-20)**




Source: EIA

**Exhibit 10: European import gas pipelines and LNG terminal load factors forecast**



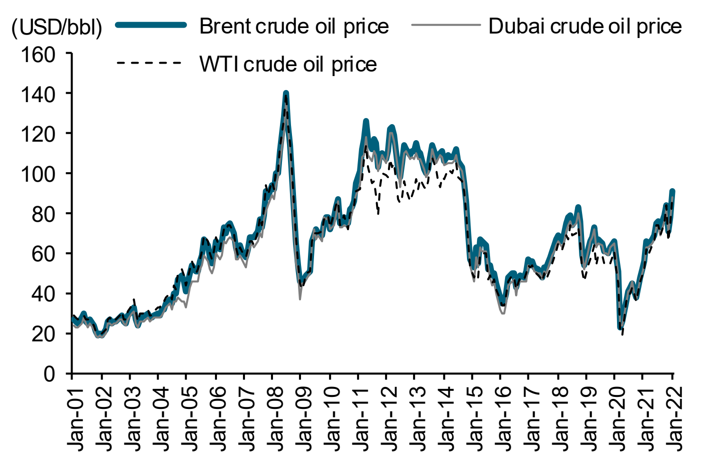

Source: EIA

## Global spot energy price responses to Russia's invasion of Ukraine

Russia's invasion of Ukraine has sent prices for everything from bread to steel soaring. The prospect of all-out war in Europe has translated into the much-expected USD100/bbl oil price. As news of the invasion rattles financial markets, all commodities – not just energy, but wheat, corn, steel and iron – are likely in for price hikes.

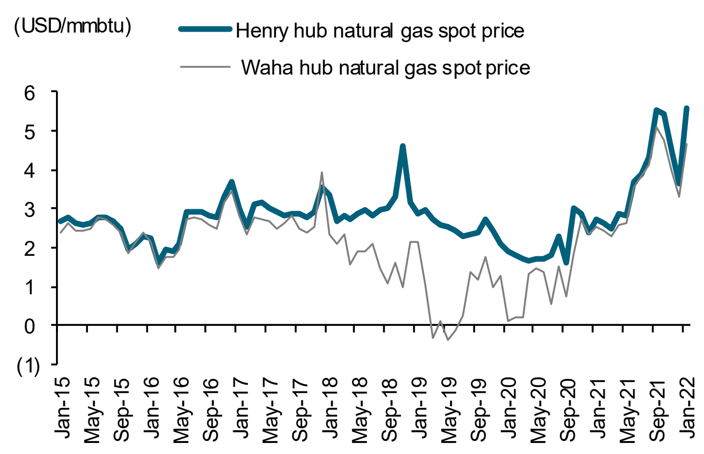
Oil hit USD100/bbl just minutes after a report that Mr. Putin had decided to conduct a special operation to "protect" the Donbas region in the east of Ukraine. All substitutes for oil rose with it: benchmark Dutch gas futures gained as much as 41% to €125 per megawatt-hour (MWh); German power for Mar-22 soared by 31%; and European coal for 2023 also surged, rising by 13% to USD145/t on Intercontinental Exchange (ICE) futures.

### Exhibit 11: Brent, Dubai, WTI crude oil price




Source: Bloomberg

### Exhibit 12: Henry Hub and Waha Hub natural gas spot price

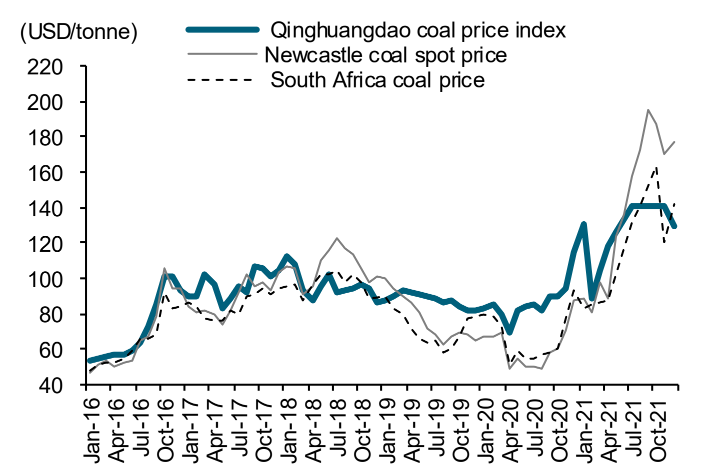



Source: Bloomberg

The Brent oil price jumped past USD100/bbl to stay at USD103/bbl, Newcastle coal jumped by 24% within two days to hit USD250/t, and the ICE UK natural gas futures price rose 15% overnight to hit £204/10,000 mmbtu as the market continued to digest the impact of the Russia-Ukraine conflict.

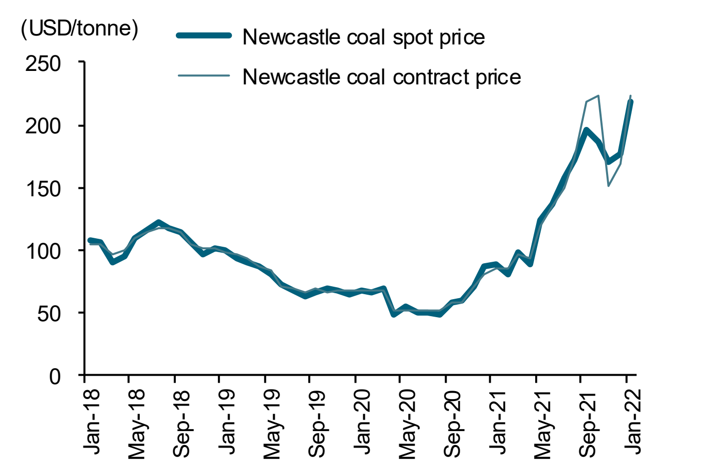
Meanwhile, the US gas benchmark Henry Hub (HH) price rose by 6.4% or USD0.3/mmbtu to USD4.9/mmbtu in response, reflecting that the US gas market is influenced more by domestic market conditions of demand-supply, rather than by the European gas market, which is now mostly dictated by the geopolitical tensions between Russia and the US and its allies, according to Natural Gas Intelligence.

### Exhibit 13: Qinghuangdao, Newcastle, and South Africa coal price




Source: Bloomberg

### Exhibit 14: Newcastle coal spot and contract price

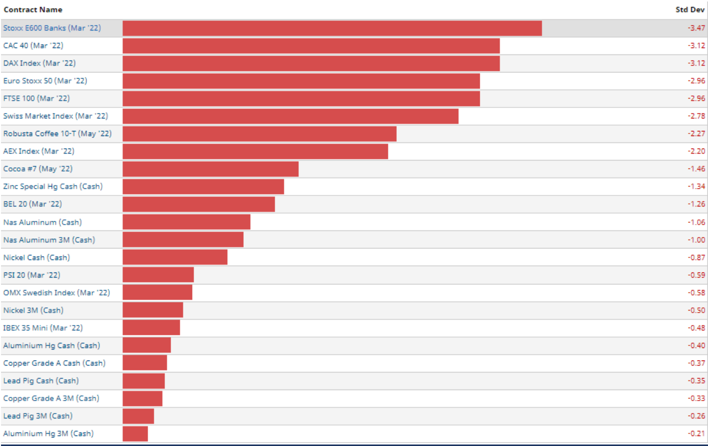



Source: Bloomberg

**European price reactions.** While all equity indices in European markets have negatively reacted to Russia's invasion of Ukraine, the prices of soft and hard commodities, precious metals, and energy have all jumped higher.

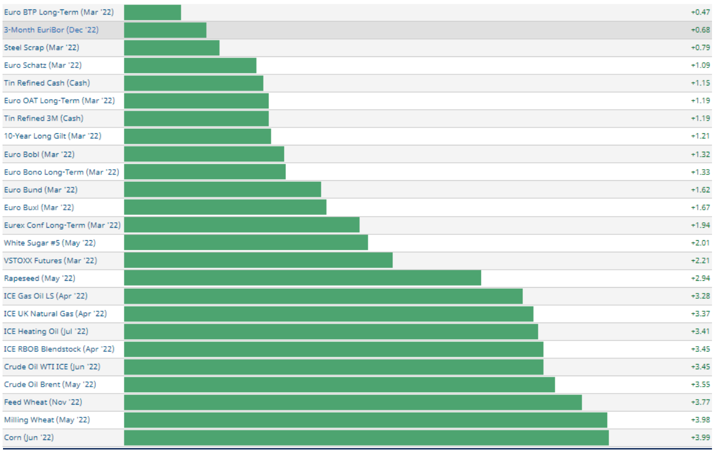
By the end of 24 February 2022, the energy prices, including the futures prices of ICE gas oil, UK natural gas, heating oil, WTI and Brent crude oil, had risen by 3.3-3.6%. But the sharpest rises in the price response have been for feed wheat (+3.77%), milled wheat (+4.0%), and corn (+4%). But why?

