FINANSIA
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Thailand Energy

การปรับเปลี่ยนกระบวนทัศน์สู่การหันกลับไปใช้ถ่านหินและการแยกตัวออกจากกระแสโลกาภิวัฒน์

- สหภาพยุโรป (EU) กำลังมีความเสี่ยงในด้านอุปทานก๊าซในขณะที่มาตรการคว่ำบาตรที่มีต่อรัสเซียเข้มข้นยิ่งขึ้น
- ความต้องการที่เพิ่มขึ้นและอุปทานที่มีจำกัดทำให้เราปรับเพิ่มสมมติฐานน้ำมัน ถ่านหินและก๊าซมากถึงประมาณ 40-100% ในช่วงปี 2022-24
- คงให้น้ำหนักกลุ่มพลังงานไทยมากกว่าตลาด แนะนำซื้อหุ้นพลังงานต้นน้ำ (PTTEP, BANPU) และปลายน้ำ (IVL, ESSO) จากประโยชน์ที่ได้ในระดับสูงจากราคาน้ำมัน ถ่านหินและก๊าซในตลาดโลกที่ปรับตัวสูงขึ้น

มาตรการคว่ำบาตรของสหรัฐฯ และ EU กำลังทำให้รัสเซียร่ำรวยขึ้น

จากมาตรการคว่ำบาตรที่กำลังเข้มข้นมากยิ่งขึ้นของสหรัฐฯ และ EU ที่มีต่อการค้าเชื้อเพลิงฟอสซิลของรัสเซีย เราเชื่อว่า EU มีความเสี่ยงที่จะขาดแคลนอุปทานก๊าซในอนาคตอันใกล้เมื่อฤดูหนาวมาถึงเนื่องจากอุปทานก๊าซที่จะมาทดแทนก๊าซของรัสเซียดูจะมีไม่เพียงพอ นอกจากนี้เรายังคิดว่านโยบายเพดานราคาก๊าซและทองคำของรัสเซียที่พึ่งประกาศไปเมื่อไม่นานมานี้อาจบั่นทอนความพยายามในการเติมก๊าซในคลังสำรองทั่ว EU ที่อยู่ในระดับต่ำในปัจจุบัน ในช่วง 100 วันแรกนับตั้งแต่สงครามเริ่มต้นขึ้นเมื่อวันที่ 24 ก.พ. 22 รัสเซียทำเงินได้ถึง €93พันล้าน (USD97พันล้าน) จากการส่งออกพลังงานโดยทำเงินได้ถึง USD20พันล้านในเดือน พ.ค. 22 เพียงเดือนเดียว น้ำมันคิดเป็น 63% ของรายได้ส่งออกของรัสเซียในช่วงดังกล่าว ในขณะที่ก๊าซอยู่ที่ 32% และถ่านหินอยู่ที่ 5% จากข้อมูลของ Energy Information Administration (EIA) ของสหรัฐฯ การปรับเปลี่ยนกระบวนทัศน์โดยไม่คาดหมายในประเด็นการปรับการใช้พลังงานของ EU สู่การหันกลับไปใช้ถ่านหินเป็นลางร้ายสำหรับโลกที่เป็นมิตรต่อสิ่งแวดล้อมมากยิ่งขึ้น เนื่องจากปัจจุบันพลังงานหมุนเวียนกำลังถูกใช้เพื่อทดแทนก๊าซที่มีราคาแพงแทนที่จะเป็นถ่านหินที่ไม่มีเป็นมิตรต่อสิ่งแวดล้อม

นรกเย็นจนเป็นน้ำแข็ง: EU จะสามารถรอดพ้นจากฤดูหนาวที่กำลังจะมาถึงโดยปราศจากก๊าซของรัสเซียได้หรือไม่?

ไม่ว่าฤดูหนาวที่กำลังจะมาถึงในปี 2022-23 จะเย็นมากหรือน้อย เราคิดว่า EU ไม่น่าจะสามารถหาก๊าซมากพอสำหรับความต้องการก๊าซขั้นต่ำของ EU ที่ 223mt เทียบเท่า LNG ได้จากผู้ขายรายอื่น ซึ่งจะทำให้ยุโรปขาดเชื้อเพลิงสำหรับทำความร้อนภายในบ้าน เมื่อพิจารณาจากฤดูหนาวในช่วง 10 ปีที่ผ่านมา (2010-19) EU ใช้พลังงาน 2,800TWh (223mt LNG) ในฤดูที่หนาวน้อย และมากถึง 3,600TWh (255mt LNG) ถ้าฤดูหนาวรุนแรงมากกว่าปกติ ดังจะเห็นได้ในช่วงฤดูหนาวที่เย็นผิดปกติในปี 2010-11 ซึ่งอุณหภูมิลดลงเหลือ −17.3°C (0.9°F) ในเดือน พ.ย. 10 หลังมวลอากาศเย็นที่เริ่มในสแกนดิเนเวียตอนใต้ค่อย ๆ เคลื่อนไปทางตะวันตกเฉียงใต้ผ่านเบลเยี่ยม เนเธอร์แลนด์และสหราชอาณาจักร (UK)

แนวโน้มเชิงบวก: USD120/bbl สำหรับน้ำมัน, USD300/t สำหรับถ่านหิน, USD20/mmbtu สำหรับก๊าซ

เนื่องจากเราคาดว่าอุปทานจะตึงตัวในท่ามกลางความความต้องการที่อั้นอยู่ตามการกลับมาเปิดเศรษฐกิจโลกและเงินเฟ้อที่อยู่ในระดับสูง ซึ่งทำให้ราคาสินค้าโภคภัณฑ์ปรับตัวขึ้นในฐานะที่เป็นการลงทุนเพื่อป้องกันความเสี่ยงจากเงินเฟ้อ เราจึงปรับเพิ่มสมมติฐานราคาน้ำมัน ถ่านหินและก๊าซในปี 2022-24 ขึ้นเป็นจำนวนมาก โดยปรับเพิ่มประมาณการราคาน้ำมันดิบดูไบขึ้น 20-22% เป็น USD120/110/110 ต่อ bbl; ดัชนีราคาถ่านหิน Newcastle ขึ้น 50-67% เป็น USD300/250/250 ต่อตัน; ดัชนีราคาก๊าซ Henry Hub ขึ้น 40-50% เป็น USD7/6/6 ต่อ mmbtu; และราคา JKM spot LNG ขึ้น 88-100% เป็น USD20/15/15 ต่อ mmbtu

PTTEP, BANPU, IVL, และ ESSO เป็นหุ้นเด่น

เราคงให้น้ำหนักกลุ่มพลังงานไทยมากกว่าตลาดโดยเลือก PTTEP กับ BANPU เป็นหุ้นเด่นในกลุ่มต้นน้ำและ IVL กับ ESSO เป็นหุ้นเด่นในกลุ่มปลายน้ำ เราชอบหุ้นทั้ง 4 จากประโยชน์ที่จะได้ในระดับสูงจากราคาน้ำมัน ถ่านหินและก๊าซในตลาดโลกที่ปรับตัวสูงขึ้น

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Paradigm shift to re-carbonisation & de-globalisation

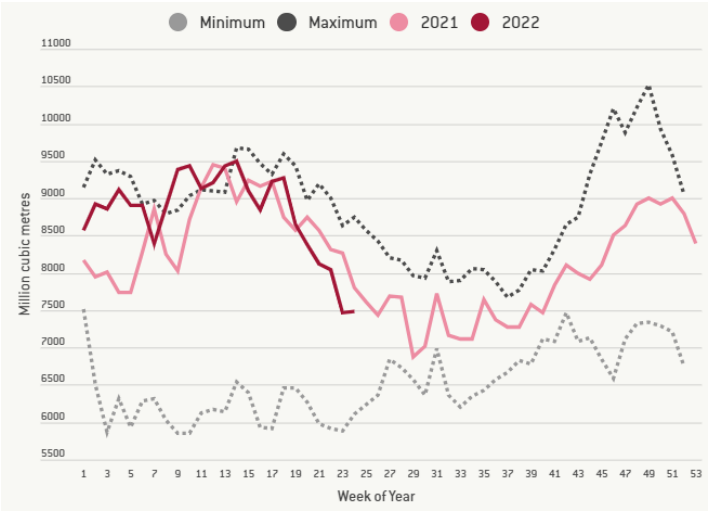
With the coming winter and an increasingly acrimonious relationship between the EU and Russia, on 19 May-22, the European Commission (EC) raised its ambitions for renewables and energy efficiency, while seeking alternative oil and gas supplies in the short term, to mostly, if not fully, replace the current energy supplies sourced from Russia.

The energy de-coupling and the renewable-driven plan under REPowerEU could cost an estimated €300b to eliminate Russian energy imports by 2027. Combined with the green legislation already in place, the new REPowerEU plan will allow Europe to save €100b a year on gas, oil, and coal imports, according to the EC. Coal-fired power plants are to be re-started to cope with the short-term electricity supply shortfall risk, potentially supporting coal prices at a higher-for-longer level, in our view.

Can EU survive the coming winter if Russia cuts off the gas supply entirely?

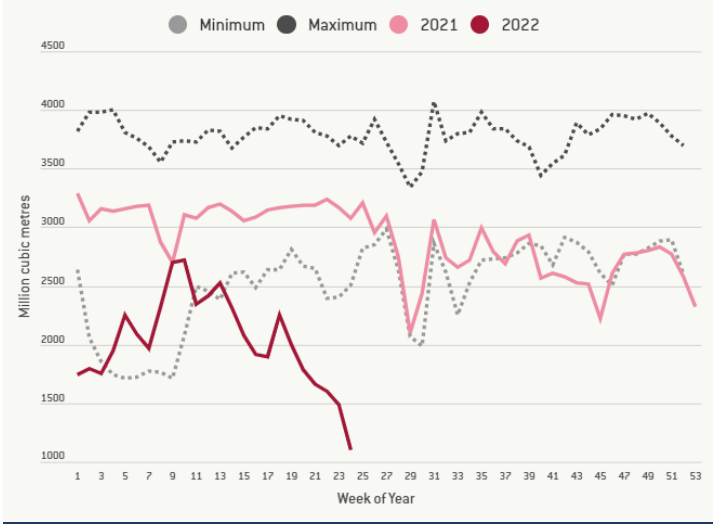
With the intensifying sanctions imposed by the EU and the US against Russia's fossil fuel trade, we believe the EU is increasingly at risk of a gas supply shortage for home heating this coming winter, given the lack of alternative suppliers, the recently introduced price cap policies for Russian gas and oil prices, and the low level of gas in storage across the EU.

Exhibit 1: EU gas imports



Source: Bruegel (as of 21 June 2022)

Exhibit 2: EU gas imports from Russia

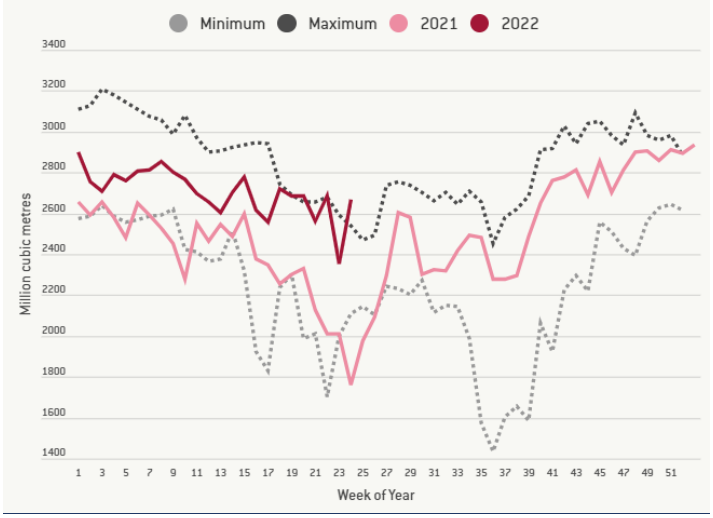


Source: Bruegel (as of 21 June 2022)

Current EU gas situation as of 21 Jun-22. In 2021, the EU imported around 9,200mcm of gas via both pipelines and seaborne LNG, with Russia as the largest gas supplier at over 3,000mcm, followed by Norway at 3,000mcm, LNG at 2,700mcm, and the remaining 700mcm from Algeria.

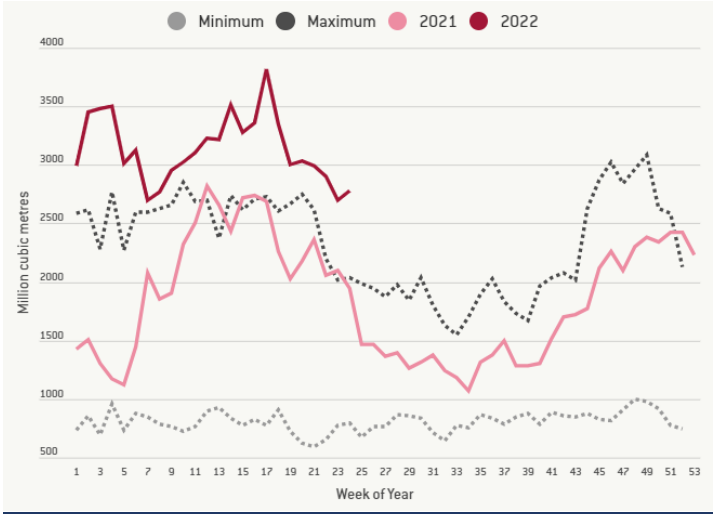
However, after Russia invaded Ukraine, the EU sanctions on Russia have significantly reduced imports of Russian gas, which now stand at 1,200mcm, down sharply from 3,200mcm in the same period in 2021.

Exhibit 3: EU gas imports from Norway



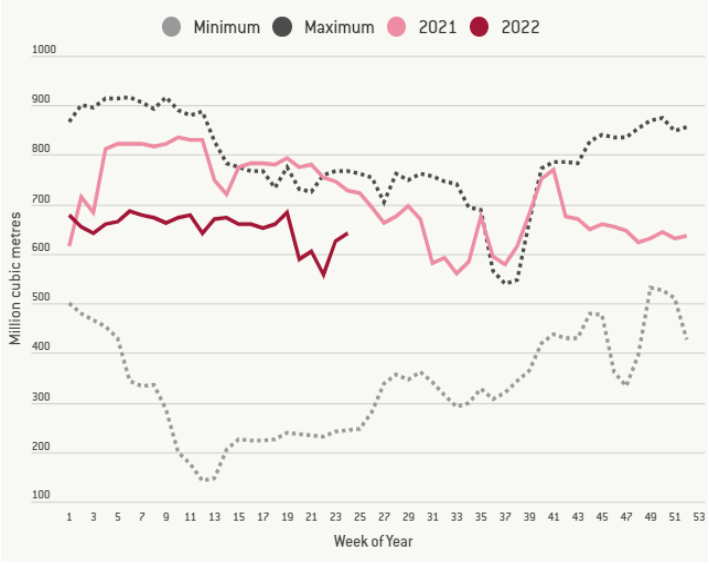
Source: Bruegel (as of 21 June 2022)

Exhibit 4: EU LNG imports



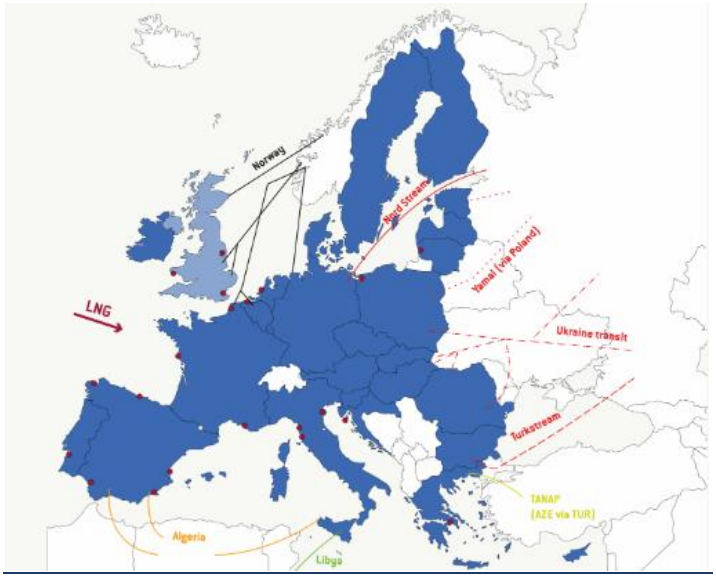
Source: Bruegel (as of 21 June 2022)

Exhibit 5: EU gas imports from Algeria



Source: Bruegel (as of 21 June 2022)

Exhibit 6: Main EU natural gas import routes



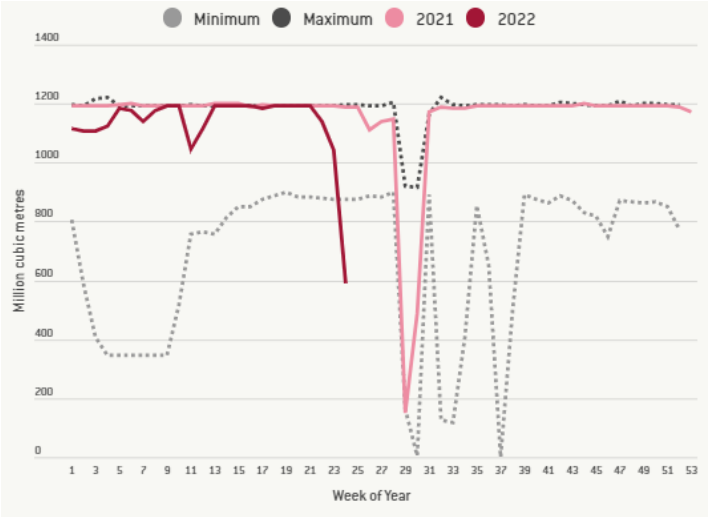
Source: Bruegel (as of 21 June 2022)

Major gas import routes for EU. The most relevant gas pipeline import routes into the EU from Russia are via four distinct corridors (Nord Stream, Yamal (via Poland), Ukraine, and Turkstream (via Turkey). These different Russian gas routes are at the heart of current geopolitical tensions surrounding the completion of Nord Stream 2.

Most of the gas from Russia is now imported via the Nord Stream 1 pipeline (NS1), which has delivered a significantly lower gas flow to Germany at 67mcm per day (equivalent to 30.4TWh) due to the delayed return of equipment being serviced by Germany's Siemens Energy, according to Reuters.

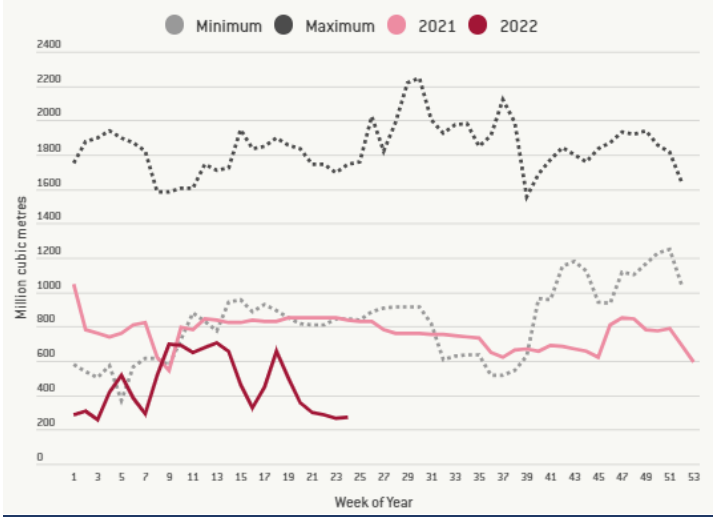
Flows of Russian gas to Europe via the NS1 pipeline were slightly higher since last week, but still at just 40% of capacity. Gas supplies to the EU via the Sudzha entry point were steady at 41.7mcm, and eastward gas flows on the Yamal-Europe pipeline fell compared to last week, according to Reuters.

Exhibit 7: Nord Stream 1 gas flow to EU



Source: Bruegel (as of 21 June 2022)

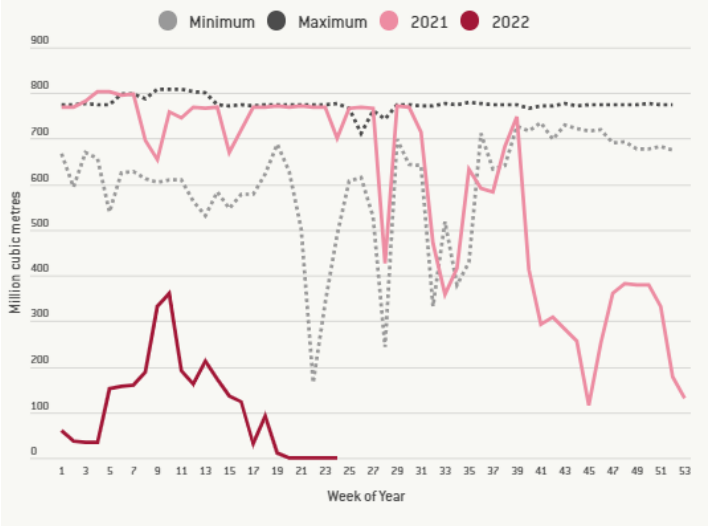
Exhibit 8: Ukraine Transit gas flow to EU



Source: Bruegel (as of 21 June 2022)

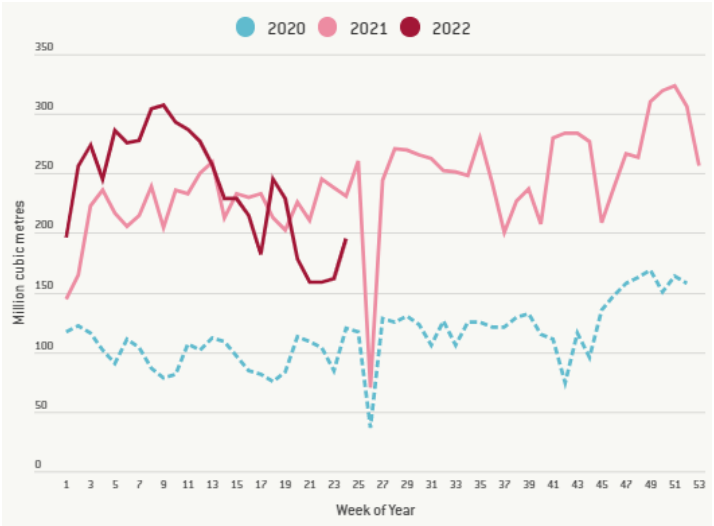
The weekly gas import data via each of these routes from Russia to the EU indicates that the gas flows are now plunging sharply for three out of four routes, compared to the minimum and maximum values from the period during 2015-21.

