

# Thailand Energy and Utilities

## การแข่งขันในตลาดก๊าซ: ผู้ชนะและผู้แพ้อาจสลับตำแหน่งกัน

- สาเหตุหลักที่ทำให้อัตราค่าไฟของโรงไฟฟ้าขนาดเล็ก (SPP) ลดลงมาจากการนำเข้า Spot LNG เพื่อชดเชยอุปทานก๊าซที่ขาดไปจากแหล่งเอราวัณ
- เราคิดว่าผลกระทบของราคาก๊าซที่ปรับขึ้นใน 4Q21-1Q22 จะส่งผลกระทบต่ออัตราค่าไฟขั้นต้นของ SPP อย่างไรก็ดีผลกระทบดังกล่าวน่าจะเริ่มลดลงใน 2Q22
- PTTEP, BANPU, IVL, และ BGRIM เป็นหุ้นเด่นของเรา

### อัตราค่าไฟของ SPP ที่ลดลงเทียบกับราคา LNG ในตลาดโลกที่ปรับขึ้นจากความตึงเครียดระหว่างรัสเซียและยูเครน

ในช่วง 6 เดือนที่ผ่านมา ราคาหุ้นของผู้ประกอบกิจการ SPP ของไทยหลัก ๆ ก็คือ BGRIM และ GPSC ได้ปรับตัวลดลงอย่างรุนแรงถึงกว่า 30% จากจุดสูงสุดก่อนหน้าจากความกังวลของนักลงทุนเกี่ยวกับผลกระทบที่อาจเกิดขึ้นจากอัตราค่าไฟที่ลดลงของไฟฟ้าที่ขายให้แก่ผู้ใช้อุตสาหกรรม (IU) ซึ่งอ้างอิงกับอัตราค่าไฟฟ้ากลางของประเทศ ความไม่เท่าเทียมระหว่างค่าไฟฟ้าที่ SPP ขายให้แก่ IU ซึ่งคิดเพดานราคาของผู้กำกับกิจการและต้นทุนก๊าซที่ปรับตัวขึ้นได้ทำให้เกิดการคาดการณ์ว่าอัตราค่าไฟขั้นต้นของผู้ประกอบกิจการ SPP จะลดลงอย่างรุนแรง เราเห็นว่าราคา LNG ที่อาจปรับขึ้นจากความเป็นไปได้ที่รัสเซียจะบุกยูเครน ซึ่งอาจตัดทอนอุปทานก๊าซที่ส่งให้ยุโรปยังมีความเป็นไปได้เนื่องจากผลกระทบทางการเงินที่สูงมากสำหรับทั้งรัสเซียในฐานะผู้ขายและประเทศในยุโรปในฐานะผู้ซื้อ

### การนำเข้า Spot LNG เพิ่มขึ้นเป็น 4.8mt (+229% y-y) ในปี 2022 ยังเป็นปัจจัยสำคัญ

สาเหตุหลักที่ทำให้อัตราค่าไฟของ SPP หดตัวมาจากการนำเข้าก๊าซในรูปของ Spot LNG เพื่อชดเชยอุปทานก๊าซที่ขาดไปจากแหล่งเอราวัณ ซึ่งทำให้มีการนำเข้า Spot LNG เพิ่มขึ้นจำนวนมากที่ราคา USD37/mmbtu ซึ่งสูงกว่าราคาก๊าซที่ USD8-9/mmbtu ปัจจัยดังกล่าวทำให้ PTT นำเข้า Spot LNG ในปริมาณที่สูงขึ้นจาก 1.4mt ในปี 2021 เป็น 4.8mt ในปี 2022 ซึ่งทำให้ปริมาณนำเข้า LNG รวมเพิ่มขึ้นเป็น 6.6mt (ปริมาณตามสัญญา 5.2mt บวกปริมาณ Spot อีก 1.4mt) ในปี 2021 และน่าจะถึง 10mt (ปริมาณตามสัญญา 5.2mt บวกปริมาณ Spot อีก 4.8mt) ในปี 2022 จากข้อมูลของผู้บริหาร PTT

### ราคาก๊าซในไทยมีแนวโน้มลดลงภายในสิ้นปี 2022

เราคิดว่าผลกระทบของราคาก๊าซที่ปรับขึ้นใน 4Q21-1Q22 จะส่งผลกระทบต่ออย่างรุนแรงส่วนมากต่ออัตราค่าไฟของ SPP อย่างไรก็ดีราคาน่าจะเริ่มลดลงใน 2Q22 จากจุดสูงสุดที่ USD11.5/mmbtu ใน 1Q22 เป็น USD7.9/mmbtu ใน 4Q22 จาก 1) การผลิตก๊าซที่สูงขึ้นจากแหล่ง G1 ที่มีราคาต่ำกว่ามากถึง USD2/mmbtu จากราคาขายในปัจจุบัน; 2) ก๊าซที่ผลิตได้จากแหล่งที่มีราคาถูกเพิ่มอีก 450mmscfd; และ 3) ราคา spot LNG ที่ลดลงในตลาดโลก เราคาดว่าปัจจัยดังกล่าวจะทำให้ราคาก๊าซลดลงจาก 320 บาท/mmbtu ใน 4Q21 และ 360 บาท/mmbtu ใน 1Q22 เหลือ 310/mmbtu ใน 2Q22 เนื่องจากความต้องการที่สูงในฤดูหนาวลดลงในขณะที่อุปทานจากสหรัฐฯ เพิ่มขึ้น ซึ่งจะช่วยลดแรงกดดันขาขึ้นต่อราคา Spot ในตลาดโลก

### PTTEP, BANPU, IVL, และ BGRIM เป็นหุ้นเด่น

ในกลุ่มพลังงานและสาธารณูปโภคไทย PTTEP, BANPU, IVL, และ BGRIM เป็นหุ้นเด่นของเราจากแนวโน้มราคาก๊าซขาขึ้นในช่วง 1H22 และขาลงที่คาดไว้ในช่วง 2H22 PTTEP เป็นผู้ผลิตก๊าซรายใหญ่และน่าจะได้ประโยชน์จากราคาที่อยู่ในระดับสูงของก๊าซที่ผลิตจากอ่าวไทย พม่า และมาเลเซียในปี 2022 BANPU น่าจะรายงาน EBITDA ของธุรกิจก๊าซจากชั้นหินดินดานปรับขึ้นในช่วง 4Q21-ปี 2022 จากราคาขายก๊าซเฉลี่ยที่สูงขึ้นและผลขาดทุนจากสัญญาป้องกันความเสี่ยงที่ลดลง IVL เป็นผู้ชนะสำคัญจากราคาก๊าซจากชั้นหินดินดานที่สูงขึ้น ซึ่งจะช่วยผลักดัน EBITDA ของธุรกิจ IOD กำไรสุทธิของ BGRIM น่าจะโตอย่างเห็นได้ชัดตั้งแต่ 2Q22 เป็นต้นไปจากการกำลังการผลิตที่สูงขึ้นของ 7 SPP ใหม่



**Suwat Sinsadok, CFA, FRM, ERP**

suwat.sin@fssia.com  
+66 2611 3558

**Siriluck Ponthusoonthorn**

siriluck.pin@fssia.com  
+66 2611 3562

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บทวิเคราะห์ฉบับนี้แปลมาจากบทวิเคราะห์ของ FSSIA ฉบับวันที่ 15 กุมภาพันธ์ 2022

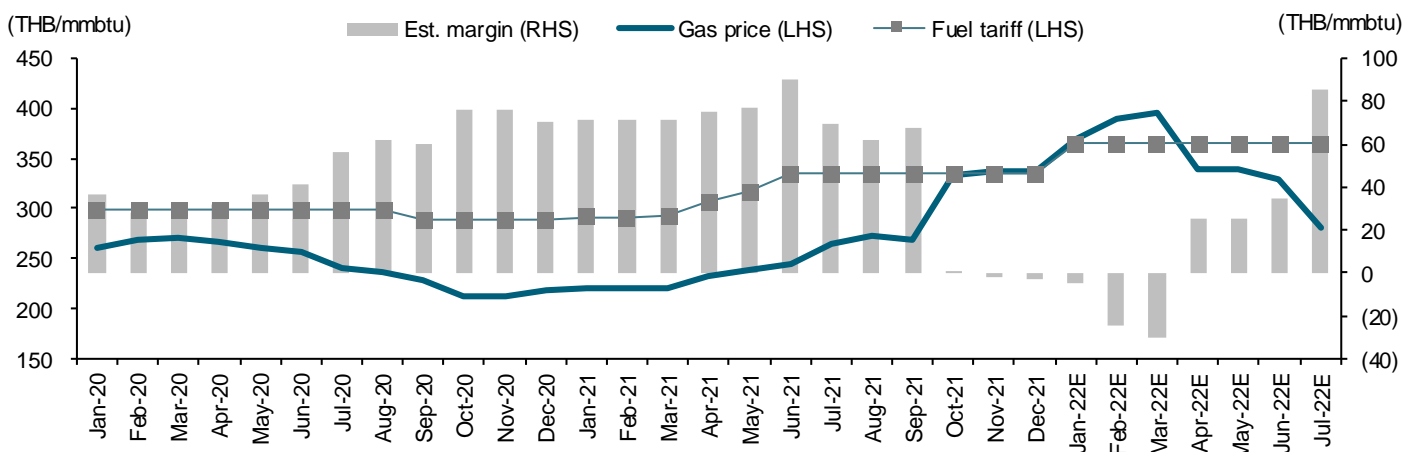
## A war of gas: winners and losers could take turns

In the past six months, the share prices of Thai small power producer (SPP) operators, mainly BGRIM and GPSC, have plunged markedly by over 30% from their recent peaks due to investors' grave concerns over the potential impact of the margin squeeze for the electricity sold to IUs, the price of which is linked to the country's grid electricity tariff.

The negative impact of the high price of gas sold from PTT as the sole supplier to SPP companies has been largely projected to kick off from 4Q21 into 2Q22. The gas price spiked from THB260/mmbtu in 3Q21 to THB320/mmbtu in 4Q21, and is likely to rise to THB380/mmbtu in 1Q22 before starting to soften to THB330/mmbtu in Jun-22, based on PTT's guidance.

In contrast, the government, in order to alleviate the burden of utilities expenses for the public, decided to maintain the national electricity tariff since Jun-Dec 2021 and only granted a gradual and small increase by only 7% every four months starting in Jan-Apr 2022. The mismatch between the electricity tariff sold to IUs by SPPs and the gas cost hike has led to the projected sharp drop in the gross margins of SPPs, thereby resulting in the sell-off of SPP companies' shares since Aug-21.

### Exhibit 1: BGRIM's gas price, tariff, and estimated margin



Sources: BGRIM; PTT; FSSIA estimates

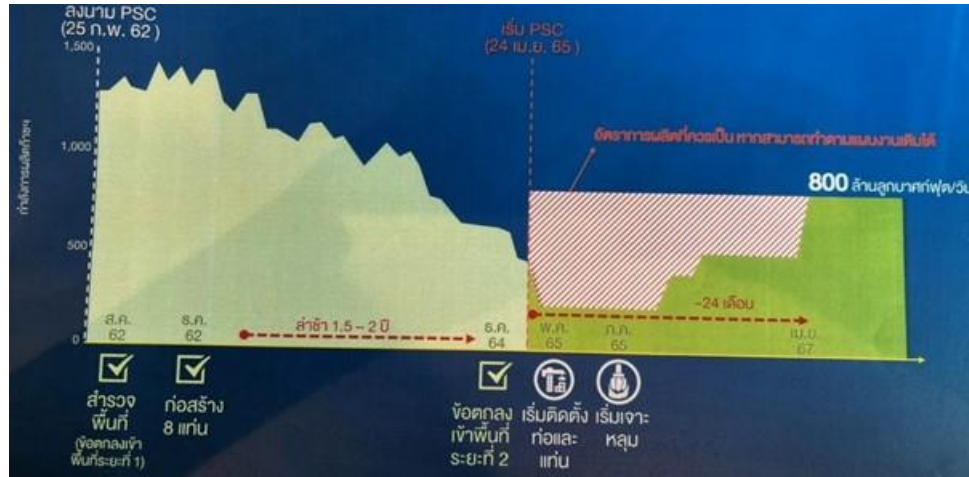
Under higher global spot LNG and pool gas prices, we think the winners would be the producers (PTTEP and BANPU) and users of gas as a key feedstock to produce more value-added downstream products (IVL for shale gas-based integrated oxide and derivatives (IOD) and polyethylene terephthalate (PET) products).

For SPP companies like BGRIM, we believe the tide will turn from it being a loser with a severe margin squeeze for its SPPs in 4Q21-1Q22 into a winner by 2Q22, as we project the pool gas price to decline on the back of additional gas supply with lower prices h-h, allowing BGRIM to timely capture the benefit of its new SPP capacity with higher operational efficiency and larger sales volumes to IUs.

**A perfect storm: the gas price hike for SPPs in 2H21-1H22.** The major cause for the shrinking margin is rooted in the import of gas supplies in the form of spot LNG in order to compensate for the gas supply shortfall from the Erawan gas field.

Since early 2021, Thailand has faced a daunting challenge in maintaining its gas supply security due to declining gas production levels from the Bongkot and Erawan fields – Thailand’s two largest gas fields which accounted for over 45% of the country’s total gas supply in 2020. Since 3Q21, the gas production has been interrupted at Erawan gas field, which accounts for the largest contribution of Thailand’s gas supply at over 20%.

