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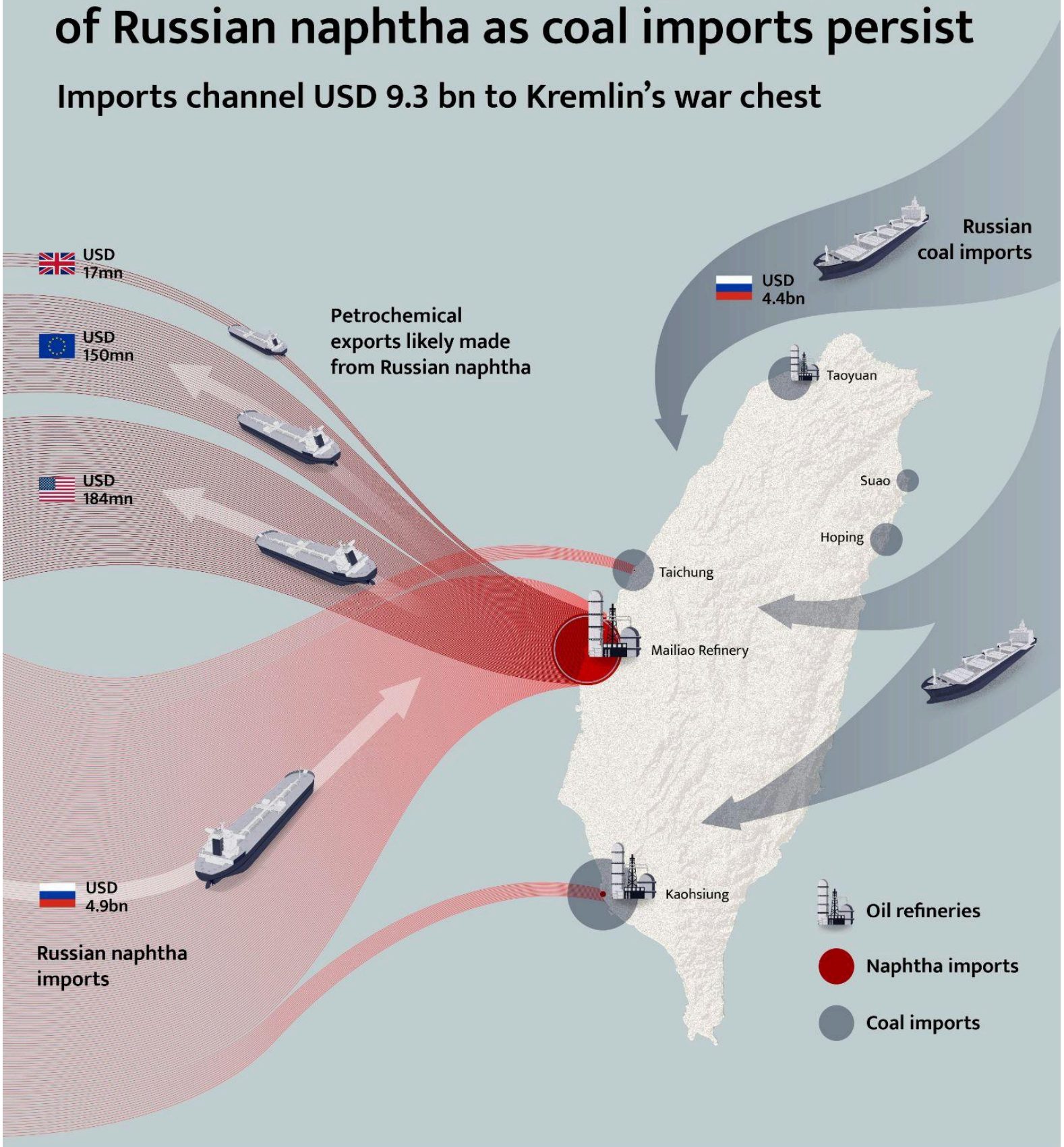

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Dangerous dependence: Taiwan becomes world's largest importer of Russian naphtha as coal imports persist

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1 October 2025

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Dangerous dependence: Taiwan becomes world's largest importer of Russian naphtha as coal imports persist

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Key findings

- Average monthly imports of Russian fossil fuel derivative naphtha spiked nearly six-fold between the average in 2022 and the first six months of 2025. In the first half of 2025, Taiwan imported naphtha worth USD 1.3 bn and became the world's largest importer of Russian naphtha.
- Taiwan's Russian naphtha imports have generated USD 1.7 bn in Mineral Extraction Tax revenues for the Kremlin, enough to finance 170,000 Gerbera drones — each capable of wreaking destruction in Ukraine.
- Over-reliance on Russian naphtha potentially affects the availability of essential materials for semiconductor manufacturers like TSMC, Nvidia, AMD, and Intel. This makes Taiwan vulnerable to geopolitical disruptions, secondary sanctions, or strategic manipulation by Russia and its allies.
- While Taiwan has provided USD 50 mn in total bilateral aid to Ukraine since the start of the full-scale invasion, it has imported Russian fossil fuels worth over 220 times the amount at USD 11.2 bn. Continued dependence on Russian fossil fuels may put Taiwan at risk of increased U.S. secondary tariffs potentially above the island's current 20% whilst raising security of supply risks, too.

Taiwan's imports of Russian naphtha

- Since the beginning of Russia's full-scale invasion of Ukraine to the end of June 2025, Taiwan imported 6.8 million tonnes of Russian naphtha worth USD 4.9 bn, equal to 20% of Russia's total exports and ranking Taiwan as the world's third-largest buyer.

- Formosa Petrochemical Corporation (FPCC)'s Mailiao refinery imported 96% of Taiwan's total Russian naphtha imports and increased its reliance from 9% before the full-scale invasion to 90% in H1 2025. The EU, US, and UK imported petrochemicals made from naphtha at the Mailiao refinery worth an estimated USD 334 mn. These shipments to sanctioning countries likely contain Russian molecules due to the refinery's heavy reliance on Russian-supplied naphtha.
- Since the start of Russia's full-scale invasion of Ukraine, FPCC has been the single largest known buyer of Russian naphtha in the world.
- 88% of Taiwan's imports of Russian naphtha were transported on vessels owned or insured in price cap coalition countries, yet prices have exceeded the USD 45 per barrel limit since December 2023, providing strong evidence of policy violations.
- US-sanctioned company Novatek supplied 72% of Taiwan's Russian naphtha imports. Continued purchases could compromise Taiwan's image as a reliable partner and undermine diplomatic relations with the US, EU, and other strategic allies.

Taiwan's imports of Russian coal

- Since the start of the full-scale invasion to the end of June 2025, Taiwan ranked as the fifth-largest buyer of Russian coal globally, importing USD 4.4 bn in value, though volumes fell 67% in the first half of 2025 compared to 2024.
- While state-owned Taipower and privately owned Taiwan Cement Corporation successfully ended Russian coal purchases, other private companies maintained imports at USD 41 mn monthly in the first half of 2025.
- A significant portion of Taiwan's imported coal comes from sanctioned Russian companies including Suek, Elgaugol and KRU, which exposes involved parties to sanctions risks and, by extension, supply disruptions.