### Exhibit 15: Performances of European equity and fixed income markets (24 Feb 2022)




Source: Bloomberg

### Exhibit 16: Performances of European commodity markets (24 Feb 2022)

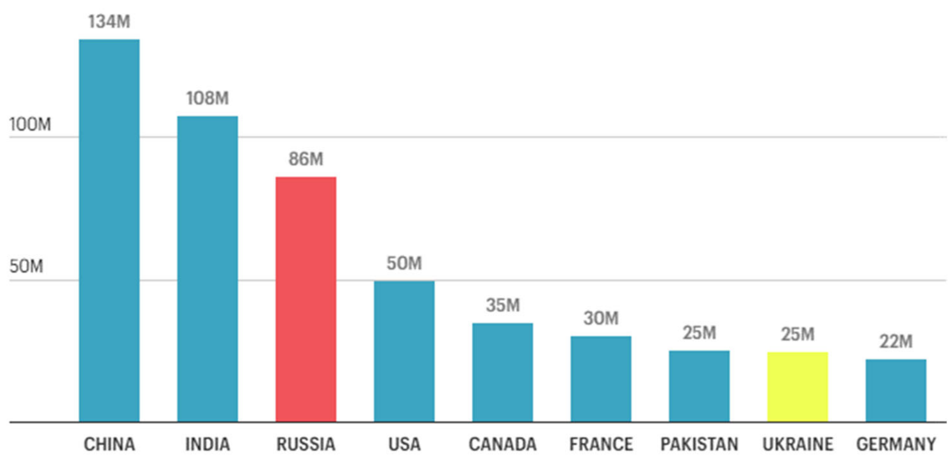



Source: Bloomberg

**Food inflation could escalate, potentially triggering a faster and higher interest rate hike.** Russia and Ukraine are the world's third and eighth largest wheat producers, according to the Food and Agriculture Organisation (FAO) of the United Nations. The conflict between Russia and Ukraine has already shot the price of wheat up to its highest level since 2012, with the wheat price in the European market rising by 4% and on the Chicago Board of Trade by 6% as of 11am London time on 24 February 2022. Russia's invasion jeopardizes a number of ports that ship out to all of Europe, as well as the country's major steel mills.

The Western world, particularly European countries, will now have to balance taking strong action against Russia with the likelihood that this could send commodity prices rocketing higher. The riskiest picture in the energy market, and perhaps the global economy via higher inflation and rising interest rates, will strongly depend on how Europe and the US will respond. Whether or not the US and its allies will pursue sanctions against the oil and gas sector will remain a key issue to watch.

### Exhibit 17: Global wheat production by country (2020)




Source: FAO

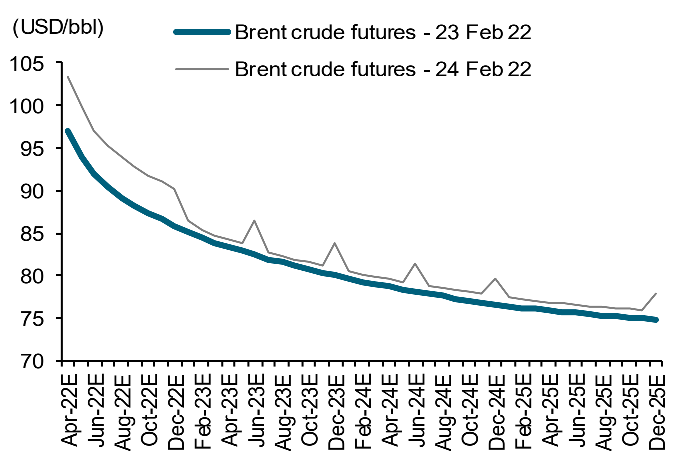
## Global futures energy price responses are limited to Russia's invasion

The impact of Russia's invasion of Ukraine has, however, resulted in a far smaller reaction for the commodity crude oil futures market than the spot price market, moving up higher in near-dated futures by 10% for the front month futures (Apr-22), and then rising by only 2-4% on average for the far-dated futures (Dec-22 onward).

**Crude oil futures reacted modestly.** While the futures of Brent and West Texas Intermediate (WTI) moved higher by 3-15%, the futures of Dubai crude oil inched up only 1-2% and there was almost no change for the near-dated futures (Feb to Apr-22).

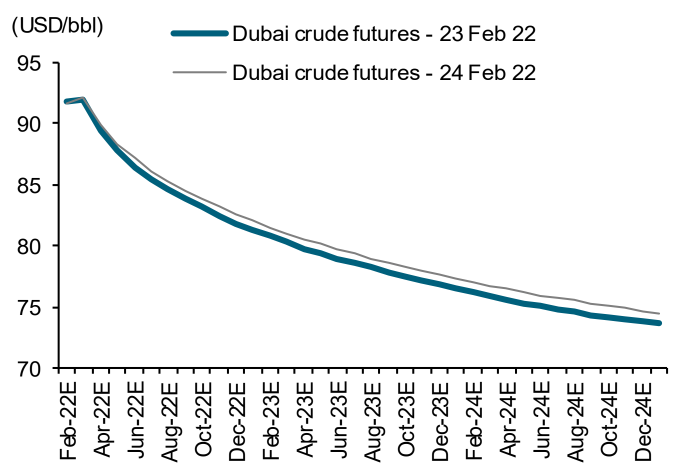
We believe this reflects investors' and the market's belief that the energy supply disruptions will be mostly limited to the European market and should last only temporarily to the end of 2022. We think the sufficient crude oil supply from OPEC+, excluding Russia, will continue to increase by 0.4mbpd until the end of 2022, and should be sufficient to serve the projected demand growth post Covid-19 in 2H22 onward.

### Exhibit 18: Brent crude futures




Source: Bloomberg

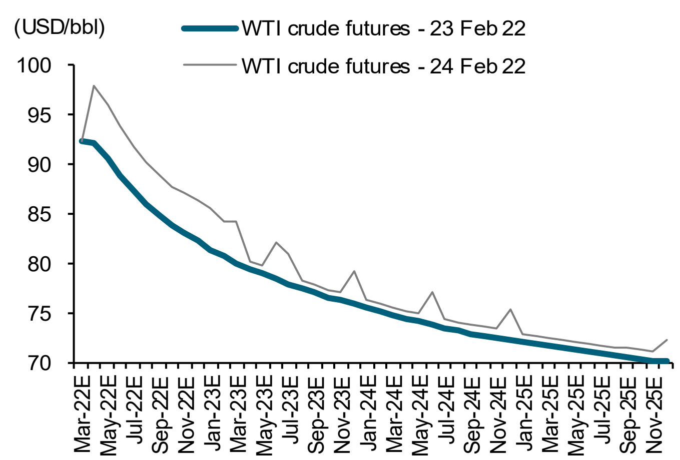
### Exhibit 19: Dubai crude futures




Source: Bloomberg

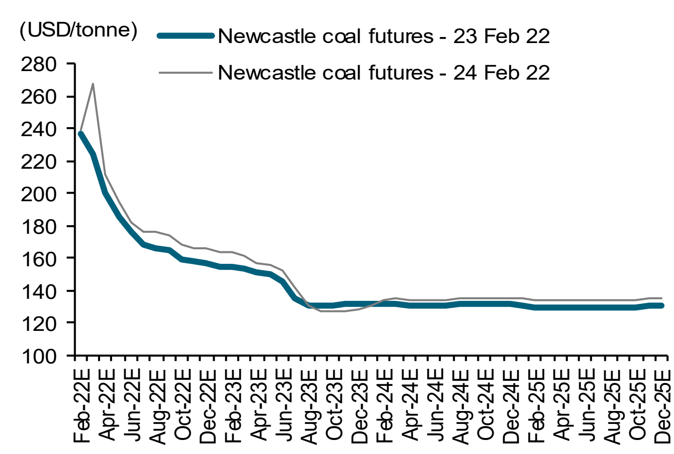
**Coal price uptrend, from strength to strength.** The Newcastle coal price index similarly moved in tandem with the spot price market, up by over 10% overnight for the near-dated futures (Feb to Apr-22) and then narrowing to 4-6% for the long-dated futures, in response to Russia's invasion of Ukraine. We believe the coal price outlook is now further catalysed by the tighter supplies of oil, gas, and coal, directly benefiting the demand for coal as a near-term substitute for oil & gas.

### Exhibit 20: WTI crude futures




Source: Bloomberg

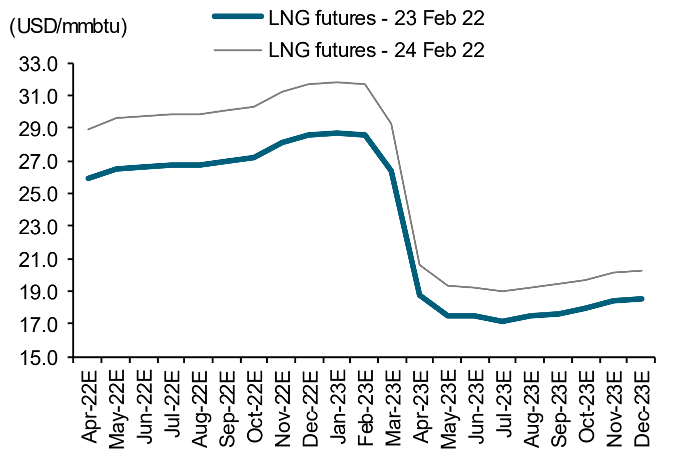
### Exhibit 21: Newcastle coal futures




Source: Bloomberg

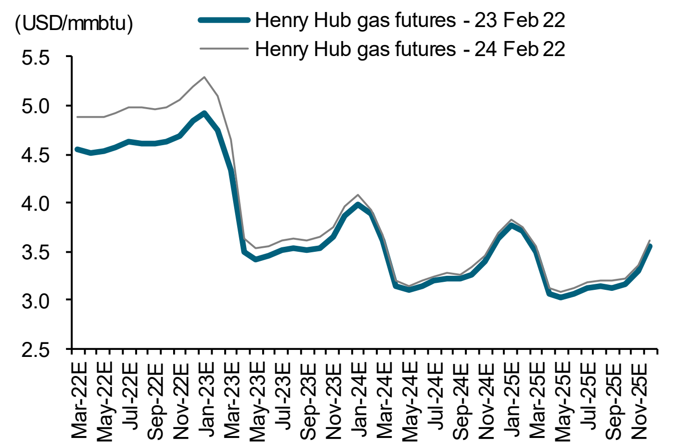
**LNG futures reacted the most among all commodities.** As the only major source of energy for the EU, LNG futures reacted the most to Russia's invasion of Ukraine, rising by over 10% to USD29-31/mmbtu for the near-dated futures from Mar-22 to Feb-23. Meanwhile, the HH benchmark gas price also jumped by over 10% immediately for the near-dated futures (Mar-22 to Jan-23). These reflect the tighter LNG market than crude oil and coal, in our view.