**Exhibit 2: Projected gas production of Erawan (G1 under PSC)**



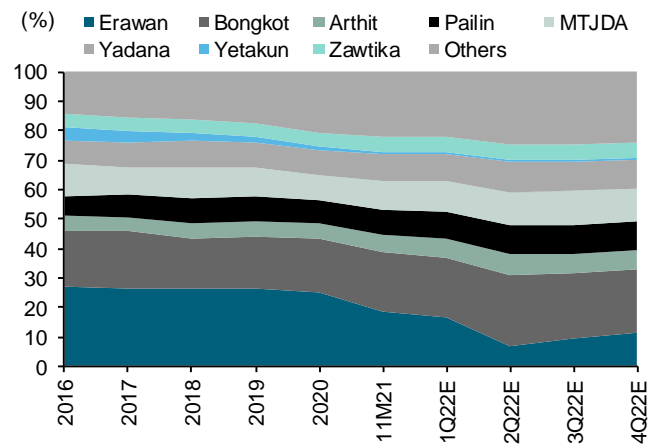
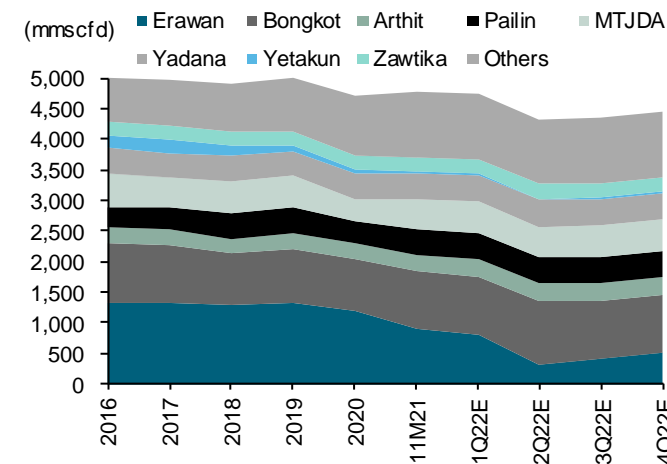
Source: PTTEP

Gas production from the Erawan field has plunged sharply from 1,200mmscfd in 2016-20 down to 900mmscfd in Nov-21. According to PTTEP, gas production from Erawan plunged further to a mere 400mmscfd in Jan-22 and will drop to 250mmscfd in Apr-22, as Chevron, the former operator, halted the investment required to maintain gas production over a dispute with the Department of Mineral Fuels (DMF) on the issue of decommissioning costs after the expiration of its concession in Apr-22.

Meanwhile, gas production from the Bongkot field similarly declined from 800mmscfd in 2016-19 to 500mmscfd at the end of 2021. The new production service contract for the operator of Bongkot from 2022-42 has effectively lowered the field’s gas production from 800mmscfd to 500mmscfd in order to extend the wet gas reserve in the Gulf of Thailand and ensure adequate feedstock for PTT’s gas separation plants that produce petrochemical products.

**Exhibit 3: Thailand’s gas production breakdown by field**

**Exhibit 4: Thailand’s gas production breakdown by field (%)**

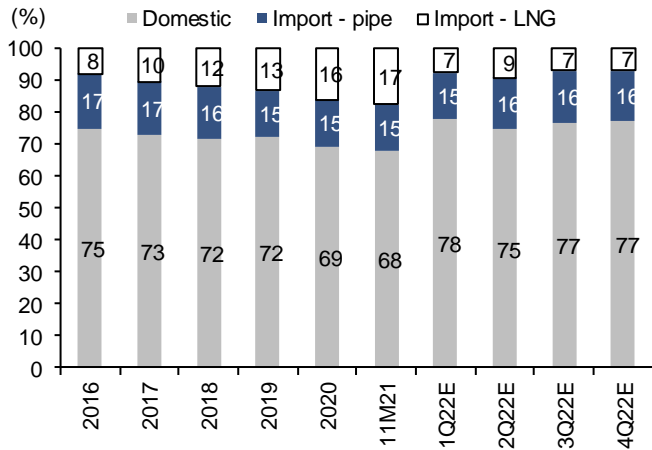


Sources: Department of Mineral Fuels (DMF) and PTT; FSSIA estimates

Sources: DMF and PTT; FSSIA estimates

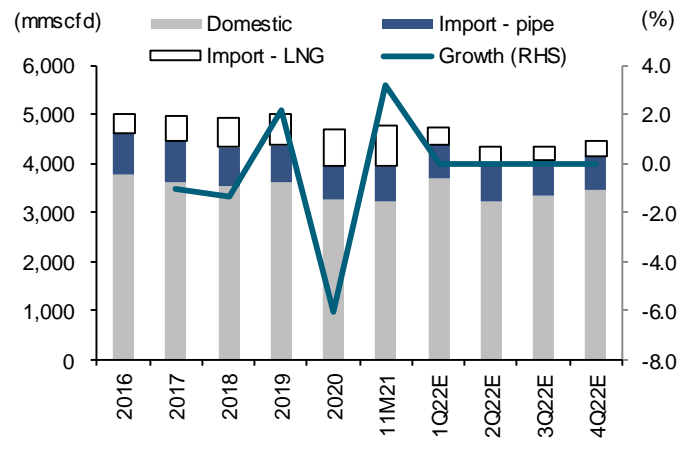
The impact of the lower gas production from Erawan and Bongkot combined has led to a gas supply shortfall of 1,100mmscfd (800mmscfd from Erawan and 300mmscfd from Bongkot). However, the regulator has mandated PTTEP, as the new operator for both Bongkot and Erawan under the new names G2 and G1, to raise 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 5: Thailand's gas supply, breakdown by source (%)



Sources: DMF and PTT; FSSIA estimates

Exhibit 6: Thailand's gas supply, breakdown by source

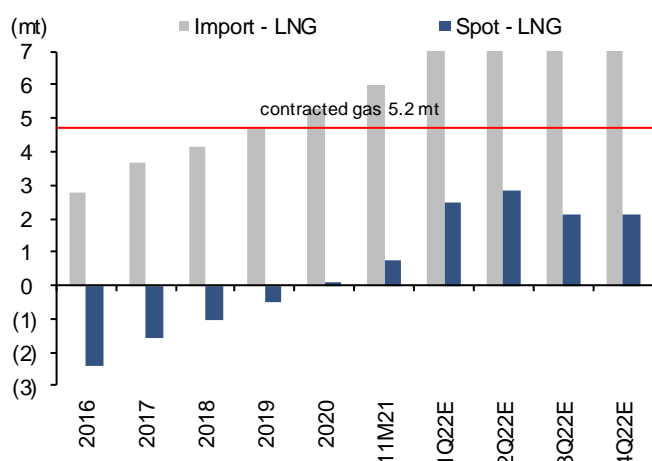


Sources: DMF and PTT; FSSIA estimates

This has forced PTT to import higher volumes of spot LNG, from 1.4mt in 2021 to 4.8mt in 2022, bringing the total LNG import volume to 6.6mt (5.2mt contract volume plus 1.4mt spot volume) in 2021 and 10mt (5.2mt contract volume plus 4.8mt spot volume) in 2022, according to PTT's management.

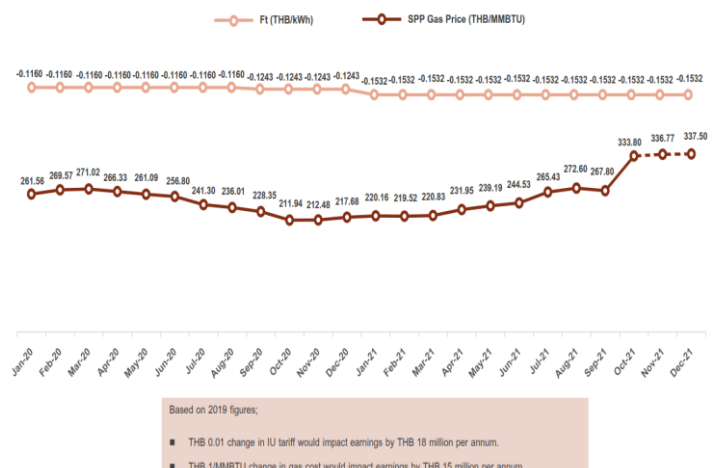
In 2022, we forecast that PTT will import up to 9.8mt of LNG, equivalent to 1,372mmscfd or 7-9% of the total gas supply in 2022 at 4,450mmscfd, up from 6.4mt in 2021 and 5.3mt in 2020, based on PTT's guidance. Of the total projected 9.8mt of LNG imported, 5.2mt would come from contract LNG at a USD8-12/mmbtu price and the remaining 4.8mt would come from spot LNG imports at a higher price of over USD10/mmbtu, based on our estimate.

Exhibit 7: Thailand's LNG imports and exports



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

Exhibit 8: Thailand's fuel tariff (Ft) and SPP gas prices

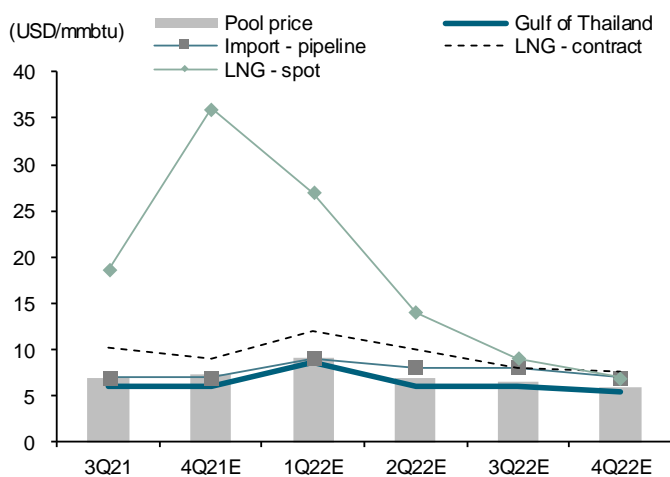


Sources: BGRIM; ERC; PTT

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. 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 remains high at over USD25/mmbtu in 1Q22.

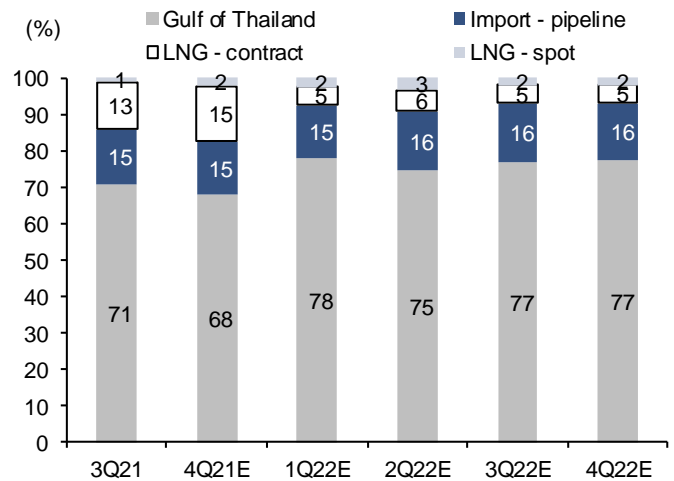
As PTT has no choice but to raise its spot LNG imports to supplement its 5.2mt LNG import contract to compensate for the gas supply shortfall in Thailand, the average pool gas price has spiked from THB260/mmbtu in 3Q21 to THB320/mmbtu in 4Q21 and is projected by PTT to shoot up further to THB380/mmbtu 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 9: Gas price by source



Sources: PTT; PTTEP; FSSIA estimates

Exhibit 10: Gas price component breakdown by source (% of pool gas price)



Sources: PTT; PTTEP; FSSIA estimates

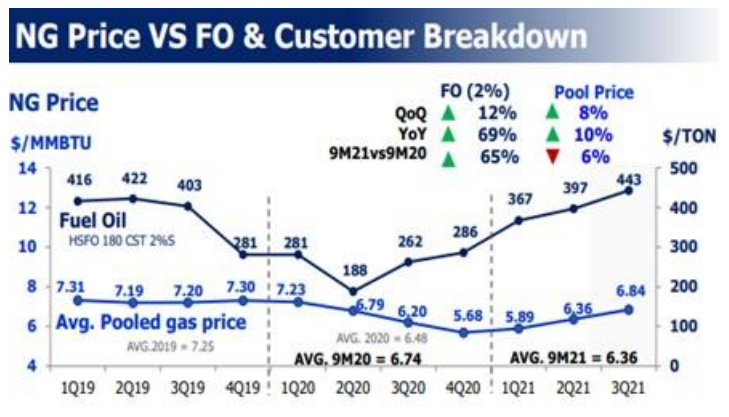
We expect the local gas price sold to SPPs – which includes the pool gas price, LNG terminal fee, transmission tariff and other charges, and the margin charged on the gas price – to dip to THB310/mmbtu in 2Q22 as high winter demand fades and supply from the US rises, relieving upward pressure on the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

Exhibit 11: Thailand's pool gas price vs JKM spot LNG price and JLC contract LNG price