Exhibit 9: Yamal (via Poland) gas flow to EU



Source: Bruegel (as of 21 June 2022)

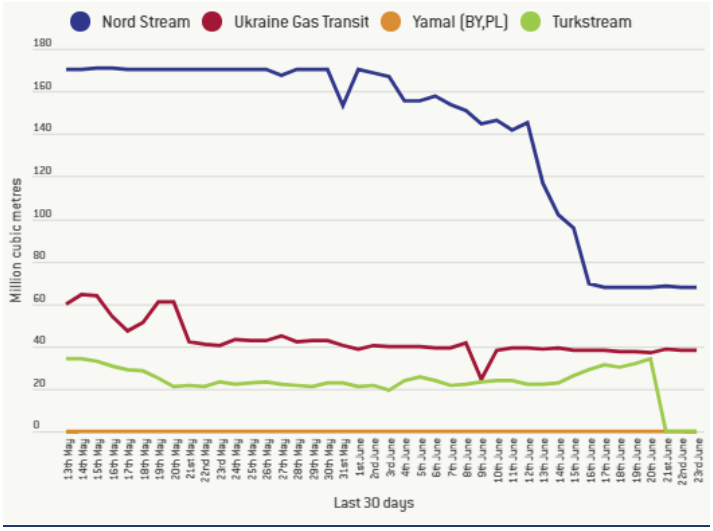
Exhibit 10: Turkstream gas flow to EU



Source: Bruegel (as of 21 June 2022)

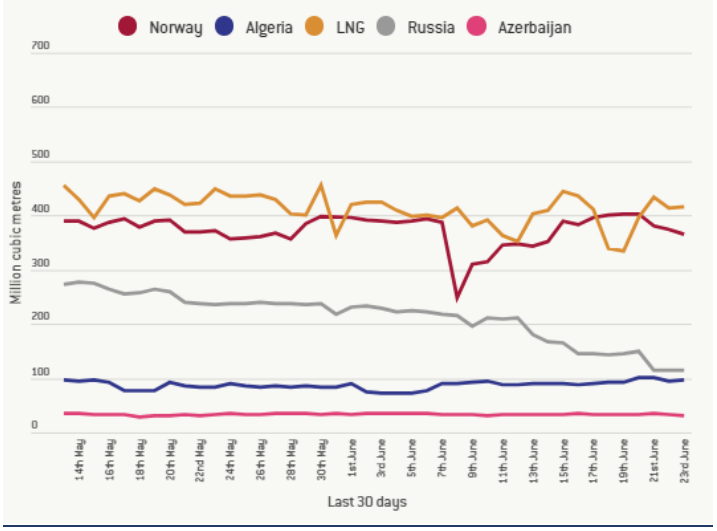
Insufficient new gas supplies to replace Russian gas. In the past 30 days, daily gas imports and storage levels for the EU have seen clear signs of declining imports of Russian gas with relatively stable gas imports from other sources, resulting in the current gas supply shortage in the EU. This implies that in the short term, the EU may not be able to secure sufficient gas supplies from other sources to replace Russian gas ahead of the coming winter season.

Exhibit 11: Daily gas imports via Russian routes



Sources: Bruegel (as of 21 June 2022)

Exhibit 12: Daily gas imports from Russia, Norway, Algeria, and LNG routes

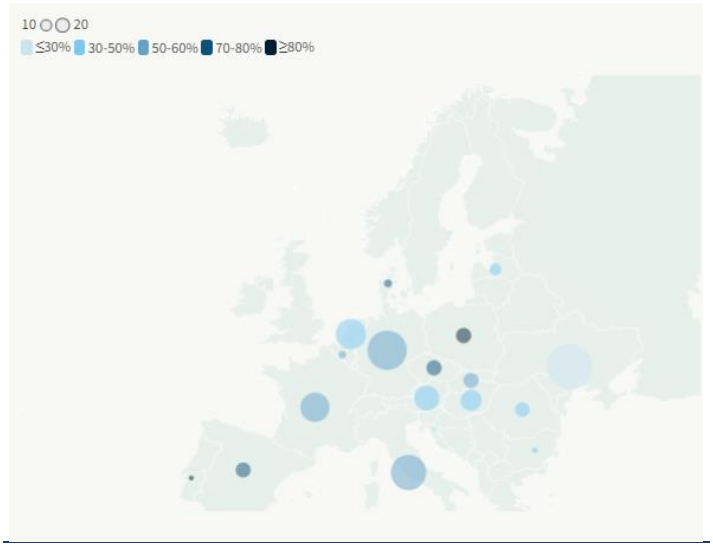


Source: Bruegel (as of 21 June 2022)

While the gas import volume declines, the levels of gas storage within the EU's borders remains low, and at this filling speed we believe the EU will be unable to achieve its target of filling 80% of its gas storage capacity by Nov-22.

Up to 3,600TWh (255mt LNG) of gas is needed for winter. Based on the past 10 winters, the EU consumes at least 2,800TWh (223mt LNG) during a "mild" winter, and as much as 3,600TWh (255mt LNG) if the winter turns out to be colder than normal. For example, during the winter of 2010-11, the temperature dropped to −17.3°C (0.9°F) in Nov-10 after a cold weather cycle that started in southern Scandinavia subsequently moved southwest over both Belgium and the Netherlands and throughout the UK.

Exhibit 13: Gas storage level (%) and max capacity (TWh) by country as of 19 Jun-22



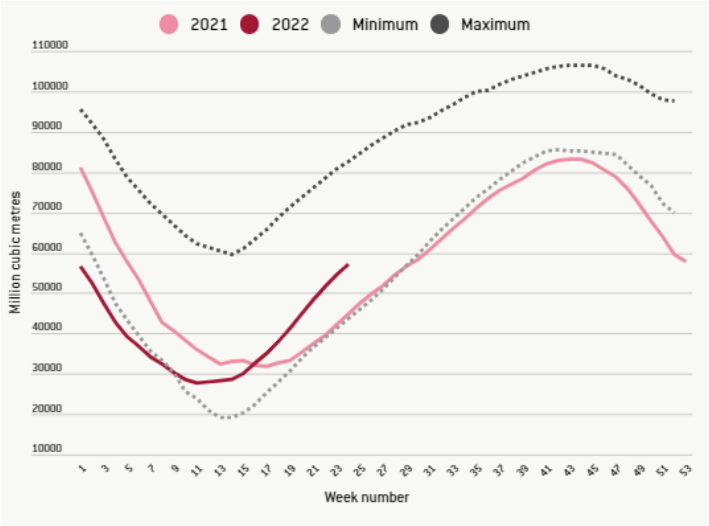
Source: Bruegel (as of 21 June 2022)

Exhibit 14: EU seasonal demand for gas over the last 10 winters

Source: European Gas Hub

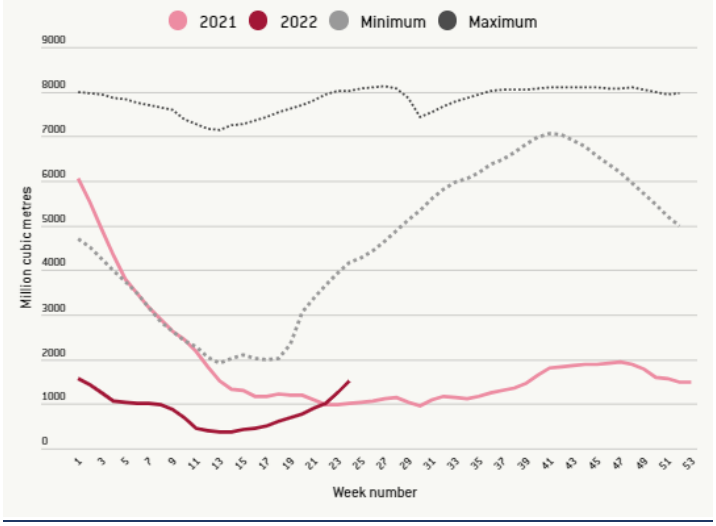
During the winter of 2020-21, the weather was rather mild in the EU with little snow and no particularly strong cold outbreaks. How cold the coming winter in 2022-23 will be in the EU remains uncertain, but we think the minimum gas amount required – the equivalent of 223mt of LNG – is unlikely to be sourced elsewhere from other suppliers, including the US, Norway, and even the Middle East or Australia, potentially leaving Europeans with a shortage of fuel for heating their homes this winter.

Exhibit 15: EU total gas storage



Source: Bruegel (as of 21 June 2022)

Exhibit 16: EU gas in storage from Russia (Gazprom)



Source: Bruegel (as of 21 June 2022)

Exhibit 17: EU gas import points

ENTSOG Point	IEA Point	Exporting Country	Exporting Route
Agia Triada	Revithoussa	LNG	
Almería	Almeria	Algeria	
Barcelona	Barcelona	LNG	
Beregdaróc 1400 (HU) - Beregovo (UA) (UA>HU); VIP Bereg (HU) / VIP Bereg (UA)	Beregdaróc	Russia	Ukraine
Bilbao	Bilbao	LNG	
Budince	Budince	Russia	Ukraine
Cartagena	Cartagena	LNG	
Cavarzere (Porto Levante / Adriatic LNG)	Adriatic LNG	LNG	
Croatia LNG		LNG	
Dornum / NETRA (jordgas Transport)	Dornum	Norway	
Dornum GASPOOL	Dornum	Norway	
Drozdovichi (UA) - Drozdowicze (PL); GCP GAZ-SYSTEM/UA TSO	Drozdowicze	Russia	Ukraine
Dunkerque	Dunkerque	Norway	
Dunkerque LNG / PEG North	Dunkerque (LNG)	LNG	
Easington	Easington	Norway	
Emden (EPT1) (OGE); Emden (EPT1) (Thyssengas); Emden (EPT1) (GTS)	Emden (EPT1)	Norway	
Emden (NPT) (GTS)	Emden (NPT)	Norway	
Fos (Tonkin/Cavaou)	Fos sur Mer	LNG	
Gate Terminal (I)	Gate	LNG	
Gela	Gela	Libya	
Greifswald / NEL; Greifswald / OPAL	Nord Stream	Russia	Nord Stream
Huelva	Huelva	LNG	
Imatra	Imatra	Russia	
Isaccea (RO) - Orlovka (UA) III, II, I	Isaccea	Russia	Ukraine
Isle of Grain	Isle of Grain	LNG	
Kipoi	Kipi	Azerbaijan	
Klaipeda (LNG)	Klaipeda	LNG	
Kondratki	Kondratki	Russia	Yamal
Kotlovka	Kotlovka	Russia	
Krk LNG		LNG	
Luhamaa; Misso Izborsk	Korneti	Russia	
Mazara del Vallo	Mazara del Vallo	Algeria	
Melendugno - IT / TAP	Trans Adriatic Pipeline (TAP)	Azerbaijan	
Milford Haven	Dragon LNG	LNG	
Montoir de Bretagne	Montoir de Bretagne	LNG	
Narva	Narva	Russia	
Nybro	Nybro	Norway	
OLT LNG / Livorno	Livorno	LNG	
Panigaglia	Panigaglia	LNG	
Sagunto	Sagunto	LNG	
Sines	Sines	LNG	
St. Fergus	St. Fergus	Norway	
Strandzha 2 (BG) / Malkoclar (TR)	N/A.	Russia	Turkstream
Swinoujscie	Swinoujscie	LNG	
Tarifa	Tarifa	Algeria	
Teesside	Teesside	LNG	
Tieterowka	Tieterowka	Russia	Yamal
Ungheni	Ungheni		
Uzhgorod (UA) - Velké Kapušany (SK)	Velke Kapusany	Russia	Ukraine
Värska	Varska	Russia	
VIP Mediesu Aurit - Isaccea (RO-UA)	Mediesu Aurit	Russia	Ukraine
Wysokoje	Wysokoje	Russia	Yamal
Zeebrugge LNG	Zeebrugge (LNG)	LNG	
Zeebrugge ZPT	Zeebrugge (ZPT)	Norway	

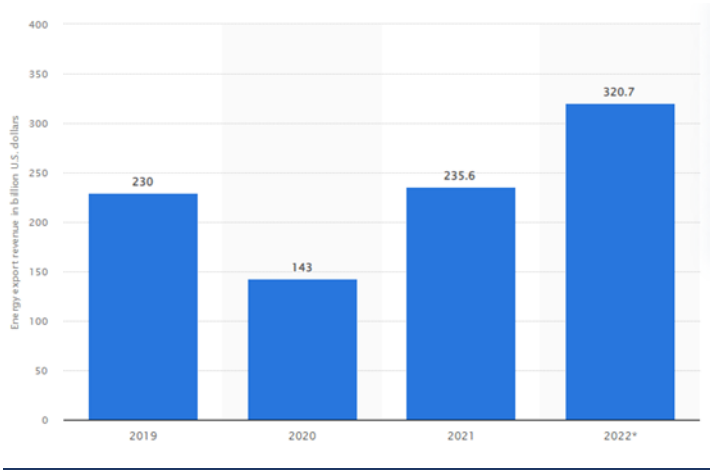
Source: Bruegel

YTD Russian oil and gas revenue is soaring, not sliding

The International Energy Agency (IEA) estimates that in 4M22, Russia's oil export revenue rose by 50% y-y, with crude oil and products generating about USD20b per month, thanks to the price effect – higher revenue per barrel, even with discounted Urals and ESPO blend – is outweighing the volume effect of lower exports.

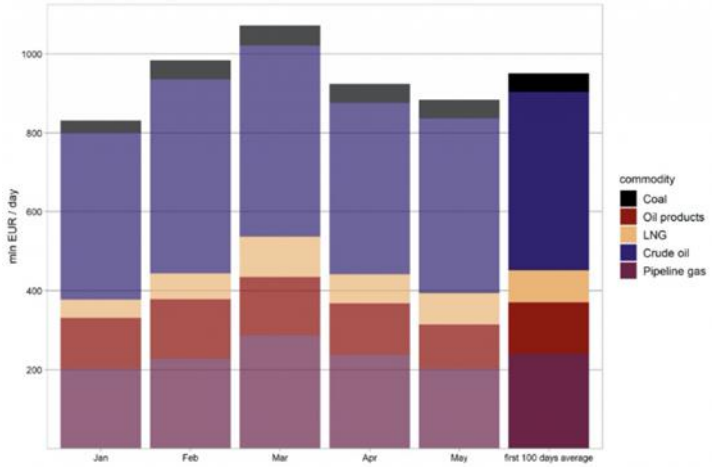
Over the years, policymakers have learned to deploy energy sanctions with greater precision but it is not clear that this round of US-EU sanctions against Russia's energy will accomplish the stated goal: to deprive Russia of revenue that fuels its war machine, while minimising the cost to European consumers and the global market.

Exhibit 18: Russia's fossil fuel revenue (USD b)



Source: Statista

Exhibit 19: Russia's estimated revenue from fossil fuel exports

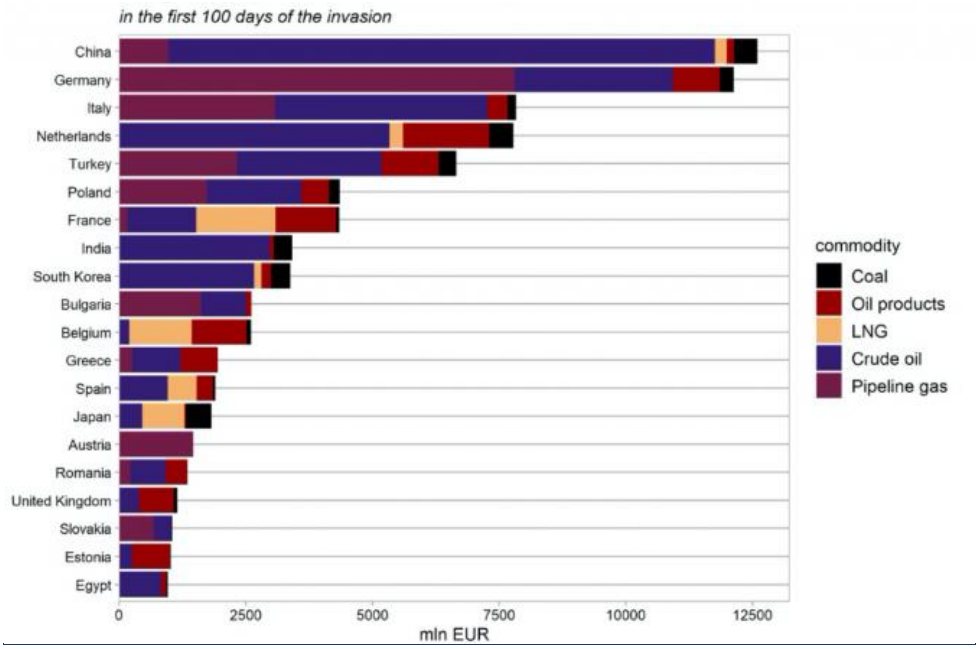


Source: Center for Research on Energy and Clean Air (CREA)

Within 100 days of the onset of the Russia-Ukraine war (24 Feb to 3 Jun-22), Russia has already earned €93b (USD97b) from energy exports, with USD20b in May-22 alone. Oil accounted for 63% of Russia's export revenue in the same period, with gas at 32%, and coal at 5%.

Despite the hefty sanctions and the EU's attempt to extricate itself from Russian energy dependency, according to the Helsinki-based Center for Research on Energy and Clean Air (CREA), the EU imported 61% of Russia's exports, worth €57b. The largest importers were China (€12.6b), Germany (€12.1b), Italy (€7.8b), the Netherlands (€7.8b), Turkey (€6.7b), Poland (€4.4b), France (€4.3b) and India (€3.4b).

Exhibit 20: Importers of fossil fuels from Russia



Source: CREA

The revenue comprises an estimated €46b for crude oil, €24b for pipeline gas, €13b for oil products, €5.1b for LNG and €4.8b for coal, even with a 15% lower sales volume from the time before the Ukraine invasion, as many countries and firms have shunned Russian supplies.

The reduction in demand and the discounted price for Russian oil cost the country approximately 200 million EUR per day in May. However, the increase in fossil demand has created a windfall: Russia's average export prices were 60% higher than last year, even if they were discounted from international prices. The energy revenue earned far exceeded the expense of USD25b that Russia spent on its military in Jan-Apr 2022, according to Russia's finance minister. In 2021, fossil fuel exports alone were worth USD235.6b, making up 45% of Russia's federal budget, according to the IEA.

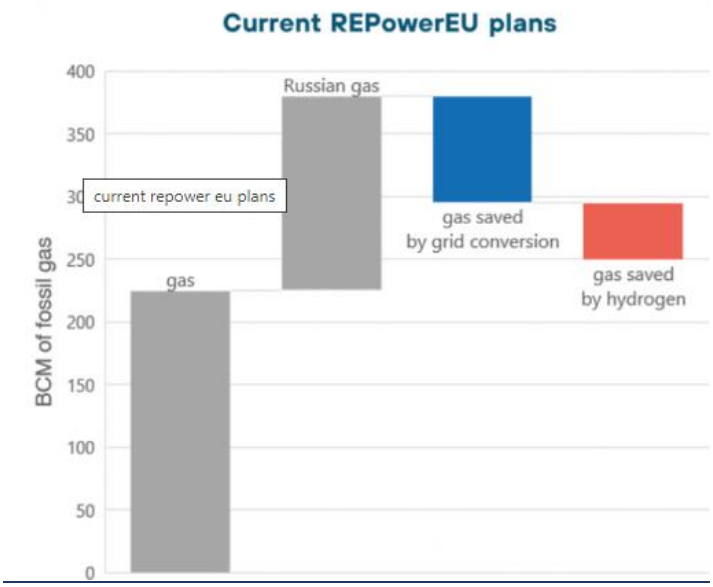
REPowerEU – will it work for this coming winter?

In 2021, the EU imported more than 40% of its total gas consumption, 27% of oil imports and 46% of coal imports, from Russia. Energy represented 62% of the EU's total imports from Russia, and cost €99b. Although it represents a significant drop in comparison with 2011, when energy represented almost 77% of EU imports from Russia (equivalent to €148b), the EU is taking further measures to cut its dependence on Russian energy imports.

On 8 Mar-22, the EC published its REPowerEU plan, outlining measures to drastically reduce Russian gas imports from their 2021 level of 155bcm before the end of 2022 – and reach complete independence from Russian fossil fuels well before the end of the decade. The key elements in this plan are diversifying supplies, reducing demand and ramping up the production of green energy in the EU.

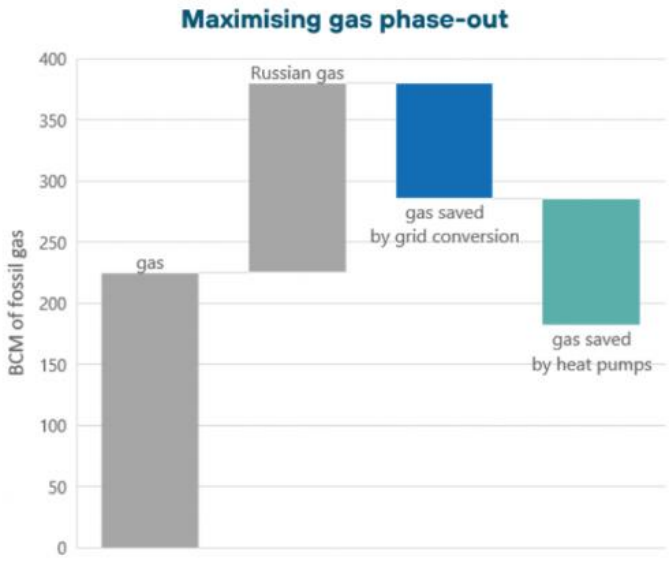
The plan states that diversification of Europe's gas supply could particularly contribute to increasing the resilience of the EU's energy system and strengthening its international partnerships with key gas suppliers. In 2021, 43.5% of the EU's natural gas imports came from Russia, but there were also significant volumes that came from Norway (23.6%), Algeria (12.6%) and the US (6.6%). Most of these imports came through pipelines, but a growing share has come in liquid form, notably from the US, whose LNG exports to the EU have substantially increased since its first shipment in Apr-16.

Exhibit 21: Current REPowerEU plans



Source: Bellona

Exhibit 22: Maximising gas phase-out



Source: Bellona

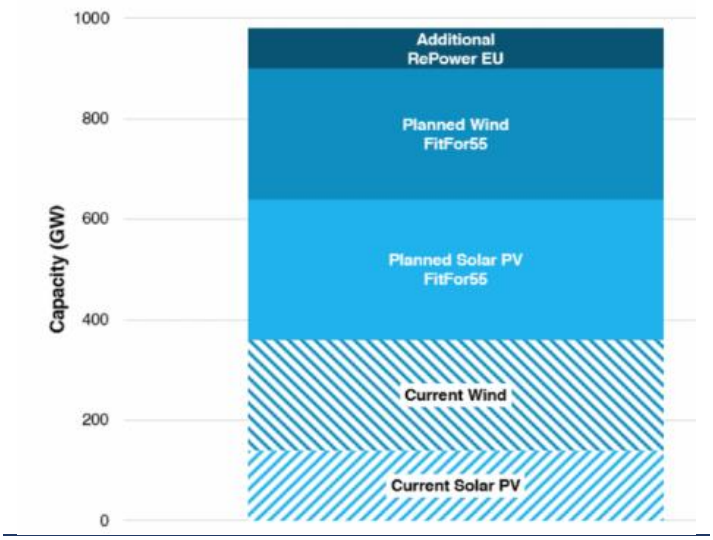
REPowerEU plan to substitute gas with hydrogen. The EC's REPowerEU strategy blames delayed efforts to address the EU's fossil fuel dependency and its short-sighted reaction after the Russian annexation of Crimea in 2014 for the current situation which may lead to a shortage of natural gas. It urges the EU to maximise its efforts and finally move towards both climate goals and energy security.