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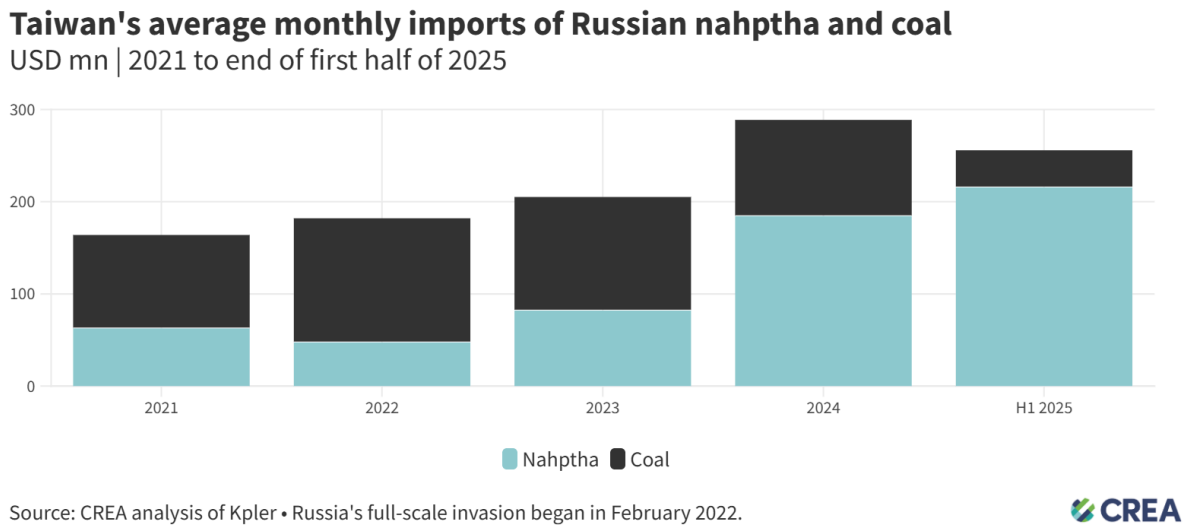

Figure 1 — Taiwan's average monthly imports of Russian naphtha and coal

Despite joining international economic sanctions on Russia just a day after the start of the full-scale invasion of Ukraine and restricting the sale of high-tech products which can potentially be used for military purposes, Taiwan has refrained from imposing legal restrictions on the importation of Russian fossil fuels.

This has led to markedly different trajectories for the island's two key Russian energy imports, coal and naphtha. While Taiwan has largely succeeded in reducing Russian coal dependence, falling 67% in the first half of 2025 compared to 2024, Taiwan's imports of Russian naphtha – a fossil fuel derivative – have surged, making it the world's largest buyer. State-owned electricity company Taipower, and Taiwan Cement Corporation (TCC), the largest private buyer of Russian coal in 2023, successfully eliminated Russian coal purchases in the latter half of 2024. Similarly, state-owned Chinese Petroleum Corporation (CPC) has not received a shipment of Russian naphtha since June 2024. Yet other private companies have moved in the opposite direction: Formosa Petrochemical corporation

(FPCC) massively increased its Russian naphtha reliance from 9% before the full-scale invasion to 90% in the first half of 2025, single-handedly making Taiwan the world's largest buyer of Russian naphtha. Furthermore, since the start of Russia's full-scale invasion of Ukraine until the end of June 2025, FPCC has been the single largest known buyer of Russian naphtha in the world. Likewise, other private companies have continued to import Russian coal, spending on average USD 41 mn per month in the first half of 2025.

The continued reliance on Russian fossil fuels exposes Taiwan to significant strategic and diplomatic risks. On August 6, 2025, President Trump signed an executive order imposing secondary tariffs on India — doubling existing duties to 50% — as punishment for its continued purchases of Russian oil, with an additional 25% penalty taking effect later that month. In a similar vein, on 13 September, 2025, the US President called NATO allies' Russian oil imports 'shocking' and demanded swift sanctions, once again signaling close scrutiny over Russia's global energy exports.

Taiwan, along with other importers of Russian fossil fuels, is putting itself at risk of increased U.S. secondary tariffs due to its continued reliance on Russian fossil fuels — potentially rising above the current 20% tariff rate that Taiwan faces. Higher tariffs could have a major impact on Taiwanese exporters, as exports to the United States — Taiwan's second-largest export market — accounted for 18% of Taiwan's export revenues in 2023.

As evidenced by the success of TCC and Taipower in ending their imports of Russian coal, paired with CPC operating for over a year without Russian naphtha, ending dependence on fossil fuels that finance the Kremlin's war chest is achievable. It is also essential for Taiwan's energy security, its industries, and its diplomatic relationships with sanctioning countries.

Taiwan becomes the world's largest importer of Russian naphtha in the first half of 2025, increasing nearly six-fold on 2022 levels