Source: PTT

Exhibit 12: Thailand's pool gas price vs fuel oil price



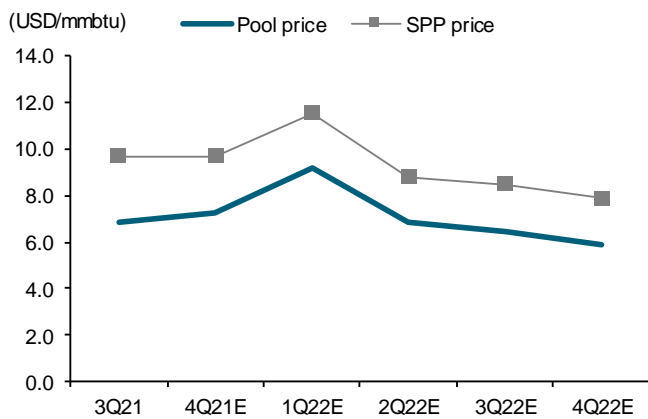
Source: PTT

The gross margin (tariff minus energy cost) of SPPs' sales volumes for the electricity and steam sold to IUs in Thailand, which normally accounts for 24-35% of total revenue, will depend on the changes in the electricity tariff and steam price, which may or may not fully match the changes in gas and coal prices due to government intervention to freeze the national 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 4Q21-1Q22 will most severely affect the gross margins of SPPs, but should begin to subside by 2Q22, dropping from a peak of USD11.5/mmbtu in 1Q22 down to USD7.9/mmbtu in 4Q22, backed by:

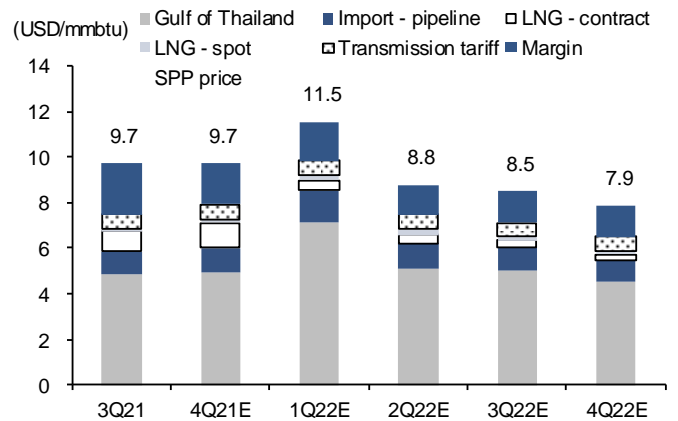
**Higher gas production from G1 with up to a USD2/mmbtu lower price than the current selling price.** According to PTTEP, the gas production from G1 should gradually recover from the 250mmscfd bottom level in Apr-22 to 500mmscfd in Dec-22, rising further to 700mmscfd in Dec-23 before reaching the contract production volume of 800mmscfd in Apr-24.

**Exhibit 13: Pool gas price vs SPPs' gas price**



Sources: PTT; BGRIM; FSSIA estimates

**Exhibit 14: Gas price components of SPPs' final gas price**



Sources: PTT; BGRIM; FSSIA estimates

**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 Apr-22. 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.

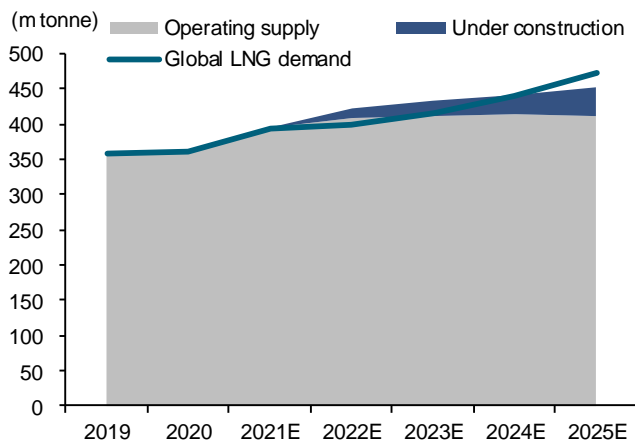
**Lower global LNG price due to higher supply.** According to the US Energy Information Administration (EIA), US LNG exports are projected to increase in 2022-23, likely leading to a shift in the gas industry balance from undersupplied in 2019-21 to oversupplied in 2022-23. This should lead to lower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

### Global LNG price is projected to normalise by 2H22

According to the EIA, global LNG supply is projected to increase in 2022-25, mainly from higher LNG exports from the US as a result of the global LNG price spike and the much lower gas inventory in Europe as a result of the gas supply shortfall from Russia caused by the geopolitical tensions between Russia and Western countries led by the US and EU against fears over Russia's potential invasion of Ukraine.

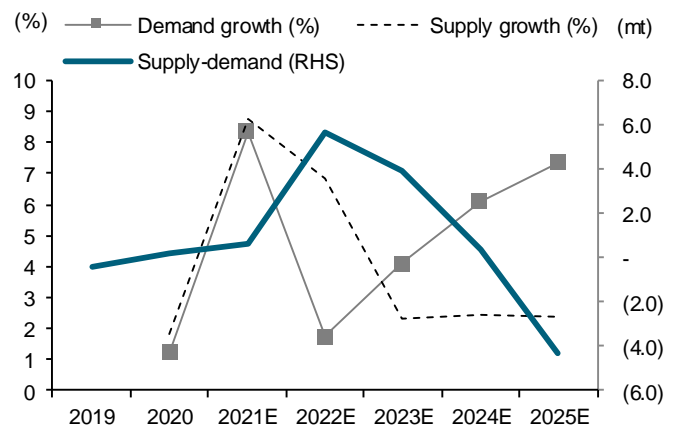
In 2022-24, global LNG demand and supply should be largely balanced, a shift from a slight deficit with demand surpassing supply in 2020 due to the global supply and logistics disruptions. The recent LNG price spike has been triggered by the geopolitical tensions that led to European countries facing a gas supply shortage, but we think the supply growth in 2022-23 will exceed the demand growth, thereby resulting in a lower price of LNG, according to the EIA's projection.

**Exhibit 15: Global LNG supplies are projected to increasingly outpace demand in 2022-25**



Source: EIA

**Exhibit 16: Global LNG growth in demand, supply and supply-demand**

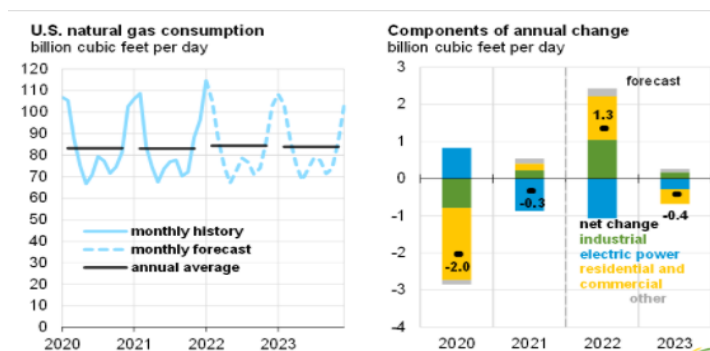


Source: EIA

**US LNG exports to soften the global LNG price in 2022-23.** The EIA indicated that US LNG exports averaged 11.2 billion cubic feet per day (bcfd) in Jan-22, up from 10.4bcfd in 4Q21, supported by the large price difference between the Henry Hub price in the US and spot prices in Europe and Asia. In particular, inventories in Europe remain much lower than their five-year averages and are contributing to strong demand for LNG imports.

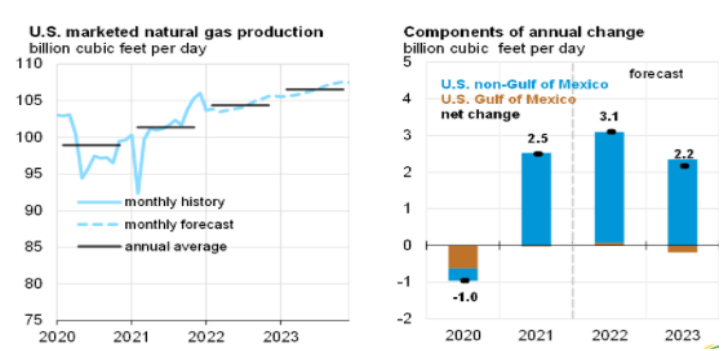
The EIA expects the high levels of US LNG exports to continue into 2022, averaging 11.3bcfd in 2022, up 16% y-y, thanks to the continued strong global natural gas demand to accommodate additional the US' LNG export capacity in 2022-23. Since 2016, the US has completed over 11 mtpa of LNG export facilities, including a liquefaction plant and export terminals. In 2022, the EIA expects an additional 3mtpa capacity of LNG exports to come on stream, which should help alleviate the currently tight demand-supply ratio of the global gas market.

**Exhibit 17: US gas demand projections**



Sources: EIA, Short-term Energy Outlook, February 2022

**Exhibit 18: US gas supply projections**

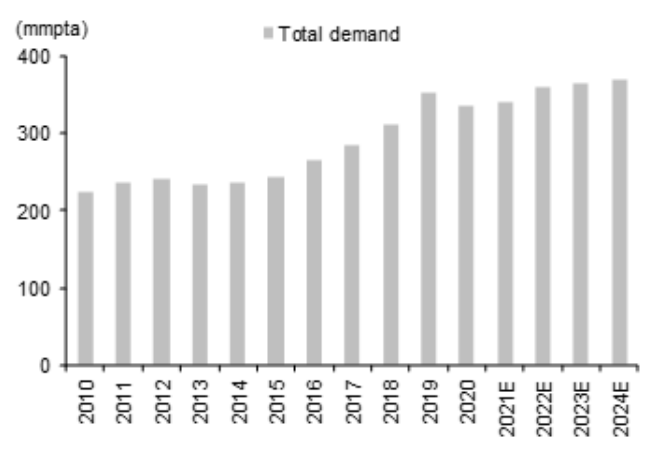
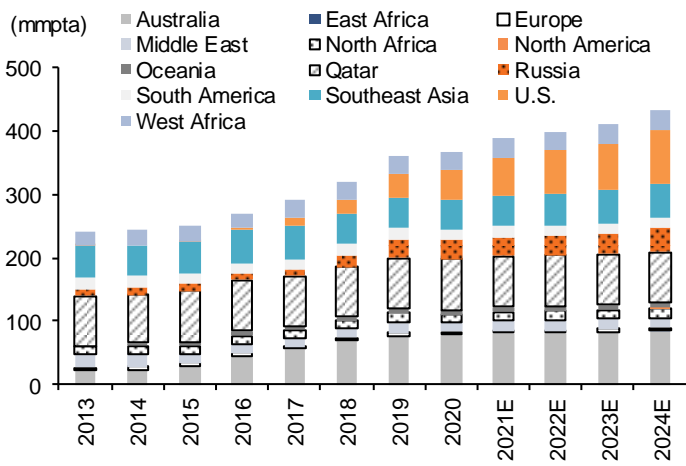


Sources: EIA, Short-term Energy Outlook, February 2022

The US began exporting LNG in Feb-16 and within only four years has become the world's third largest LNG exporter behind only Australia and Qatar. Once LNG liquefaction units at the Sabine Pass LNG and Calcasieu Pass LNG are placed in service in 2022, the US' LNG export capacity will become the world's largest.

Exhibit 19: Liquefaction capacity by country

Exhibit 20: LNG demand projection



Source: EIA

Source: EIA

According to the EIA, the announced LNG project plans and capacity expansions will occur between Dec-21 and fall 2022:

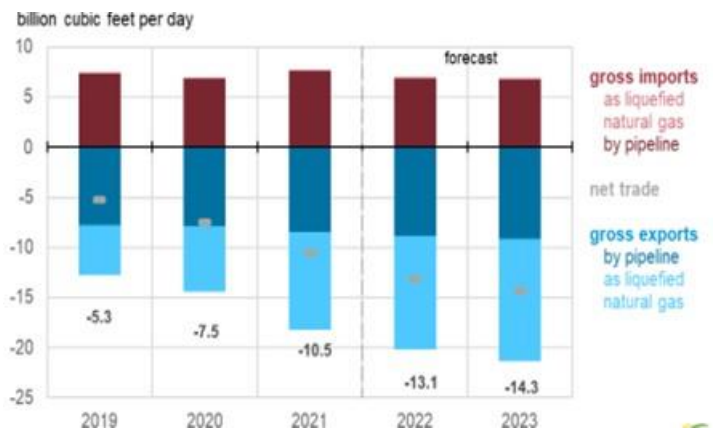
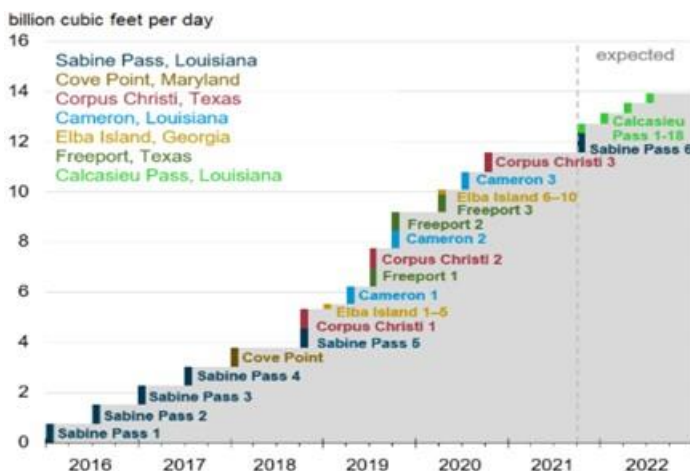
**The completion of Train 6 at the Sabine Pass LNG export facility.** Train 6 will add up to 0.76bcfd of peak export capacity. Train 6 began producing LNG in late November and the first export cargo from this train is expected to be shipped before the end of this year.

**Increase in LNG production at Sabine Pass and Corpus Christi LNG terminals as a result of optimising operations.** The US Federal Energy Regulatory Commission (FERC) approved an increase in annual LNG production at these two facilities by a combined 261 billion cubic feet per year (bcfy) or 0.7bcfd (+11.5%) through uprates and modifications to maintenance.