According to Bellona, an Oslo-based independent non-profit organisation aiming to fight climate change, REPowerEU aims to nearly triple the current installed wind and solar capacity in the EU, reaching 980GW of installed wind and solar photovoltaic (PV) capacity combined. This entails installing 280GW of PV, 260GW of wind and deploying an additional 80GW dedicated to renewable hydrogen production. Overall, this additional capacity will produce more than 1,000TWh of renewable electricity – the combined demand of France and Germany – that the EU will need to decide how to use to maximise its interests.

Key takeaways from REPowerEU:

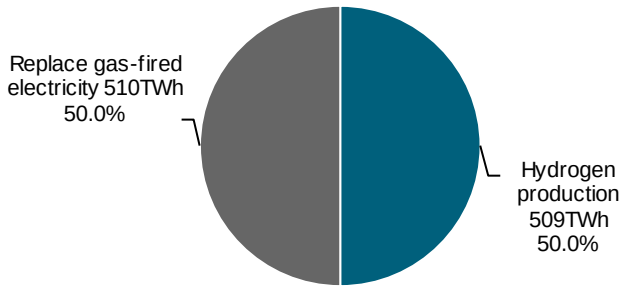
- Using renewable electricity can reduce gas use substantially if used effectively.
- Direct electrification offers the biggest reduction for gas; heat pumps are particularly effective at displacing gas demand.
- Natural gas cannot simply be replaced by hydrogen, given the large amount of renewables needed to displace small amounts of gas.
- Relying on hydrogen will keep the EU dependent on fossil gas in the system.
- A future-proof strategy needs to both drastically reduce dependence on fossil fuels while also deploying hydrogen in no-regret sectors where other decarbonisation pathways don't exist.
- Additional electricity deployed for hydrogen production must be dimensioned on the hydrogen targets: RePowerEU's additional 80 GW of capacity which could be earmarked for hydrogen production would only be enough to produce 2.8mt of hydrogen per year, or just 20% of the proposed Renewable Energy Directive target.

Exhibit 23: Additional renewable capacity under REPowerEU



Source: Bellona

Exhibit 24: Target of current RePowerEU to reduce gas-fired power capacity and generate hydrogen



Source: Bellona

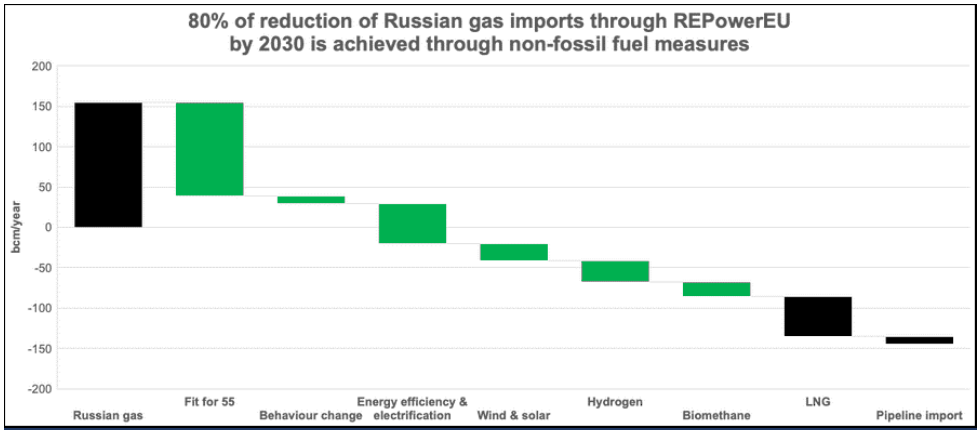
Is REPowerEU an effective plan? According to Bellona's assessment, the current REPowerEU strategy will be ineffective at reducing gas use. By prioritising technologies that are inefficient for displacing gas, the EU is missing the opportunity to free itself from Russian gas quickly and cheaply. At the same time the EU continues to finance the Russian regime through its fossil fuel imports, and Russia has grown even stronger now that the prices of fossil fuels have skyrocketed on rising global supply risks.

Reducing fossil gas dependency will require enormous investments into renewable capacity deployment. How that electricity is used will give very different outcomes in terms of the EU's dependency on Russian gas, and on fossil fuels in general, according to Bellona.

Using 1TWh of electricity to heat homes with heat pumps instead of gas boilers displaces three times more gas than using it to produce hydrogen for electricity production. Switching off gas-fired power plants to power the grid through renewables is also a much more efficient solution than turning this electricity into hydrogen for power production. How effectively the EU uses electricity will determine how easily it can move away from fossil gas dependency in the upcoming decade, added Bellona.

Under the current REPowerEU plan, which prioritises hydrogen production to achieve the EU's target of 10.6mt of hydrogen per year by 2030, half of the newly installed electricity production will go to hydrogen production and the remainder will stay on the grid to substitute the existing demand for fossil gas-fired electricity. This will increase the EU's renewable ambitions only slightly (+80GW). If the increase was to be dedicated to hydrogen production alone, only 2.8mt of hydrogen could be produced.

Exhibit 25: Gas supply reduction target under REPowerEU plan



Source: Financial Analyst

A mixed approach would allow the EU to break free from Russian gas and address hydrogen deployment. Prioritising renewable electricity to decarbonise the electricity grid and power heat pumps, ensures that the gas phase-out is the priority. The 80GW of renewable electricity added under the REPowerEU plan should be dedicated to producing hydrogen, allowing the hydrogen market to start up, but not at the expense of the planned phase-out of Russian gas.

Exhibit 26: REPowerEU to cut EU's dependence on Russian gas

Source: Baltic Wind

The gas price crisis led to the EU's electricity price spike

Even before the Russia-Ukraine war broke out in Feb-22, the Transfer Title Facility (TTF) gas price benchmark contract for the EU market had already spiked by 585% y-y in Dec-21 – an unprecedented surge in the gas price.

The culprits for the gas price spike include:

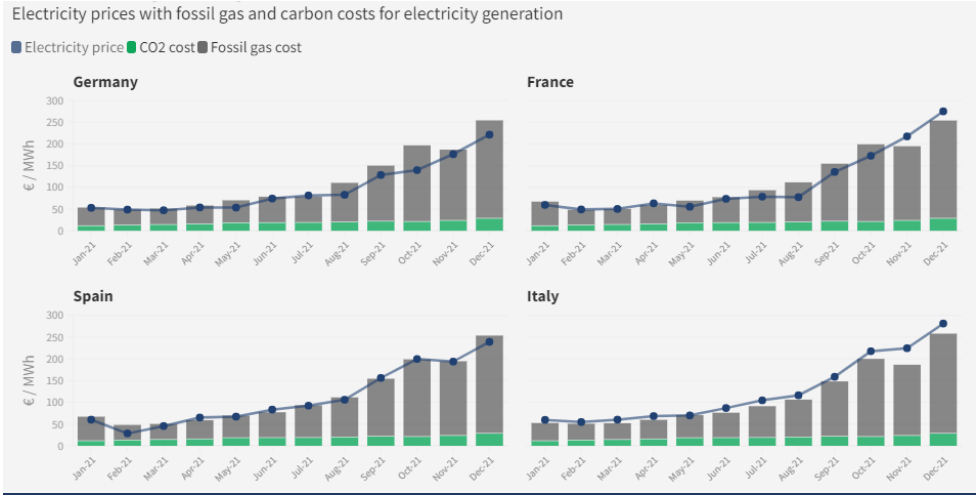
1) a cold Northern Hemisphere winter in early 2021 which depleted the EU's gas storage levels;

2) the increasing demand and higher prices in Asia and South America that drove away the LNG exports from the EU to Asia and South American markets;

3) the strong gas demand in the EU following the full economic reopening; and

4) lower gas imports from Russia.

Exhibit 27: Spikes in gas costs pushed up EU electricity prices



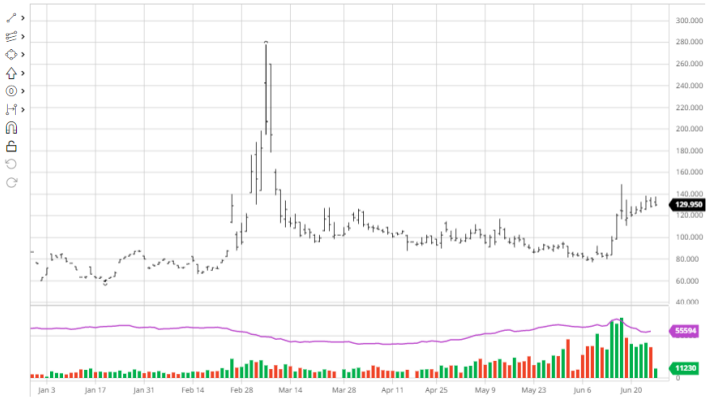
Source: Ember Climate

According to Ember Climate, the cost of electricity generation in the EU was €255/MWh in Dec-21, up almost 7x y-y, which resulted in record high monthly wholesale power prices across the EU: France (€275/MWh); Germany (€221/MWh); Greece (€235/MWh); Italy (€281/MWh); Hungary (€246/MWh); Spain (€239/MWh); and the Netherlands (€238/MWh).

The dramatic increase in the gas cost for electricity generation was overwhelmingly passed on to EU consumers, and worsened by the additional emission charge at €89/tonne in Dec-21. This added €21/MWh to the cost of producing electricity using fossil gas and equated to 10% of the increase in gas generation costs in 2021.

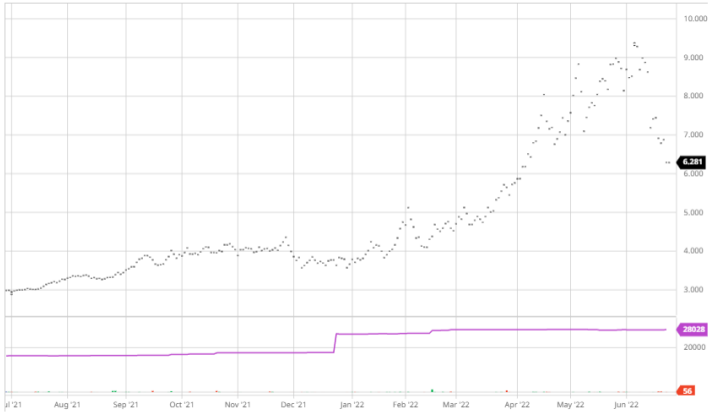
The EU's gas crisis could extend beyond 2023. Current TTF futures indicate that the gas price in the EU is expected to stay above €100/MWh until at least 2023, which implies that gas-fired power generation will remain the most expensive way of generating electricity in the EU, at a higher cost than coal or lignite.

Exhibit 28: TTF gas price benchmark in the EU



Source: Barchart.com

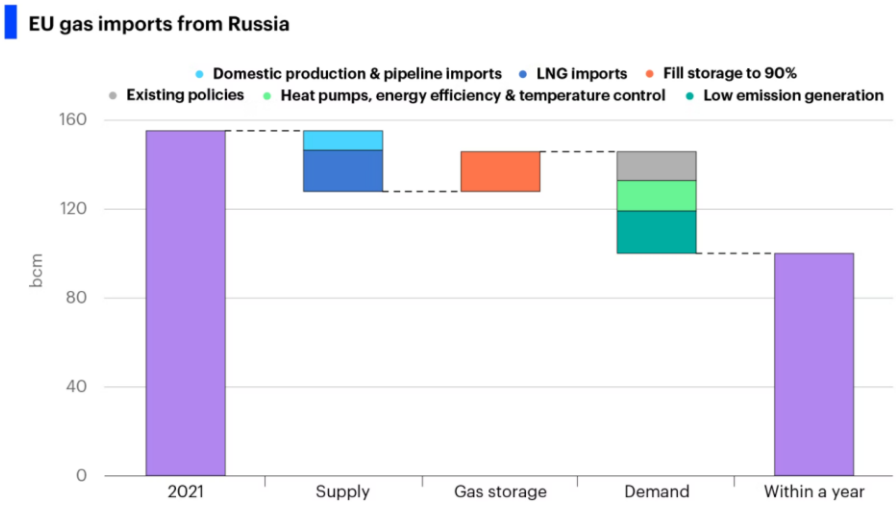
Exhibit 29: Henry Hub gas price benchmark in the US



Source: Barchart.com

We think the challenges facing the EU in terms of gas supply due to the Russia-Ukraine war clearly illustrate that the EU cannot simply rely on increasing supply to replace Russian natural gas volumes. Demand will have to play a role as well. Only a combination of the two can deliver a workable outcome.

Exhibit 30: IEA's 10-point plan to reduce the EU's reliance on Russian gas supplies



Source: IEA

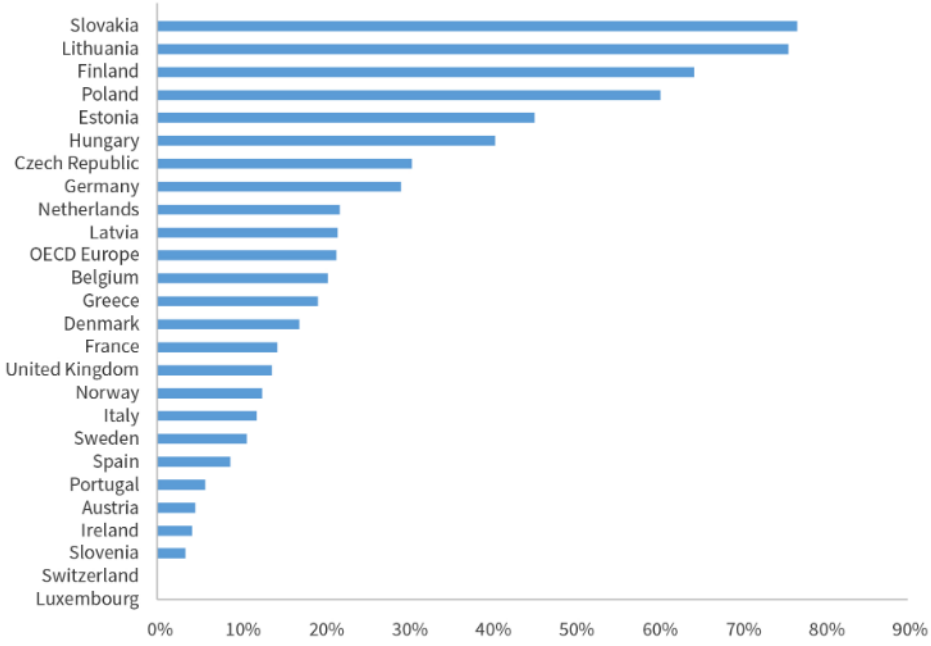
The EU's bold move to partially ban Russian oil imports

On 31 May-22, after several weeks of stalemated negotiations mostly blocked by Hungary, the EU agreed to ban seaborne imports of Russian oil and refined oil products by the end of 2022. In 2021, Russian natural gas exports to the EU amounted to 1,550TWh (123mt LNG) via pipeline and around 120TWh (9.6mt) via LNG. This implies that around 1,700TWh (135.5mt LNG) would have to be replaced should Russia stop its natural gas exports to Europe completely.

Quickly increasing domestic production is only possible at gas fields that have spare capacity. Technically, more gas could be extracted from the Groningen field – but getting a few dozen additional TWhs per year would require the Dutch government to loosen the moratorium that strongly constrains production to prevent earthquakes in the region. In terms of EU natural gas imports, there appears to be significant unused capacity, mostly in France (41% utilisation rate as of Feb-22), Belgium (24%), Italy (50%), and Azerbaijan (62%).

On 8 Jun-22, the EU further imposed a partial embargo on Russian oil and petroleum products, as well as a ban on shipping insurance for oil exports from Russia. In 2021, Russia exported 3.1mbpd of crude oil, natural gas liquids (NGL) and refinery feedstock to the EU, and 1.3mbpd of diesel and other petroleum products. Russia exported 0.75mbpd of crude oil by pipeline and the remainder by tanker (seaborne).

Exhibit 31: Dependence on Russian crude oil and products (% of total imports, monthly average, 2021)



Source: Center for Strategic & International Studies (CSIS)

The EU's most recent round of sanctions is its sixth package, which includes:

1) a ban on all seaborne imports of Russian oil as of Dec-22;

2) a ban on all petroleum products as of Feb-23;

3) pipeline oil and gas imports will be exempted, in a compromise with EU members Hungary, Slovakia, and the Czech Republic, which largely depend on gas imports via the Druzhba pipeline;

4) a ban on all resales of Russian oil and petroleum products to other EU members;

5) allowing Bulgaria to import gas until the end of 2024; and

6) allowing Croatia to import Russian vacuum gas oil until the end of 2023.

The critical part of the sanction package (Article 3n) concerns shipping insurance, which dictates that after a six-month grace period, EU companies are forbidden to provide "technical assistance, brokering services or financing or financial assistance, related to the transport, including through ship-to-ship transfers, to third countries of crude oil or petroleum products" from Russia. The UK is expected to follow suit, according to the Center for Strategic & International Studies (CSIS).

Why is the ban on maritime insurance critical to Russia? Cutting off shipping insurance and reinsurance from the EU and the UK – the hearts of the maritime insurance industry – will hinder Russia's ability to redirect crude oil and petroleum products to other regions. However, the insurance vacuum left by the EU and the UK could be partly filled by insurance companies in Russia, China, India, or other countries.

A potential price cap on Russian oil prices by the G7? According to The Guardian newspaper, on 26 Jun-22, the leaders of the G7: Canada, France, Germany, Italy, Japan, the UK, and the US, have proposed a cap on the price of Russian oil and pipeline gas to slash Russia's fossil revenue and reduce inflationary pressures in countries that are net importers of energy, food, and fertiliser, which ironically, are mainly members of the G7 themselves.

Price caps on Russian oil and pipeline gas by the EU? Twin caps on the price of Russian oil and pipeline gas are being pushed hard by Italy. The gas price cap on Russian gas sold to EU buyers currently has an unspecified price. It is arguable that in the short-term Russia would have no alternative but to sell its pipeline gas at the capped price to EU buyers unless it is prepared to take a huge hit to its revenue by shutting down the pipeline altogether. However, Russia's LNG would be exempted from the price cap policy.

What could happen to the EU if Russia shuts down its pipeline gas supply? Of the G7 nations, Germany is probably the one most uneasy about the price caps, fearing both a bust-up inside the EU over the proposal and that Russia may simply turn off its supplies of gas to Europe. Last week, Russia cut gas flows by 60%, citing delays in maintenance equipment, but the explanation was not regarded as credible within the G7. A cut-off now would leave Europe struggling to build up the gas reserves it needs to survive what could be a difficult winter. EU countries have been directed to fill their gas reserves to a minimum of 80% but they are well short of that.

Could the maritime insurance ban be a weapon to sanction Russian fuel revenue? A price cap would operate by dictating to the quasi-monopoly responsible for insuring Russian oil tankers that they will be sanctioned if they allow oil to be sold above a fixed price. About 95% of the world's tanker liability coverage is arranged through a London-based insurance organisation called the International Group of Protection and Indemnity Clubs, which is subject to European laws.

The US could emerge as the world's largest gas producer by 2023

On 25 Mar-22, the US and EU announced a major deal on LNG in a bid to reduce the EU's reliance on Russian energy. The contracts will see the US provide the EU with extra gas, equivalent to 10% of the EU's gas purchases from Russia.

Since 2021, the US has gained a larger share of Europe's LNG supply at the expense of Qatar and Russia. These three LNG exporters combined account for almost 70% of Europe's total LNG imports, according to the EIA. The US was already Europe's largest LNG supplier in 2021, with a 26% market share of all the LNG imported by EU member countries (EU-27) and the UK, followed by Qatar with 24% and Russia with 20%.

In Jan-22, the US supplied more than half of all of Europe's LNG imports 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 the EU-27 and the UK rose from 3.4bcfd in Nov-21 to 6.5bcfd in Jan-22, the highest-ever 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.

EU's current power portfolio and diversification

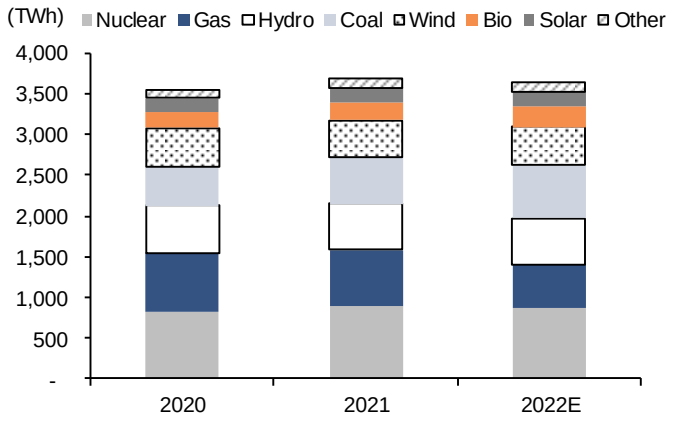
As of 2021, the EU still generated most of the continent's power from gas, estimated to be at least 543TWh in 2022, according to Energy Northern's estimate.

Ironically, the most unloved power generation source – coal-fired – is projected to rise by 11% y-y in 2022, followed by 19% y-y growth in biomass power generation, 6% y-y growth in solar, and 5% y-y in wind. Both nuclear and coal-fired power sources are either dirty (coal-fired) or dangerous (nuclear), but we think the EU has no choice but to rely on these unloved power sources, at least in the short term, to ensure its power and energy security amid the uncertainty around Russia's gas and nuclear power plant sources.

Gas remains a key strategic energy source for the EU in 2022. Undoubtedly, the EU will depend on gas-fired power plants, estimated to account for 15% of total power generation capacity in 2022, according to the EIA, down from 20% in 2020 and 19% in 2021, as the EU diversifies away from gas-fired into more coal-fired power capacity.