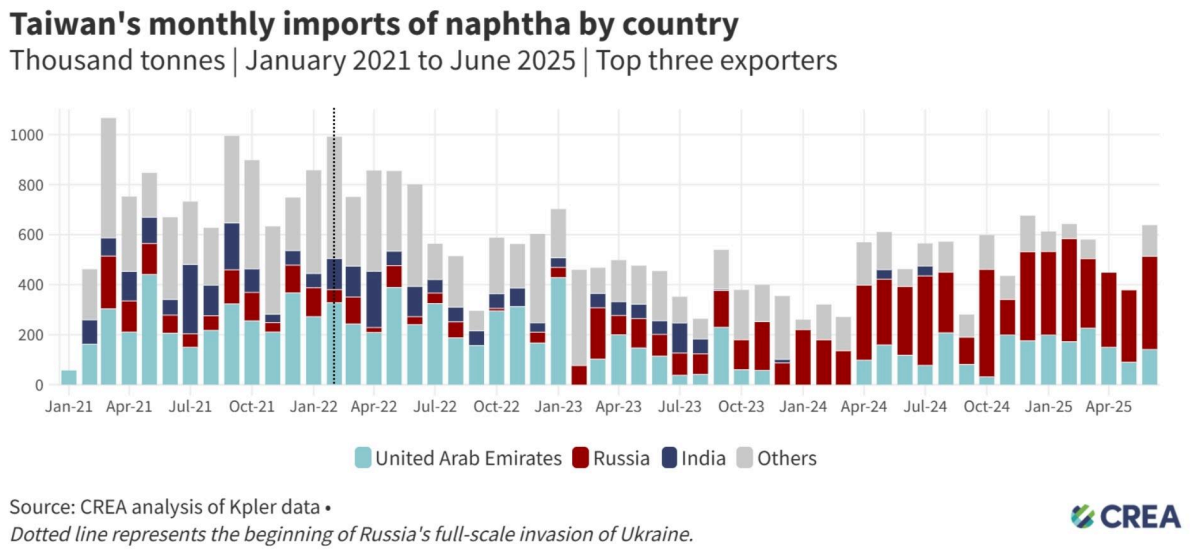

Figure 2 — Monthly imports of naphtha by country

From the start of Russia's full-scale invasion of Ukraine through to the end of June 2025, Taiwan imported 6.8 mn tonnes of Russian naphtha worth over USD 4.9 bn. This makes it the third-largest importer of Russian naphtha worldwide, representing approximately 20% of Russia's total exports of this refined fossil fuel during this period. Notably, naphtha is the only fossil fuel for which Taiwan's imports from Russia have grown consistently throughout this period. Taiwan's annual imports of Russian naphtha have increased significantly since 2022, rising from 574 thousand tonnes (valued at USD 478 mn) in 2022 to 3 mn tonnes (USD 2.2 bn) in 2024 as seen in Figure 2. Imports have continued to climb in 2025. In the first half of 2025, Taiwan imported 1.9 million tonnes from Russia valued at USD 1.3 bn, representing a 44% increase in volume compared to the same period in 2024. This means Taiwan has spent an average of USD 220 mn per month on Russian naphtha in 2025, a nearly six-fold increase compared to 2022. Since the beginning of 2024, Russia has

replaced the United Arab Emirates as Taiwan's top naphtha supplier. As a result, in the first half of 2025, Taiwan has become the world's largest importer of Russian naphtha. This rise in imports is largely driven by the widening discount offered for Russian naphtha compared to other sources.

CREA estimates that Taiwan's imports of Russian naphtha have generated USD 1.7 bn in Mineral Extraction Tax revenues for the Kremlin from the crude oil used to produce the refined naphtha, covering the period from the start of the full-scale invasion until the end of June 2025. At an estimated production cost of USD 10,000 each, Russia's naphtha exports to Taiwan could finance approximately 170,000 Gerbera drones — Russian knockoffs of Iran's Shahed drones — each capable of wreaking destruction in Ukraine.

96% of Taiwan's imported Russian naphtha arrived at the Mailiao port supplying FPCC's Mailiao complex

Taiwan operates five naphtha-fed steam crackers with a combined ethylene capacity of 4.03 mn tonnes per annum, supplied through three major ports. Formosa Petrochemical Corporation (FPCC) operates three naphtha crackers with a combined capacity of 2.93 mn tonnes of ethylene per annum at its Mailiao complex—equivalent to 73% of Taiwan's total ethylene capacity.

Figure 3 — Monthly imports of naphtha to Mailiao

Since the start of the full-scale invasion of Ukraine until the end of June 2025, FPCC has been responsible for importing 96% of Taiwan's Russian naphtha imports valued at USD 4.7 bn. As seen in Figure 3, the company's reliance on Russian supply has increased dramatically – in 2021, before the full-scale invasion of Ukraine, only 9% of FPCC's total naphtha imports to the Mailiao complex originated from Russia. Previously, the company imported largely from the United Arab Emirates (36%) and India (16%). In 2023, while operating only one of its crackers due to "poor demand and unhealthy margins", the share of Russian naphtha increased sharply to 32%. By the first half of 2025, this dependence had reached extreme levels, with 90% of total shipments to FPCC's Mailiao complex coming from Russia. The company has effectively abandoned its previous suppliers, no longer importing from either the UAE or India, and instead sourcing from the US (5%), with Kuwait and Singapore making up the final 5%. While overall demand remains weak, the FPCC Mailiao refinery is still operating two of its three naphtha crackers at a combined rate of 60% as stated in April 2025.

Formosa Petrochemical Corporation is currently Taiwan's only major buyer of Russian naphtha and according to Kpler's data, FPCC has been the largest known buyer of Russian naphtha in the world since the start of Putin's full-scale invasion of Ukraine.

Figure 4 — Monthly imports of naphtha to the port of Kaohsiung

In stark contrast, Chinese Petroleum Corporation (CPC), a fully state-owned enterprise, has moved in the opposite direction, essentially eliminating its Russian naphtha imports — as seen in Figure 4. CPC operates two naphtha crackers at the Linyuan Petrochemical Complex — with a total ethylene capacity of 1 million tonnes per annum — which are supplied via the port in Kaohsiung. The capacity of CPC's naphtha crackers at Linyuan is about a quarter that of the Formosa Plastics complex at Mailiao. The Linyuan Petrochemical Complex crackers are directly linked to CPC's Talin refinery.

In 2021, both the Kaohsiung and Mailiao ports received similar volumes of Russian naphtha — 472 and 575 thousand tonnes, respectively. However, the share of Russian naphtha imported to Kaohsiung in the same period was much higher at 27% compared to just 9% at Mailiao. Kaohsiung's imports of Russian naphtha fell by three-quarters in 2022, decreasing the share to only 7% (130 thousand tonnes valued at USD 108 mn). Since then, only one shipment of 32 thousand tonnes of Russian naphtha has been sent to the Talin

refinery at the port of Kaohsiung in April 2024. While the overall volume of naphtha that CPC imports is much less than FPCC's, state-owned CPC has proven that it can rely primarily on non-Russian supply from the UAE instead — comprising 87% of the Talin refineries' imported naphtha in the first half of 2025.

Though small, naphtha imports — almost exclusively Russian origin — also arrive at the Taichung port despite not being directly connected to any of Taiwan's naphtha crackers. Between the start of the full-scale invasion and the end of June 2025, around 2% (149 thousand tonnes valued at USD 103 mn) of Taiwan's total Russian naphtha imports have been delivered to Taichung. Annual imports from Russia to this port have steadily risen, with only one shipment of 10 thousand tonnes received in 2022 compared to four shipments with a combined volume of 60 thousand tonnes in 2025.

Given Taichung's relative proximity to FPCC's Mailiao complex, the port likely serves as a storage and distribution hub for the petrochemical giant or other private buyers — though the ultimate destination of these Russian imports is unknown.