**New LNG export facility Calcasieu Pass LNG in Louisiana comes online.** The project consists of 9 blocks, each containing 2 mid-scale modular liquefaction units for a total of 18 liquefaction units with a combined peak capacity of 1.6bcfd. Commissioning activities at Calcasieu Pass LNG started in Nov-21, and the first LNG production is expected before the end of this year. All units are expected to be placed in service by the fourth quarter of 2022.

Exhibit 21: US LNG export capacity by project (2016-22)

Exhibit 22: US annual gas trade



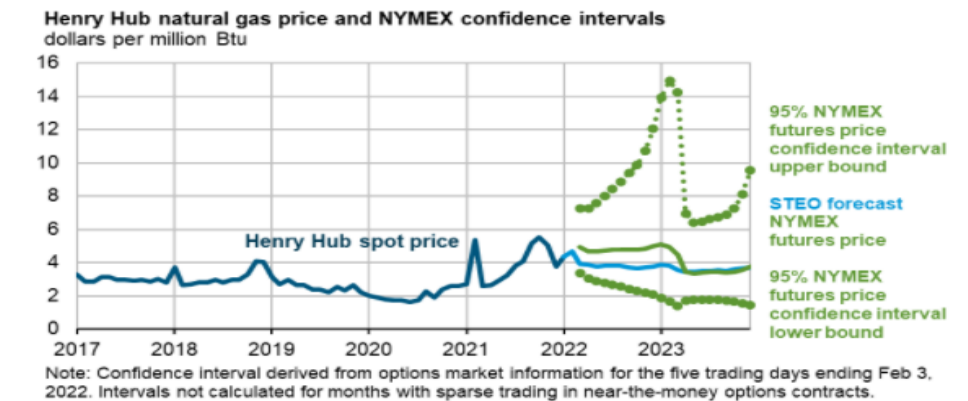
Source: EIA

Sources: EIA, Short-term Energy Outlook, February 2022



Hence, we believe the global LNG price, particularly the spot LNG price, will decline from its high level of USD25-30/mmbtu in Jan-Feb 2022 down to USD14/mmbtu in 2Q22, USD9/mmbtu in 3Q22, and USD7/mmbtu in 4Q22, based on the EIA's projections.

**Exhibit 23: Projections for US Henry Hub gas price index**



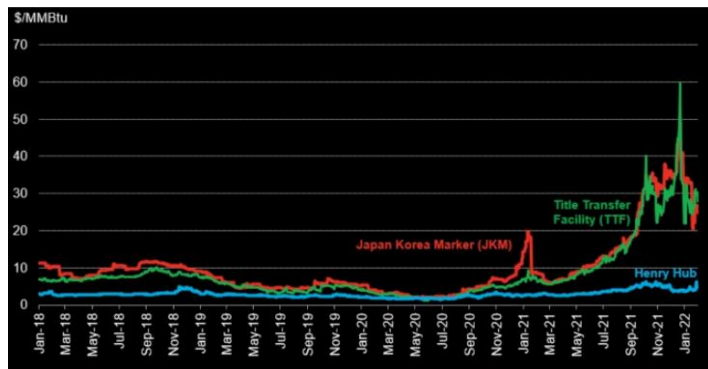
Sources: EIA, Short-term Energy Outlook, February 2022

**Bloomberg expects the spot LNG price to stay above USD30/mmbtu in 2022.**

Bloomberg NEF (BNEF) forecasts the JKM LNG spot price in Asia to stay high at over USD30/mmbtu in 2022, even softening from its peak in 1Q22 at a USD32/mmbtu average. The main source of pressure on Europe's benchmark Title Transfer Facility gas price (TTF) is the historically low gas inventory in Europe and the higher demand for LNG to substitute the coal-fired as well as the gas-fired power capacity, as the gas imported from Russia is expected to decline in 2022.

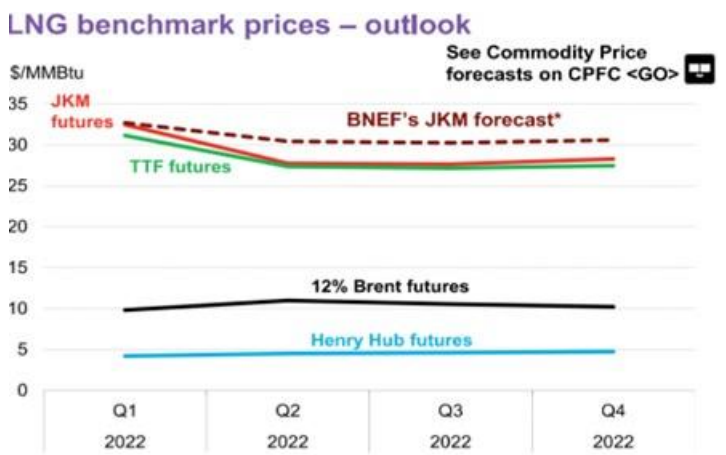
The LNG prices in Europe (TTF) and Asia (JKM) have become increasingly correlated with each other in 2021 to Jan-22 as the LNG trading between these two markets are highly linked due to the competition for LNG supply from major producers including Australia, Qatar, the US and Russia.

**Exhibit 24: Gas futures index for US (Henry Hub), EU (TTF), and Asia (JKM)**



Source: BNEF

**Exhibit 25: LNG benchmark price forecasts by BNEF**

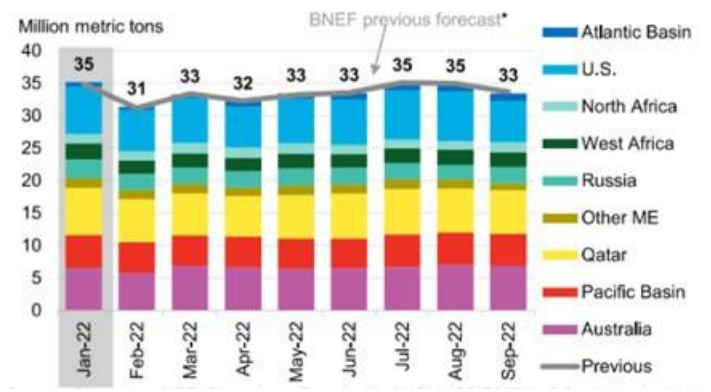


Source: BNEF

BNEF forecasts the JKM LNG spot price in Asia to stay high in 2022, averaging USD32.7/mmbtu in 1Q22, USD30.4/mmbtu in 2Q22, USD30.3/mmbtu in 3Q22, and USD30.6/mmbtu in 4Q22. But we think the JKM price should decline over the course of 2022 as the new supply comes on stream from the rising US LNG exports, and the demand should slow down after the high winter season.

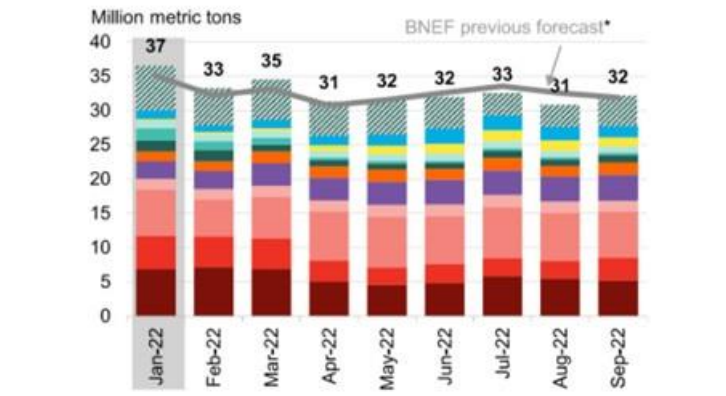
We think the inventory restocking demand for Europe is unlikely to sustain the JKM spot LNG price benchmark at over USD30/mmbtu as the new US supply should more than offset the restocking demand in Europe.

**Exhibit 26: Global LNG supply forecast by BNEF**



Source: BNEF

**Exhibit 27: Global LNG demand forecast by BNEF**



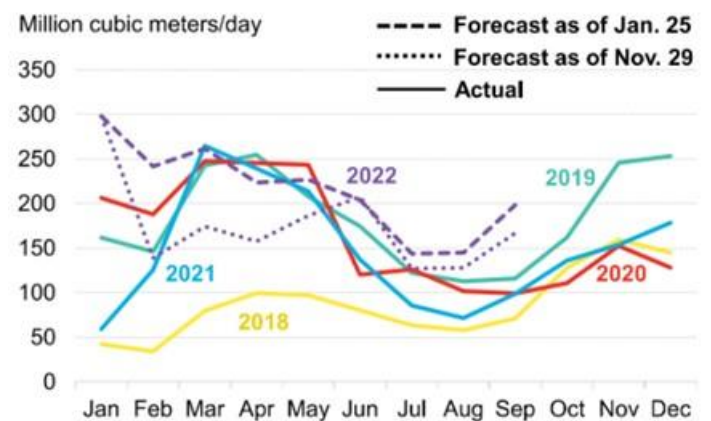
Source: BNEF

The European gas market is expected to stay tight in 2022 due to the low inventory, which in turn will likely pressure the JKM LNG price as Asian buyers will have to compete with European buyers for the spot LNG cargo availability. The key issue will be the Nord Stream 2 (NS2) gas pipeline which had its commercial operation date (COD) halted since the US and its allies have prevented Russia from selling its gas via NS2, predicated on fears of a looming invasion of Ukraine.

According to BNEF, the LNG import volume to northwest Europe and Italy, the key areas for LNG demand in Europe, has risen in Feb-Mar 2022 to stay close to the 2021 levels, and we think the restocking demand should result in an LNG import level similar to 2021 with only marginal growth y-y.

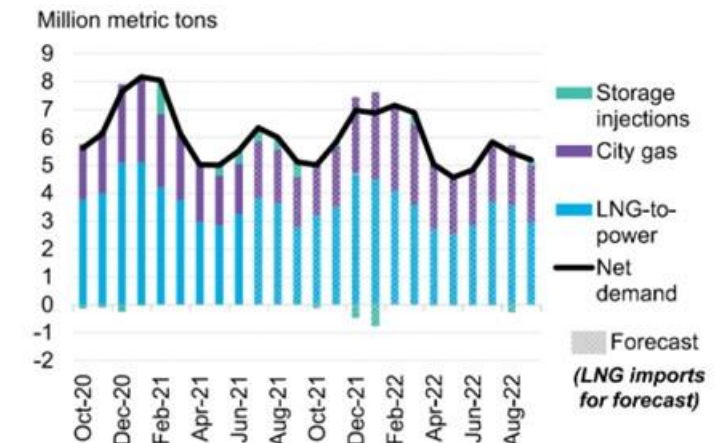
Hence, we think the USD30/mmbtu JKM price average for 2022 as forecast by BNEF is too high, and project the JKM LNG price to decline from USD32/mmbtu in 1Q22 down to USD7-10/mmbtu by 4Q22 as the new US LNG exports come on stream throughout 2022.

**Exhibit 28: LNG imports to northwest Europe and Italy**



Source: BNEF

**Exhibit 29: Japan LNG demand forecasts**



Source: BNEF

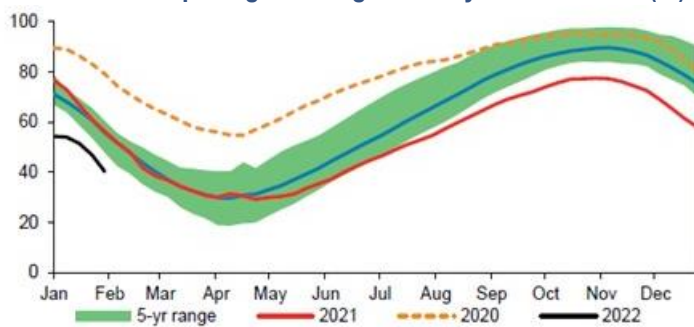
### Russian gas supply to EU is key for global spot LNG price in 2022

As the US and its allies continue to work together to discourage Russia from an invasion of Ukraine, effectively sanctioning the COD of Russia’s new NS2 pipeline to export gas to the European market via Germany’s northern shore, the world is closely watching what Russia’s next step will be in respect to gas exports to Europe.

According to BNP Paribas’ report, “**Russia-Ukraine conflict: Implications for commodity markets**”, dated 31 Jan-22, Russia is currently supplying around 39% and 28% of EU gas and crude imports, respectively, mostly via pipelines. The disruptions to gas and oil flows from Russia to Europe could trigger a domino effect to drive up the global LNG price, given that the European gas market is currently tight with an inventory hitting a 5-year record low in Jan-Feb 2022.

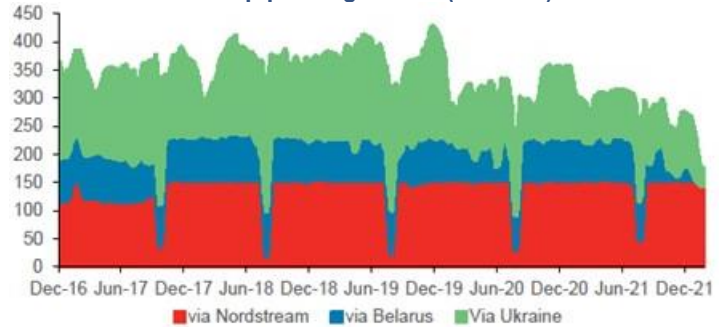
The major causes for the gas price spike in Europe are the lower-than-expected renewable power production levels and, mostly importantly, the sharp drop in the gas supply from Russia over the past 12 months.