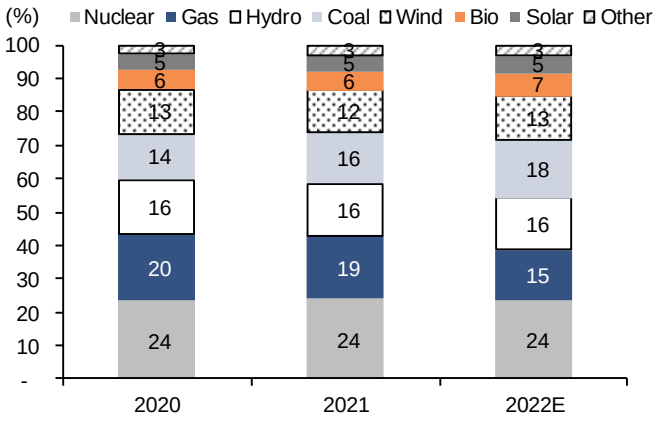
Coal-fired power is here to stay for the EU. Even after many years of strategic de-carbonisation of the European power market, the EU still heavily depends on coal-fired electricity, which should rise to 18% of total capacity from 470TWh in 2021 to 579TWh in 2022, according to Rystad Energy. Gas, hydro and wind power generation dropped in 2021, increasing the pressure on other energy sources, including coal, to bridge the gap.

Exhibit 32: EU power generation breakdown by power plant type (TWh)



Source: Energy Northern

Exhibit 33: EU power generation breakdown by power plant type (%)



Source: Energy Northern

Coal-fired electricity generation has been steadily declining in Europe since 2012, but affordability, and most recently the availability – due to Russia's gas weaponizing strategy – concerns surrounding gas, along with the limitations of nuclear, wind and hydro generation, could maintain coal's momentum in 2022 and beyond.

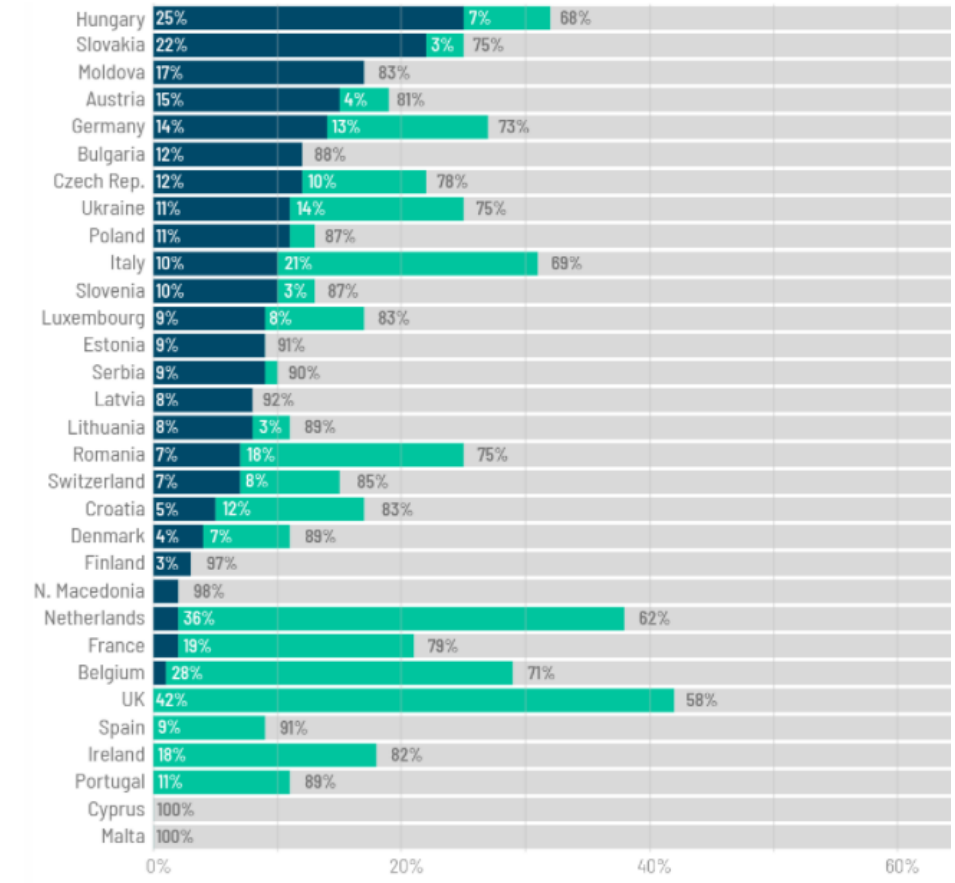
Coal's resurgence last year was triggered by other components of the continental power mix facing new challenges, including record-high gas prices and tensions between Russia and Ukraine, which has raised questions about the long-term security of gas imports through Russian-operated pipelines.

Under the circumstance that the gas price spike is likely to persist due to the military conflict between Russia and Ukraine, coal-fired power generation could jump by an additional 11% in 2022 to 641TWh – a return to the 2018 level – to ensure that the lights stay on across the continent.

A dilemma between greener and safer energy security for Europe. European countries have been gradually decommissioning coal infrastructure in recent years, as the power market moves towards a greener, less carbon-heavy future. However, as the regional energy crisis shows, coal remains a critical component of the power mix, especially when the reliability of other sources of energy is called into question, and that is unlikely to change in the immediate future, according to Rystad Energy.

While a military escalation in Eastern Europe would disrupt Russian gas flows – albeit the extent of which is uncertain – even without any supply disruption, record-high prices are forcing buyers to explore alternatives. Gas prices in Dec-21 hit €182 ($207) per megawatt-hour (MWh), a record high, and a staggering 900% year-over-year increase.

Exhibit 34: Which European countries are most dependent on Russian gas?



Source: CNN

Despite soaring prices, European gas demand from the power sector fell only marginally in 2021, by around 3bcm to 144bcm, as other components of the power mix faced myriad challenges. The continued reliance on gas helped catalyse the widespread energy crisis and sent consumer electricity prices skyrocketing across the continent last year.

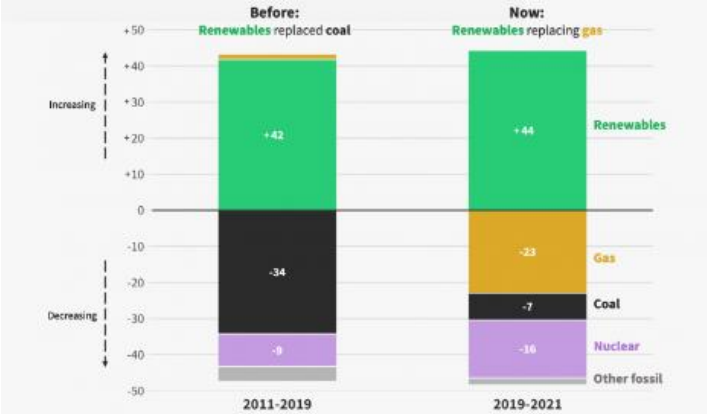
Hydro and wind-generated power fell in 2021 for the first time, helping to support fossil fuel dependency on the back of low wind speeds and hydro dam levels in crucial producing countries. While Rystad Energy projects wind generation to increase marginally in 2022 – from 447TWh to 469TWh – hydro generation is expected to remain low.

Will the gas crisis interrupt the EU's coal exit?

If the EU, its member states and the industry invest in fossil fuels to end their reliance on Russian energy, the decarbonisation process and the energy transition must suffer. The EC indicated that it would also accelerate energy efficiency measures and the deployment of renewables and green hydrogen, but it is difficult to achieve the priority of higher costly LNG import usage to replace the dirty coal at the same time as green energy.

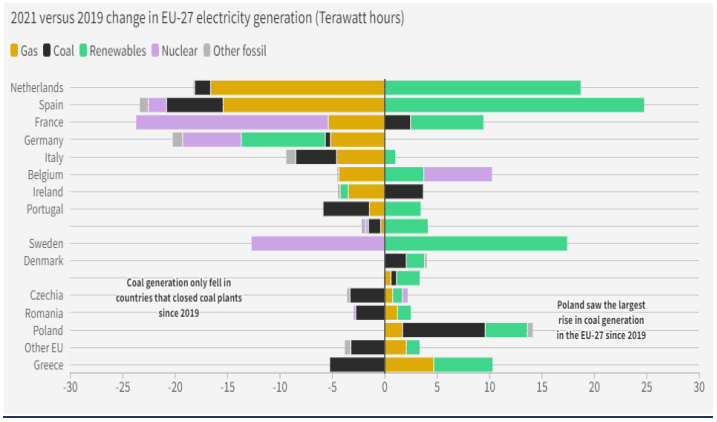
The ongoing energy crisis and the economic fallout from the war in Ukraine are likely making the already sky-high inflation worse, eating away at energy investment potential. The giant Next Generation EU funding plan for the recovery from the pandemic, worth €750b, was already an emergency measure, so it is questionable whether the EU administration and member countries can fund their newest ambitions. Renewable energy industry groups and international organisations have been warning that the rate of green energy investment is much too slow for the EU to meet its 2050 decarbonisation goal and for the world to avoid the worst effects of global warming.

Exhibit 35: Changes in EU-27 electricity generation, annual average in terawatt hours



Source: Ember Climate

Exhibit 36: Renewables mainly replaced gas, not coal, since 2019



Source: Ember's European Electricity Review 2022

Paradigm shift for re-carbonisation? This is an ironic "paradigm shift" for the EU's electricity transition as new renewables are now replacing costly gas, not dirtier coal power in the EU, according to the EIA. Historically, Europe's growing renewables replaced coal power, the most emissions-intensive fuel. However, as a result of soaring gas prices from 2H21 to date, new renewables replaced fossil gas instead, and the interruption of the EU's coal phase-out slowed emission reductions. With market prices indicating that the gas crisis will continue for at least the next two years, Europe's climate goals could be at risk if countries fail to step up renewables deployment and legislate to close coal plants.

Since 2019, around 52% of new renewable power generation in the EU has replaced gas power, and a third replaced nuclear, while only a sixth replaced coal power, according to Ember Climate. The trend has clearly shifted from the past, when over 80% of new renewables replaced coal power during 2011-19.

In 2020-21, coal-fired power capacity only declined in countries that closed coal power plants like Spain (-42%) and Greece (-43%), but this was mostly offset by increases in Poland (+7%). The increased nuclear outages and plant closures also reduced the extent to which coal generation fell in the EU.

Emissions fell only at 50% of the 1.5°C target in 2019-21. Even before the Russia-Ukraine war sparked an energy crisis, EU power sector emissions declined at less than half of the rate required for reaching the 1.5°C target, indicating that the shift from fossil fuels to clean power is not moving fast enough. Coal, the dirtiest fuel, has declined just 3% since 2019, compared to a 29% drop in 2017-18. Fossil fuels still accounted for 37% of EU electricity production in 2021, down from 39% in 2019, while renewables generated 37% and nuclear generated 26%, according to the EIA.

Coal-fired electricity generation has been steadily declining in Europe since 2012, but affordability, and most recently the availability issue, could maintain coal's momentum in 2022 and beyond. Coal's resurgence last year was triggered by other components of the continental power mix facing new challenges, including record-high gas prices and tensions between Russia and Ukraine, which has raised questions about the long-term security of gas imports through Russian-operated pipelines.

If the gas price spike is likely to persist due to the Russia-Ukraine war, coal-fired power generation could jump by an additional 11% in 2022 to 641TWh – a return to the 2018 level – to ensure that the lights stay on across the continent.

Will LNG and non-Russian gas pipelines be able to rescue Europe from a shortfall of gas from Russia? Compared to an import capacity of around 151.5mtpa (1,900TWh), the EU only imported 58.2mt (730TWh) of LNG in 2021. Hence, Europe's regasification terminals would be able to handle 87.7mtpa (1,100TWh) of additional LNG imports into the EU.

As for pipelines, in 2021 the EU had unused import capacities of 200TWh from Norway, 400TWh from North Africa and 50TWh from Azerbaijan – a total of 650TWh – leaving the EU with a spare import capacity of 1,800TWh from alternative suppliers. This could, theoretically, allow the EU to replace Russian flows entirely (amounting to 1,700TWh in 2021, of which some is LNG).

Moreover, additional capacity is available from the UK, with two connecting pipelines offering approximately another 400TWh per annum, but this would depend on the UK importing levels significantly above its domestic demand.

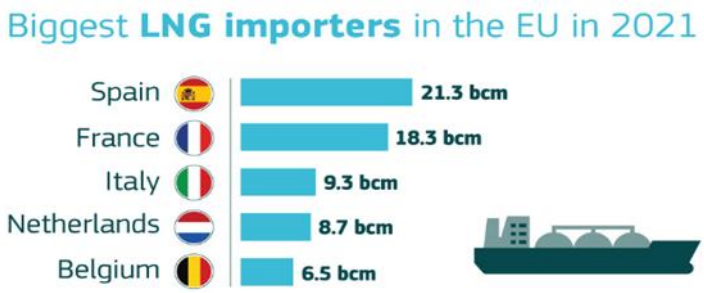
Exhibit 37: European LNG infrastructure

Source: European Commission

Over the last decade, the EU has invested significant amounts in LNG infrastructure, with more than 20 large-scale terminals now in operation and connected to the grid, and more under construction. Further accelerating the upgrade and extension of LNG infrastructure and diversifying sources and routes of pipeline gas are therefore a priority to make the EU energy system more resilient. The EU is prioritising the assessment of measures and investments that might be needed to overcome bottlenecks to the full use of the EU's LNG capacity.

Two weeks after the EC outlined the RePowerEU plan, the US committed to increasing its LNG export volumes for the EU market with an additional 15bcm this year, and up to 50bcm annually by 2030. The EU is also closely working with energy partners such as Norway, Japan, South Korea and Qatar to address the current challenges in energy markets worldwide, and to further develop their cooperation on LNG.

Exhibit 38: EU LNG importers in 2021



Source: European Commission (EC)

Gas storage is critically important to the EU's gas supply for the coming winter. Gas storage facilities are another element of the EU's security of supply as they provide back-up volumes in case of strong demand or supply disruptions. They account for between 25% and 30% of the gas consumed in winter. In short, storage reduces the need to import additional gas during the heating season.

Following Russian's invasion of Ukraine, the Gas Coordination Group estimated that the biggest threat to security of supply would come from the failure to restock gas storage facilities ahead of next winter.

To address this, the EC proposed on 23 Mar-22 an amendment to the Security of Gas Supply Regulation to include measures to deal with energy market imbalances, ensure ample gas storage in the EU, and enhance the resilience of the EU's energy system. This proposal includes a requirement for EU countries to ensure that the storage infrastructures in their territories are filled up to at least 90% of their capacity by the first of November each year, and to 80% in 2022.

Divergence: Russian crude to Asia, African and US crudes to the EU

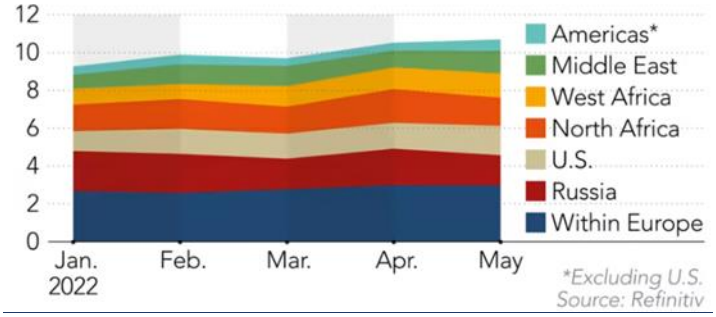
Russian oil for Asia vs US and African oils for the EU. According to Nikkei Asia, the EU has increased its oil imports from Western Africa – led by Angola, Nigeria, Cameroon, and Gabon – and the US and the Middle East, notably Iraq and Saudi Arabia, heralding a shift that its 27 member countries will have to comply with in 2022. In May, the EU agreed to ban seaborne crude imports from Russia by the end of 2022 to increase pressure on the Russian economy.

Since many European refineries are designed to process Urals crude, the most similar substitutes will come from Saudi Arabia and Iraq, thereby likely expanding the market shares of the EU's oil imports for Saudi Arabia and Iraq.

Exhibit 39: Price difference between Brent and Urals crude (USD/bbl)

Source: Nikkei Asia

Exhibit 40: Europe increased oil imports from Africa, the US, and the Middle East to replace Russian oil (mbpd)



Source: Nikkei Asia

According to Nikkei Asia, China and India have significantly raised their Russian oil imports, which is greatly reshaping the global oil trade. However, the ability of Asia to replace the crude sales lost to European buyers remains to be seen as EU countries continue to wind down their oil imports from Russia.

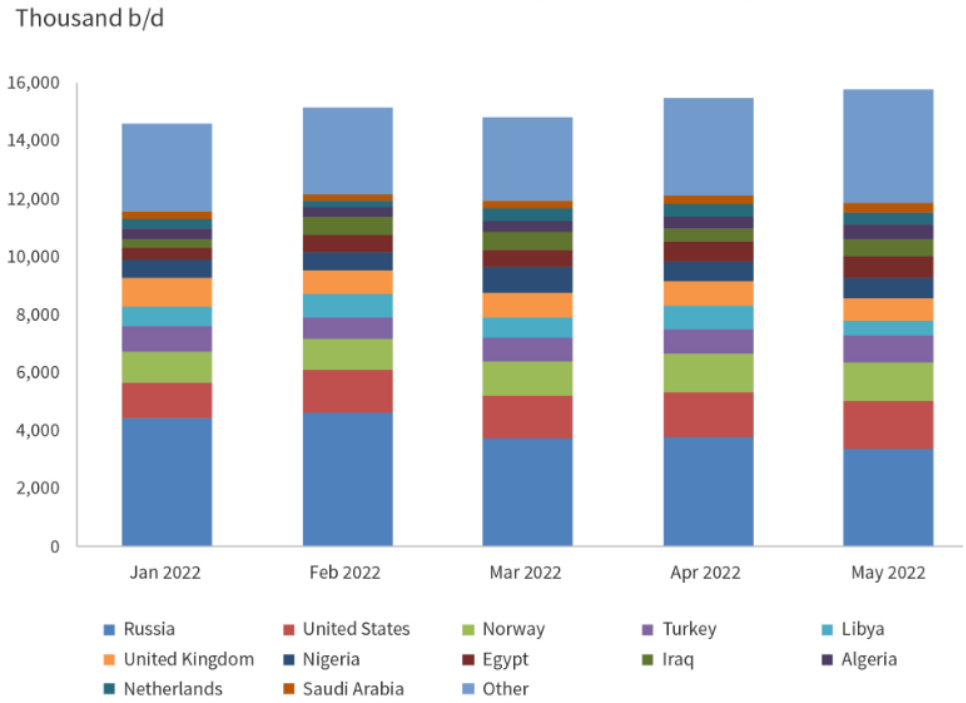
From 24 Feb to Jun-22, a total of 290 oil tankers departed Russia for Asia, up by 100 tankers y-y, according to Nikkei Asia. India, China, and Turkey recorded the largest oil purchase increases, aggregately up almost 8x for India, 70% y-y for China, and 54% y-y for Turkey.

According to CSIS, the drop in Russian exports in the past two months has been lower than expected. Even as more oil and gas majors and commodity traders have stopped lifting Russian cargoes, the country has been able to sell more volumes to Asia, particularly India.

Rising EU imports of Russian crude oils and petroleum products in 2H22?
Because there is a phase-in period before the sanctions take place, it is possible that Russian oil exports to Europe will increase in the next six to eight months before the trade becomes illegal. Refiners may have incentives to ramp up imports from Russia – possibly at discounted prices – to build inventories. There are some parallels to the natural gas market. Russian gas flows to Europe actually rose earlier this spring, as countries sought to avoid risks related to currency exchange and payments, and to fill inventories ahead of next winter.

Russia's oil production rose by 0.3mbpd in May. After a 1mbpd fall to 9.14mbpd in April, far below its quota of 10.44mbpd under the OPEC+ crude production agreement, Russia's oil production is now back with a vengeance, rising by 0.3mbpd in May and likely to rise further in June, according to the Russian deputy prime minister.

Exhibit 41: OECD EU: crude oil and product imports by country



Source: CSIS

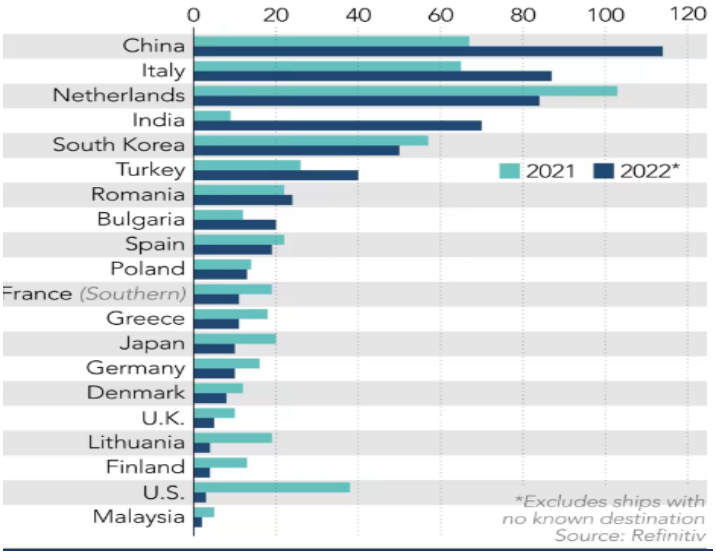
China's oil imports from Russia hit a record high in May-22. According to Reuters, China's crude oil imports from Russia soared 55% y-y to a record high in May-22, displacing Saudi Arabia as the top oil supplier for China, as Chinese refiners cashed in on discounted supplies amid sanctions on Russia for its Ukraine invasion. China's oil imports from Russia, including supplies pumped via the East Siberia Pacific Ocean pipeline and seaborne shipments from Russia's European and Far Eastern ports, totalled around 1.98mbpd (8.4m tonnes), up from 1.59mbpd in April, according to data from the Chinese General Administration of Customs.

While China's overall crude oil demand has been dampened by Covid-19 curbs and a slowing economy, leading oil refiners including Sinopec have raised their crude purchases from Russia on top of the sanctioned supplies from Iran and Venezuela that allows both Iran and Venezuela to scale back competition against the oil producers in West Africa and Brazil. Russia is now the top-ranking oil supplier to China after a 19-month gap, indicating that Russia is able to find buyers for its oil despite Western sanctions, even at the deeply discounted prices.

Exhibit 42: China, India, and Turkey are three major crude buyers of Russian oil YTD

Source: Nikkei Asia

Exhibit 43: Seaborne oil imports from Russia by destination (number of ships departing Russia, Jan to 2 Jun-22)



Source: Nikkei Asia

Are Russian oil flows to Asia sustainable and sufficient to replace EU demand? The key question is whether EU sanctions will force Russian oil off the market or simply redirect it to other regions. Russia aims to reorient its oil and gas exports from Europe to Asia, principally India and China. So far, it has been relatively successful.

India may have imported nearly 0.8mbpd from Russia in May and could buy even more this month from an extremely low base last year. India depends heavily on oil imports to meet domestic demand, and as a price-sensitive buyer, it has taken advantage of deeply discounted volumes from Russia.