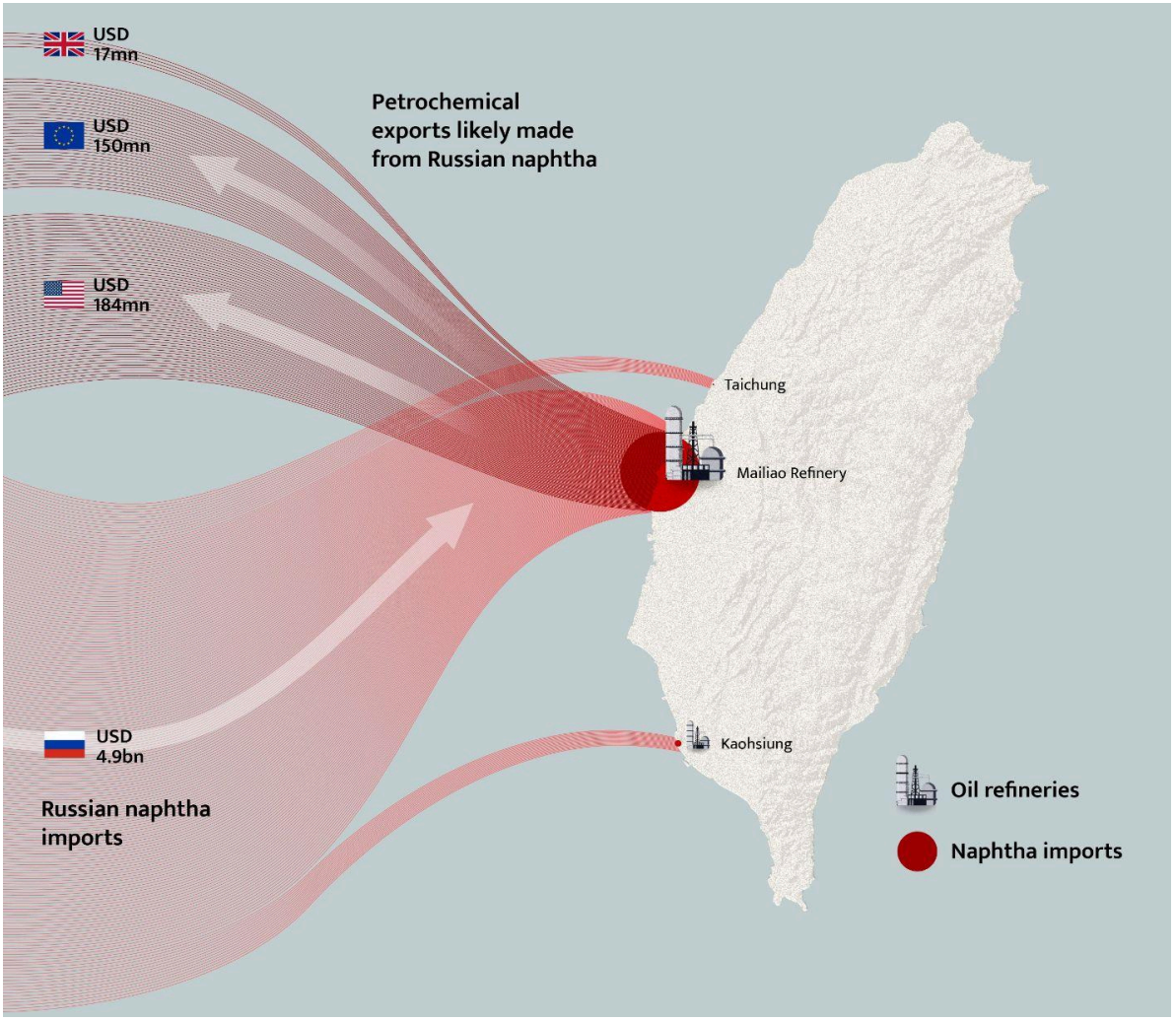

Figure 5 — Taiwan's imports of Russian naphtha and exports of petrochemicals likely made from Russian naphtha to the US, UK, and EU

Russian hydrocarbons are likely reaching the US, EU, & UK through trade with Taiwan

The Formosa Petrochemical Corporation's Mailiao refinery is the largest refinery on the island of Taiwan and is supplied via the port of Mailiao. Since the start of the full-scale invasion of Ukraine to the end of June 2025, this port has received USD 4.3 bn worth of Russian naphtha.

Naphtha can be upgraded through refining processes and then further processed or blended to derive fuels and other petrochemicals (via catalytic reforming or blending with other streams).

Thirty percent of the FPCC-owned Mailiao refinery's exports were sent to sanctioning countries since the start of the Russian full-scale invasion of Ukraine. Australia was the largest export market and the USA was the seventh largest buyer of oil products from the Taiwanese refinery that runs partially on Russian naphtha.

In the period between the EU's ban on Russian oil product imports (including naphtha) in February 2023 until the end of June 2025, the FPCC Mailiao refinery received 65% of its total naphtha from Russia. The refinery's reliance on supply from Russia rose to over 90% in 2025. A proportion of the FPCC Mailiao refinery's Russian naphtha imports could have been used to blend or further process Russian hydrocarbons into products that are being sent to sanctioning countries. This means that sanctioning countries could be importing refined petrochemicals from the FPCC Mailiao refinery that contain fuels that are partially made from Russian oil despite banning their import on February 5, 2023.

The US alone imported 180 thousand tonnes (estimated to be valued at USD 184 mn) of Paraxylene and reformate combined since the ban was implemented to the end of June 2025.

As a case study, the vessel named Torm Durga (IMO number 9682382), delivered 8,300 tonnes of reformate (estimated to be valued at USD 10 mn) from the FPCC Mailiao refinery to the port of Houston in the USA arriving on 25 June 2024. Reformate is a gasoline blending stock made through catalytic reforming, a refining process that uses catalysts and hydrogen to convert low-octane naphtha into higher-octane fuels that burn in a more controlled and stable way. This shipment departed the FPCC Mailiao refinery in late April 2024. In the same month, 60% of the refinery's imported naphtha feedstock came from Russia.

Likewise, CREA has identified over 20 shipments of petrochemicals including but not limited to orthoxylene, paraxylene, aniline and styrene that have been exported from the FPCC Mailiao refinery to the EU since the ban on oil products from Russia was implemented. These shipments of petrochemicals from the Mailiao refinery to the EU most likely contain blended or processed Russian naphtha and are estimated to be valued at USD 150 mn for all identified shipments since the start of the ban on Russian oil products. Orthoxylene is primarily produced by the catalytic reforming of petroleum naphtha. Using a case study example, the vessel named Ncc Qamar (IMO number 9387671) transported 6,700 tonnes of orthoxylene (USD 7.4 mn) from the FPCC Mailiao refinery to the Euroenergo terminal at the port of Tarragona in Spain, unloading on 19 April 2025. In the month of April 2025, Mailiao refinery received 100% of its naphtha from Russia.

The UK has also received a 15 thousand tonne shipment (worth approximately USD 17 mn) of Paraxylene on 30 June 2023. Twenty-six percent of the naphtha received by the Mailiao refinery in this month was from Russia.

In total, FPCC's Mailiao refinery exported petrochemicals and intermediates worth USD 334 mn to the US, EU, and UK combined between the EU ban on oil products to the end of June 2025.

According to discussions with Ciaran Tyler, Kpler's Lead Research Naphtha Analyst, "*It's very likely based on Kpler data that the EU, UK, and USA have imported petrochemicals from Formosa's Mailiao industrial complex which have been made from Russian-origin naphtha*."