**Exhibit 30: European gas storage hit a 5-year record low (%)**



Sources: Bloomberg, BNP Paribas

**Exhibit 31: Russian pipeline gas flow (mmscfd)**



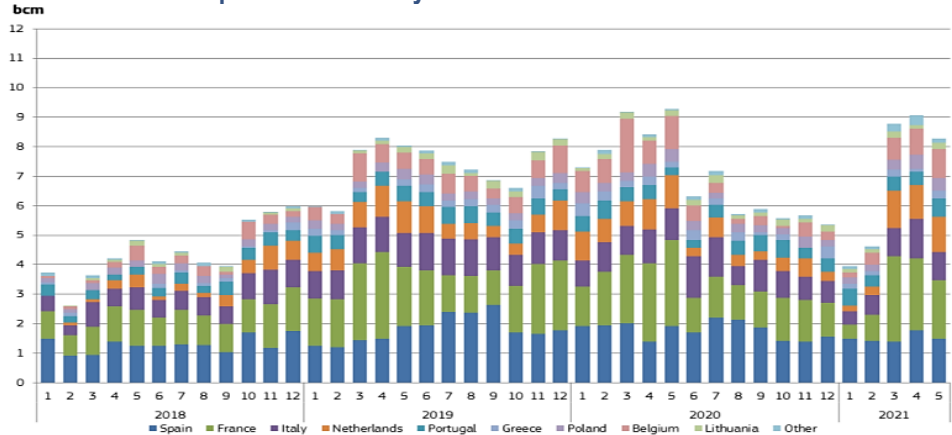
Sources: Bloomberg, BNP Paribas

As much as 40% of Europe’s natural gas is imported from Russia. Sanctions on Russia’s gas supply have a large implication for the global LNG price and market. No country buys more natural gas from Russia than Germany, which depends on the fuel to help heat homes in the winter and operate factories. The Russia-to-Germany pipeline NS2 is clearly becoming the centre of the conflict.

If the gas imported from Russia via NS2 is blocked due to sanctions, BNP expects the benchmark TTF gas price to spike to over €200/MWh (USD50/mmbtu for LNG), surpassing the previous high at the €180/MWh peak seen in Dec-21. The tight LNG supply could sustain the gas price in Europe to €160/MWh in the coming summer, unless the gas supply disruption risk from Russia is removed, according to BNP.

On 2 Feb-22, NS2, owned by Russian energy company Gazprom, was to transport Russian natural gas from Russia to Germany, but President Biden has prohibited the move, citing that the gas transport will not go forward if Russia invades Ukraine. Germany, however, has hesitated to agree, given the significant repercussion to its economy from the energy shortfall.

**Exhibit 32: LNG imports to the EU by member states**



Source: [Quarterly report on European gas markets by European Commission](#)

**Historical impact of sanctions on Russia and global gas and oil prices.** Two previous rounds of sanctions have been enacted against Russia by the US and its allies.

**February 2014: Crimea invasion.** The impact from the sanctions against Russia on the back of Russia's invasion and annexation of Crimea were insignificant to the energy market as the gas supply remained sufficient.

**April 2018: Alleged interference in 2016 US election.** Under the Trump administration, the Treasury Department imposed sanctions against seven Russian oligarchs with ties to President Vladimir Putin along with 12 companies they owned or control. The gas price in Europe rose slightly after the sanctions in Apr-18, with the price of European base load power moving only little with a one-year forward base load power price in Germany – as a proxy for the European energy market – at €40/MWh.

**Current crisis:** Invasion of Ukraine? We think that if further sanctions are applied, they would have a deeper impact on the global energy market, particularly for the LNG spot price, given the currently tight supply and the already high price of the one-year forward base load power price at €142/MWh, far above its average of €40-50/MWh.

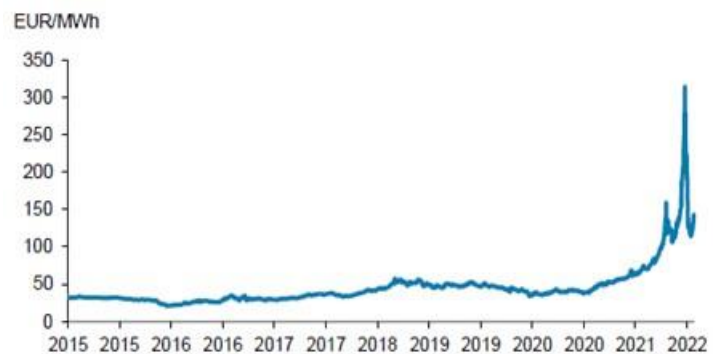
Under potential sanctions against Russia to block the gas flow via NS2, we think the resultant spike in the gas price would lead to a sharp rise in the base load power price in Europe.

#### Exhibit 33: Volovets gas station in western Ukraine



Sources: The Christian Science Monitor

#### Exhibit 34: German one-year forward base load power price



Sources: Bloomberg, BNP Paribas

**Nord Stream gas pipeline.** Nord Stream is a twin set of pipelines that provides gas transportation capacity for the natural gas that comes from western Russia (Vyborg) into Lubmin, Germany, for distribution into the European gas grid. This system is composed of a set of 1,224km pipelines through the Baltic Sea, and each holds the capacity to transport 27.5bcm of natural gas per year. Nord Stream 1 (NS1) had its COD in 2011, while NS2 remains non-operational.

If it starts operating, NS2 will all but remove the remaining leverage that Ukraine had as a major transit country for the export of Russia's Siberian and Central Asian gas to the EU. Russia's onetime economic dependency on Ukraine was reduced with the start of the first leg of the original NS1 pipeline's operation in 2011.

After the US and Germany agreed in Jul-21 to allow Russia to complete its USD11b, 1,230km NS2 pipeline, owned by Gazprom under the Baltic Sea with a capacity of 55bcm per annum to transport gas from Russia's Arctic region to Germany, Russia has yet to transport and sell any gas to Germany. NS2 would effectively bypass Ukraine and Poland and double the amount of Russian-supplied gas to Europe and Germany, essentially making it possible for Germany to phase out its current overreliance on nuclear and coal power energy.

Exhibit 35: EU gas pipeline networks



Source: [Economist](#)

Exhibit 36: The receiving station of the Nord Stream 2 gas pipeline stands near Lubmin, Germany



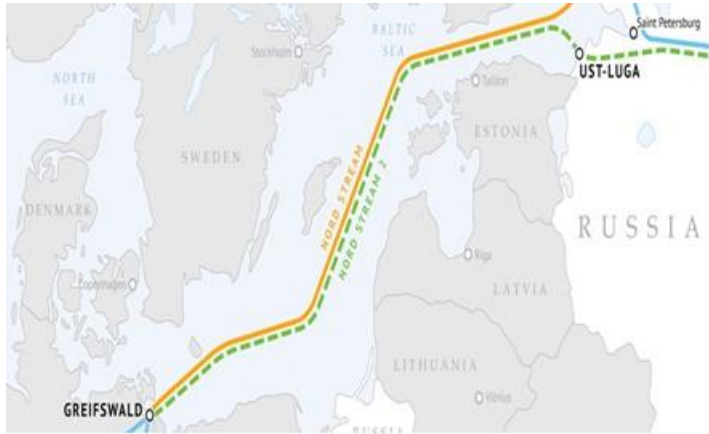
Source: NPR

However, given that NS2 transits through the Baltic Sea, posing geo-economic and security challenges to the US and Europe, the Russia-Germany gas sales via NS2 have since become a major political conflict between the US and its allies and Russia. The commencement of the COD of NS2 remains unsettled, pending the certification process by European authorities and the US' final approval.

Whether or not NS2 will go online, its emergence raises questions about the EU's future relationship with Kyiv, as well as Ukraine's role both as a transit and storage country for natural gas and as a potential alternative energy exporter. Russia sees the completion of the controversial pipeline not only as a commercial and technological achievement, but as a major geopolitical victory for Moscow.

**Russia's gain at Ukraine's loss.** Ukraine's ties with Russia have been in crisis since Russia's annexation of Crimea in 2014 and its backing of the separatist uprising in Eastern Ukraine. With its annexation of Crimea and intervention in Eastern Ukraine in 2014, Russia began to treat Ukraine in the same way as it had been treating Moldova and Georgia for many years before, according to [Euronews, dated 1 Oct 2021](#). The activation of Gazprom's TurkStream pipeline via the Black Sea in early 2020, and the completion of NS2 via the Baltic Sea in Sep-21, concluded Russia's energy-industrial disentanglement from Ukraine.

**Exhibit 37: The Nord Stream and Nord Stream 2 pipeline routes from Russia to Germany from Gazprom**



Source: Ane Gil Elorri, [Universidad de Navarra](#)

**Exhibit 38: Major gas pipeline network in EU countries**



Source: Ane Gil Elorri, [Universidad de Navarra](#)

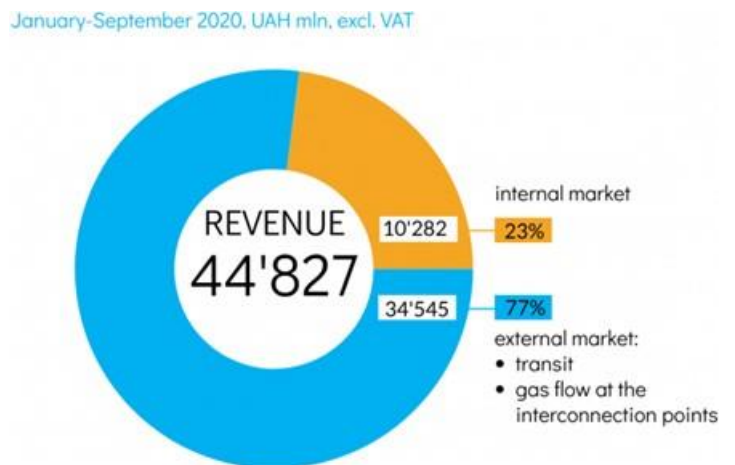
Under the terms of a long-term supply deal with Budapest that kicked in on 1 Oct-21, Gazprom will no longer ship its gas to Hungary via Ukraine, but will send it via Serbia and Austria instead. That deprives Ukraine of transit revenues and also means it can no longer import reverse flow gas via Hungary, which it has been doing since 2015 as a way of not buying gas directly from Russia

**Exhibit 39: Ukraine's gas pipeline network**



Source: The National Gas Union of Ukraine

**Exhibit 40: Ukraine's revenue from gas pipelines (Jan-Sep 2020)**



Source: [Gas Transmission System Operator of Ukraine](#)

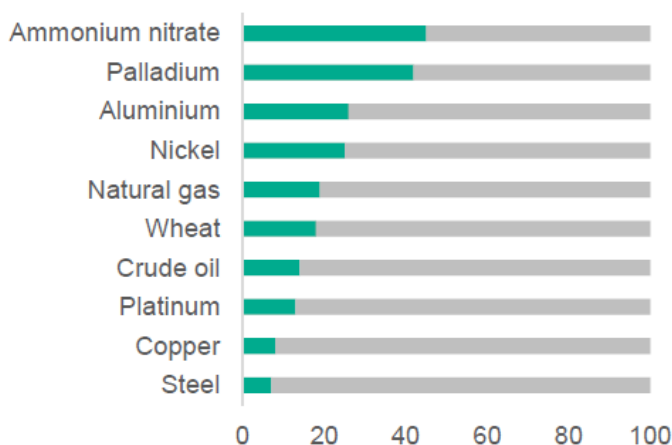
**Will Russia cut off the gas supply to Europe entirely? We do not think so.** While Russia now sits on USD630b in currency reserves at the end of 2021, meaning it could withstand the short-term hit to its energy revenue, we think the full package of sanctions that could be imposed on Russia if an invasion of Ukraine does occur could significantly impact Russia as a country. 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).

Russia pumped 175bcm of gas into Europe in 2021, and nearly a quarter of it through the pipelines in Ukraine. In Jan-22, Russia reduced its gas exports via pipelines in Ukraine to only 50mmscfd, down more than 50% y-y, according to the EIA. While Russia could afford to cut off the gas exports via Ukraine's pipelines if it invades Ukraine, we think it is less likely that Russia would cut off the gas flows via the pipelines under the Baltic Sea and through Poland.

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 EIA's forecast. Russia could also reroute some of that gas through other pipelines, reducing the need for additional LNG to about a half-shipload per day.

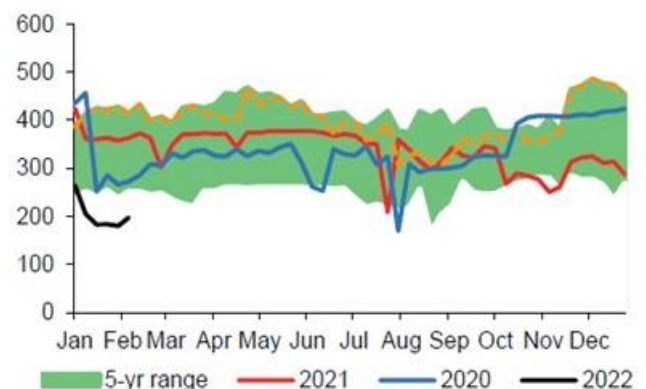
The stalling of Russia's USD11b NS2 from sanctions could also hurt Russia's financial coffers. So, whether Europe is more dependent on Russia's gas, or Russia is more reliant on Europe's money, remains a tricky question.

**Exhibit 41: Share of Russia on global exports in 2019-21 (%)**



Sources: WTO; Russian Trade Ministry; BNP Paribas

**Exhibit 42: Russian gas exports below a five-year band (mmscfd)**



Sources: Bloomberg; BNP Paribas

### **Will the US come to the rescue on behalf of Russia's gas shortfall in Europe?**

**We think it is still unlikely in 2022.** Since 2017, the US has become a net exporter of LNG, and it has been on track to become the world's largest LNG exporter by the end of 2022. For Europe, the US has already secured the LNG market in the UK, Spain, and France, but Germany remains the most promising market for US LNG exports due to the potential demand diversion from Russian to US LNG.