Russia has been forced to offer cargoes of Urals blend at USD30-35 per barrel below Brent crude oil prices. Russian oil exports to China have also picked up, with China importing up to 1.1mbpd in seaborne volumes in May, compared with a monthly average of around 0.8mbpd in May-21. Sinopec, Zhenhua Oil, and others appear to be ramping up purchases of Russian crude oil, particularly Russia's ESPO blend.

There are limits to how much India and China can absorb, and Russia may not be able to redirect all the roughly 1.6mbpd in seaborne exports that it previously sent to Europe. But Russian exports have proven resilient in recent months, and there is good reason to believe that Indian and Chinese buyers will take advantage of the opportunity to secure discounted crude oil from Russia at a time of high prices.

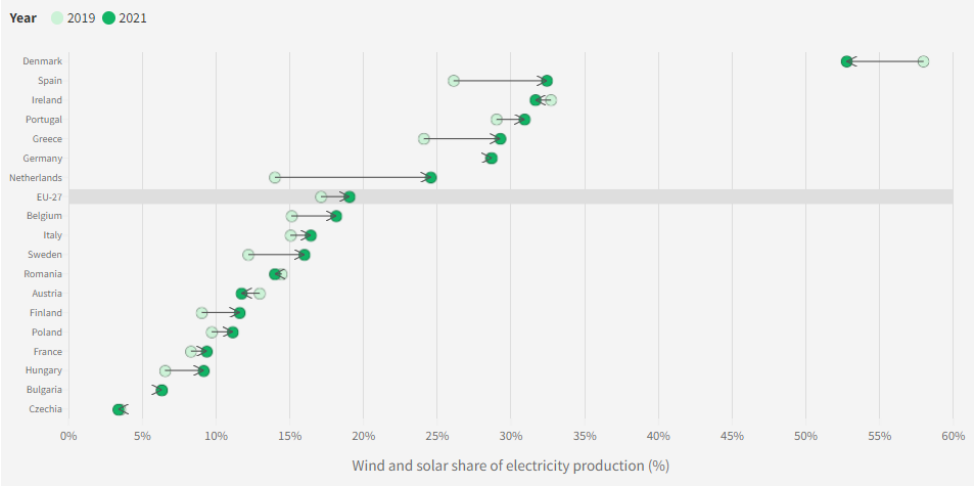
Can renewable energy rescue the EU?

Although new wind and solar capacity has grown by 1% y-y to 1,068TWh and 9% (+88TWh) from 2019, and has predominantly replaced fossil gas, some countries have managed to decrease their coal consumption. Coal power output in Spain has almost halved since 2019, following the closure of 6.5GW of coal capacity – over half of the fleet – in the last two years.

It is a similar story across the other countries where coal has fallen – the declines have mostly been driven by coal plant closures. In the last two years, Czechia, Greece, Italy, Romania and Portugal all retired about 1-2GW each (including power plants retired at the end of 2019). The closures in Portugal made it only the 4th country to go completely coal-free.

However, the impact of coal closures in some countries was mostly offset by the increased use of existing coal power stations elsewhere in the EU. Most notably, Poland's coal power output has increased 7% (+8TWh) since 2019, as local production increased to meet higher import demand from its EU neighbours. Poland even became a net exporter of electricity in Aug-21 after 53 continuous months of imports. Ireland's coal power output also increased sharply as coal replaced gas, which was exacerbated by a string of gas plant outages.

Exhibit 44: The EU's wind and solar leaders and laggards



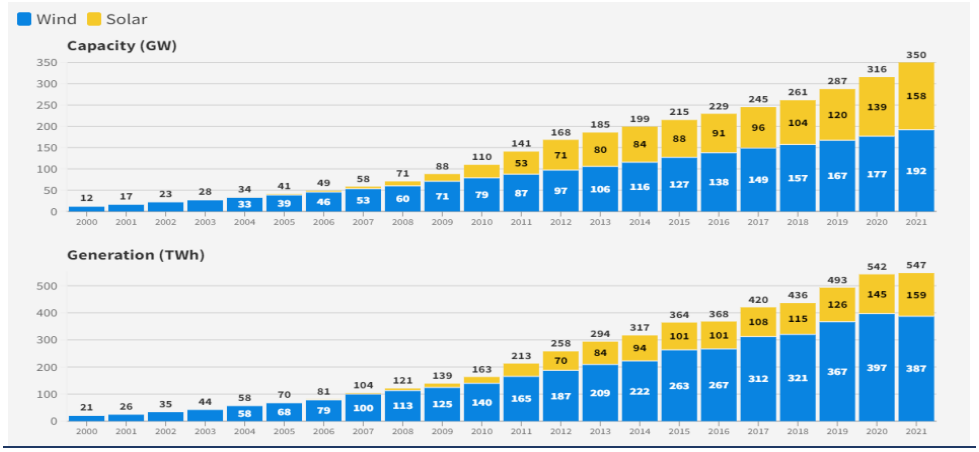
Source: Ember's European Electricity Review 2022

The EU's renewable leaders and laggards. According to Ember's European Electricity Review 2022, Spain, the Netherlands and Greece have become the new engines of EU wind and solar power growth. In each country, the wind and solar market share grew by about 10 ppts in just three years, after minimal growth in the previous three years.

Wind and solar provided a third of Spain's electricity in 2021, and at least a quarter in the Netherlands and Greece. Together these countries have been responsible for over half of all growth in wind and solar output in the EU since 2019, despite accounting for just 16% of electricity demand.

Wind and solar growth in these countries is being driven by supportive policy frameworks, falling costs and ambitious targets. Both Spain and the Netherlands plan to provide about two-thirds of their electricity from wind and solar by 2030, with Greece targeting 50%. This is in sharp contrast to countries such as Poland and Italy, where renewables are still not expanding fast enough, or countries such as Bulgaria, Czechia and Romania which have failed to deploy almost any wind and solar.

Exhibit 45: EU-27 wind and solar power capacity growth acceleration



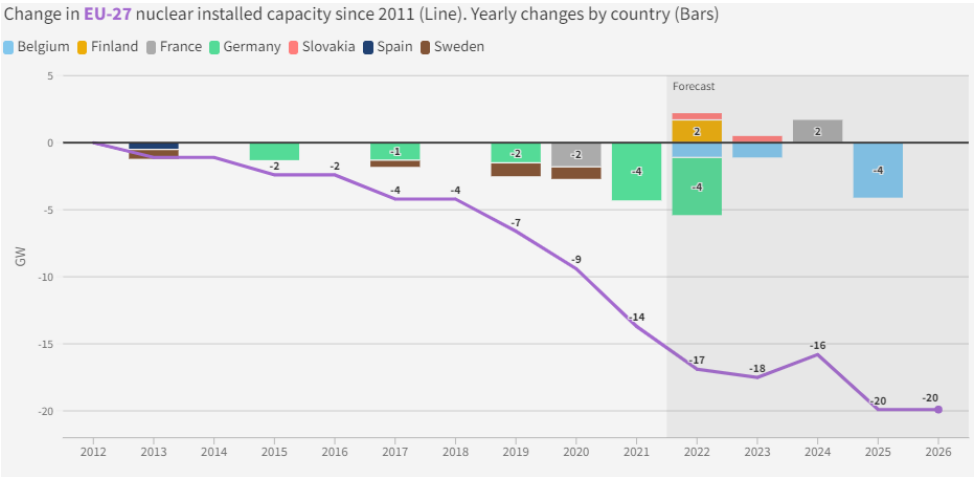
Source: Ember's European Electricity Review 2022

Will nuclear remain an option for solving the EU's energy crisis?

In 2021, nuclear power stations in the EU produced 733TWh of electricity. This was 7% (+47TWh) more than in 2020 as French and Belgian power plant availability improved. However, nuclear output remained 4% lower (-32TWh) than in 2019, primarily caused by the planned closure of nuclear reactors. Nuclear accounted for 26% of the EU's electricity production in 2021, down from 29% 10 years ago.

The declines in nuclear power output since 2019 were led by France (-18TWh), Sweden (-13TWh) and Germany (-6TWh). All three countries have closed at least 1.8 GW of nuclear capacity since the end of 2019. This was only partially offset by improved output in Belgium (+7TWh).

Exhibit 46: EU nuclear power capacity is set to further decline

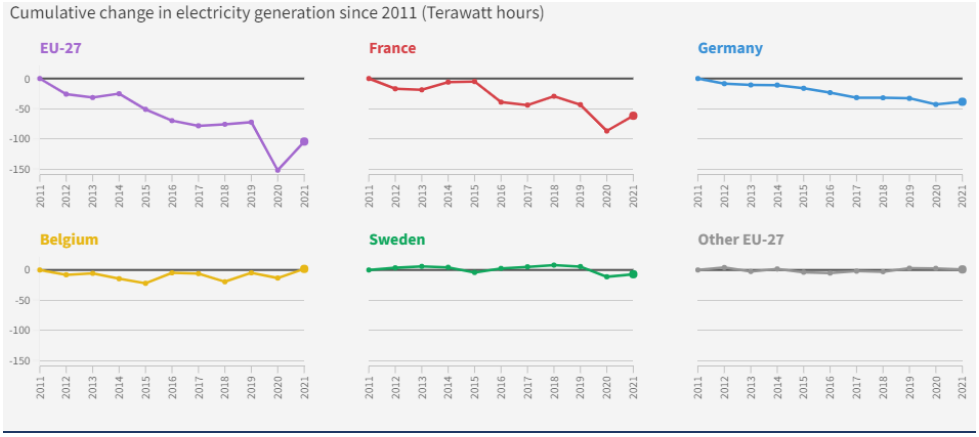


Source: Ember's European Electricity Review 2022

The long-term, structural decline of nuclear power in the EU has slowed power sector decarbonisation. Some of the growth in renewables output is needed to replace lost nuclear output, slowing down the replacement of fossil fuels. This “re-carbonisation” trend looks set to accelerate in the short term given the EU’s energy crisis which could become disastrous if Russia completely cuts off its energy supplies in the coming winter, leaving Europeans to freeze in the dark.

The structural decline of nuclear power output has slowed emissions reductions in the EU power system. The last decade has seen rapid growth in wind and solar (+334TWh), while EU nuclear power output has declined by 105TWh. Consequently, almost a third of wind and solar power growth in the last decade has replaced lost nuclear output, rather than fossil fuels, which has slowed decarbonisation efforts, according to Ember.

Exhibit 47: Structural decline of nuclear power in the EU-27 since 2011

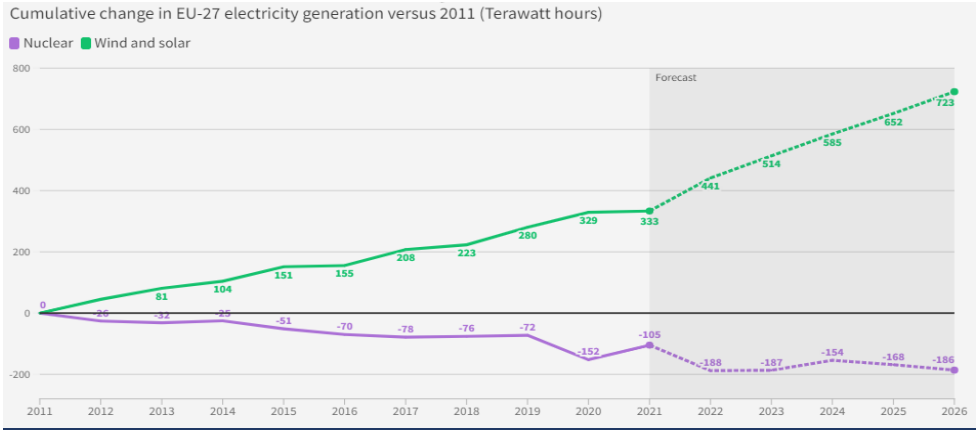


Source: Ember’s European Electricity Review 2022

The declining trend of nuclear power in the EU looks set to continue in the next five years. At the end of 2021, half of the remaining nuclear reactors in Germany were closed (4GW), and the rest will close at the end of 2022. In Dec-21, the Belgian government agreed in principle to close its nuclear power plants (6GW) by 2025, with reactor shutdowns beginning this year. Furthermore, French nuclear output looks set to fall sharply in 2022, by an estimated 50TWh as extended outages at five reactors were announced after faults were detected. The losses will be only partially offset by new reactors starting operations in Finland, Slovakia and France in the coming years.

If nuclear remains in structural decline and the danger of fossil fuel shortfalls from Russia loom due to sanctions, policy makers will need to ensure that wind and solar deployment plans and further efficiency measures are sufficiently ambitious to both replace lost nuclear output and phase out fossil fuels at the speed required to stay on track for 1.5°C.

Exhibit 48: Structural decline of nuclear is slowing down power sector decarbonisation



Source: Ember’s European Electricity Review 2022

Oil price likely to hit USD150/bbl by the end of 2022

Amid the increasingly intensifying political conflict between Russia, one of the world's largest producers of oil, gas, coal, wheat, and fertilisers, and the US and EU, we believe the prices of oil, gas, and coal, are likely to stay higher for longer in 2H22 into 2023, based on:

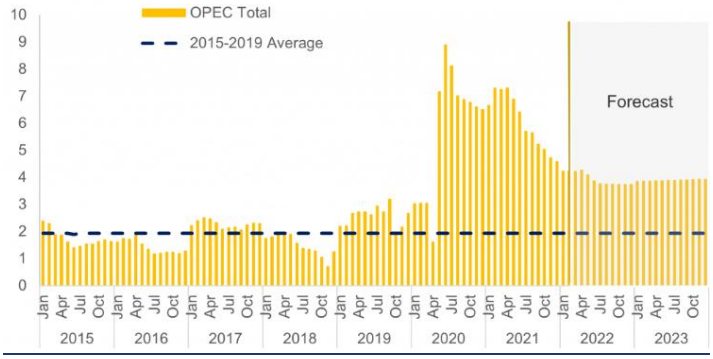
1) The Russia-Ukraine war is likely to drag on into 2023, thereby further tightening global supplies of oil, gas, and coal, as the EU and US tighten their sanctions on Russia's fossil fuel trade, which has been a key source of Russian revenue YTD. Hence, any spare oil production capacity from Russia is unlikely to be released under the sanctions by the US and the EU. As of Jun-22, Russian oil production was still down by over 1mbpd from its average level in 2021 before the Russia-Ukraine war began.

2) The lower spare capacity of oil globally, which is estimated to be 5.9mbpd in 2Q22, according to the EIA. This is based on Iran remaining under sanctions, shut-in crude capacity being excluded, and the OPEC+ oil production cut being phased out by Sep-22.

3) The 432kbpd oil production increase announced by OPEC+ on 5 May-22 to raise the group's monthly oil production in Jul-Oct 2022 is unlikely to be achieved, as most OPEC+ members are already unable to raise output as a result of a lack of investment or internal disruptions.

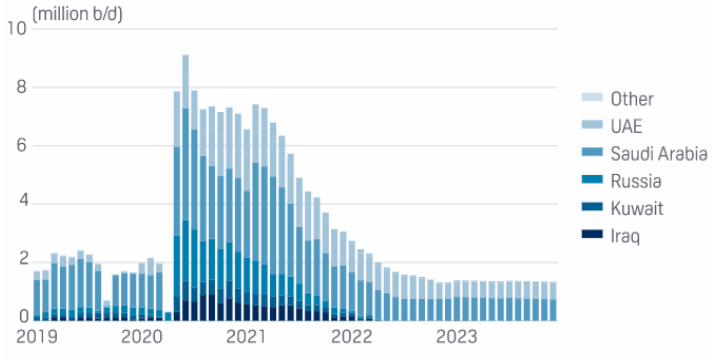
4) Only Saudi Arabia and the UAE, who are keen to keep Russia within the OPEC+ fold despite the global opprobrium over its Ukraine invasion, hold significant spare production capacity, which we believe is still insufficient to fully substitute for the expected Russian output declines.

Exhibit 49: OPEC spare capacity as of Oct-21



Source: EIA

Exhibit 50: OPEC+ spare capacity as of Jun-22



Source: S&P Global Commodity Insight

NOPEC threat from the US against OPEC. According to the EIA, the US senate panel is set to approve the latest draft of NOPEC registrations that would allow lawsuits to be filed against OPEC for collusion and antitrust violations.

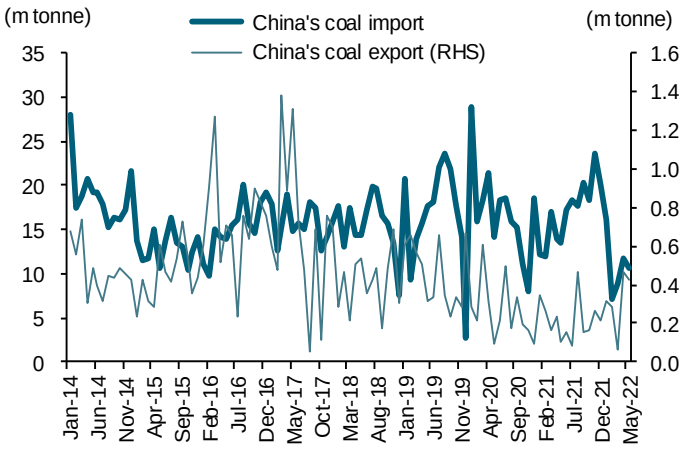
The US is also leading the IEA-coordinated release of 240mbbl from its strategic oil reserve, which will be hitting the market in Jun-Oct 2022. OPEC+ officials continue to shrug off the threat of NOPEC legislation as the group believes that their current management of the oil production increase to match global demand has been effective at balancing the global demand-supply fundamentals.

Coal: USD500/t Newcastle coal price index likely in 2022

We believe coal will be the most attractive, yet unloved, commodity in 2022-23, and that its price is likely to stay higher for longer in 2H22-23, based on:

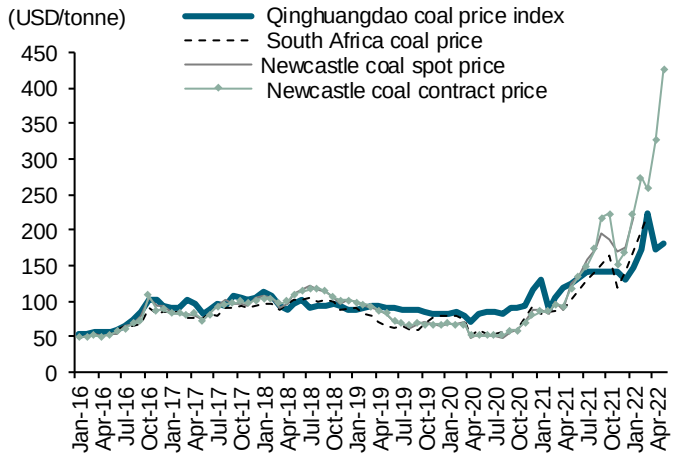
Rising demand for coal from China. Despite a sharp drop in coal imports by China in 4M22 to a mere 5% of the 2021 amount, the Newcastle coal price index (NCT) has risen to a record high of over USD400/t while China's coal price benchmark Qinghuangdao (QHD) has been relatively stable at USD180-200/t, resulting in a much wider price gap between QHD and NCT of over USD80/t in May-22 after China's government restricted coal import amounts as it attempted to boost domestic coal production.

Exhibit 51: China's coal imports plunged sharply in 2022



Source: Bloomberg

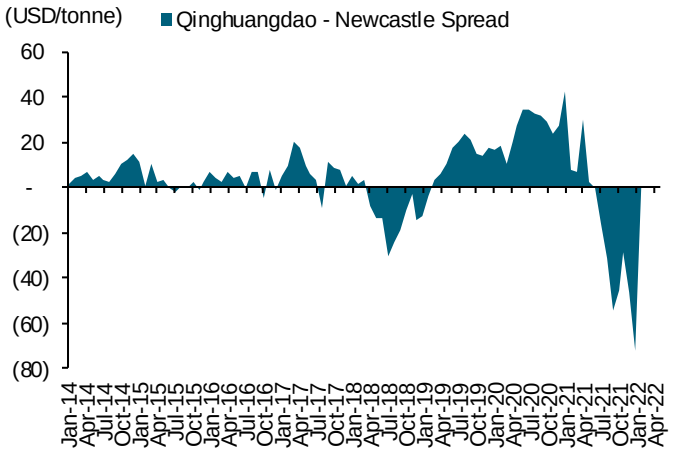
Exhibit 52: Coal price index comparison – Qinghuangdao, Richard Bay, and Newcastle



Source: Bloomberg

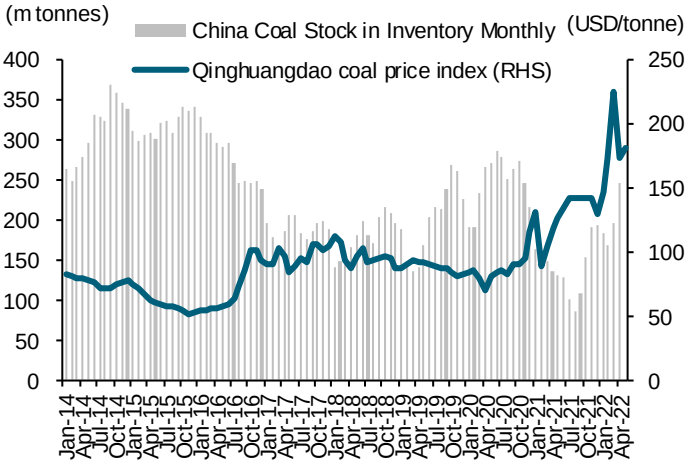
With the coal production increase, China's coal inventory has gradually risen from its bottom in 4Q21, when the country faced power crunches in many regions, to close to its 9-year average at 250mt in Apr-22, based on Bloomberg's data.

Exhibit 53: The price gap between China's QHD and Newcastle coal price indexes



Source: Bloomberg

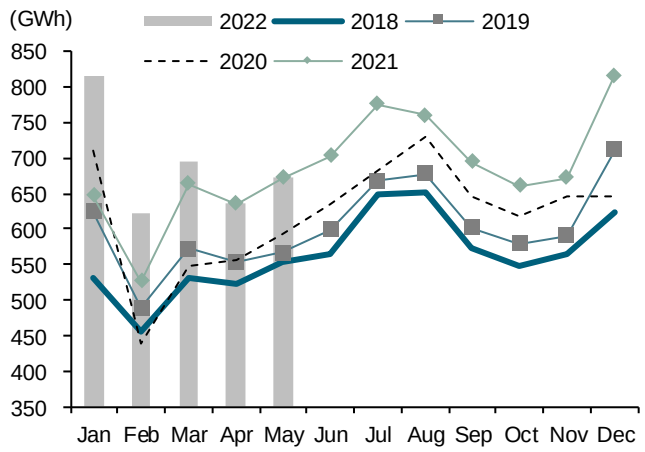
Exhibit 54: China's coal inventory has gradually risen YTD



Source: Bloomberg

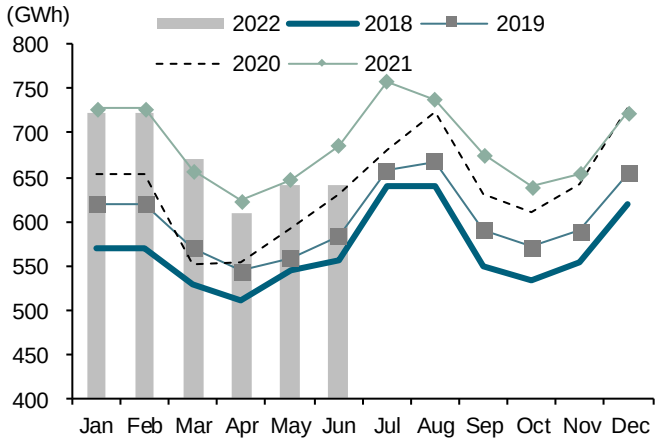
China's coal demand, mainly for electricity generation, has remained high despite multiple lockdowns in many major areas under its zero Covid-19 policy. Hence, we believe the reopening of China's economy in 2H22 should lead to higher demand for coal used for electricity production, particularly during the coming winter.