### Exhibit 22: LNG Japan-Korea Market (JKM) futures




Source: Bloomberg

### Exhibit 23: Henry Hub futures




Source: Bloomberg

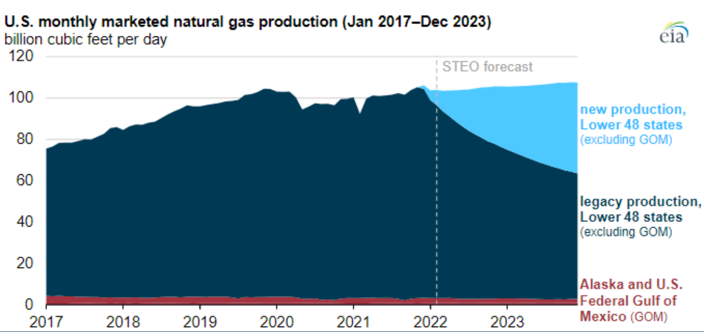
## US LNG exports to gain at the expense of Russia's gas supply loss

According to the EIA's "Short-term Energy Outlook" report dated February 2022, the US natural gas production should increase to an average of 104.4bcfd in 2022 and then further increase to a record high 106.6bcfd in 2023. Around 97% of production over the next two years should come from the Lower 48 states (L48), excluding the Federal Offshore Gulf of Mexico (GOM). The other 3% should come from Alaska and the GOM.

The EIA also estimates that the HH price will average USD3.92/mmbtu in 2022, an 8-year high, and will average USD3.60/mmbtu throughout 2023. The elevated HH prices would likely drive continued increases in US drilling activity and natural gas production.

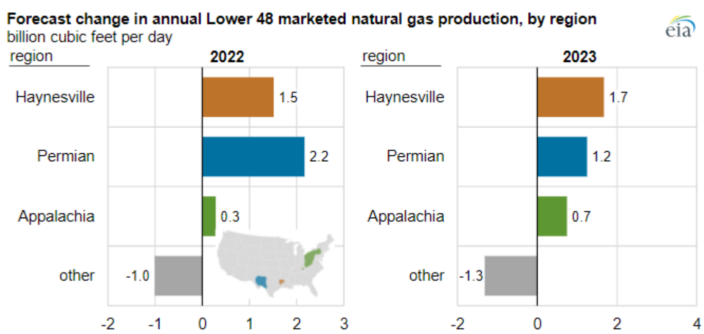
US natural gas production growth would primarily come from the Appalachian region in the northeast (Marcellus), the Permian region in western Texas and southeastern New Mexico, and the Haynesville region in Texas and Louisiana. BANPU has a total shale gas production of 800mmscfd in Appalachia and Barnett (western Texas), thereby should benefit from the higher projected gas demand in both the domestic and LNG export markets in 2022-23.

### Exhibit 24: US market natural gas production forecast to rise in 2022-23




Source: EIA

### Exhibit 25: Changes in annual gas production by region



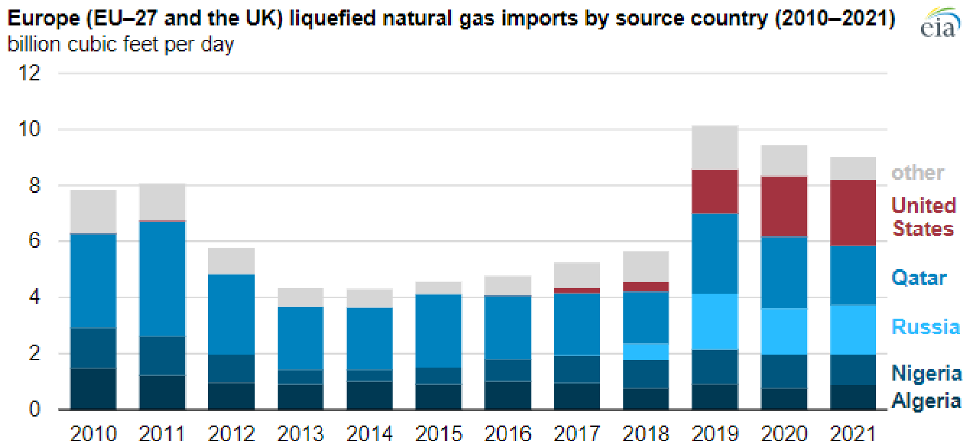

Source: EIA

## US LNG exports to Europe surged even before Russia's invasion of Ukraine

Since 2021, the US has already gained a large share of Europe's supply of LNG at the expense of lower supplies from Qatar and Russia. Three LNG suppliers combined accounted for almost 70% of Europe's total LNG imports, according to the EIA. Indeed, the US already became Europe's largest LNG supplier in 2021, gaining a 26% market share of all LNG imported by EU member countries (EU-27) and the UK, followed by Qatar with 24%, and Russia with 20%.

In January 2022, the US supplied more than half of all LNG imports into Europe for the month and the potential gas supply disruptions from Russia could further allow the US to export even more LNG to Europe in 2022. Exports of LNG from the US to EU-27 and the UK rose from 3.4bcfd in November 2021 to 6.5bcfd in January 2022, the historically highest LNG export volume from the US shipped to Europe, according to the US Department of Energy, based on LNG shipping data. Rising US LNG exports are the result of both natural gas supply challenges in Europe and the sizable price differences between natural gas produced in the US and the current prices at European trading hubs.

### Exhibit 26: Russia, Qatar, and the US supplied 70% of the LNG to Europe in 2021




Source: EIA

Natural gas supply constraints in Europe and the low storage inventories of the past year contributed to recent increases in US LNG exports to Europe. Europe's natural gas production has been in continuous decline because of production limits on the Groningen field in the Netherlands and declines in the mature fields in the North Sea. To meet the demand, Europe's natural gas imports, particularly from Russia, have increased in recent years.

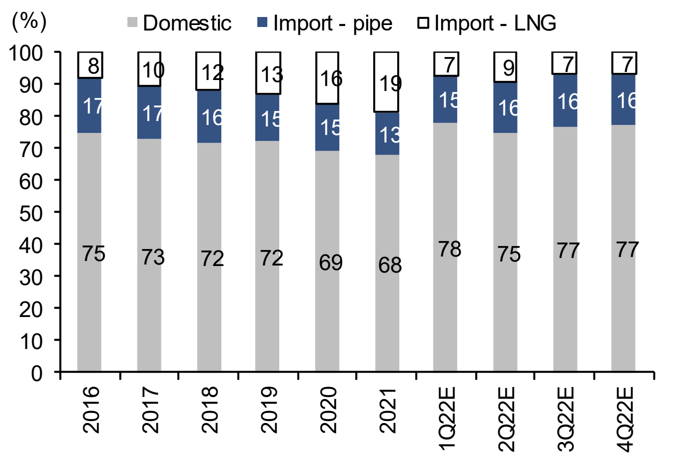
Pipeline flows of natural gas from Russia decreased during 2021. Pipeline receipts from Russia at the three main entry points (Kondratki in Poland, Greifswald in Germany, and Velke Kapusany in Slovakia, which combined account for 14.3bbcfd of the import pipeline capacity from Russia) averaged 10.7bcfd in 2021, compared with 11.8 bcfd in 2020 and 14.1bcfd in 2019, according to data by Refinitiv Eikon. More natural gas delivered by pipeline from Norway, which increased from 10.4bcfd in 2019 and 2020 to 11.1bcfd in 2021, was not enough to offset the reduced pipeline receipts from Russia.

Historically, spot natural gas in Europe has traded at prices lower than the LNG spot prices in Asia. In recent months, however, natural gas prices in Europe have closely tracked LNG prices in Asia. On some days, the natural gas price in Europe has exceeded the LNG price in Asia, attracting higher volumes of flexible LNG supplies to Europe. LNG imports to Europe increased in December 2021 and January 2022, averaging 10.8bcfd and 14.9bcfd, respectively, partly in response to the price at the Title Transfer Facility (TTF) rising above LNG spot prices in Asia.