In Jan-22, European countries imported higher amounts of LNG from the US, accounting for 34% of the European LNG import volume and two-thirds of US LNG exports, implying that if the entire US LNG export volume was sent to Europe, it would still not be sufficient to replace the gas supply from Russia. The higher US LNG exports came at the expense of lower gas imports from Russia, which made up just 17% of total imports, down from 39% in 2021.

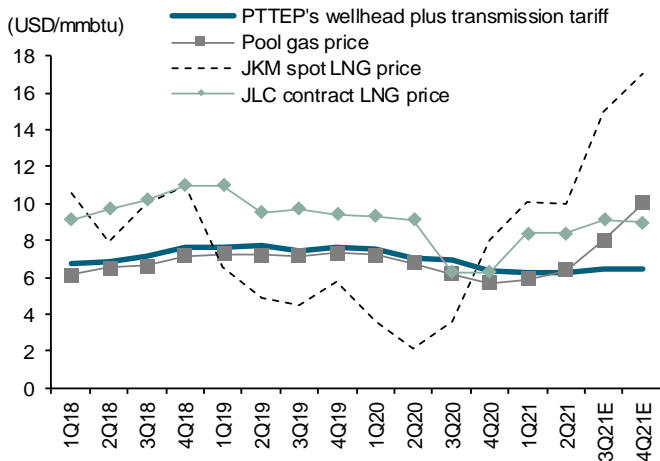
According to the EIA, Europe has ample LNG regasification capacity, but is insufficient to fill the entire supply gap left by Russia if it were to stop exporting gas to Europe.

**Will LNG supply in other markets be sufficient to replace Russia's gas supply to Europe? We don't think so.** In the event of a full cut-off, even if all of Europe's LNG import facilities were at full utilisation rates, the amount of LNG imported would only be about two-thirds of what Russia sends via pipelines, based on the EIA's estimate.

### Impact on Thailand's pool gas price and SPPs

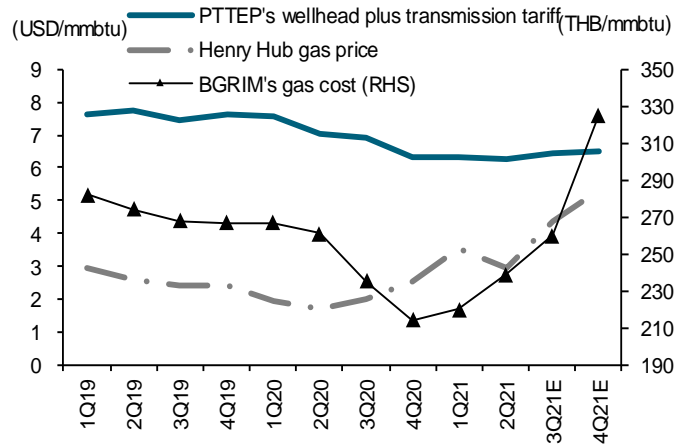
With the EIA's projected lower global LNG price and additional supplies from gas fields, including G2 (+200mmscfd), Bongkot (+150mmscfd), Arthit (+60mmscfd), and MTJDA (+40mmscfd) in 2Q22-4Q22 onward, we believe Thailand's pool price will gradually decline in 2Q22 onward, mainly due to the rising supply from the US.

**Exhibit 43: PTTEP's wellhead average gas price, Thailand's pool gas price, JKM spot LNG price, and JLC contract LNG price**



Sources: PTT; Bloomberg; PTTEP

**Exhibit 44: PTTEP's average gas selling price plus transmission tariff, US Henry Hub gas price, and BGRIM's gas cost**

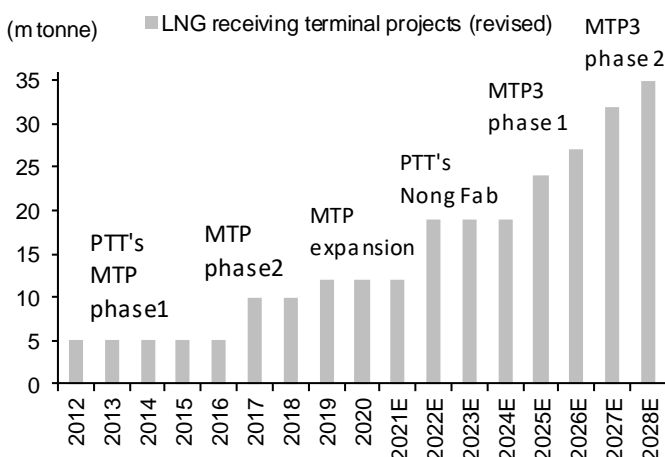


Sources: PTTEP, BGRIM, Bloomberg

**Thailand's LNG imports in 2022-23.** After the Energy Regulatory Commission (ERC) granted shipper licenses for private companies to import LNG starting in 2022, with BGRIM securing the largest import share at a 1.2mt volume, followed by GULF at 0.3mtpa and EGCO at 0.2mtpa. Hin Kong Power, an independent power producer that will commence its COD in 2024, will import LNG only for its own consumption for its 1.4GW power plant.

However, given the spike in the global spot LNG price, no private companies will import LNG in 2022, according to the ERC. Instead, the companies with shipper licenses will begin to import LNG under the contract, not spot price scheme, in the range of USD7-9/mmbtu, based on our estimate. The 7-9/mmbtu gas price range, plus the additional USD1/mmbtu cost of the LNG terminal and transmission pipeline tariff, should still be more competitive than the pool gas price currently paid by SPPs to PTT. The impact of the high price of the contacted LNG volume of 5.2mtpa by PTT is higher than the contract LNG price imported by private companies, based on our estimate.

**Exhibit 45: LNG terminals in Thailand**



Source: PTT

**Exhibit 46: Owners of LNG shipper import licences in Thailand**

Company	Import quota	
	(mtpa)	(mmscfd)
1 PTT	n/a	n/a
2 EGAT	n/a	n/a
3 GULF	0.3	42
4 Hin Kong Power Holding	1.4	196
5 BGRIM	1.2	168
6 EGCO	0.2	35
7 PTT Global LNG	n/a	n/a
8 SCC	n/a	n/a
<b>Total</b>	<b>3.1</b>	<b>441</b>

Source: PTT

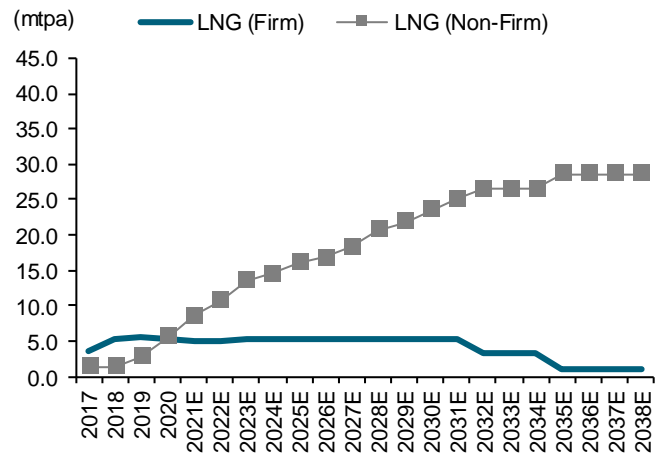
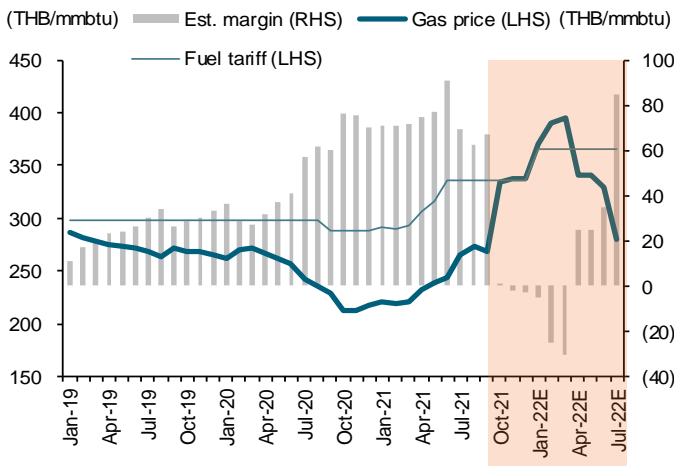


While we project the gas price to continue to rise q-q from 4Q21 into 1Q22, and note PTT's plan to import more spot LNG to fill the supply gap caused by gas production declines from the Bongkot and Erawan gas fields, we expect the gas price to begin to decline by end-2Q22 thanks to the projected lower spot global LNG price.

As PTT plans to import 4.8mt of spot LNG in 2022, up from 1.4mt in 2021 (imported in Sep-Dec 2021), it is highly likely that the price of imported LNG would be much higher than the revised prices of the contract LNG at USD9-11/mmbtu and the USD8-12/mmbtu for the gas produced in the Gulf of Thailand and imported from Myanmar, as the gas prices of these sources would be linked to the rising high sulphur fuel oil price in the past 6-12 months, based on our estimate.

**Exhibit 47: Estimated gross margin, gas price, and fuel tariff**

**Exhibit 48: Thailand's projected LNG imports (firm contract volume vs non-firm spot volume)**



Sources: BGRIM; PTT; EGAT; FSSIA estimates

Source: Gas Plan 2018

**1Q22 should be the most depressing quarter for SPPs.** In 1Q22, we expect the margins of SPPs' electricity sold to IUs to reach its nadir, potentially turning the margin into negative territory. Not until 2Q22 do we project the margin to turn black again for SPPs. We expect it to recover further toward the normal margin level by 3Q22 based on the concurrent positive impacts of a higher electricity tariff and lower gas cost.

**Exhibit 49: Correlation between the gas price and Ft charge**



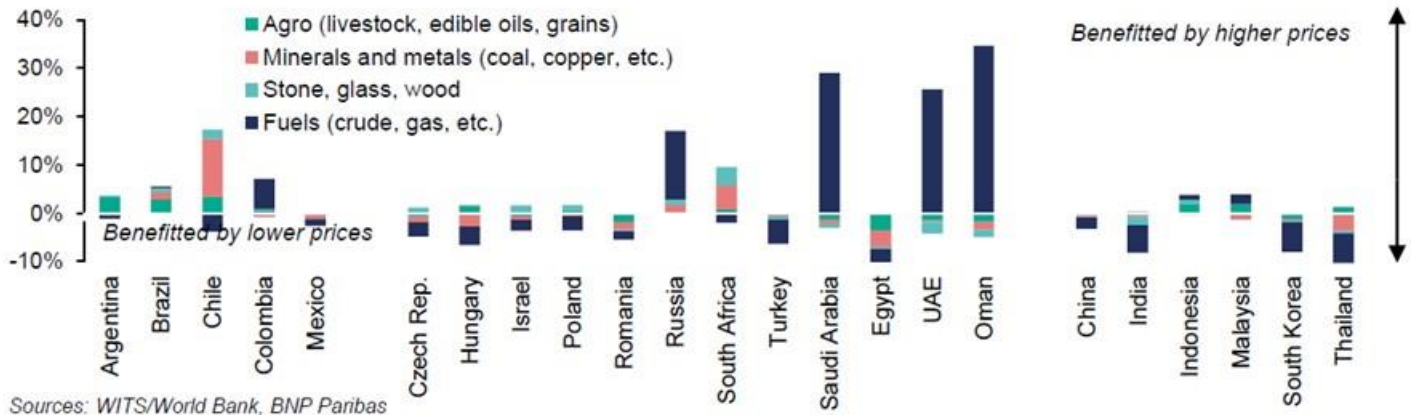
Source: BGRIM

### Sanctions on Russia: implications for Thailand and energy and power sectors

Thailand is a net importer of energy, mostly oil (85% of total consumption in 2021) and coal (80%), while the country exports agricultural, automotive, electrical & electronics, and oil-related products from the refinery and petrochemical industries.

According to BNP Paribas' report, "Russia-Ukraine conflict: Implications for EM", dated 3 Feb-22, the major food exporters such as Argentina, Brazil, and Thailand should feel the pinch from higher fertilizer prices, and we think the resulting energy price crisis in the event that sanctions are placed on Russia if there is an invasion of Ukraine could jeopardize global travel and tourism, which is part of the lifeblood of Thailand's service income.

Exhibit 50: Thailand's exposure to commodities is high for energy imports and agricultural exports

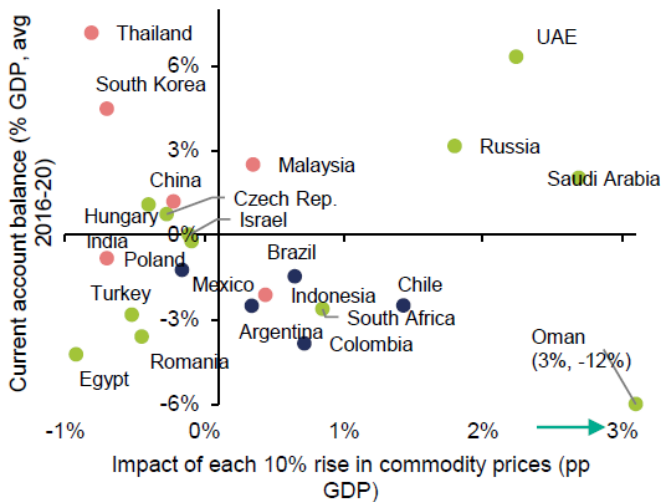


Sources: World Bank; BNP Paribas

The higher prices of imported oil and LNG could exacerbate Thailand's national budget and capital inflows, and potentially worsen the financial positions of the downstream users of gas and oil, including the power sector, but would benefit the upstream producers like PTTEP and PTT.