Geopolitical and supply security risks of Taiwan's overreliance on Russian naphtha

Naphtha is one of the most essential feedstocks for Taiwan's petrochemical industry – it comprises 66% of all imported oil products in Taiwan. Key naphtha-derived chemicals—such as ethylene, propylene, benzene, butadiene, and toluene—serve as foundational raw materials for the production of plastics, synthetic fibres, and electronic components, all of which are core to Taiwan's industrial output and export economy. Over-reliance on Russian naphtha threatens supply chain resilience, making Taiwan

vulnerable to geopolitical disruptions, secondary sanctions, or strategic manipulation by Russia and its allies.

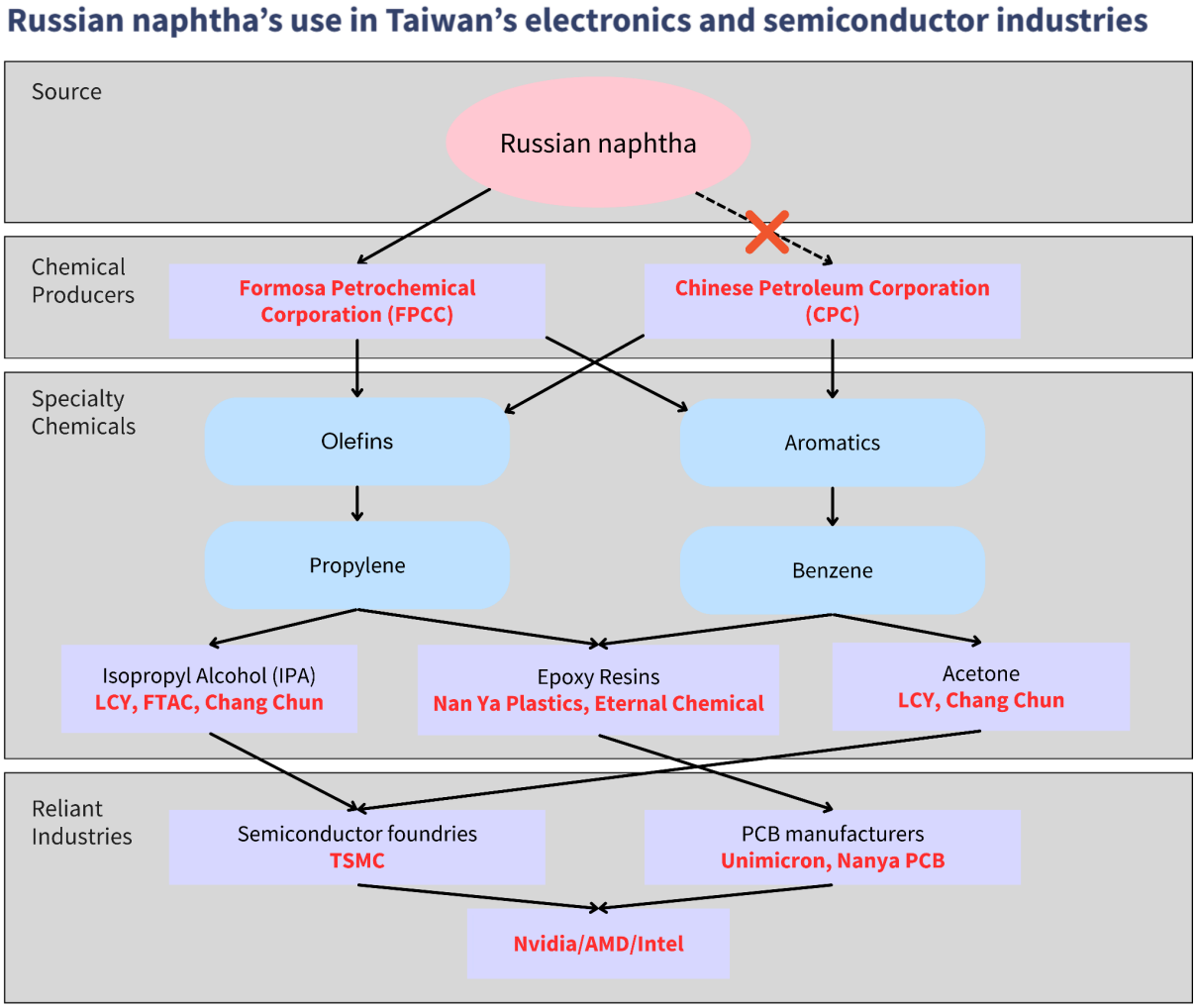

Figure 6 — Russian naphtha's use in Taiwan's key electronics and semiconductor supply chains

Taiwan's semiconductor and electronics industries — the backbone of its economic prosperity — depend on naphtha-derived chemicals that are increasingly being sourced from Russia. Naphtha is refined into key olefins (propylene) and aromatics (benzene, toluene) that serve as the essential feedstock for the petrochemicals used in Taiwan's semiconductor and electronic component manufacturing.

For instance, Taiwan Semiconductor Manufacturing Company (TSMC) relies on various semiconductor process chemicals for its manufacturing. Among these, isopropyl alcohol (IPA) and acetone have the highest degree of local production, supplied by domestic manufacturers including Lee Chang Yung Chemical (李長榮 or LCY), Formosa Tokuyama Specialty Chemicals (台塑德山), and Chang Chun Group (長春) — all of which depend on naphtha feedstock from either Formosa Plastics or CPC.

This vulnerability extends to Taiwan's printed circuit board (PCB) industry, where manufacturers like Unimicron (欣興) and Nan Ya PCB (南亞電路板) require epoxy resins as peripheral materials for the production of PCBs, which are used in almost all electronic devices. These resins are made with naphtha and are predominantly supplied by local manufacturers Nan Ya Plastics (南亞塑膠) and Eternal Chemical (長興).

Central to this supply chain vulnerability is Formosa Plastics Group's vertically integrated structure. Its subsidiaries — including Nan Ya PCB and Formosa Tokuyama Specialty Chemicals (FTAC) — source propylene, their upstream raw material, in high proportions from Formosa Petrochemical's Mailiao complex, which depends on Russian naphtha for 90% of its supply. This corporate structure transforms a single import dependency into a systemic vulnerability across Taiwan's entire high-tech manufacturing base. By importing large volumes of Russian refined fuels from Kremlin-linked or sanctioned entities, companies risk losing access to markets such as the US and EU as well as leaving themselves at risk of being secondary sanctioned.

In August 2025, Ukraine carried out its largest wave of drone strikes on Russian energy infrastructure since mid-2022, including on Novatek's refinery in Ust-Luga, which since the start of the full-scale invasion has supplied 72% of Taiwan's imports of Russian naphtha. Debris from the destroyed Ukrainian drones started a fire at this terminal, the damage to which could take up to six months to repair, likely resulting in a decrease in its naphtha

exports including to Taiwan. This is not the first time Russian refineries have been targeted and naphtha exports have been disrupted.