## Thailand: Impact on energy and utilities sectors from Russia-Ukraine war

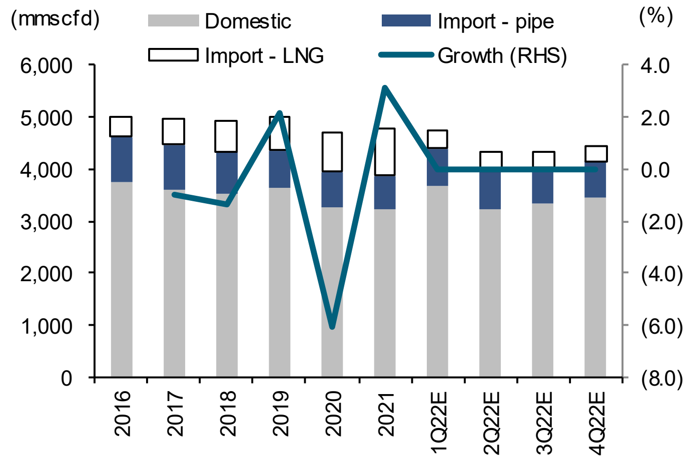
Since 3Q21, Thailand's gas production has been interrupted at Erawan gas field, which accounts for the largest contribution of Thailand's gas supply at over 20%. The impact of the lower gas production from Erawan and Bongkot combined has led to a gas supply shortfall of 1,100mmscfd (800mmscfd from Erawan and 300mmscfd from Bongkot). However, the regulator has mandated PTTEP, as the new operator for both Bongkot and Erawan under the new names G2 and G1, to raise gas production from Bongkot to 800mmscfd (+300mmscfd) and the Arthit gas field to 350mmscfd (+100mmscfd) to compensate for the 800mmscfd gas supply shortfall from G1.

**Exhibit 27: Thailand's gas supply, breakdown by source (%)**




Sources: Department of Mineral Fuels (DMF) and PTT; FSSIA estimates

**Exhibit 28: Thailand's gas supply, breakdown by source**

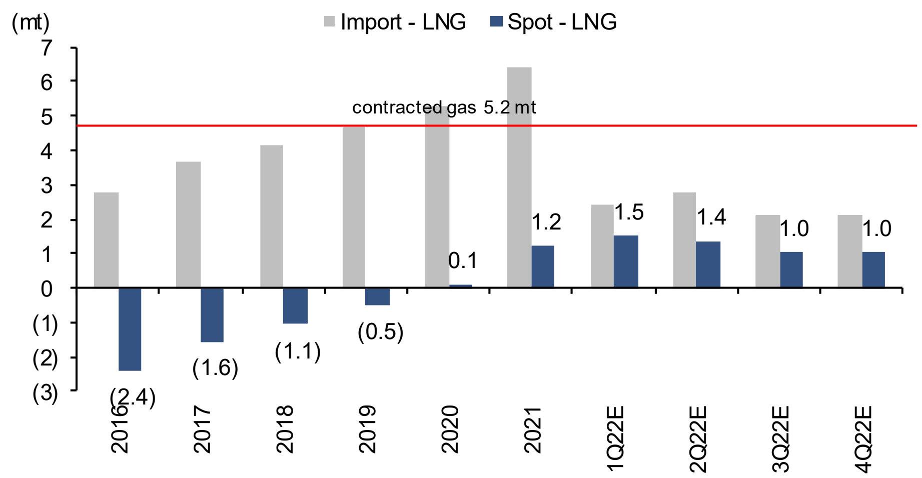



Sources: DMF and PTT; FSSIA estimates

This has forced PTT to import higher volumes of spot LNG, from 1.2mt in 2021 to 4.5mt in 2022, bringing the total LNG import volume to 6.4mt (5.2mt contract volume plus 1.2mt spot volume) in 2021 and 9.7mt (5.2mt contract volume plus 4.5mt spot volume) in 2022, according to PTT's management.

In 2022, we forecast that PTT will import up to 9.8mt of LNG, equivalent to 1,372mmscfd or 7-9% of the total gas supply in 2022 at 4,450mmscfd, up from 6.4mt in 2021 and 5.3mt in 2020, based on PTT's guidance. Of the total projected 9.8mt of LNG imported, 5.2mt would come from contract LNG at a USD8-13/mmbtu price and the remaining 4.5mt would come from spot LNG imports at a higher price of over USD25-30/mmbtu, based on our estimate.

**Exhibit 29: Thailand's LNG imports and exports**

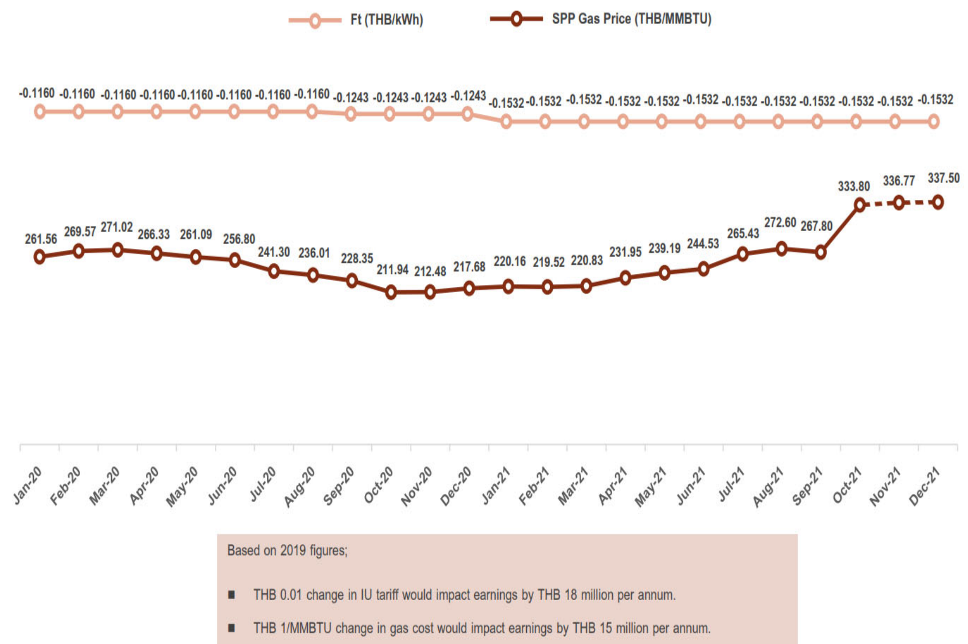



Sources: Energy Regulatory Commission (ERC); PTT; Bloomberg; FSSIA estimates

The global LNG price has spiked sharply since 4Q21, mainly due to the abrupt gas supply shortfall in European markets after Russia, which is Europe's largest gas supplier with more than a 40% market share, cut its gas sales volume to Europe due to political disputes. As Russia has already invaded eastern Ukraine, the gas supply from Russia to Europe will be now in jeopardy and could be cut completely if the full sanctions by the EU and US against Russia are implemented.

Hence, the global spot LNG price, represented by the Japan-Korea Market (JKM) price benchmark, has spiked from below USD16/mmbtu in 3Q21 to USD36/mmbtu in 4Q21, and jumped further by over 10% on 24 February 2022 when Russia invaded Ukraine, sending the JKM LNG spot price to over USD29mmbtu.

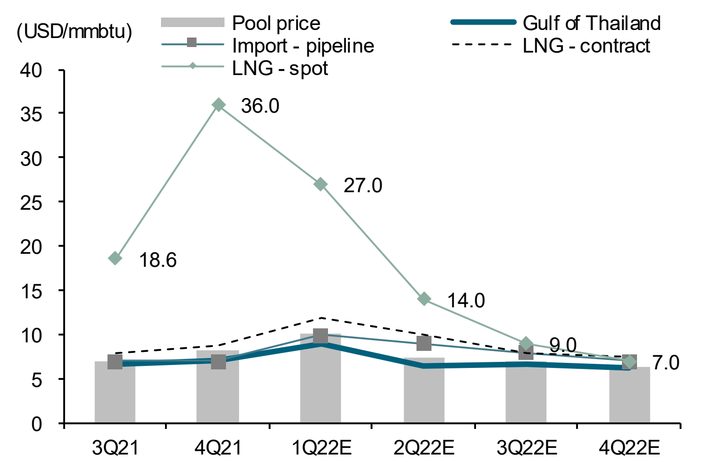
### Exhibit 30: Thailand's fuel tariff (Ft) and SPP gas prices




Sources: BGRIM; ERC; PTT

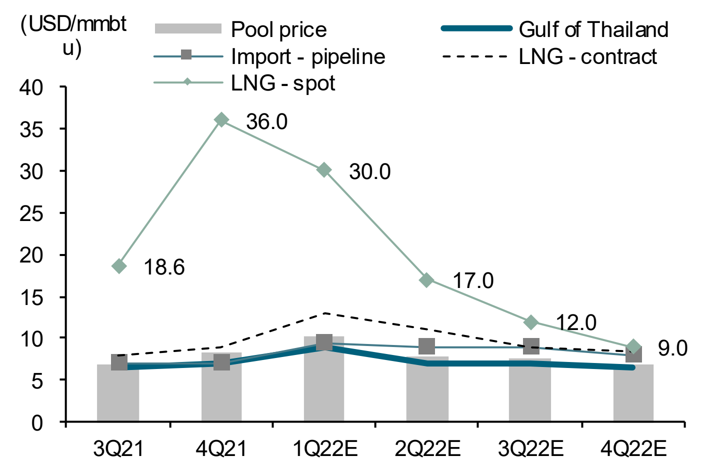
As PTT has no choice but to raise its spot LNG imports to supplement its 5.2mt LNG import contract to compensate for the gas supply shortfall in Thailand, the average pool gas price has spiked from THB260/mmbtu in 3Q21 to THB320/mmbtu in 4Q21 and is projected by PTT to shoot up further to THB380/mmbtu in 1Q22, as the price of spot LNG is much higher at USD27/mmbtu in 1Q22, before declining to USD14/mmbtu in 2Q22, USD9/mmbtu in 3Q22, and USD7/mmbtu in 4Q22, based on our estimate.