Exhibit 55: China's thermal power generation



Source: Bloomberg

Exhibit 56: China's total power generation



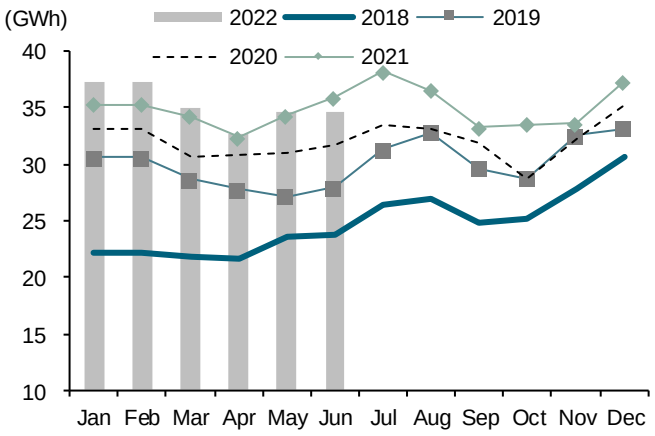
Source: Bloomberg

In China, the spot price for 5,500 NAR has been corrected down to USD187.5/t FOB Qinhuangdao. The decrease in steam coal quotations on the Chinese domestic market resulted from the production growth in key Chinese coal mining provinces as well as price restrictions introduced by the government, according to China's National Development Regulatory Commission.

In addition, a significant deterioration in weather conditions, including floods in the central and southern regions of the country, had a negative impact on the recovery of economic and industrial activity in China.

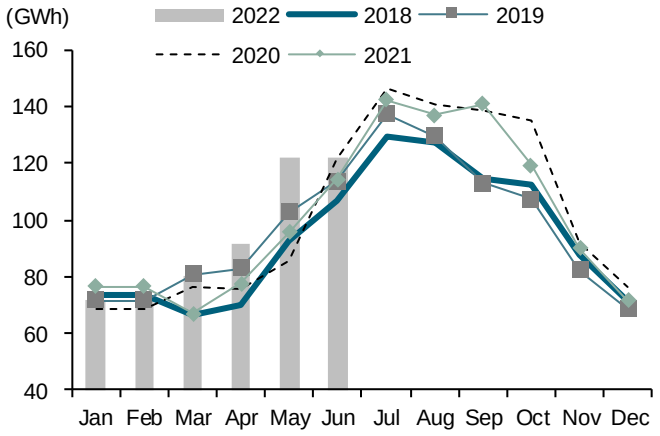
Since the start of 2022, Chinese authorities have approved the construction of 28 new coal-fired power plants with a capacity of 37GW, compared to 33GW in 2021. The new capacity, expected to be commissioned in 2024, is estimated to consume at least 74mt of coal per year. China currently has about 1,000GW of coal-fired power plant capacity.

Exhibit 57: China's nuclear power generation



Source: Bloomberg

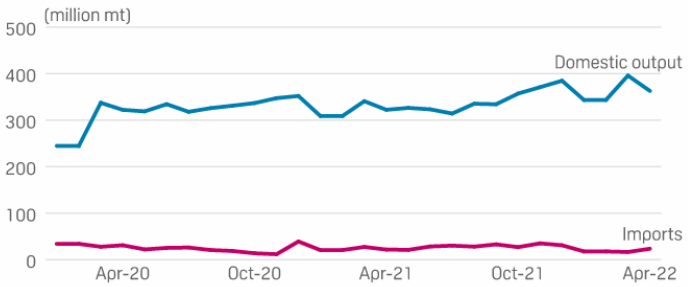
Exhibit 58: China's hydropower generation



Source: Bloomberg

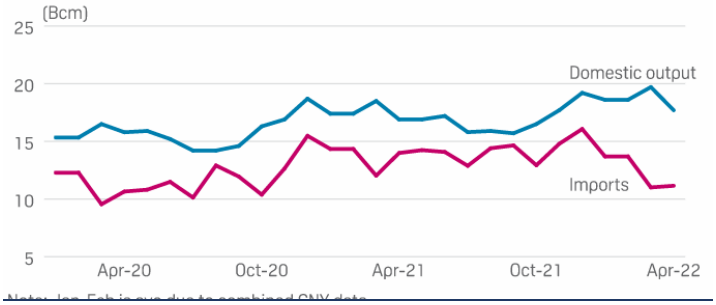
China has ramped up its coal production to reduce not only imports of coal but also LNG as a result of high global prices. According to China's National Bureau of Statistics and General Administration of Customs, China's coal output has risen to 380-400mt per month, up from the 350mt average in 2021.

Exhibit 59: China's domestic coal output on the rise



Source: China's National Bureau of Statistics and General Administration of Customs

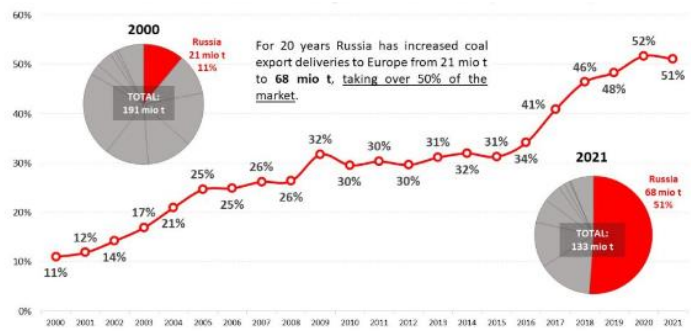
Exhibit 60: China's natural gas imports shrink YTD on higher prices



Source: China's National Bureau of Statistics and General Administration of Customs

Russia's declining coal supply. As a result of EU sanctions, Russia's coal exports declined in 2022. In 2021, the EU imported 68mt of coal from Russia, up from 41.5mt in 2020 but still lower than the peak level of 68.7mt in 2018. Coal prices in Europe again surpassed the historic high of USD417/t in early Mar-22. Gas prices rose 15% to USD1,385/1,000m3 (+USD185/1,000m3 w-w). German Minister for Economic Affairs and Climate Protection Robert Habeck acknowledged that the situation with the country's winter gas reserves remain critical and called for gas conservation measures and the extended use of coal.

Exhibit 61: Russia's coal export share to the EU (68mt in 2021)



Source: Statista 2022

Exhibit 62: Australia's energy market

Source: EIA

Germany is poised to restart its coal-fired power plants in 2H22. In response to this situation, on 8 Jul-22, Germany will vote on a bill to restart coal-fired power plants with a combined capacity of 10GW. At the same time, Gazprom is not expected to enhance its supplies via Nord Stream 1, after Siemens cited anti-Russian sanctions as the reason it was still unable to return a turbine to Gazprom after it was repaired in Canada.

The EU's return to coal-fired power could boost coal demand in 2H22-23. Over the past week, in the European market there was significant growth in quotations of thermal coal above USD420/t amid the ongoing rise in prices for electricity and gas, caused by reduced Russian supplies as a result of scheduled and unplanned outages of the Nord Stream 1 pipeline. Another driver of growth in coal indices was the plan by European countries to intensify the use of coal-fired generation. Also, the load on thermal power plants increased due to weather conditions in Central Europe, where temperatures exceeded 40°C on 18-19 June.

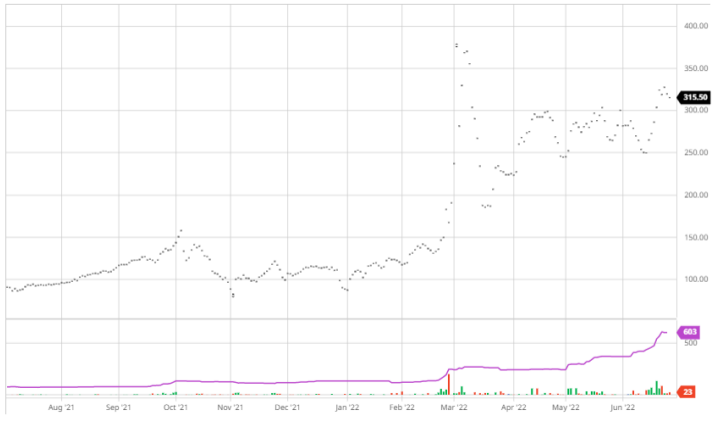
Australia's lower coal supply may be redirected to the domestic market. Australian thermal coal indices strengthened considerably to USD400/t amid growing demand from the European market. The state of New South Wales, which produces mostly steam coal, is considering measures to redirect some of its coal exports to the domestic market to combat the energy crisis, according to Coal Hub.

Newcastle coal price index average forecasts: USD300/t in 2022 and USD250/t in 2023-24. We now project NCT to average USD300/t in 2022 and USD250/t in 2023-24, up from USD200/t and USD150/t, respectively, based on our expectation of rising coal demand from the EU, sustained high demand for coal in China for electricity generation, and potentially higher coal demand globally in response to the high global prices of gas and oil. As the high seasonal demand for energy arrives, particularly for coal in China and the EU this winter (2022-23), we believe NCT will see an uptrend for the next 12 months.

Exhibit 63: ICE Newcastle coal futures (Jul-22)

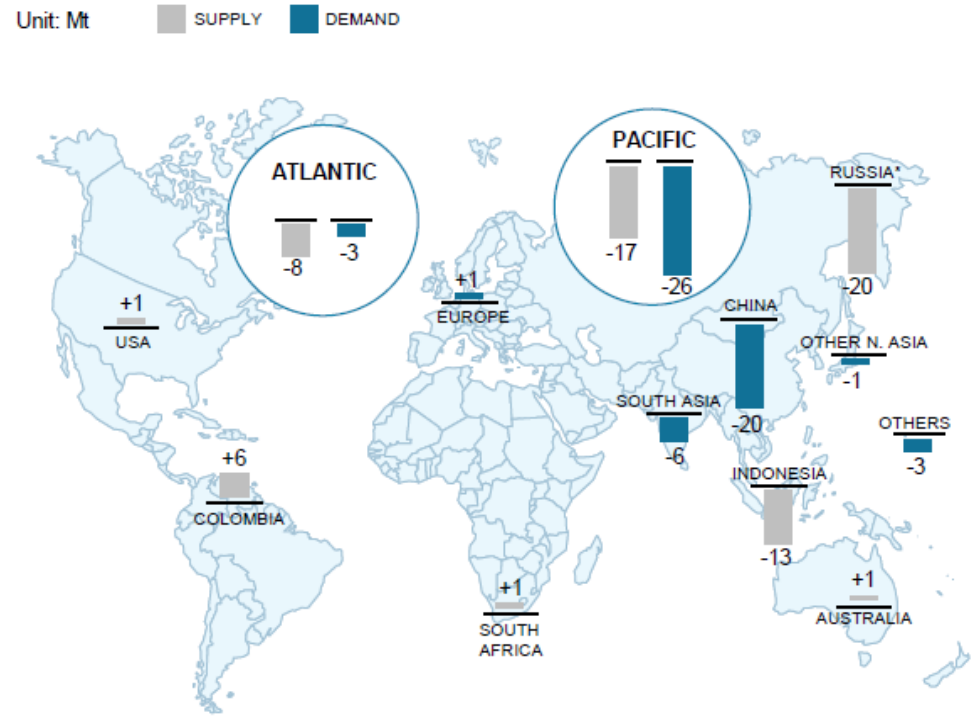
Source: Barchart.com

Exhibit 64: ICE Richard Bay Coal futures (Sep-22)



Source: Barchart.com

Exhibit 65: Global thermal coal market



Source: Banpu

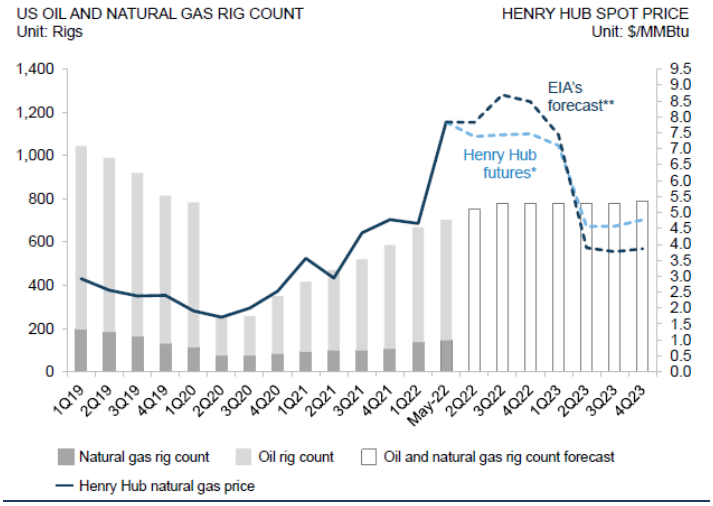
Gas: USD7/mmbtu Henry Hub and USD20/mmbtu JKM LNG price in 2022

We turn more positive on global gas prices, expecting the Henry Hub gas price index in the US to average USD7/mmbtu and the spot JKM LNG price to average USD20/mmbtu in 2022.

As European countries deal with energy insecurity in the wake of Russia's invasion of Ukraine, demand for LNG is set to outstrip supply by the end of 2022. While demand has spurred a rush of worldwide LNG projects not seen in over a decade, construction timelines mean material relief is unlikely before 2024. Global LNG demand is expected to reach 436mt in 2022, outpacing the available supply of just 410mt, according to Rystad Energy's research.

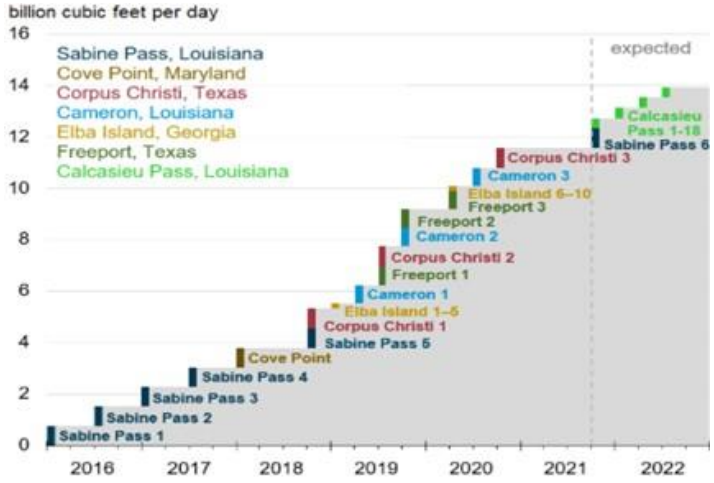
The EU's REPowerEU plan set an ambitious target to reduce dependence on Russian gas by 66% within the year – an ambition that will clash with the EU's goal of replenishing gas storage to 80% of capacity by Nov-22.

Exhibit 66: US gas price to stay high in 2H22



Sources: Banpu; EIA

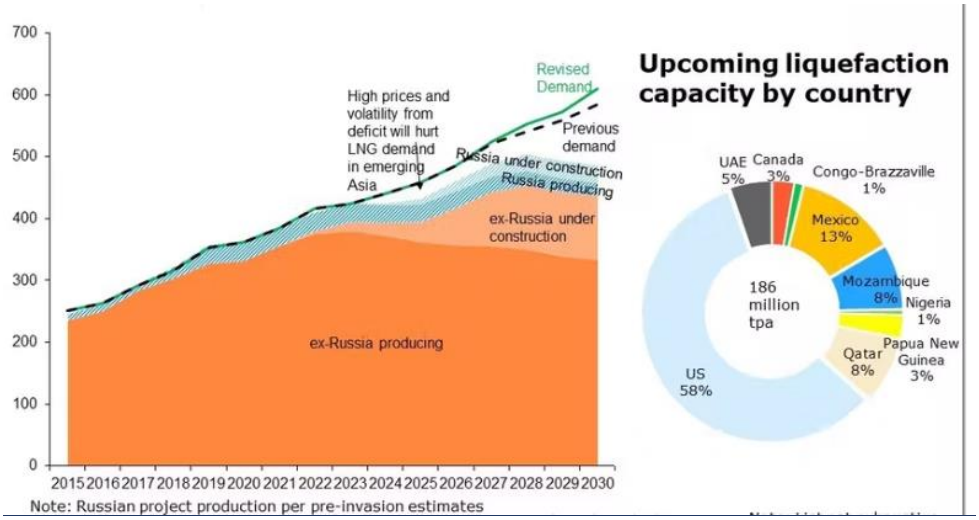
Exhibit 67: US LNG export capacity by project (2016-22)



Source: EIA

By shunning Russian gas, Europe has destabilised the entire global LNG market that began the year with a precarious balance after a tumultuous 2021. The decision to sharply reduce reliance on Russian gas and LNG from the current levels of between 30-40% will transform the global LNG market, resulting in a steep increase in energy-security based European LNG demand that current and under-development projects will likely not be able to supply.

Exhibit 68: Global LNG supply and demand outlook



Source: Rystad Energy

Europe was on course to increase Russian imports of gas and LNG to over 40% of its supply by 2030, if the now-stalled Nord Stream 2 pipeline had been approved. Instead, imports are expected to drop to around 20% by 2030 as current contracts are not being renewed. To facilitate additional LNG imports, a slew of regasification terminals has been planned across Europe – some new and some reactivated.

If Russian flows were to stop tomorrow, the gas currently in storage (about 35% full as of May-22) would likely run out before the end of 2022, leaving Europe exposed to a brutal winter. Under this scenario, in the absence of joint buying arrangements and countries competing for limited molecules, the TTF gas price could climb to more than USD100/mmbtu, resulting in industrial curtailments and widespread fuel switching in the power sector.

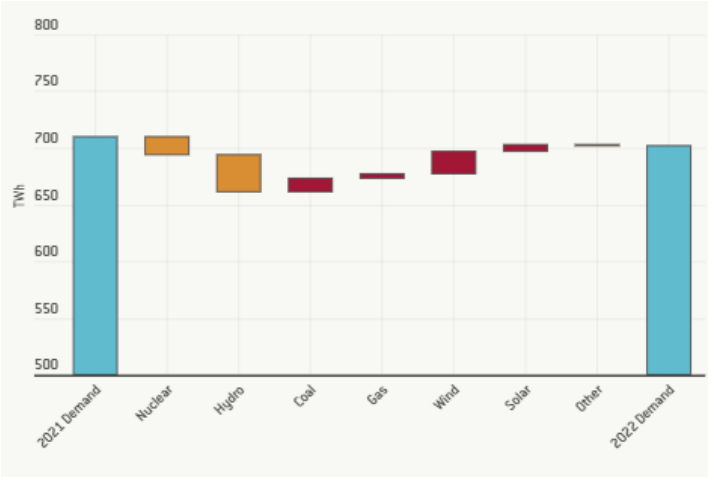
We have already seen curtailments to fertiliser, steel, and paper manufacturers in Europe, underscoring the economic pain that awaits. In an extreme scenario of a severely cold winter, not even the residential sector would be safe, in our view.

European gas markets are in turmoil. Supplies from Russia in 1Q22 (289TWh) were down 30% y-y from the 2021 level (408TWh). Policymakers in both Russia and the European Union are discussing the possibility of a complete stop to Russian gas flows to the EU. Markets are extremely nervous, resulting in a six-fold y-y gas price increase in 1Q22.

High EU gas prices led the EU to import 305TWh of LNG (24.3mt) in 1Q22 vs 170TWh in 2021. The high gas prices have not only lured new gas supply into Europe but also encouraged consumers to reduce gas demand significantly.

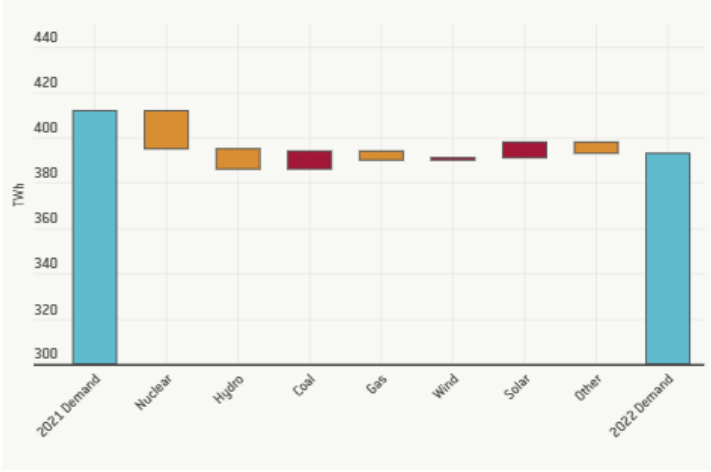
Gas-to-coal switching in the EU power sector has not contributed to reduced demand as gas-fired generation was actually up by 4TWh in 1Q22 compared to 2021, because of lower nuclear and hydro production.

Exhibit 69: EU27 2021-22 electricity production and consumption forecast before the Russia-Ukraine war



Source: Bruegel

Exhibit 70: EU27 2021-22 electricity production and consumption forecast after Russia-Ukraine war began



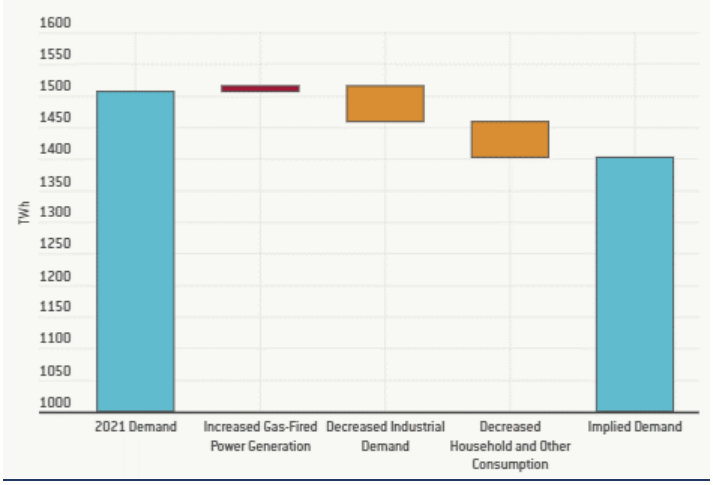
Source: Bruegel

EU gas demand was 11% lower y-y in 1Q22. This implies that household and other gas demand (including services and non-individual household heat generation) in 1Q22 was about 5% y-y lower, bringing total gas consumption savings to 11% y-y, according to Bruegel.