Given that, in the first half of 2025, a significant portion (58%) of Taiwan's naphtha imports came from Russia, any disruption or restriction on Russian naphtha supply could ripple through this above described chain. This could potentially affect the availability of essential materials for processing-units manufacturers such as Nvidia, AMD, and Intel, thereby posing industrial and national security concerns. Purchasing Russian naphtha as well as coal is not only financing the Russian energy sector — which comprises between a third and half of all the Kremlin's tax revenues — but exposes the island to risk of energy blackmail and price volatility.

72% of Taiwan's imports of Russian naphtha sold by sanctioned Novatek

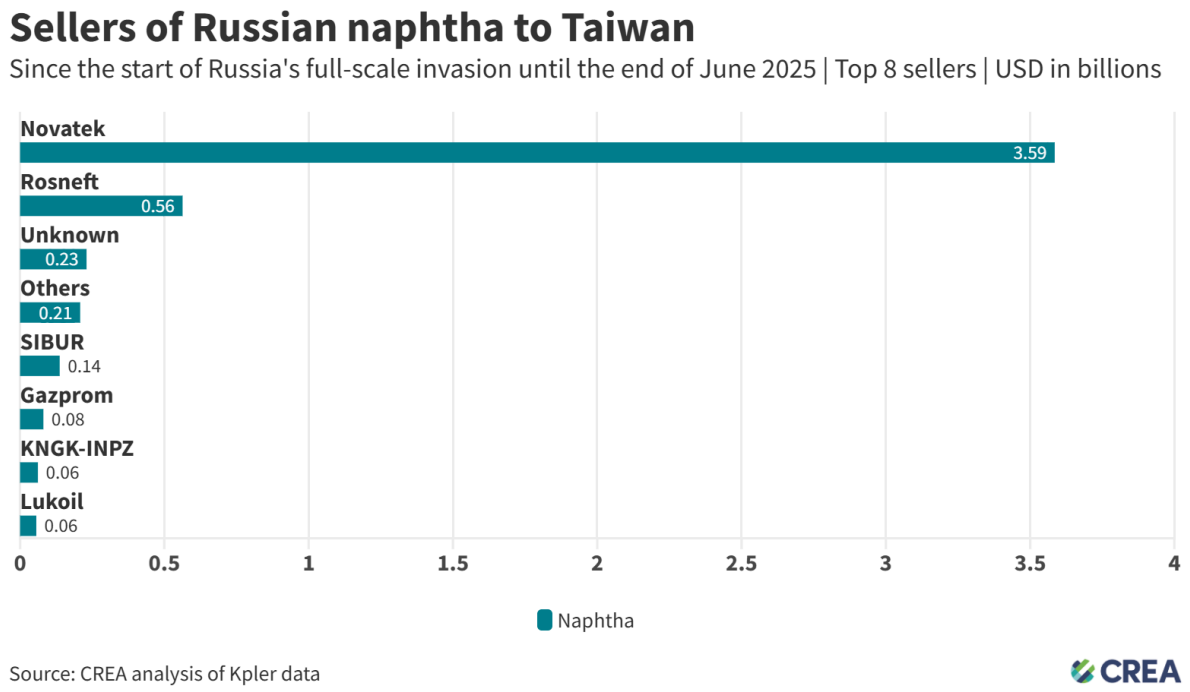

Figure 7 — Top eight sellers of Russian naphtha to Taiwan

In volume terms, since the start of the full-scale invasion until the end of June 2025, Novatek has been responsible for selling 72% of Taiwan's Russian naphtha imports, valued at USD 3.59 bn. As can be seen in Figure 7, this extreme concentration means that the vast majority of Taiwan's Russian petrochemical purchases flow through a single Russian energy giant that has been subject to an array of international sanctions from the US, UK and the EU.

All of the identified Russia's sellers of naphtha to Taiwan except KNGK-INPZ are either directly affiliated with the Kremlin — such as the second biggest Russian supplier to Taiwan, Rosneft, that are part-owned by the Russian Government — or subject to sanctions imposed by the US, the EU, or the UK. Novatek in particular faces a range of sanctions targeting its operations, including its Arctic LNG 2 project, related infrastructure, technology, and its 'shadow' fleet.

Continued purchases from Novatek and other sanctioned Russian energy firms could compromise Taiwan's image as a reliable partner and undermine its diplomatic relations with the US, EU, and other strategic allies. Furthermore, the concentration of purchases from Novatek creates reputational risks for Taiwanese companies and financial institutions engaged in transactions involving sanctioned firms, potentially affecting their access to Western markets and financial systems. Companies such as FPCC doing business with and making payments to US-sanctioned entities such as Novatek could leave them at risk of secondary sanctions. Further details of these Russian companies are provided in the annex of this report.

Taiwan's shipments of Russian naphtha likely violate the price cap policy

The Russian oil price cap is a G7-led policy that limits the price at which Russian oil can be sold internationally, aiming to reduce Russia's revenue from oil exports while keeping global supply stable. 88% of shipped Russian naphtha exported to Taiwan was transported on tankers that are owned or insured in price cap coalition countries — meaning, it must legally comply with the price cap policy. Naphtha is classified as a discounted oil product, which means that, under the price cap policy, it must be sold at USD 45 per barrel or less when transported on a tanker that is Western-owned or insured.

CREA's analysis of price data shows that the average monthly price of Russian naphtha has not been below the price cap level since December 2023. This provides strong evidence that Taiwan's imports of Russian naphtha are consistently violating the oil products price cap policy and could expose the entities involved in these purchases—or those fraudulently reporting the prices they pay for the imported hydrocarbon—to fines or further sanctions.

"In my expert opinion and based on Argus Media's reported pricing data, I believe it's highly likely buyers in Taiwan have been paying well above the G7 imposed price cap for Russian-origin naphtha," said Ciaran Tyler, Kpler's Lead Research Naphtha Analyst.

Shifting attention North across the East China Sea, South Korea can be considered an interesting case study of a country that has successfully ended reliance on Russian naphtha following fears of price cap violations. South Korea once depended heavily on Russian naphtha, but imports fell sharply after the start of Russia's full-scale invasion of Ukraine and following government scrutiny over compliance with the G7 price cap. Officials launched an investigation in March 2024 into whether Russian cargoes were being disguised through third countries like the UAE, Malaysia, Singapore, and Tunisia. Although imports from Russia are still technically allowed under the cap, South Korean refiners have largely avoided them to sidestep regulatory risks, by contrast Russian flows have increasingly shifted to Taiwan. South Korea has successfully reduced dependence on Russian naphtha to avoid violations of the price cap policy and increased supply from alternative producers including the UAE, Algeria, and Qatar.