### Exhibit 31: Thailand's gas price by source before Russia's invasion of Ukraine (24 Feb 2022)




Sources: PTT; PTTEP; FSSIA estimates

### Exhibit 32: Thailand's gas price by source after Russia's invasion of Ukraine (24 Feb 2022)




Sources: PTT; PTTEP; FSSIA estimates

**Impact on Thailand's gas price from Russia's invasion of Ukraine.** With 4.5mtpa of LNG imports in 2022, we have revised up our spot JKM LNG price assumptions by 15-20%. For the LNG contract prices applied to PTT's 5.2mt of LNG under its long-term contracts, we raise our LNG contract price assumptions by USD1-2/mmbtu in 1Q-4Q22 as follows:

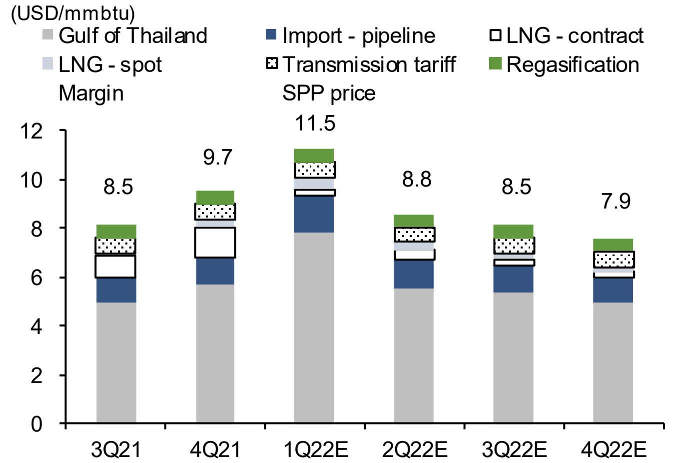
1Q22E: Spot to USD30/mmbtu (+USD3/mmbtu). Contract to USD13/mmbtu (+USD1/mmbtu).

2Q22E: Spot to USD17/mmbtu (+USD3/mmbtu). Contract to USD11/mmbtu (+USD1/mmbtu).

3Q22E: Spot to USD12/mmbtu (+USD3/mmbtu). Contract to USD9/mmbtu (+USD1/mmbtu).

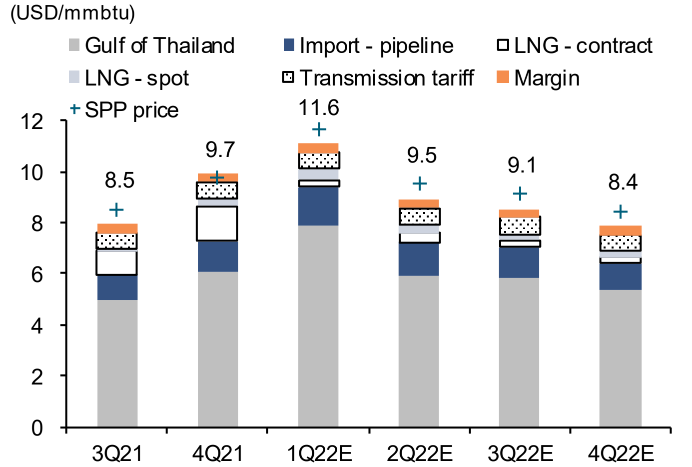
4Q22E: Spot to USD9/mmbtu (+USD2/mmbtu). Contract to USD8.5/mmbtu (+USD1/mmbtu).

### Exhibit 33: Pre-Russian invasion gas price components of SPPs' final gas price




Sources: PTT; BGRIM; FSSIA estimates

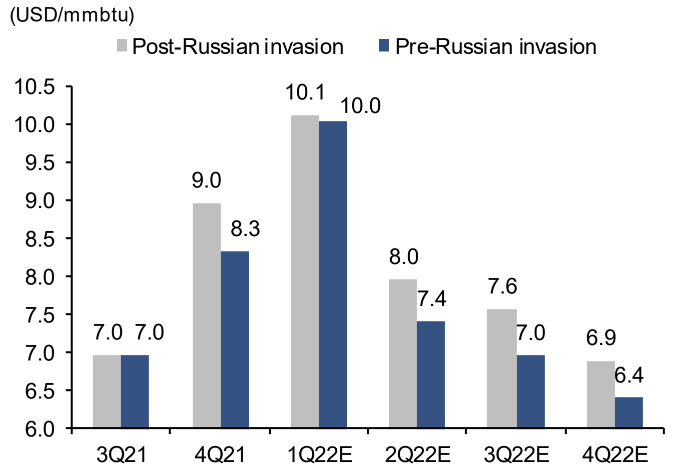
### Exhibit 34: Post-Russian invasion gas price components of SPPs' final gas price




Sources: PTT; BGRIM; FSSIA estimates

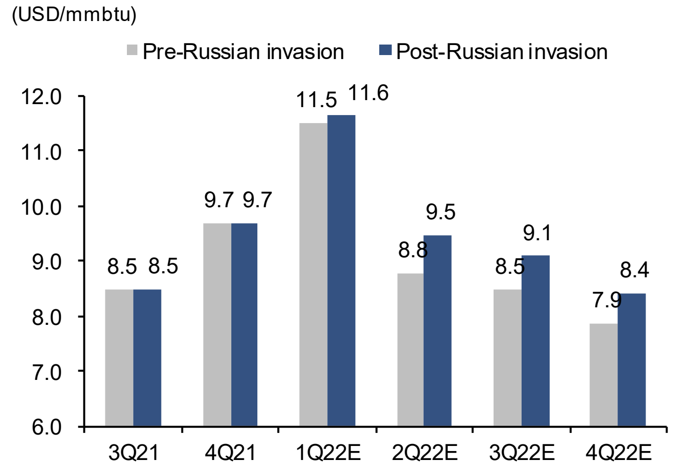
As a result, we think the final gas prices sold to small power producers (SPPs) will increase by 8-12% on average in 2Q-4Q22 and rise by USD0.1/mmbtu in 1Q22, as PTT has already imported 0.6mt of spot LNG out of 0.9mt in 1Q22 at the price of USD30/mmbtu.

### Exhibit 35: Thailand's pool gas price, pre and post Russian invasion




Sources: PTT; BGRIM; FSSIA estimates

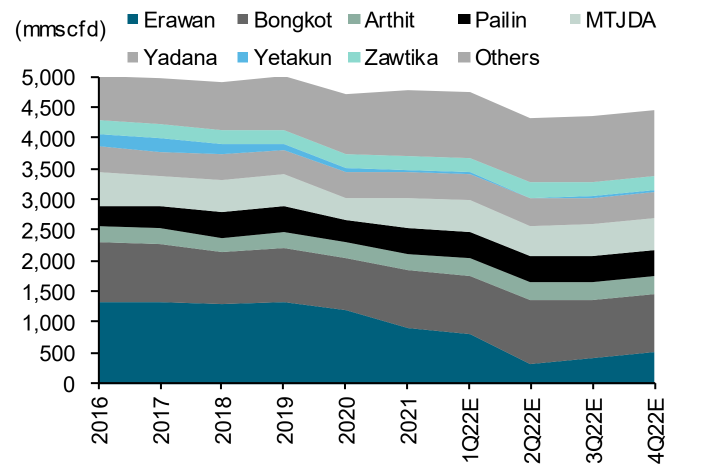
### Exhibit 36: Thailand's gas price sold to SPPs, pre and post Russian invasion




Sources: PTT; BGRIM; FSSIA estimates

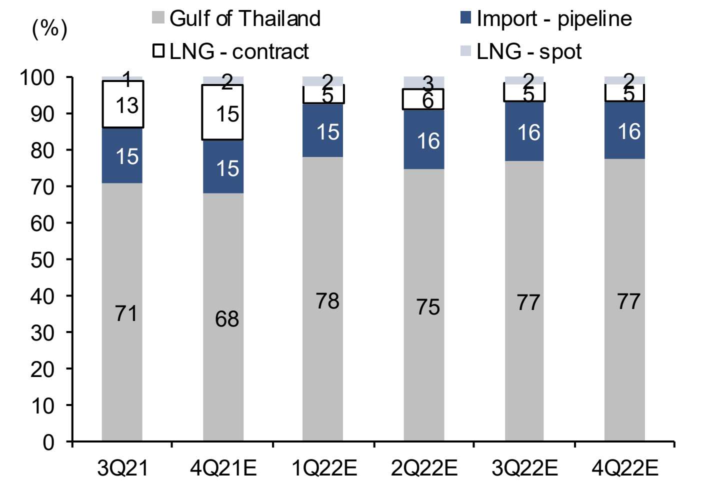
**c10% higher gas price for SPPs from Russia's invasion of Ukraine.** In 2022, Thailand needs to import a higher volume of spot LNG of 4.5mt, up from 1.2mt in 2021, and most of the prices of the LNG imported by PTT (60-70% in 2021 of total spot LNG import of 1.2mt) will be included in Thailand's gas pool price. The price of the 1.75mt spot LNG imported under the shipper license quotas awarded to private companies and the Electricity Generating Authority of Thailand (EGAT), will be excluded from pool price. Hence, we think the impact of Russia's invasion of Ukraine on Thailand's gas price will be around a 10% increase throughout 2022.