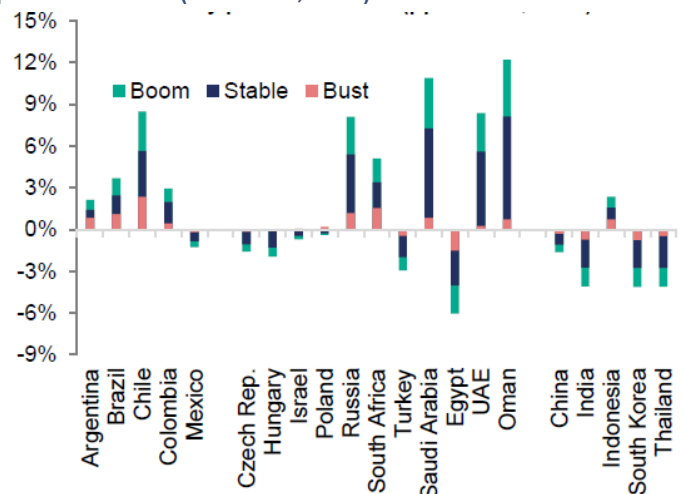
While the capital outflows have higher values and the imported energy could hurt Thailand's revenue, we think Thailand will be healthy enough to withstand the spike in the energy prices thanks to the country's high current account balance.

Exhibit 51: Concern over net importer countries like Thailand is lower thanks to its high current account balance



Sources: IMF; World Bank; BNP Paribas

Exhibit 52: Change in net exports under different commodity price scenarios (% of GDP, 2021)



Bust = Return to Q4 2021 levels; Stable = compared to 1 February 2022. Boom = further 33% rise. Sources: IIF, WITS/World Bank, BNP Paribas estimates

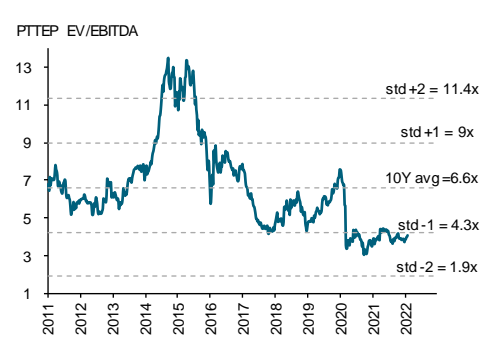
Sources: World Bank; BNP Paribas

### Bottom-fish SPPs and BANPU, Buy on IVL, and trading Buy on PTTEP

Among Thai energy and utilities companies, PTTEP, BANPU, IVL, and BGRIM are our top picks for the gas price uptrend in 1H22 and the projected downtrend in 2H22.

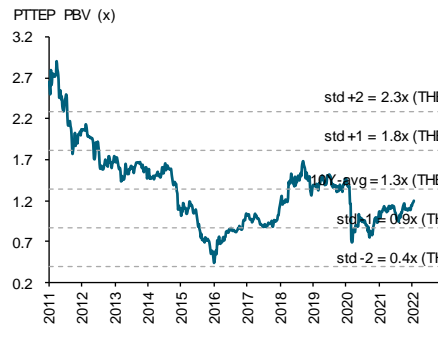
**PTTEP: A key gas producer.** As a key producer of gas, PTTEP should benefit from the high gas price for the gas produced in the Gulf of Thailand, Myanmar, and Malaysia in 2022. It could also gain from the high LNG price via its 8.5%-owned Mozambique LNG area 1 project, scheduled to COD in 2024 when the global LNG price should be higher as a result of a tighter demand-supply balance, based on the EIA's forecast.

Exhibit 53: PTTEP's EV/EBITDA band



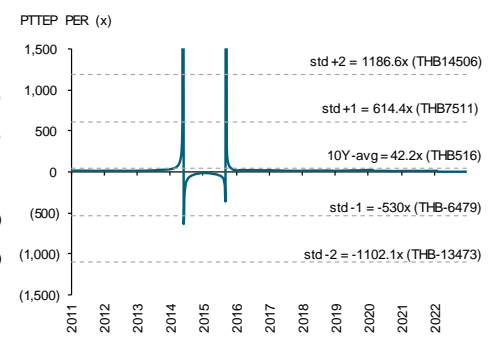
Sources: PTTEP; Bloomberg; FSSIA estimates

Exhibit 54: PTTEP's P/BV band



Sources: PTTEP; Bloomberg; FSSIA estimates

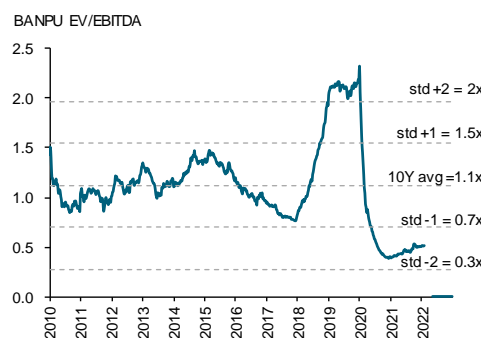
Exhibit 55: PTTEP's P/E band



Sources: PTTEP; Bloomberg; FSSIA estimates

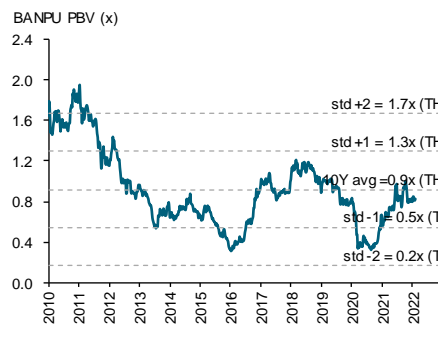
**BANPU: A key shale gas play.** BANPU should see its EBITDA from shale gas rise in 4Q21-2022, driven by a higher ASP for gas and lower hedging losses. We expect quarterly EBITDA of over USD100m in 4Q21-2022, further strengthening its earnings from coal and power.

Exhibit 56: BANPU's EV/EBITDA band



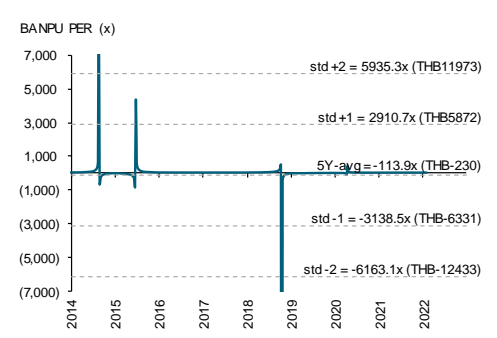
Sources: BANPU; Bloomberg; FSSIA estimates

Exhibit 57: BANPU's P/BV band



Sources: BANPU; Bloomberg; FSSIA estimates

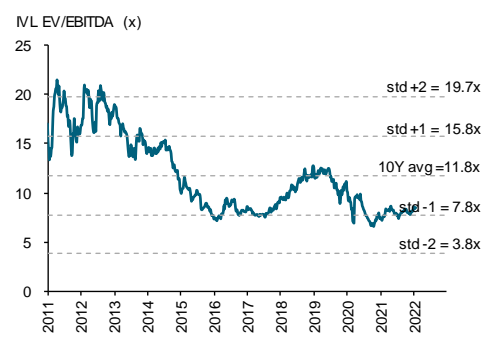
Exhibit 58: BANPU's P/E band



Sources: BANPU; Bloomberg; FSSIA estimates

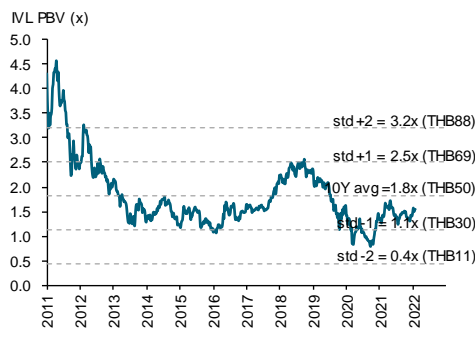
**IVL: Higher shale gas price should drive its EBITDA from IOD.** Thanks to IVL's two IOD asset acquisitions in 2020-1Q22, we think the expanded capacity of IVL's IOD group to over 5mt will timely allow it to capture the upcoming strong demand post Covid-19 pandemic and the higher margins of IOD in the US due to its cost competitiveness and operational integration and synergy.

Exhibit 59: IVL's EV/EBITDA band



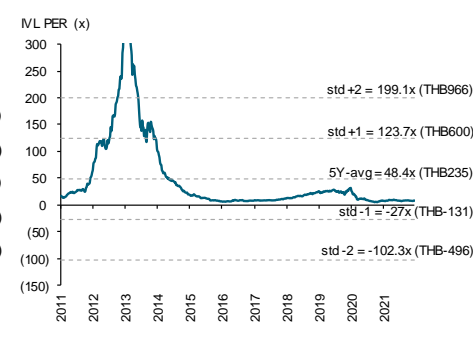
Sources: IVL; Bloomberg; FSSIA estimates

Exhibit 60: IVL's P/BV band



Sources: IVL; Bloomberg; FSSIA estimates

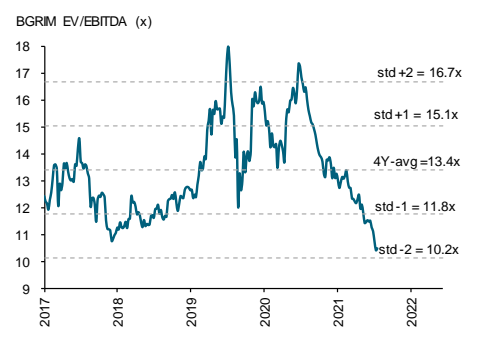
Exhibit 61: IVL's P/E band



Sources: IVL; Bloomberg; FSSIA estimates

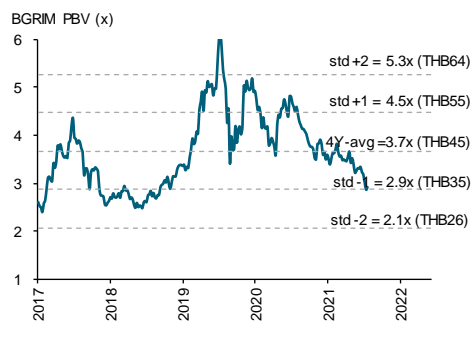
**BGRIM: From a loser to a winner on gas price trend.** In 4Q21-1Q22, we expect BGRIM to suffer from the gross margin squeeze for its SPPs due to the mismatch of the gas price hike vs the lower fuel tariff rise. However, starting in 2Q22, the margin trend could turn around from the bottom in 1Q22 to gradually rise in 2Q-4Q22, driven by lower gas costs, the improving operational efficiency of its five new SPPs (COD in 2H22), and capacity growth from M&A and the organic growth from five new SPPs with SPP replacement power purchase agreements, scheduled to commence CODs in 2H22 (5 SPPs) and 2023 (2 SPPs).

Exhibit 62: BGRIM's EV/EBITDA band



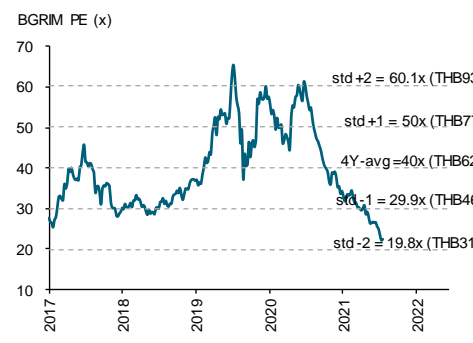
Sources: BGRIM; Bloomberg; FSSIA estimates

Exhibit 63: BGRIM's P/BV band



Sources: BGRIM; Bloomberg; FSSIA estimates

Exhibit 64: BGRIM's P/E band



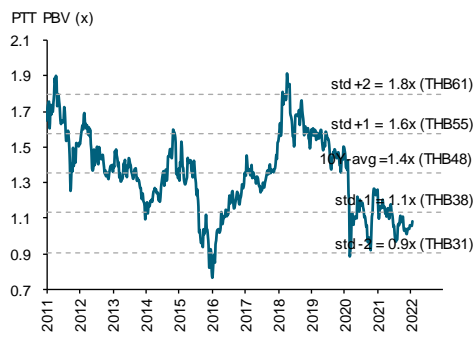
Sources: BGRIM, Bloomberg, FSSIA estimates

Exhibit 65: PTT's EV/EBITDA band



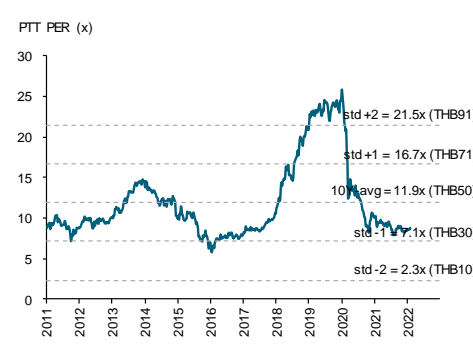
Sources: PTT; Bloomberg; FSSIA estimates

Exhibit 66: PTT's P/BV band



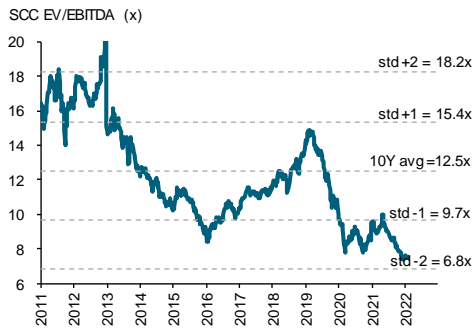
Sources: PTT; Bloomberg; FSSIA estimates