Taiwan unloads oil products from 'shadow' tankers and a sanctioned vessel, posing environmental and geopolitical risks

Since the start of the G7+ price cap policy on Russian oil products until the end of June 2025, 12% of Russian exported oil products to Taiwan were transported on 'shadow' tankers (valued at USD 593 mn). These tankers are often old and hold dubious, inadequate, or non-existing maritime insurance. This means that in the event of an oil spill involving a Russian 'shadow' tanker unloading at ports in Taiwan or in Taiwan's coastal waters, the astronomical cost of clean-up would likely fall on the island. Additionally, with a growing number of Russian 'shadow' tankers being sanctioned by Ukraine's allies, Taiwan risks unloading oil products from a sanctioned tanker — doing so would put Taiwanese importers at greater risk of penalisation from sanctioning countries.

In fact, on 16 September, 2025, Taiwan unloaded 65,195 tonnes (valued at USD 43.8 mn) of high sulphur gasoil that was transported on an EU and UK sanctioned tanker (International Maritime Organization number 9286023). Furthermore, this ship transported high sulphur gasoil from the Vadinar refinery, which is owned by Nayara Energy — an entity that is sanctioned by the EU due to the 49.1% stake held by the Russian oil giant Rosneft. The gasoil unloaded at the Taichung oil terminal was very likely partly produced from Russian crude, as the Vadinar refinery sourced 70% of its feedstock from Russia in 2025. Exports from the Vadinar refinery funnel money to the Kremlin both through the sale of Russian crude used in the exported refined products and through the refinery's profit margins. Unloading oil from a sanctioned tanker purchased from a sanctioned refinery exposes buyers in Taiwan to the risk of secondary sanctions, while also undermining the effectiveness of Western sanctions — an outcome that could be diplomatically undesirable for the island.

In the first half of 2025, Taiwan spent on average USD 41 mn per month on Russian coal

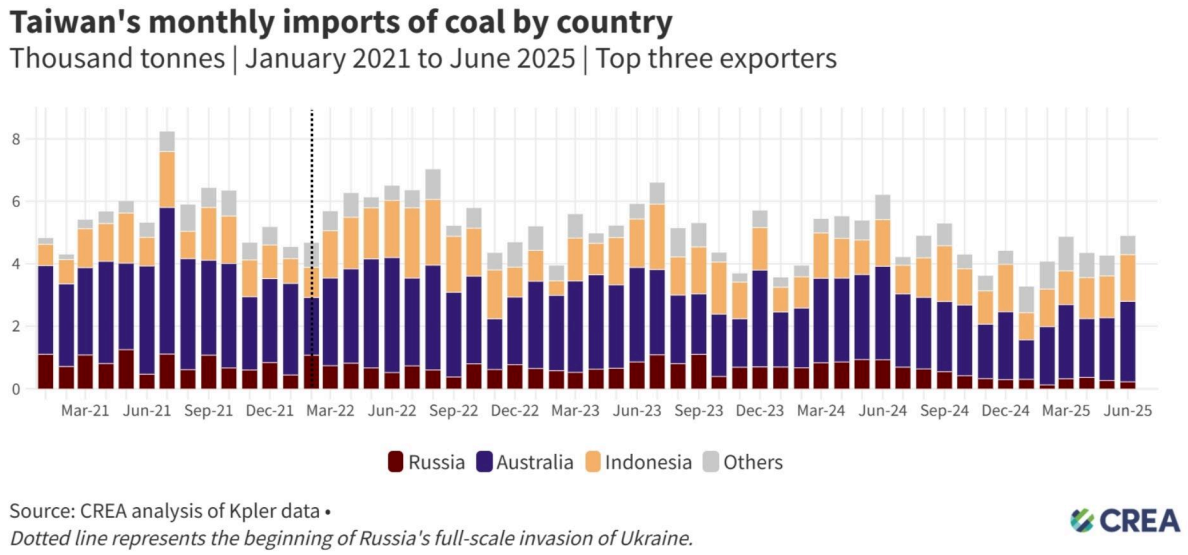

Figure 8 — Monthly imports of coal by country

Since CREA and partners published their last report on Taiwan's reliance on Russian fossil fuels in July 2024, there has been a sharp decline in its coal imports from Russia. In the first half of 2024, Taiwan imported 16% of its coal from Russia, equivalent to 4.9 mn tonnes valued at USD 760 mn. Australia and Indonesia were the island's first and second largest suppliers of coal, making up 49% and 24% of Taiwan's total imports in the same period respectively.

In the first half of 2025, the share of Russian coal has fallen to 6% (1.6 mn tonnes valued at USD 246 mn), with Taiwan instead importing more from Indonesia. In volume terms, Taiwan has managed to reduce its imports of Russian coal by 67%. However, this still makes Taiwan the eighth largest importer of Russian coal in the first half of 2025, sending Russia an average estimated USD 41 mn (265 thousand tonnes) per month.

During this period, Russian coal has been delivered to five ports in Taiwan, the largest being Kaohsiung (38.5% of total), followed by Taichung (27.3%), Mailiao (26.7%), Taoyuan (4.8%), and Suao (2.8%).

Figure 9 — Taiwan's imports of Russian coal by destination port

No more coal imports at the Hoping Power Plant

On 13 September 2024, Taiwan Cement Corporation (TCC), issued a press release stating that after discussions with the Environmental Rights Foundation (ERF), the Centre for Research on Energy and Clean Air (CREA), and Ecodefense in June 2024, its Hoping power plant will not be purchasing any more Russian coal after fulfilling its last procurement contract made in August 2024.

TCC was the largest known buyer of Russian coal in Taiwan in 2023. Its Hoping port accounted for about 17% of Taiwan's total Russian coal imports in 2023, and 7% in 2024. From the start of Russia's full-scale invasion of Ukraine until TCC's last received shipment in November 2024, it had imported just under 3 mn tonnes (worth USD 556 mn) of Russian coal. Its imports represented just over 13% of Taiwan's total Russian coal imports in this same period.

Since its last shipment of Russian coal in November 2024, the Hoping power plant has relied on supply mainly from Australia (51%) and Indonesia (40%). Despite the higher cost of non-Russian suppliers such as Australia, TCC's operating revenue from the first quarter of 2025 (USD 3.2 mn) is actually greater than in the same period in 2024 (USD 2.6 mn). While this is most likely the result of rising average energy prices in Taiwan, TCC has shown clearly that phasing out Russian coal at their Hoping power plant is possible without causing damage to overall revenues, while improving energy security and depriving the Kremlin of financial flows to fuel their war in Ukraine.

Risks of Taiwan's reliance on Russian coal

As an island defined by its overwhelming dependence on imported energy (96%) and a rising demand for electricity largely driven by its semiconductor and AI industries, reliance on fossil fuels from nations that could cut supply presents major threats to Taiwan's energy security and industry. Any dependence on Russia for fossil fuels carries the inherent risk that supplies—and therefore prices—are at the mercy of those in the Kremlin.

Beyond supply security concerns, continued Russian coal purchases expose Taiwan to mounting diplomatic and sanctions risks that could strain relations with key strategic

allies. Additionally, since the start of Putin's full-scale invasion, Taiwan sent Russia USD 4.4 bn for their importation of coal, which undermines the USD 50 mn in total bilateral aid that the island has sent to Ukraine.