**Exhibit 37: Gas price by source**




Sources: PTT; PTTEP; FSSIA estimates

**Exhibit 38: Gas price component breakdown by source (% of pool gas price)**




Sources: PTT; PTTEP; FSSIA estimates

We expect the local gas price sold to SPPs – which includes the pool gas price, LNG terminal fee, transmission tariff and other charges, and the margin charged on the gas price – to dip to THB310/mmbtu (USD9.5/mmbtu) in 2Q22 as high winter demand fades, supply from the US rises, and the Russia-Ukraine potentially crisis wanes, relieving upward pressure on the global spot price.

The gross margin (tariff minus energy cost) of SPPs' sales volumes for the electricity and steam sold to industrial users (IUs) in Thailand, which normally accounts for 24-35% of total revenue, should improve over the course of 2022 as the government has already indicated a series of rises in the pooled grid electricity tariff, which is directly linked to the tariff for electricity sold to IUs. We think the impact of the gas price hike in 2022 will most severely affect the gross margins of SPPs, but should begin to subside by 2Q22 even with the recent impact of the global spike in the spot LNG price, before dropping from a peak of USD11.6/mmbtu in 1Q22 down to USD8.4/mmbtu in 4Q22, backed by:

**Higher gas production from G1 with up to a USD2/mmbtu lower price than the current selling price.** According to PTTEP, the gas production from G1 should gradually recover from the 250mmscfd bottom level in April 2022 to 500mmscfd in December 2022, rising further to 700mmscfd in December 2023 before reaching the contract production volume of 800mmscfd in Apr-24.

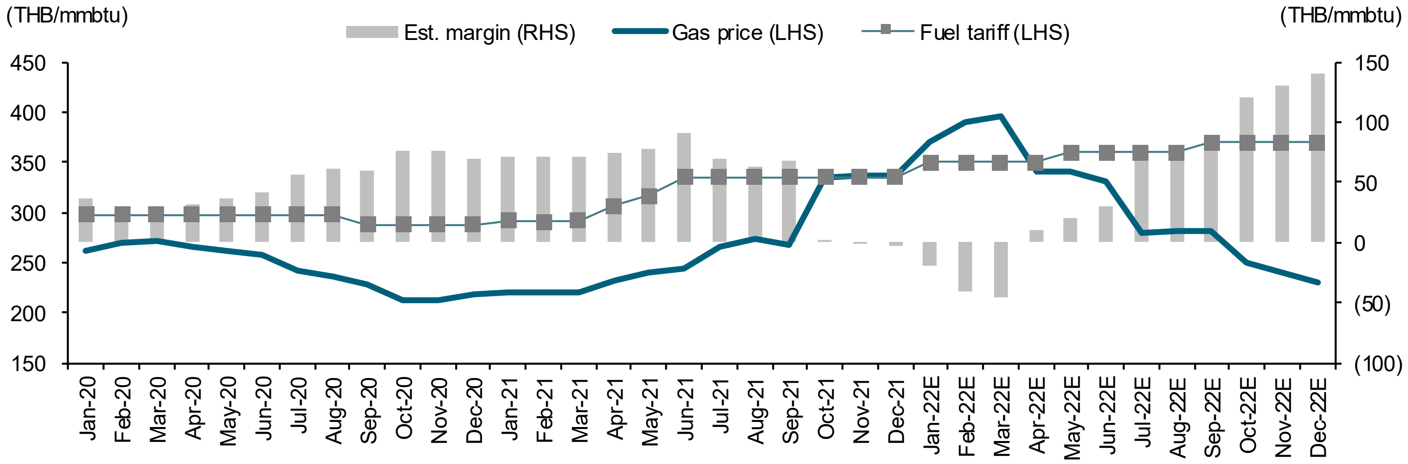
**Additional 450mmscfd of gas production from low-price sources.** The projected gas production volume from G2 of 200mmscfd in 2022 with a USD2/mmbtu lower price than the current price would be due to the concession expiration that will come on stream in April 2022. In addition, an additional 250mmscfd of combined gas production from three gas fields – 150mmscfd from Bongkot (under existing concession), 60mmscfd from Arthit, and 40mmscfd from MTJDA – should come on stream to compensate the gas production shortfall of 550mmscfd from G1.

**Lower global LNG price due to higher supply.** According to the EIA, US LNG exports are projected to increase in 2022-23, likely leading to a shift in the gas industry balance from undersupplied in 2019-21 to oversupplied in 2022-23. This should lead to lower global LNG prices to normalise to USD7-10/mmbtu by 4Q22, based on the EIA's projection.

## Top picks remain PTTEP, BANPU, IVL, and BGRIM

We maintain our top picks in the Thai energy and utilities sectors despite the impact of Russia's invasion of Ukraine, with PTTEP, BANPU, IVL, and BGRIM as our top picks for both the gas price uptrend in 1H22 and the expected downtrend in 2H22.

### Exhibit 39: BGRIM's gas price, tariff, and estimated margin




Sources: BGRIM; PTT; FSSIA estimates

While the price hikes of oil, gas, and coal due to the supply concerns over Russia's invasion should be obvious to investors, we think SPP companies BGRIM and GPSC stand as the best plays on the margin recovery of the projected gas price downtrend in 2H22 and the endemic capacity growth and margin expansion, thanks to their committed inorganic and organic growth and high operational efficiency.

### Exhibit 40: Peer comparisons

| Company | BBG code | Rec | Share Price (LCY) | Target price (LCY) | *Up side (%)* | Market Cap (USD m) | 3Y EPS CAGR (%) | PE 21E (x) | PE 22E (x) | ROE 21E (%) | ROE 22E (%) | PBV 21E (x) | PBV 22E (x) | EV / EBITDA 21E (x) | EV / EBITDA 22E (x) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **THAILAND** | | | | | | | | | | | | | | | |
| PTT | PTT TB | BUY | 38.75 | 60.00 | *55* | 33,836 | 38.8 | 12.4 | 8.3 | 9.5 | 12.7 | 1.1 | 1.0 | 5.5 | 4.8 |
| PTT Explor & Prod | PTTEP TB | BUY | 132.50 | 162.00 | *22* | 16,081 | 24.0 | 10.8 | 11.5 | 12.6 | 10.8 | 1.3 | 1.2 | 4.7 | 4.5 |
| PTT Global Chemical | PTTGC TB | BUY | 54.25 | 75.00 | *38* | 7,478 | 54.8 | 7.8 | 9.4 | 10.5 | 8.2 | 0.8 | 0.8 | 6.9 | 9.5 |
| Siam Cement | SCC TB | BUY | 387.00 | 483.00 | *25* | 14,197 | 23.2 | 9.8 | 7.8 | 13.7 | 15.4 | 1.3 | 1.1 | 10.8 | 8.6 |
| Indorama Ventures | IVL TB | BUY | 47.00 | 70.00 | *49* | 8,067 | 74.8 | 9.7 | 8.8 | 19.4 | 18.4 | 1.7 | 1.5 | 7.5 | 6.8 |
| B Grimm Power | BGRIM TB | BUY | 32.50 | 46.00 | *42* | 2,590 | 32.1 | 39.4 | 20.5 | 7.6 | 13.2 | 2.9 | 2.6 | 13.5 | 9.9 |
| Gulf Energy Development | GULF TB | BUY | 49.75 | 60.00 | *21* | 17,845 | 48.9 | 66.2 | 42.4 | 11.0 | 13.6 | 6.0 | 5.5 | 43.0 | 31.9 |
| Global Power Synergy | GPSC TB | BUY | 73.50 | 90.00 | *22* | 6,336 | 6.2 | 23.3 | 29.2 | 8.4 | 6.5 | 1.9 | 1.9 | 13.7 | 18.6 |
| Electricity Generating | EGCO TB | BUY | 176.50 | 245.00 | *39* | 2,841 | 26.2 | 7.1 | 5.4 | 12.3 | 14.5 | 0.8 | 0.7 | 13.9 | 10.1 |
| Ratch Group | RATCH TB | BUY | 45.25 | 60.00 | *33* | 2,006 | 12.3 | 8.4 | 7.7 | 11.9 | 14.6 | 0.9 | 0.9 | 20.5 | 12.5 |
| Banpu | BANPU TB | BUY | 10.80 | 16.90 | *56* | 2,234 | (212.5) | 3.1 | 6.1 | 33.6 | 14.3 | 0.9 | 0.8 | 4.2 | 5.9 |
| **Average (all)** | | | | | | **113,510** | **27.0** | **20.7** | **15.5** | **11.9** | **12.8** | **2.0** | **1.9** | **13.3** | **11.1** |