If the goal is to replace Russian gas entirely, this is a promising start, as Russia invaded Ukraine near the end of 1Q22 and so far, the EU and its members have not introduced strong energy-saving policies.

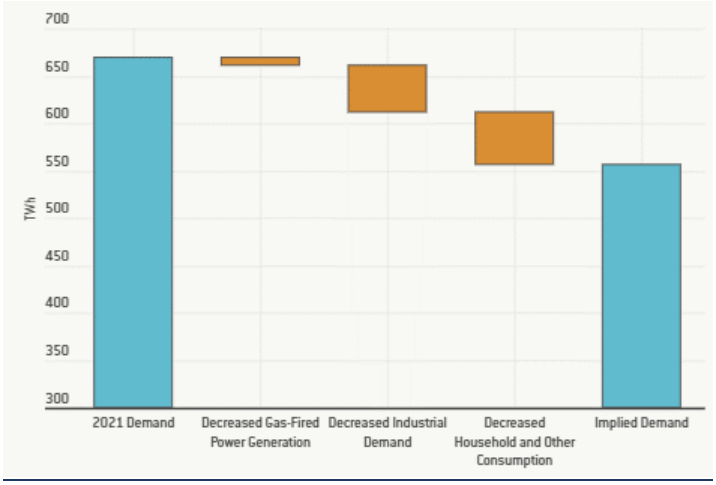
On the contrary, national policies in response to rising energy prices have focused on cutting taxes and boosting demand. In Bruegel's estimation, with stronger policies, savings of roughly 20% of total demand could be achieved.

Exhibit 71: EU27 gas consumption (2021 vs 2022) forecast before the Russia-Ukraine war



Source: Bruegel

Exhibit 72: EU27 gas consumption (2021 vs 2022) forecast after Russia-Ukraine war began

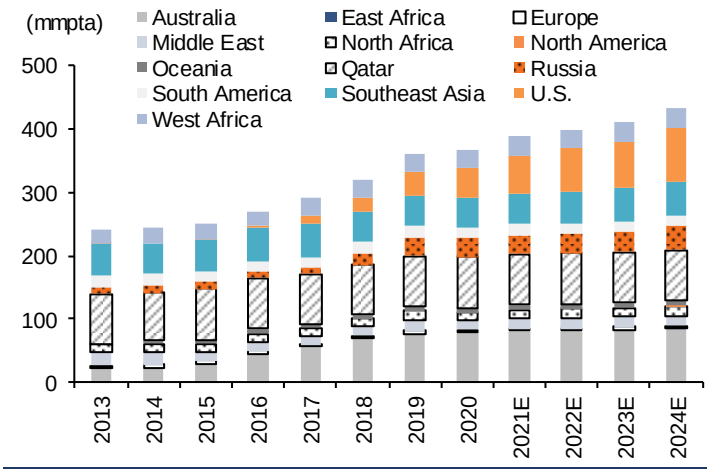


Source: Bruegel

US LNG supply growth is insufficient. More than 20 LNG projects with a combined capacity of over 180mtpa by 2030 have made development progress recently but the market will need more than 150mtpa of LNG from the 186mtpa supply planned, which means more than 80% of the projects in the pipeline must be realised.

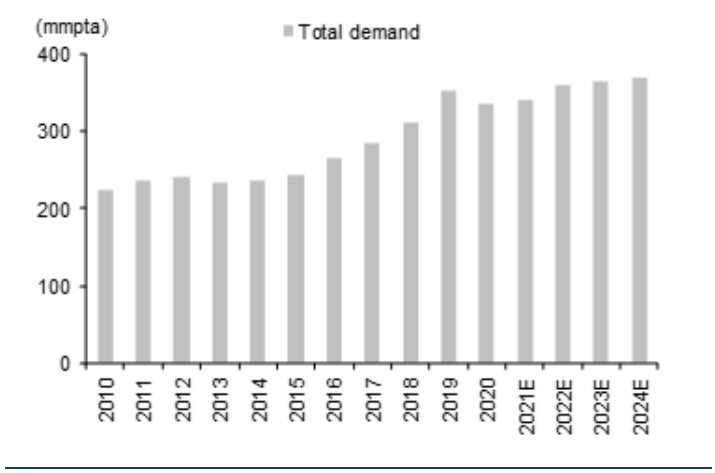
US projects are in a leading position. Projects lying dormant awaiting rising demand are now advancing. Energy Transfer's Lake Charles and NextDecade's Rio Grande projects, previously on pause, have reported 9.45mtpa worth of deals following Russia's invasion of Ukraine, including a 1.75mtpa deal with Engie, which had in Nov-20 pulled out of negotiations with NextDecade.

Exhibit 73: Liquefaction capacity by country



Source: EIA

Exhibit 74: LNG demand projection

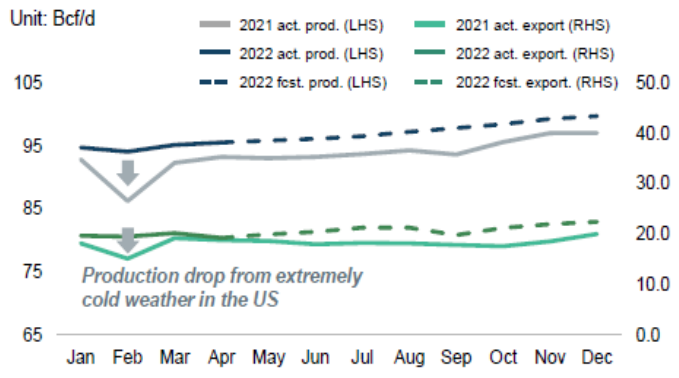


Source: EIA

We believe the current global LNG project pipeline still cannot rescue the market. One project – the 15mtpa Rovuma Area 4 LNG project – lies adjacent to Total Energies' Area 1 LNG (also owned 8.5% by PTTEP) in the currently at-risk Palma region of Mozambique. Rystad Energy expects little to no progress on the project until Total Energies resumes construction. Mexico is well-positioned for Asian exports due to its geographical proximity and non-dependence on transit through the Panama Canal and appears to be gaining momentum among Asian buyers.

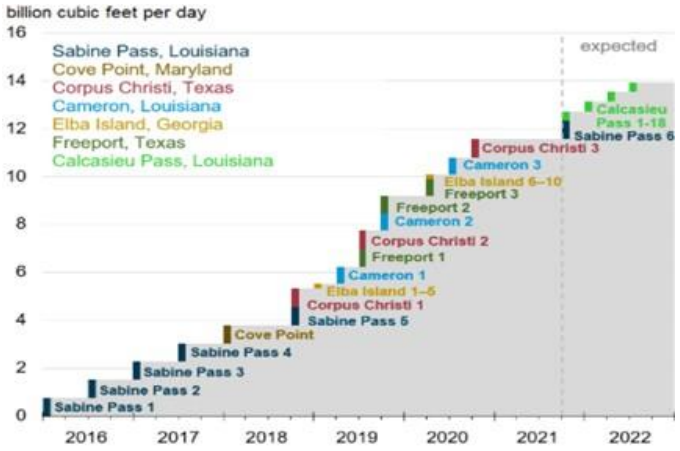
At the same time, higher prices will slow Asian LNG demand growth in the medium term, which means the continent will remain dependent on fuel oil and coal. In some scenarios, Asian LNG demand may be permanently dented, and deployment of renewables accelerated, in our view.

Exhibit 75: US natural gas production



Sources: Banpu; EIA

Exhibit 76: US LNG export capacity by project (2016-22)



Source: EIA

More bullish on higher commodity price assumptions in 2022-24

With our projections of tighter supply and rising demand due to pent-up demand following the full reopening of the global economy, and the higher inflation that should drive commodity prices up further as inflation-hedged investments, we revise up our assumptions for oil, coal, and gas substantially.

Oil: We raise our Dubai oil price assumptions by 20-22% to USD120/110/110 per bbl for 2022-24 as we think the low spare capacity, the supply risks for Russian oil, and the demand growth for jet, gasoline, and diesel after China's reopening will be the key catalysts supporting the Dubai oil price in 2022.

Coal: We boost our Newcastle coal price index assumptions by 50-67% to USD300/250/250 per tonne for 2022-24 on our expectation of stronger demand for coal from China and the EU to further tighten the demand-supply balance in 2022-24.

Gas: We lift our assumptions for the Henry Hub gas price index by 40-50% to USD7/6/6 per mmbtu in 2022-24 to reflect the strong demand for LNG exports to the EU and the rising demand for gas in the domestic market. We also raise our assumption for the JKM spot LNG price by 88-100% to USD20/15/15 per mmbtu in 2022-24 to incorporate the impact of the rising demand in the EU and the limited supply growth outside the US.

Exhibit 77: Revision of commodity price assumptions

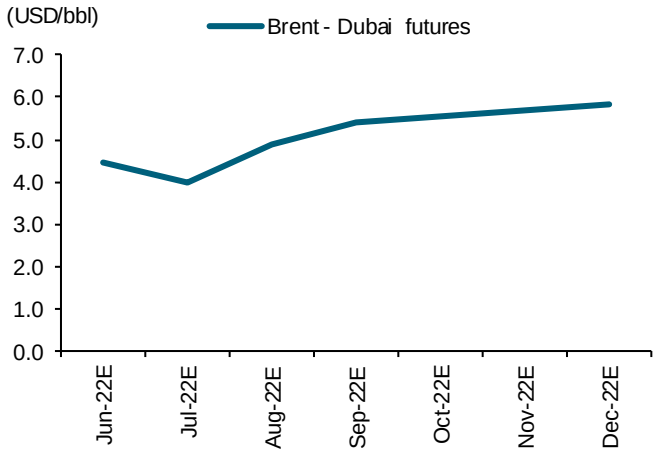
	2022E	2023E	2024E
Newcastle coal price index	**(USD/t)**	**(USD/t)**	**(USD/t)**
Previous	200	150	150
New	300	250	250
% change	*50*	*67*	*67*
Dubai crude oil price	**(USD/bbl)**	**(USD/bbl)**	**(USD/bbl)**
Previous	100	90	90
New	120	110	110
% change	*20*	*22*	*22*
Henry Hub gas price	**(USD/mmbtu)**	**(USD/mmbtu)**	**(USD/mmbtu)**
Previous	5.0	4.0	4.0
New	7.0	6.0	6.0
% change	*40*	*50*	*50*
Spot JKM LNG price	**(USD/mmbtu)**	**(USD/mmbtu)**	**(USD/mmbtu)**
Previous	10	8	8
New	20	15	15
% change	*100*	*88*	*88*

Source: FSSIA estimates

Our price assumptions vs spot prices and oil, coal, and gas futures

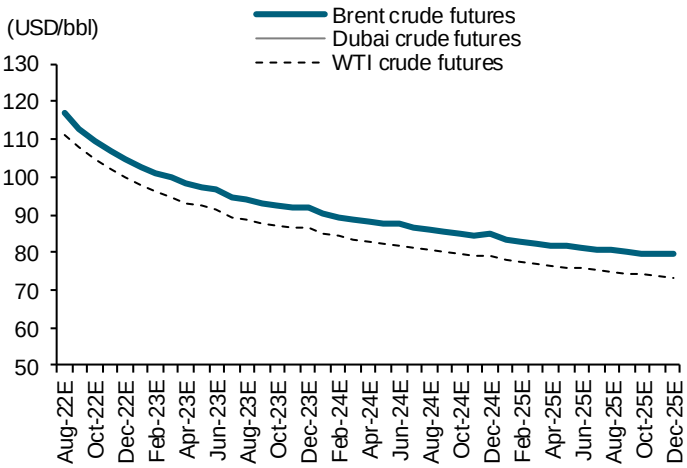
In testing our revised price assumptions for oil, coal, and gas vs the current futures and spot price markets, we found that our oil price assumptions of USD120/bbl in 2022 and USD110/bbl in 2023-24 are higher than the futures, which have been declining from the USD110-118/bbl range down to USD100/bbl at the end of 2022, USD90/bbl at the end of 2023, and USD85/bbl at the end of 2024. We believe the key variance comes from our expectations that the Russian-Ukraine war will continue into 4Q22 and well into 2023. Therefore, we think energy sanctions will have a larger impact on the oil price than supply growth.

Exhibit 78: Brent-Dubai oil price spread



Source: Bloomberg

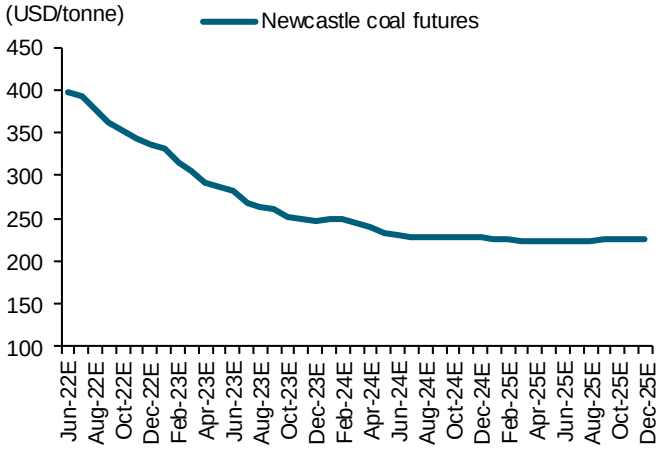
Exhibit 79: Futures of Brent, WTI, and Dubai



Source: Bloomberg

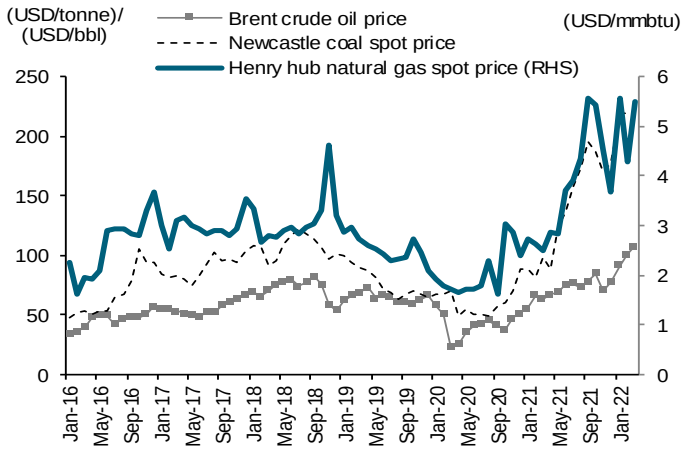
For coal prices, our new assumption of USD300/t in 2022 is still lower than the estimated average of USD350/t NCT in 2022 implied by the futures. However, our USD250/t projection for 2023-24 is similar to the current long-term NCT futures in 2024 onward. This reflects that our revised NCT assumption of USD300/t still has an upside compared to the futures.

Exhibit 80: Newcastle coal futures



Source: Bloomberg

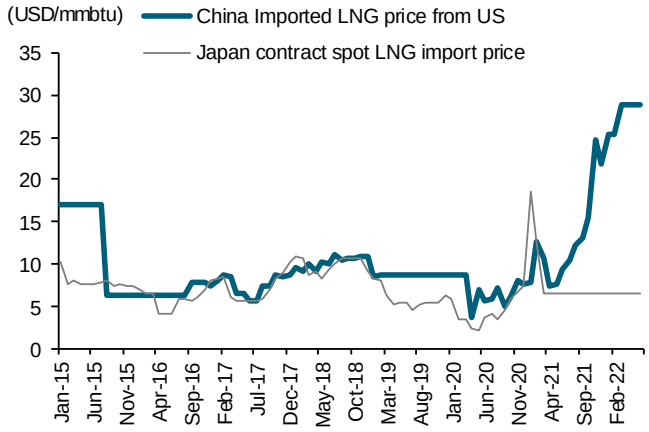
Exhibit 81: Brent oil price, Newcastle coal price, and Henry Hub gas price



Source: Bloomberg

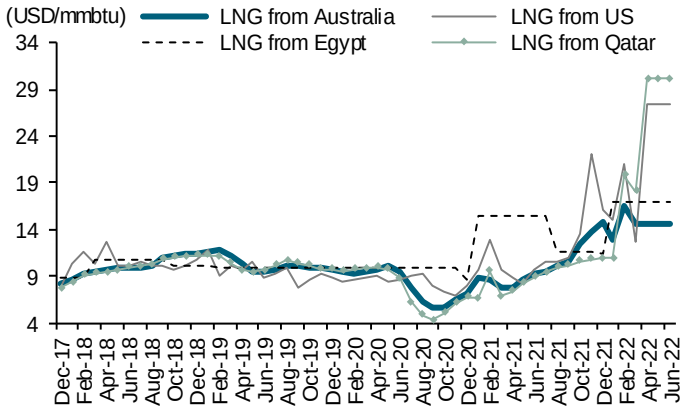
For the gas market, we found that our assumptions of USD7/mmbtu for Henry Hub and USD20/mmbtu for the JLK LNG spot price in 2022 remain far below the current spot LNG prices from the US to China & Asia and from Qatar to Asia, while they are higher than the LNG spot prices from Australia to Asia and from Egypt to Asia.

Exhibit 82: LNG contract and spot price for Japan and China from the US



Source: Bloomberg

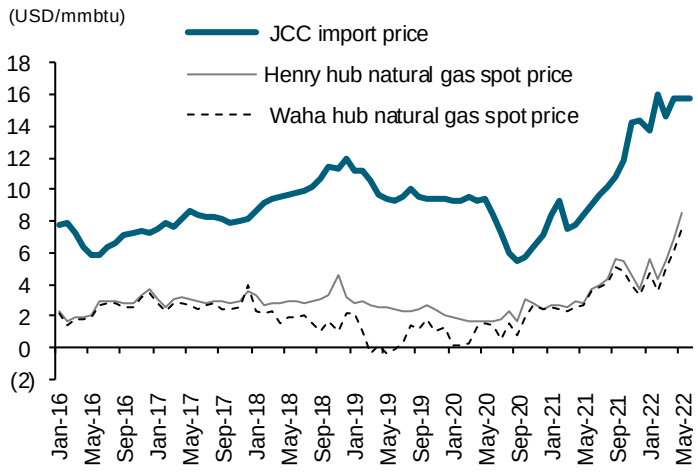
Exhibit 83: Spot LNG prices to Asia by sources



Source: Bloomberg

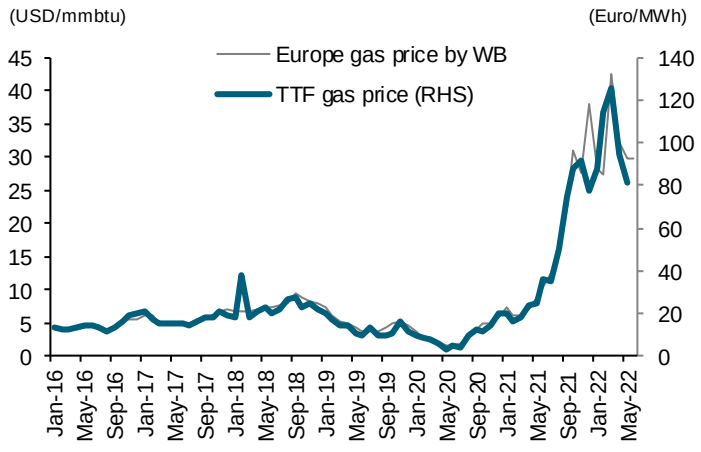
Compared to the Japan Crude Cocktail (JCC) long-term contract, our assumptions of USD20/mmbtu in 2022, then dropping to USD15/mmbtu in 2023-24, are in line with the market's futures. However, the gas price benchmarks in the EU market – TTF and the Europe gas price by WB – have been much higher than the LNG prices in the rest of the world, thanks to the sanctions imposed on the Russian gas supply.

Exhibit 84: JCC LNG contract price, Henry Hub gas price, and Waha Hub gas price



Source: Bloomberg

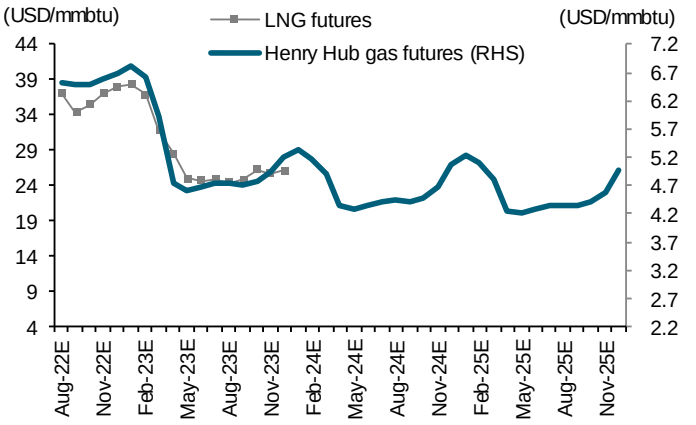
Exhibit 85: TTF gas price and Europe gas price by WB in the EU market



Source: Bloomberg

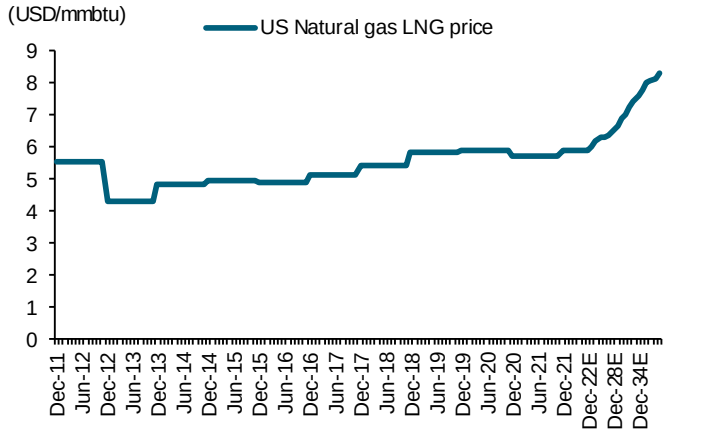
For the US gas market, the price of LNG futures and the spot Henry Hub price are highly elevated close to USD40/mmbtu until Feb-23, and then softening to USD24/mmbtu in 2023 before moving range-bound within USD20-30/mmbtu in 2024-25. Hence, our JKM LNG spot price assumptions of USD20/mmbtu in 2022 and USD15/mmbtu in 2023-24 remain much lower than the LNG futures in the US market.