Exhibit 67: PTT's P/E band



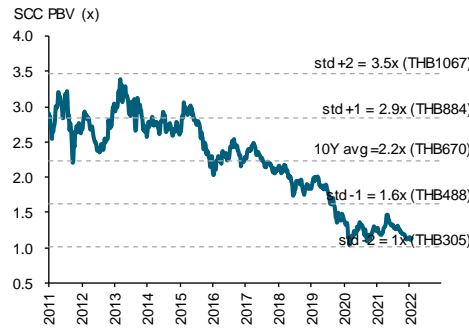
Sources: PTT, Bloomberg, FSSIA estimates

**Exhibit 68: SCC's EV/EBITDA band**



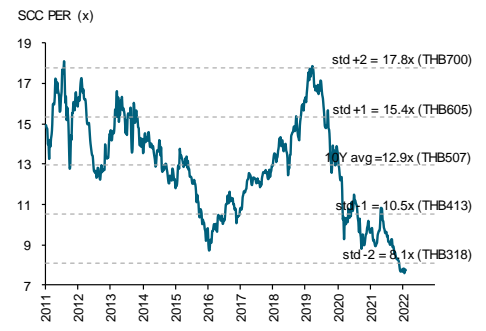
Sources: SCC; Bloomberg; FSSIA estimates

**Exhibit 69: SCC's P/BV band**



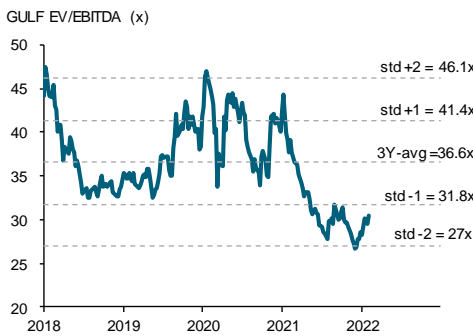
Sources: SCC; Bloomberg; FSSIA estimates

**Exhibit 70: SCC's P/E band**



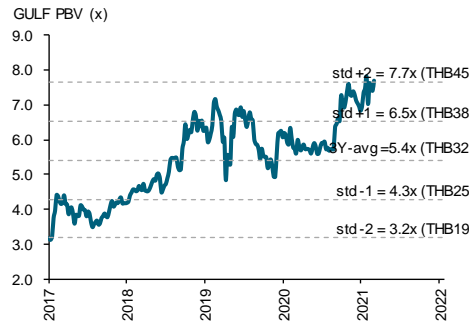
Sources: SCC; Bloomberg; FSSIA estimates

**Exhibit 71: GULF's EV/EBITDA band**



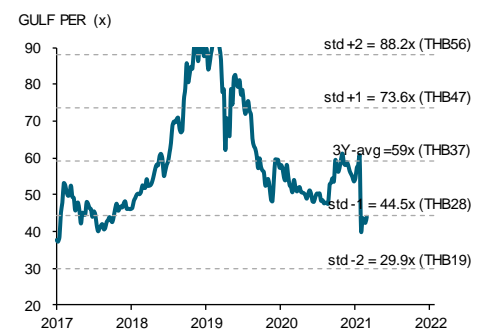
Sources: GULF; Bloomberg; FSSIA estimates

**Exhibit 72: GULF's P/BV band**



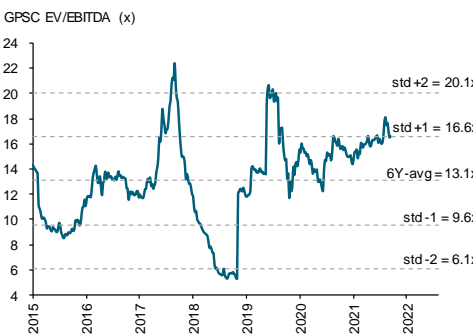
Sources: GULF; Bloomberg; FSSIA estimates

**Exhibit 73: GULF's P/E band**



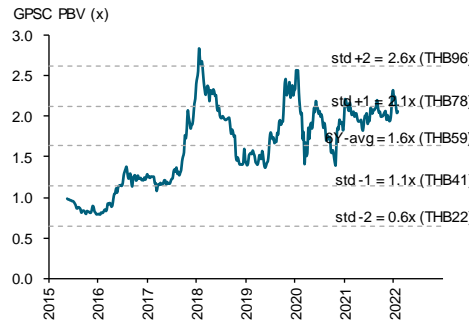
Sources: GULF; Bloomberg; FSSIA estimates

**Exhibit 74: GPSC's EV/EBITDA band**



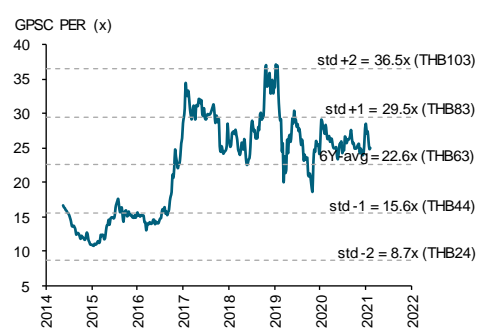
Sources: GPSC; Bloomberg; FSSIA estimates

**Exhibit 75: GPSC's P/BV band**



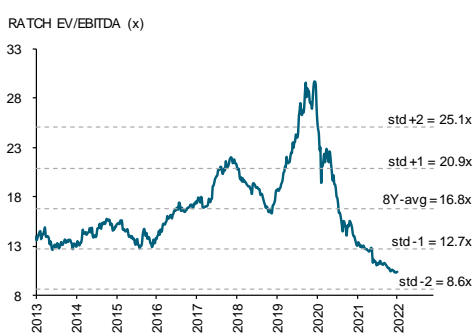
Sources: GPSC; Bloomberg; FSSIA estimates

**Exhibit 76: GPSC's P/E band**



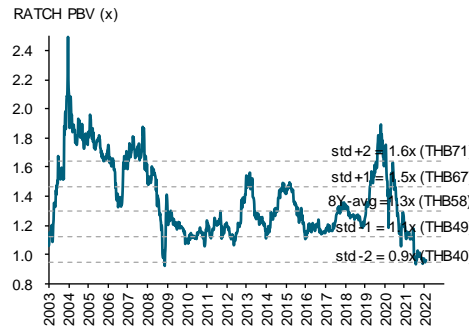
Sources: GPSC; Bloomberg; FSSIA estimates

**Exhibit 77: RATCH's EV/EBITDA band**



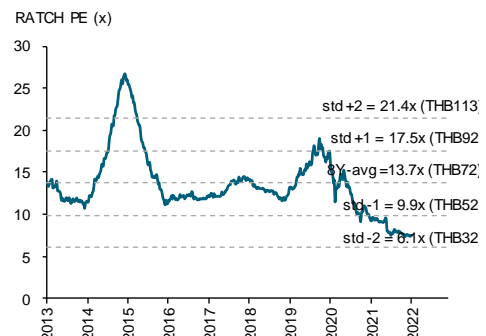
Sources: RATCH; Bloomberg; FSSIA estimates

**Exhibit 78: RATCH's P/BV band**



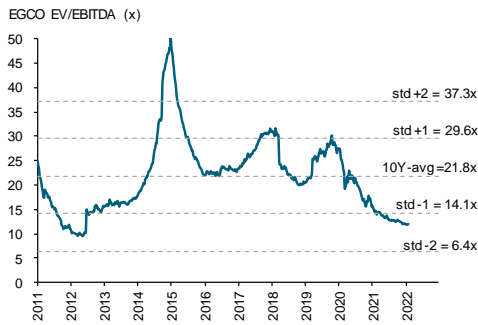
Sources: RATCH; Bloomberg; FSSIA estimates

**Exhibit 79: RATCH's P/E band**



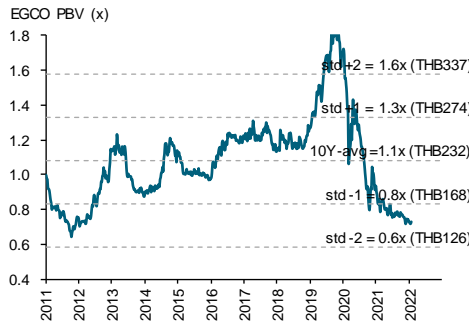
Sources: RATCH; Bloomberg; FSSIA estimates

**Exhibit 80: EGCO's EV/EBITDA band**



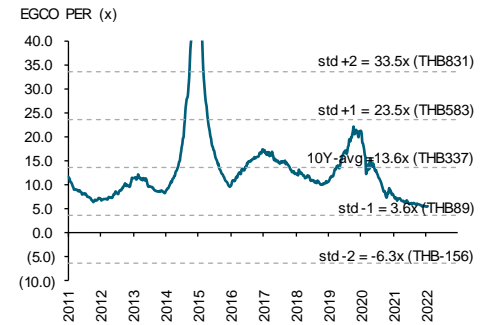
Sources: EGCO; Bloomberg; FSSIA estimates

**Exhibit 81: EGCO's P/BV band**



Sources: EGCO; Bloomberg; FSSIA estimates

**Exhibit 82: EGCO's P/E band**



Sources: EGCO; Bloomberg; FSSIA estimates

**Exhibit 83: Peer comparisons**

Company	BBG code	Rec	Share Price (LCY)	Target price (LCY)	Up side (%)	Market Cap (USD m)	3Y EPS CAGR (%)	PE		ROE		PBV		EV / EBITDA	
								21E (x)	22E (x)	21E (%)	22E (%)	21E (x)	22E (x)	21E (x)	22E (x)
<b>THAILAND</b>															
PTT	PTT TB	BUY	40.50	60.00	48	35,617	38.1	9.6	8.9	13.0	12.9	1.2	1.1	4.9	4.2
PTT Explor & Prod	PTTEP TB	BUY	133.50	162.00	21	16,318	24.0	10.9	11.6	12.6	10.8	1.3	1.2	4.8	4.5
PTT Global Chemical	PTTGC TB	BUY	57.25	75.00	31	7,948	nm	8.0	10.2	11.2	8.7	0.9	0.9	10.3	9.6
Siam Cement	SCC TB	BUY	383.00	483.00	26	14,151	23.2	9.7	7.7	13.7	15.4	1.3	1.1	10.8	8.6
Indorama Ventures	IVL TB	BUY	50.75	70.00	38	8,773	74.8	10.5	9.5	19.4	18.4	1.8	1.6	7.9	7.2
B Grimm Power	BGRIM TB	BUY	32.50	46.00	42	2,609	32.3	38.0	21.1	7.9	13.3	2.9	2.7	13.0	10.5
Gulf Energy Development	GULF TB	BUY	50.00	60.00	20	18,063	48.8	78.9	43.5	11.2	18.5	8.6	7.6	58.4	30.7
Global Power Synergy	GPSC TB	BUY	74.00	90.00	22	6,424	6.2	23.4	29.4	8.4	6.5	1.9	1.9	13.8	18.6
Electricity Generating	EGCO TB	BUY	174.50	245.00	40	2,829	26.2	7.0	5.4	12.3	14.5	0.8	0.7	13.8	10.0
Ratch Group	RATCH TB	BUY	45.50	60.00	32	2,031	13.4	8.6	7.7	12.2	15.7	1.0	1.0	11.2	11.7
Banpu	BANPU TB	BUY	11.50	16.90	47	2,396	nm	5.7	6.5	15.7	14.7	0.8	0.9	4.2	5.2
<b>Average (all)</b>						<b>117,158</b>	<b>26.1</b>	<b>21.7</b>	<b>15.8</b>	<b>12.8</b>	<b>13.7</b>	<b>2.4</b>	<b>2.2</b>	<b>15.4</b>	<b>10.7</b>

Share prices as of 14 February 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	ICI	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	PAP	PCSGH	PDJ	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	SEOIL	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	AMANAHA	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	WIJK	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	TIPIP	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	WIJK	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)

**Disclaimer:**

The disclosure of the Anti-Corruption Progress Indicators of a listed company on the Stock Exchange of Thailand, which is assessed by Thaipat Institute, is made in order to comply with the policy and sustainable development plan for the listed companies of the Office of the Securities and Exchange Commission. Thaipat Institute made this assessment based on the information received from the listed company, as stipulated in the form for the assessment of Anti-corruption which refers to the Annual Registration Statement (Form 56-1), Annual Report (Form 56-2), or other relevant documents or reports of such listed company. The assessment result is therefore made from the perspective of Thaipat Institute that is a third party. It is not an assessment of operation and is not based on any inside information. Since this assessment is only the assessment result as of the date appearing in the assessment result, it may be changed after that date or when there is any change to the relevant information. Nevertheless, FSS International Investment Advisory Company Limited does not confirm, verify, or certify the accuracy and completeness of the assessment results.

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

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Company	Ticker	Price	Rating	Valuation & Risks
PTT PCL	PTT TB	THB 40.50	BUY	Risks to our SoTP-based valuation are the oil price and potential earnings downside from government intervention.
PTT Explor & Prod	PTTEP TB	THB 133.50	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 57.25	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 383.00	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 50.75	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 50.00	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 74.00	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 174.50	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 45.50	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 11.50	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 14 Feb 2022 unless otherwise stated.

## RECOMMENDATION STRUCTURE

### Stock ratings

Stock ratings are based on absolute upside or downside, which we define as  $(\text{target price}^* - \text{current price}) / \text{current price}$ .

**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.