As of 24 Feb 2022
Sources: Bloomberg; FSSIA estimates

## Corporate Governance report of Thai listed companies 2020

| EXCELLENT LEVEL | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| AAV | ADVANC | AF | AIRA | AKP | AKR | ALT | AMA | AMATA | AMATAV | ANAN |
| AOT | AP | ARIP | ARROW | ASP | BAFS | BANPU | BAY | BCP | BCPG | BDMS |
| BEC | BEM | BGRIM | BIZ | BKI | BLA | BOL | BPP | BRR | BTS | BWG |
| CENTEL | CFRESH | CHEWA | CHO | CIMBT | CK | CKP | CM | CNT | COL | COMAN |
| COTTO | CPALL | CPF | CPI | CPN | CSS | DELTA | DEMCO | DRT | DTAC | DTC |
| DV8 | EA | EASTW | ECF | ECL | EGCO | EPG | ETE | FNS | FPI | FPT |
| FSMART | GBX | GC | GCAP | GEL | GFPT | GGC | GPSC | GRAMMY | GUNKUL | HANA |
| HARN | HMPRO | ICC | ICHI | III | ILINK | INTUCH | IRPC | IVL | JKN | JSP |
| JWD | K | KBANK | KCE | KKP | KSL | KTB | KTC | LANNA | LH | LHFG |
| LIT | LPN | MAKRO | MALEE | MBK | MBKET | MC | MCOT | METCO | MFEC | MINT |
| MONO | MOONG | MSC | MTC | NCH | NCL | NEP | NKI | NOBLE | NSI | NVD |
| NYT | OISHI | ORI | OTO | PAP | PCSGH | PDJ | PG | PHOL | PLANB | PLANET |
| PLAT | PORT | PPS | PR9 | PREB | PRG | PRM | PSH | PSL | PTG | PTT |
| PTTEP | PTTGC | PYLON | Q-CON | QH | QTC | RATCH | RS | S | S & J | SAAM |
| SABINA | SAMART | SAMTEL | SAT | SC | SCB | SCC | SCCC | SCG | SCN | SDC |
| SEAFCO | SEAOIL | SE-ED | SELIC | SENA | SIRI | SIS | SITHAI | SMK | SMPC | SNC |
| SONIC | SORKON | SPALI | SPI | SPRC | SPVI | SSSC | SST | STA | SUSCO | SUTHA |
| SVI | SYMC | SYNTEC | TACC | TASCO | TCAP | TFMAMA | THANA | THANI | THCOM | THG |
| THIP | THRE | THREL | TIP | TIPCO | TISCO | TK | TKT | TTB | TMILL | TNDT |
| TNL | TOA | TOP | TPBI | TQM | TRC | TSC | TSR | TSTE | TSTH | TTA |
| TTCL | TTW | TU | TVD | TVI | TVO | TWPC | U | UAC | UBIS | UV |
| VGI | VIH | WACOAL | WAVE | WHA | WHAUP | WICE | WINNER | TRUE | | |

| VERY GOOD LEVEL | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 2S | ABM | ACE | ACG | ADB | AEC | AEONTS | AGE | AH | AHC | AIT |
| ALLA | AMANAH | AMARIN | APCO | APCS | APURE | AQUA | ASAP | ASEFA | ASIA | ASIAN |
| ASIMAR | ASK | ASN | ATP30 | AUCT | AWC | AYUD | B | BA | BAM | BBL |
| BFIT | BGC | BJC | BJCHI | BROOK | BTW | CBG | CEN | CGH | CHARAN | CHAYO |
| CHG | CHOTI | CHOW | CI | CIG | CMC | COLOR | COM7 | CPL | CRC | CRD |
| CSC | CSP | CWT | DCC | DCON | DDD | DOD | DOHOME | EASON | EE | ERW |
| ESTAR | FE | FLOYD | FN | FORTH | FSS | FTE | FVC | GENCO | GJS | GL |
| GLAND | GLOBAL | GLOCON | GPI | GULF | GYT | HPT | HTC | ICN | IFS | ILM |
| IMH | INET | INSURE | IRC | IRCP | IT | ITD | ITEL | J | JAS | JCK |
| JCKH | JMART | JMT | KBS | KCAR | KGI | KIAT | KOOL | KTIS | KWC | KWM |
| L&E | LALIN | LDC | LHK | LOXLEY | LPH | LRH | LST | M | MACO | MAJOR |
| MBAX | MEGA | META | MFC | MGT | MILL | MITSIB | MK | MODERN | MTI | MVP |
| NETBAY | NEX | NINE | NTV | NWR | OCC | OGC | OSP | PATO | PB | PDG |
| PDI | PICO | PIMO | PJW | PL | PM | PPP | PRIN | PRINC | PSTC | PT |
| QLT | RCL | RICHY | RML | RPC | RWI | S11 | SALEE | SAMCO | SANKO | SAPPE |
| SAWAD | SCI | SCP | SE | SEG | SFP | SGF | SHR | SIAM | SINGER | SKE |
| SKR | SKY | SMIT | SMT | SNP | SPA | SPC | SPCG | SR | SRICHA | SSC |
| SSF | STANLY | STI | STPI | SUC | SUN | SYNEX | T | TAE | TAKUNI | TBSP |
| TCC | TCMC | TEAM | TEAMG | TFG | TIGER | TITLE | TKN | TKS | TM | TMC |
| TMD | TMI | TMT | TNITY | TNP | TNR | TOG | TPA | TPAC | TPCORP | TPOLY |
| TPS | TRITN | TRT | TRU | TSE | TVT | TWP | UEC | UMI | UOBKH | UP |
| UPF | UPOIC | UT | UTP | UWC | VL | VNT | VPO | WIIK | WP | XO |
| YUASA | ZEN | ZIGA | ZMICO | | | | | | | |

| GOOD LEVEL | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 7UP | A | ABICO | AJ | ALL | ALUCON | AMC | APP | ARIN | AS | AU |
| B52 | BC | BCH | BEAUTY | BGT | BH | BIG | BKD | BLAND | BM | BR |
| BROCK | BSBM | BSM | BTNC | CAZ | CCP | CGD | CITY | CMAN | CMO | CMR |
| CPT | CPW | CRANE | CSR | D | EKH | EP | ESSO | FMT | GIFT | GREEN |
| GSC | GTB | HTECH | HUMAN | IHL | INOX | INSET | IP | JTS | JUBILE | KASET |
| KCM | KKC | KUMWEL | KUN | KWG | KYE | LEE | MATCH | MATI | M-CHAI | MCS |
| MDX | MJD | MM | MORE | NC | NDR | NER | NFC | NNCL | NPK | NUSA |
| OCEAN | PAF | PF | PK | PLE | PMTA | POST | PPM | PRAKIT | PRECHA | PRIME |
| PROUD | PTL | RBF | RCI | RJH | ROJNA | RP | RPH | RSP | SF | SFLEX |
| SGP | SISB | SKN | SLP | SMART | SOLAR | SPG | SQ | SSP | STARK | STC |
| SUPER | SVOA | TC | TCCC | THMUI | TIW | TNH | TOPP | TPCH | TPIPP | TPLAS |
| TTI | TYCN | UKEM | UMS | VCOM | VRANDA | WIN | WORK | WPH | | |

| Description | Score Range |
|---|---|
| Excellent | 90-100 |
| Very Good | 80-89 |
| Good | 70-79 |

**Disclaimer:**
The disclosure of the survey results of the Thai Institute of Directors Association ('IOD") regarding corporate governance is made pursuant to the policy of the Office of the Securities and Exchange Commission. The survey of the IOD is based on the information of a company listed on the Stock Exchange of Thailand and the Market for Alternative Investment disclosed to the public and able to be accessed by a general public investor. The result, therefore, is from the perspective of a third party. It is not an evaluation of operation and is not based on inside information.
The survey result is as of the date appearing in the Corporate Governance Report of Thai Listed Companies. As a result, the survey results may be changed after that date. FSS International Investment Advisory Company Limited does not confirm nor certify the accuracy of such survey results.
* CGR scoring should be considered with news regarding wrong doing of the company or director or executive of the company such unfair practice on securities trading, fraud, and corruption SEC imposed a civil sanction against insider trading of director and executive; ** delisted