Exhibit 86: US LNG futures, Henry Hub gas price



Source: Bloomberg

Exhibit 87: US LNG futures



Source: Bloomberg

Winners under inflation-elevated prices of oil, coal, and gas

In the Thai energy sector, we prefer both upstream PTTEP and BANPU and downstream IVL and ESSO as our "Fantastic Four", thanks to their high leverage over the higher global prices for oil, coal, and gas.

Oil & gas upstream: PTTEP over PTT. In Thailand's energy sector, we prefer PTTEP over PTT in the upstream oil & gas segment, given PTTEP's higher earnings leverage over the oil and gas price changes (1.2-1.5x over the price changes for oil & gas). PTT, as a state-owned enterprise, should still face high subsidies for natural gas for vehicles (NGV), LPG for households and public transportation, its gas separation plants for LPG feedstock, and indirect subsidies via its associates' downstream refinery and petrochemical companies.

Refinery downstream: ESSO and SPRC over BCP and TOP. We prefer two US-owned refiners, SPRC (owned by Chevron) and ESSO (owned by ExxoMobil) given that they will have 1) no downsides from hedging losses; 2) higher upsides from the strong market GRMs on the back of higher gasoline yields (28-30% for SPRC and ESSO vs 20-25% for BCP and TOP); and 3) earnings growth from oil stations for ESSO.

Petrochemical downstream: IVL and SCC over PTTGC and IRPC. IVL stands as our top pick in the Thai petrochemical sector thanks to its high pricing power for the necessity polyester and PET bottle products with low demand elasticity, superior cost control, and strong inorganic growth. Most importantly, IVL's regional pricing power from its production presence in every major continent should greatly benefit the company from the ongoing de-globalisation trend between the "West" of the US, the EU, and their allies and the "East", led by the Sino-Russo stronghold and other countries in the BRICS group (Brazil, Russia, India, China, and South Africa).

SCC is emerging as a preferred pick in the Thai petrochemical sector, based on 1) its well-diversified asset portfolio of packaging (SCG Packaging (SCGP TB, BUY, TP THB70)), cement and building materials, and petrochemicals; and 2) the visibly improving competitiveness and capacity growth from its new Longsan petrochemical complex in Vietnam, scheduled to be commercially running in 2023.

Coal & gas: BANPU stands out as our only top pick to greatly benefit from the spikes in global coal and gas prices, thanks to its reliable coal production in Indonesia, Australia, and China, and its fast-expanding shale gas portfolio via multiple timely acquisitions to capture the gas and LNG price hikes in 2022-24.

Exhibit 88: Summary of key valuations of companies under coverage

			-- Share price --		Up (down)	Recur profit		NP growth		---- P/E ----		---- PBV ----		---------- 2022E ---------		
Company			Current	Target	side	22E	23E	22E	23E	22E	23E	22E	23E	ROE	Div	EV/EBITDA
	BBG	Rec	(THB)	(THB)	(%)	(THB m)	(THB m)	(%)	(%)	(x)	(x)	(x)	(x)	(%)	(%)	(x)
Energy & Utilities						**354,712**	**381,254**	**41.0**	**7.5**	**18.9**	**16.4**	**2.5**	**2.2**	**14.5**	**3.9**	**10.9**
Oil & Gas						**265,096**	**283,815**	**37.5**	**7.1**	**12.4**	**10.8**	**1.4**	**1.3**	**13.5**	**4.8**	**6.5**
PTT PCL	PTT TB	BUY	35.00	60.00	*71*	134,095	151,749	50.2	13.2	7.5	6.6	0.9	0.8	12.7	4.3	4.5
PTT Explor & Prod	PTTEP TB	BUY	163.50	176.00	*8*	54,880	51,174	13.1	(6.8)	11.8	12.7	1.5	1.4	12.9	5.4	4.7
PTT Oil & Retail	OR TB	BUY	26.25	32.00	*22*	11,654	13,879	(1.1)	19.1	27.0	22.7	3.0	2.8	11.3	1.8	15.6
Bangkok Aviation	BAFS TB	BUY	29.00	36.00	*24*	120	408	nm	240.4	154.3	45.3	4.1	3.7	2.6	0.3	22.5
Thai Oil	TOP TB	BUY	52.25	70.00	*34*	13,238	13,825	5.2	4.4	8.1	7.7	0.8	0.8	10.6	5.6	10.5
Star Petroleum Refin	SPRC TB	BUY	12.20	14.00	*15*	7,375	6,844	280.7	(7.2)	7.2	7.7	1.3	1.1	19.6	3.3	4.2
Bangchak Corp	BCP TB	BUY	32.00	40.00	*25*	6,830	6,887	100.8	0.8	6.5	6.4	0.8	0.7	12.3	7.8	5.3
PTG Energy	PTG TB	BUY	13.70	18.30	*34*	1,784	2,263	77.3	26.8	12.8	10.1	2.4	2.1	20.3	1.5	4.6
Esso Thailand	ESSO TB	BUY	11.60	12.90	*11*	5,782	6,289	528.3	8.8	6.9	6.4	1.8	1.5	27.7	4.3	6.3
Susco	SUSCO TB	BUY	3.76	3.50	*(7)*	303	365	29.6	20.5	13.7	11.3	1.0	0.9	8.1	2.1	9.9
Scan Inter	SCN TB	BUY	2.36	3.10	*31*	118	225	70.0	91.5	24.1	12.6	1.0	1.0	4.3	2.1	22.8
Banpu	BANPU TB	BUY	12.60	18.80	*49*	28,728	29,682	20.7	3.3	3.2	3.8	0.8	0.8	30.4	17.7	3.6
WP Energy	WP TB	BUY	4.72	5.90	*25*	189	225	0.0	0.0	13.0	10.9	1.9	1.7	14.7	5.3	3.2
Petrochemical						**57,832**	**64,859**	**(17.9)**	**12.2**	**10.6**	**9.1**	**1.1**	**1.0**	**10.8**	**5.7**	**7.7**
Indorama Ventures	IVL TB	BUY	47.75	70.00	*47*	23,553	25,905	7.6	10.0	11.4	10.3	1.5	1.3	13.7	5.4	7.3
IRPC PCL	IRPC TB	REDUCE	3.26	3.00	*(8)*	4,676	10,098	(71.6)	115.9	14.2	6.6	0.8	0.7	5.5	3.5	9.3
PTT Global Chem	PTTGC TB	REDUCE	46.00	40.00	*(13)*	29,027	28,054	(7.4)	(3.4)	7.1	7.4	0.7	0.7	9.1	7.1	7.3
Global Green Chem	GGC TB	BUY	15.20	13.50	*(11)*	576	802	(25.7)	39.4	27.0	19.4	1.5	1.4	5.7	2.0	11.9
Building materials						**63,830**	**67,812**	**24.3**	**6.2**	**8.3**	**7.8**	**1.2**	**1.1**	**15.5**	**4.7**	**8.8**
Siam Cement	SCC TB	BUY	380.00	483.00	*27*	59,433	63,912	26.0	7.5	7.7	7.1	1.1	1.0	15.4	4.5	8.6
Eastern Polymer Group	EPG TB	BUY	9.50	16.00	*68*	1,448	1,670	20.9	15.3	18.4	15.9	2.3	2.1	12.7	2.5	13.5
Tipco Asphalt	TASCO TB	BUY	16.00	22.50	*41*	2,949	2,230	(1.6)	(24.4)	8.6	11.3	1.9	2.0	20.7	11.3	7.9

Share prices as of 29 Jun 2022
Sources: Bloomberg; FSSIA estimates

Corporate Governance report of Thai listed companies 2021

EXCELLENT LEVEL – Score range 90-100

AAV	BCPG	CPALL	GCAP	K	MSC	PLANET	SAMART	SPI	THRE	TVD
ADVANC	BDMS	CPF	GFPT	KBANK	MST	PLAT	SAMTEL	SPRC	THREL	TVI
AF	BEM	CPI	GGC	KCE	MTC	PORT	SAT	SPVI	TIPCO	TVO
AH	BGC	CPN	GLAND	KKP	MVP	PPS	SC	SSSC	TISCO	TWPC
AIRA	BGRIM	CRC	GLOBAL	KSL	NCL	PR9	SCB	SST	TK	U
AKP	BIZ	CSS	GPI	KTB	NEP	PREB	SCC	STA	TKT	UAC
AKR	BKI	DDD	GPSC	KTC	NER	PRG	SCCC	STEC	TMT	UBIS
ALT	BOL	DELTA	GRAMMY	LALIN	NKI	PRM	SCG	STI	TNDT	UV
AMA	BPP	DEMCO	GULF	LANNA	NOBLE	PROUD	SCGP	SUN	TNITY	VGI
AMATA	BRR	DRT	GUNKUL	LH	NSI	PSH	SCM	SUSCO	TOA	VIH
AMATAV	BTS	DTAC	HANA	LHFG	NVD	PSL	SDC	SUTHA	TOP	WACOAL
ANAN	BTW	DUSIT	HARN	LIT	NWR	PTG	SEAFCO	SVI	TPBI	WAVE
AOT	BWG	EA	HMPRO	LPN	NYT	PTT	SEAOIL	SYMC	TQM	WHA
AP	CENTEL	EASTW	ICC	MACO	OISHI	PTTEP	SE-ED	SYNTEC	TRC	WHAUP
ARIP	CFRESH	ECF	ICHI	MAJOR	OR	PTTGC	SELIC	TACC	TRU	WICE
ARROW	CHEWA	ECL	III	MAKRO	ORI	PYLON	SENA	TASCO	TRUE	WINNER
ASP	CHO	EE	ILINK	MALEE	OSP	Q-CON	SHR	TCAP	TSC	ZEN
AUCT	CIMBT	EGCO	ILM	MBK	OTO	QH	SIRI	TEAMG	TSR	
AWC	CK	EPG	INTUCH	MC	PAP	QTC	SIS	TFMAMA	TSTE	
AYUD	CKP	ETC	IP	MCOT	PCSGH	RATCH	SITHAI	TGH	TSTH	
BAFS	CM	FPI	IRPC	METCO	PDG	RS	SMK	THANA	TTA	
BANPU	CNT	FPT	ITEL	MFEC	PDJ	S	SMPC	THANI	TTB	
BAY	COM7	FSMART	IVL	MINT	PG	S & J	SNC	THCOM	TTCL	
BBL	COMAN	GBX	JSP	MONO	PHOL	SAAM	SONIC	THG	TTW	
BCP	COTTO	GC	JWD	MOONG	PLANB	SABINA	SPALI	THIP	TU	

VERY GOOD LEVEL – Score range 80-89

2S	ASIMAR	CHOW	FLOYD	IT	LOXLEY	OCC	RPC	SKY	TCC	TVT
7UP	ASK	CI	FN	ITD	LRH	OGC	RT	SLP	TCMC	TWP
ABICO	ASN	CIG	FNS	J	LST	PATO	RWI	SMIT	TEAM	UEC
ABM	ATP30	CMC	FORTH	JAS	M	PB	S11	SMT	TFG	UMI
ACE	B	COLOR	FSS	JCK	MATCH	PICO	SA	SNP	TFI	UOBKH
ACG	BA	CPL	FTE	JCKH	MBAX	PIMO	SAK	SO	TIGER	UP
ADB	BAM	CPW	FVC	JMART	MEGA	PJW	SALEE	SORKON	TITLE	UPF
AEONTS	BC	CRD	GEL	JMT	META	PL	SAMCO	SPA	TKN	UPOIC
AGE	BCH	CSC	GENCO	KBS	MFC	PM	SANKO	SPC	TKS	UTP
AHC	BEC	CSP	GJS	KCAR	MGT	PMTA	SAPPE	SPCG	TM	VCOM
AIT	BEYOND	CWT	GYT	KEX	MICRO	PPP	SAWAD	SR	TMC	VL
ALL	BFIT	DCC	HEMP	KGI	MILL	PPPM	SCI	SRICHA	TMD	VPO
ALLA	BJC	DCON	HPT	KIAT	MITSIB	PRIME	SCN	SSC	TMI	VRANDA
ALUCON	BJCHI	DHOUSE	HTC	KISS	MK	PRIN	SCP	SSF	TMILL	WGE
AMANAH	BLA	DOD	HYDRO	KOOL	MODERN	PRINC	SE	STANLY	TNL	WIIK
AMARIN	BR	DOHOME	ICN	KTIS	MTI	PSG	SFLEX	STGT	TNP	WP
APCO	BROOK	DV8	IFS	KUMWEL	NBC	PSTC	SFP	STOWER	TOG	XO
APCS	CBG	EASON	IMH	KUN	NCAP	PT	SFT	STPI	TPA	XPG
APURE	CEN	EFORL	IND	KWC	NCH	QLT	SGF	SUC	TPAC	YUASA
AQUA	CGH	ERW	INET	KWM	NETBAY	RBF	SIAM	SWC	TPCS	
ASAP	CHARAN	ESSO	INSET	L&E	NEX	RCL	SINGER	SYNEX	TPS	
ASEFA	CHAYO	ESTAR	INSURE	LDC	NINE	RICHY	SKE	TAE	TRITN	
ASIA	CHG	ETE	IRC	LEO	NRF	RML	SKN	TAKUNI	TRT	
ASIAN	CHOTI	FE	IRCP	LHK	NTV	ROJNA	SKR	TBSP	TSE	

GOOD LEVEL – Score range 70-79

A	BGT	CITY	GIFT	JTS	MDX	PK	SGP	SUPER	TQR	YGG
AI	BH	CMAN	GLOCON	JUBILE	MJD	PLE	SICT	SVOA	TTI	ZIGA
AIE	BIG	CMO	GREEN	KASET	MORE	PPM	SIMAT	TC	TYCN	
AJ	BLAND	CMR	GSC	KCM	MUD	PRAKIT	SISB	TCCC	UKEM	
ALPHAX	BM	CPT	GTB	KK	NC	PRAPAT	SK	THMUI	UMS	
AMC	BROCK	CRANE	HTECH	KKC	NDR	PRECHA	SMART	TNH	UNIQ	
APP	BSBM	CSR	HUMAN	KWI	NFC	PTL	SOLAR	TNR	UPA	
AQ	BSM	D	IHL	KYE	NNCL	RJH	SPACK	TOPP	UREKA	
ARIN	BTNC	EKH	IIG	LEE	NOVA	RP	SPG	TPCH	VIBHA	
AS	BYD	EMC	INGRS	LPH	NPK	RPH	SQ	TPIPL	W	
AU	CAZ	EP	INOX	MATI	NUSA	RSP	SSP	TPIPP	WIN	
B52	CCP	F&D	JAK	M-CHAI	PAF	SABUY	STARK	TPLAS	WORK	
BEAUTY	CGD	FMT	JR	MCS	PF	SF	STC	TPOLY	WPH	

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

Sources: Thai Institute of Directors Association (IOD); FSSIA's compilation; data as of 26 October 2021

Anti-corruption Progress Indicator

CERTIFIED										
2S	BCH	CPALL	GC	K	MFC	PE	QLT	SNP	THCOM	TU
7UP	BCP	CPF	GCAP	KASET	MFEC	PG	QTC	SORKON	THIP	TVD
ADVANC	BCPG	CPI	GEL	KBANK	MILL	PHOL	RATCH	SPACK	THRE	TVI
AF	BE8	CPN	GFPT	KBS	MINT	PK	RML	SPALI	THREL	TVO
AI	BEYOND	CSC	GGC	KCAR	MONO	PL	RWI	SPC	TIDLOR	TWPC
AIE	BGC	DCC	GJS	KCE	MOONG	PLANB	S & J	SPI	TIPCO	U
AIRA	BGRIM	DELTA	GPI	KGI	MSC	PLANET	SAAM	SPRC	TISCO	UBE
AKP	BJCHI	DEMCO	GPSC	KKP	MST	PLAT	SABINA	SRICHA	TKS	UBIS
ALPHAX	BKI	DIMET	GSTEEL	KSL	MTC	PM	SAPPE	SSF	TKT	UEC
AMA	BLA	DRT	GUNKUL	KTB	MTI	PPP	SAT	SSP	TMD	UKEM
AMANAH	BPP	DTAC	HANA	KTC	NBC	PPPM	SC	SSSC	TMILL	UOBKH
AMATA	BROOK	DUSIT	HARN	KWC	NEP	PPS	SCB	SST	TMT	UPF
AMATAV	BRR	EA	HEMP	KWI	NINE	PR9	SCC	STA	TNITY	UV
AP	BSBM	EASTW	HENG	L&E	NKI	PREB	SCCC	STOWER	TNL	VGI
APCS	BTS	ECL	HMPRO	LANNA	NMG	PRG	SCG	SUSCO	TNP	VIH
AQUA	BWG	EGCO	HTC	LH	NNCL	PRINC	SCN	SVI	TNR	WACOAL
ARROW	CEN	EP	ICC	LHFG	NOBLE	PRM	SEAOIL	SYMC	TOG	WHA
AS	CENTEL	EPG	ICHI	LHK	NOK	PROS	SE-ED	SYNTEC	TOP	WHAUP
ASIAN	CFRESH	ERW	IFEC	LPN	NSI	PSH	SELIC	TAE	TOPP	WICE
ASK	CGH	ESTAR	IFS	LRH	NWR	PSL	SENA	TAKUNI	TPA	WIIK
ASP	CHEWA	ETE	ILINK	M	OCC	PSTC	SGP	TASCO	TPP	XO
AWC	CHOTI	FE	INET	MAKRO	OGC	PT	SINGER	TBSP	TRU	ZEN
AYUD	CHOW	FNS	INSURE	MALEE	ORI	PTG	SIRI	TCAP	TRUE	
B	CIG	FPI	INTUCH	MATCH	PAP	PTT	SITHAI	TCMC	TSC	
BAFS	CIMBT	FPT	IRC	MBAX	PATO	PTTEP	SKR	TFG	TSTE	
BAM	CM	FSMART	IRPC	MBK	PB	PTTGC	SMIT	TFI	TSTH	
BANPU	CMC	FSS	ITEL	MC	PCSGH	PYLON	SMK	TFMAMA	TTA	
BAY	COM7	FTE	IVL	MCOT	PDG	Q-CON	SMPC	TGH	TTB	
BBL	COTTO	GBX	JKN	META	PDJ	QH	SNC	THANI	TTCL	
DECLARED										
AJ	CHG	DDD	ETC	JR	MAJOR	NUSA	RS	SSS	TQM	YUASA
ALT	CPL	DHOUSE	FLOYD	JTS	NCAP	NYT	SAK	STECH	TSI	ZIGA
APCO	CPR	DOHOME	GULF	KEX	NCL	OR	SCGP	STGT	VARO	
B52	CPW	ECF	III	KUMWEL	NOVA	PIMO	SCM	TKN	VCOM	
BEC	CRC	EKH	INOX	LDC	NRF	PLE	SIS	TMI	VIBHA	

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 th e 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 26 October 2021) are categorised into: 1) companies that have declared their intention to join CAC, and; 2) companies certified by CAC.

Sources: 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.

Company	Ticker	Price	Rating	Valuation & Risks
PTT PCL	PTT TB	THB 35.00	BUY	Risks to our SoTP-based valuation are the oil price and potential earnings downside from government intervention.
PTT Explor & Prod	PTTEP TB	THB 163.50	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 Oil and Retail Business	OR TB	THB 26.25	BUY	The downside risks to our SOTP-based TP include: 1) lower-than-expected demand for petroleum products; 2) a lower marketing margin; and 3) weaker-than-expected jet demand.
Bangkok Aviation Fuel Services	BAFS TB	THB 29.00	BUY	Downside risks to our SoTP-based target price include a slower-than-expected vaccination rate, leading to slower demand in tourism activities, and uncertainty in the fuel volume demand in the north which could lead to volatility in Fuel Pipeline Transportation Limited (FPT)'s income.
Thai Oil	TOP TB	THB 52.25	BUY	Downside risks to our EV/EBITDA-based TP are a sharp fall in oil price and weak demand for refined oil products.
Star Petroleum Refining	SPRC TB	THB 12.20	BUY	TP is based on EV/EBITDA. Downside risks are a sharp rise in oil price and weak demand for refined oil products.
Bangchak Corp	BCP TB	THB 32.00	BUY	The downside risks to our SoTP-based TP include: 1) lower-than-expected demand for petroleum products; 2) higher crude premiums; and 3) unplanned shutdowns of the company's refinery plants.
PTG Energy	PTG TB	THB 13.70	BUY	The downside risks to our SoTP-based TP include 1) a government cap on oil prices; and 2) weaker demand for diesel and gasoline.
Esso Thailand	ESSO TB	THB 11.60	BUY	The downside risks to our SoTP-based TP on ESSO include 1) lower-than-expected demand for petroleum products; 2) a higher crude premium; and 3) unplanned shutdowns of its refinery and petrochemical plants.
Susco	SUSCO TB	THB 3.76	BUY	The downside risks to our SOTP-based TP include: 1) lower-than-expected demand for petroleum products; 2) a lower marketing margin; and 3) weaker-than-expected jet fuel demand.
Scan Inter	SCN TB	THB 2.36	BUY	The downside risks to our SOTP-based TP include 1) a sharp decline in oil prices; and 2) weaker demand for NGV and delays in new NGV projects.
Banpu	BANPU TB	THB 12.60	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.
WP Energy	WP TB	THB 4.72	BUY	The downside risks to our SOTP-based TP include: 1) lower-than-expected demand for LPG gas; and 2) a lower marketing margin.
Indorama Ventures	IVL TB	THB 47.75	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.
IRPC PCL	IRPC TB	THB 3.26	REDUCE	Key risks to our bearish view and EV/EBITDA-based target price are rising margins of PP-naphtha, SM and ABS-benzene, and a higher market GRM.
PTT Global Chemical	PTTGC TB	THB 46.00	REDUCE	The key upside risks to our EV/EBITDA-based TP are a stronger-than-expected HDPE price and HDPE-naphtha margin.
Global Green Chemicals	GGC TB	THB 15.20	BUY	Downside risks to our EV/EBITDA-based target price include: 1) a sharp decline in crude palm oil price; 2) a change in government policy for biodiesel from the current B7; and 3) a narrower fatty alcohol margin due to the new supply in the US
Siam Cement	SCC TB	THB 380.00	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.
Eastern Polymer Group	EPG TB	THB 9.50	BUY	Downside risks to our EV/EBITDA-based target price include 1) a sharp rise in feedstock prices, driven mostly by a higher oil price; and 2) lower-than-expected demand for plastics used for insulators and the automobile and packaging industries.
Tipco Asphalt	TASCO TB	THB 16.00	BUY	Downside risks to our EV/EBITDA multiple based TP include 1) a lower asphalt margin due to a oversupply in Asia on the back of faster recovery of utilisation rate for global refiners; and 2) a lower-than-expected supply of alternative crudes and asphalt.
SCG Packaging	SCGP TB	THB 55.25	BUY	Downside risks to our EV/EBITDA-based TP include a lower-than-expected demand for packaging, rising raw material costs of recycled paper and higher energy costs.

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 29-Jun-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.