Source: Thai Institute of Directors Association (IOD); FSSIA's compilation

## Anti-corruption Progress Indicator 2020

| CERTIFIED | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 2S | ADVANC | AI | AIE | AIRA | AKP | AMA | AMANAH | AP | AQUA | ARROW |
| ASK | ASP | AYUD | B | BAFS | BANPU | BAY | BBL | BCH | BCP | BCPG |
| BGC | BGRIM | BJCHI | BKI | BLA | BPP | BROOK | BRR | BSBM | BTS | BWG |
| CEN | CENTEL | CFRESH | CGH | CHEWA | CHOTI | CHOW | CIG | CIMBT | CM | CMC |
| COL | COM7 | CPALL | CPF | CPI | CPN | CSC | DCC | DELTA | DEMCO | DIMET |
| DRT | DTAC | DTC | EASTW | ECL | EGCO | FE | FNS | FPI | FPT | FSS |
| FTE | GBX | GC | GCAP | GEL | GFPT | GGC | GJS | GPSC | GSTEEL | GUNKUL |
| HANA | HARN | HMPRO | HTC | ICC | ICHI | IFS | INET | INSURE | INTUCH | IRPC |
| ITEL | IVL | K | KASET | KBANK | KBS | KCAR | KCE | KGI | KKP | KSL |
| KTB | KTC | KWC | L&E | LANNA | LHFG | LHK | LPN | LRH | M | MAKRO |
| MALEE | MBAX | MBK | MBKET | MC | MCOT | MFC | MFEC | MINT | MONO | MOONG |
| MPG | MSC | MTC | MTI | NBC | NEP | NINE | NKI | NMG | NNCL | NSI |
| NWR | OCC | OCEAN | OGC | ORI | PAP | PATO | PB | PCSGH | PDG | PDI |
| PDJ | PE | PG | PHOL | PL | PLANB | PLANET | PLAT | PM | PPP | PPPM |
| PPS | PREB | PRG | PRINC | PRM | PSH | PSL | PSTC | PT | PTG | PTT |
| PTTEP | PTTGC | PYLON | Q-CON | QH | QLT | QTC | RATCH | RML | RWI | S & J |
| SABINA | SAT | SC | SCB | SCC | SCCC | SCG | SCN | SEAOIL | SE-ED | SELIC |
| SENA | SGP | SIRI | SITHAI | SMIT | SMK | SMPC | SNC | SNP | SORKON | SPACK |
| SPC | SPI | SPRC | SRICHA | SSF | SSSC | SST | STA | SUSCO | SVI | SYNTEC |
| TAE | TAKUNI | TASCO | TBSP | TCAP | TCMC | TFG | TFI | TFMAMA | THANI | THCOM |
| THIP | THRE | THREL | TIP | TIPCO | TISCO | TKT | TTB | TMD | TMILL | TMT |
| TNITY | TNL | TNP | TNR | TOG | TOP | TPA | TPCORP | TPP | TRU | TSC |
| TSTH | TTCL | TU | TVD | TVI | TVO | TWPC | U | UBIS | UEC | UKEM |
| UOBKH | UWC | VGI | VIH | VNT | WACOAL | WHA | WHAUP | WICE | WIIK | XO |
| ZEN | TRUE | | | | | | | | | |

| DECLARED | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 7UP | ABICO | AF | ALT | AMARIN | AMATA | AMATAV | ANAN | APURE | B52 | BKD |
| BM | BROCK | BUI | CHO | CI | COTTO | DDD | EA | EFORL | EP | ERW |
| ESTAR | ETE | EVER | FSMART | GPI | ILINK | IRC | J | JKN | JMART | JMT |
| JSP | JTS | KWG | LDC | MAJOR | META | NCL | NOBLE | NOK | PK | PLE |
| ROJNA | SAAM | SAPPE | SCI | SE | SHANG | SINGER | SKR | SPALI | SSP | STANLY |
| SUPER | SYNEX | THAI | TKS | TOPP | TRITN | TTA | UPF | UV | WIN | ZIGA |

| Level | |
|---|---|
| Certified | This level indicates practical participation with thoroughly examination in relation to the recommended procedures from the audit committee or the SEC's certified auditor, being a certified member of Thailand's Private Sector Collective Action Coalition Against Corruption programme (Thai CAC) or already passed examination to ensure independence from external parties. |
| Declared | This level indicates determination to participate in the Thailand's Private Sector Collective Action Coalition Against Corruption programme (Thai CAC) |



Note: Companies participating in Thailand's Private Sector Collective Action Coalition Against Corruption programme (Thai CAC) under Thai Institute of Directors (as of June 24, 2019) are categorised into: 1) companies that have declared their intention to join CAC, and; 2) companies certified by CAC.

Source: The Securities and Exchange Commission, Thailand; * FSSIA's compilation

# GENERAL DISCLAIMER

## ANALYST(S) CERTIFICATION

### Suwat Sinsadok, CFA, FRM, ERP FSS International Investment Advisory Securities Co., Ltd

The individual(s) identified above certify(ies) that (i) all views expressed in this report accurately reflect the personal view of the analyst(s) with regard to any and all of the subject securities, companies or issuers mentioned in this report; and (ii) no part of the compensation of the analyst(s) was, is, or will be, directly or indirectly, related to the specific recommendations or views expressed herein.

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 Investment in securities has risks. Investors are advised to consider carefully before making investment decisions.

| Company | Ticker | Price | Rating | Valuation & Risks |
|---|---|---|---|---|
| PTT PCL | PTT TB | THB 38.75 | BUY | Risks to our SoTP-based valuation are the oil price and potential earnings downside from government intervention. |
| PTT Explor & Prod | PTTEP TB | THB 132.50 | BUY | Risks our TP, which is based on EV/EBITDA, are a sharp decline in oil price and a potential earnings downside from government intervention. |
| PTT Global Chemical | PTTGC TB | THB 54.25 | BUY | The key downside risks to our EV/EBITDA-based TP are the weaker-than-expected HDPE price and HDPE-naphtha margin |
| Siam Cement | SCC TB | THB 387.00 | BUY | Downside risks to our SOTP based TP include 1) a lower-than-expected demand for chemicals, CBM, and packaging; 2) rising coal costs for its cement and packaging units; and 3) weaker demand from the automobile industry that could erode the demand for SCC?s chemical unit and its dividend contributions. |
| Indorama Ventures | IVL TB | THB 47.00 | BUY | The key downside risks to our EV/EBITDA-based TP are weaker-than-expected margins for PX-PTA and PET-PTA, lower demand for polyester, and delays in IVL’s projects. |
| B.Grimm Power | BGRIM TB | THB 32.50 | BUY | The downside risks to our SoTP-based TP include 1) lower-than-expected demand for electricity in Thailand, 2) a lower crude price, and 3) unplanned shutdowns of its SPPs. |
| Gulf Energy Development | GULF TB | THB 49.75 | BUY | The downside risks to our SoTP-based TP on GULF include 1) lower-than-expected demand for electricity in Thailand; 2) a lower crude price; and 3) delays in project commercial operation dates. |
| Global Power Synergy | GPSC TB | THB 73.50 | BUY | The downside risks to our SoTP-based TP on GPSC include 1) lower-than-expected demand for electricity in Thailand; 2) a lower crude price; and 3) lower-than-expected demand from industrial users. |
| Electricity Generating | EGCO TB | THB 176.50 | BUY | Downside risks to our SoTP-based TP include 1) lower-than expected demand for electricity in Thailand; 2) delays in project commencement or commercial operation dates (COD); and 3) government intervention in electricity tariff subsidies. |
| Ratch Group | RATCH TB | THB 45.25 | BUY | The downside risks to our SoTP-based TP include 1) lower-than-expected demand for electricity in Thailand; 2) lower crude price; and 3) delays in starting new projects. |
| Banpu | BANPU TB | THB 10.80 | BUY | We see downside risks to our SoTP-based TP from lower coal prices, higher diesel costs and any unplanned shutdowns of its power plants. |

Source: FSSIA estimates

**Additional Disclosures**

Target price history, stock price charts, valuation and risk details, and equity rating histories applicable to each company rated in this report is available in our most recently published reports. You can contact the analyst named on the front of this note or your representative at Finansia Syrus Securities Public Company Limited

FSSIA may incorporate the recommendations and target prices of companies currently covered by FSS Research into equity research reports, denoted by an ‘FSS’ before the recommendation. FSS Research is part of Finansia Syrus Securities Public Company Limited, which is the parent company of FSSIA.

All share prices are as at market close on 24-Feb-2022 unless otherwise stated.

## RECOMMENDATION STRUCTURE

### Stock ratings

Stock ratings are based on absolute upside or downside, which we define as (target price* - current price) / current price.

BUY (B). The upside is 10% or more.
HOLD (H). The upside or downside is less than 10%.
REDUCE (R). The downside is 10% or more.
Unless otherwise specified, these recommendations are set with a 12-month horizon. Thus, it is possible that future price volatility may cause a temporary mismatch between upside/downside for a stock based on market price and the formal recommendation.

* In most cases, the target price will equal the analyst's assessment of the current fair value of the stock. However, if the analyst doesn't think the market will reassess the stock over the specified time horizon due to a lack of events or catalysts, then the target price may differ from fair value. In most cases, therefore, our recommendation is an assessment of the mismatch between current market price and our assessment of current fair value.

### Industry Recommendations

**Overweight.** The analyst expects the fundamental conditions of the sector to be positive over the next 12 months.
**Neutral.** The analyst expects the fundamental conditions of the sector to be maintained over the next 12 months.
**Underweight.** The analyst expects the fundamental conditions of the sector to be negative over the next 12 months.

### Country (Strategy) Recommendations

**Overweight (O).** Over the next 12 months, the analyst expects the market to score positively on two or more of the criteria used to determine market recommendations: index returns relative to the regional benchmark, index sharpe ratio relative to the regional benchmark and index returns relative to the market cost of equity.

**Neutral (N).** Over the next 12 months, the analyst expects the market to score positively on one of the criteria used to determine market recommendations: index returns relative to the regional benchmark, index sharpe ratio relative to the regional benchmark and index returns relative to the market cost of equity.

**Underweight (U).** Over the next 12 months, the analyst does not expect the market to score positively on any of the criteria used to determine market recommendations: index returns relative to the regional benchmark, index sharpe ratio relative to the regional benchmark and index returns relative to the market cost of equity.