Sanctioned Russian coal companies continue sales to Taiwan

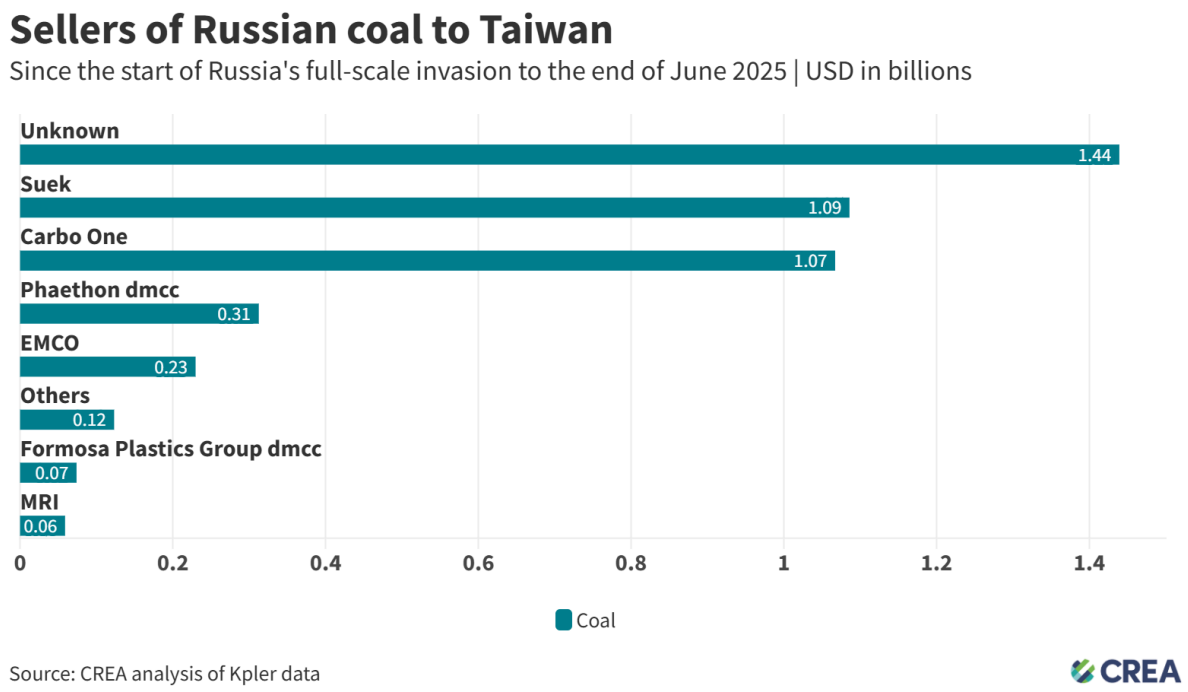

Figure 10 — Top eight sellers of Russian coal to Taiwan

As seen in the Kpler data represented in the figure above, a high proportion of Russian coal exporters are unknown and not listed in the data. Suek is the largest coal producer and exporter in Russia. As seen in Figure 10, 25% of Taiwan's imported Russian coal from the start of the full-scale invasion until the end of June 2025 was sold by Suek. 24% of all Taiwan's imports of Russian coal were sold by Carbo One according to the Kpler data — this company is the sales vehicle for the sanctioned coal giant KRU (Kuzbassrazrezugol).

Analysing customs data to compare and verify the findings, KRU (Kuzbassrazrezugol) were identified as a key supplier of Russian coal to Taiwan. This sanctioned entity was closely followed by Suek Kuzbass JSC and Elgaugol LLC — both these companies also appear

sanctioned by the Office of Foreign Assets Control (OFAC). In fact, following US sanctions implemented in January 2025, almost 80% of Russian coal exports are now under the sanctions.

Who is buying Russian coal?

According to CREA's analysis of customs data, Taiwan's largest buyer of Russian coal appears to be a company named Black Sand Commodities FZ LLC. This company is registered in the UAE and under sanctions by the Office of Foreign Assets Control (OFAC) of the US. Companies in Taiwan that are purchasing coal from the OFAC sanctioned Black Sand Commodities FZ LLC leave themselves at risk of facing secondary sanctions from the US or even the EU now that the bloc has sanctioned the first refinery outside of Russia (in India) for its links to the Kremlin. Reliance on Russian coal weakens Taiwan's energy security, leaving it exposed to payment restrictions from international sanctions, and potential energy blackmail from Russia or its partners.

Recommendations

To the Taiwanese Government

1. **The Ministry of Economic Affairs issues a public statement**: In its role as the regulator of state-owned enterprises, the Ministry should declare that state-owned enterprises have ceased and will not in future purchase Russian naphtha and coal. The statement serves a declaratory purpose in addition to actually stopping the purchases of Russian fossil fuels, not only signalling that Taiwan stands alongside the US and European democracies and enhancing its international image, but also guiding the private sector to follow suit.
2. **CPC Corporation issues a public statement**: From the perspective of a state-owned enterprise, CPC publicly explains the rationale behind its proactive decision to cease purchasing Russian naphtha in 2024. This not only demonstrates the responsibility and integrity of a state-owned enterprise, but also shows that replacing Russian naphtha can remain commercially viable, providing practical guidance for the private sector to emulate.

3. **Regarding Formosa Plastics' procurement of Russian naphtha and coal**: Through measures such as issuing guidelines and engaging with companies in closed-door meetings, the Ministry of Economic Affairs must actively support the private sector in proposing a timeline for cessation of the purchases and identifying alternative sources.
4. **Regarding Russian coal of unknown destination**: Conduct a thorough review of Taiwan's overall procurement of coal from Russia, regularly publish findings and outcomes, and actively promote and assist enterprises in stopping such purchases — especially from sanctioned entities.
5. **Regarding companies sanctioned by the US and Europe**: Investigate whether Taiwanese companies maintain commercial relationships with these sanctioned entities and publicly release the results of the investigation. Implement a ban on Taiwanese companies buying from sanctioned Russian sellers.

To Taiwanese Companies

1. **Assess sanctions exposure and compliance risks**: Companies in Taiwan that rely on Russian coal and naphtha should conduct thorough due diligence on all Russian suppliers. This includes identifying sanctioned entities and evaluating secondary sanctions risks, as well as potential impacts on access to Western markets and financial systems.
2. **Develop clear phase-out timelines with alternative sourcing strategies**: Companies should establish concrete deadlines to end Russian coal and naphtha purchases, following the examples of CPC and Taiwan Cement Corporation. They should also identify and contract with alternative suppliers, as CPC demonstrated by sourcing 100% of its naphtha from non-Russian sources.
3. **Ensure price cap compliance during the phase out of Russian naphtha:** Given the evidence that 88% of Russian naphtha shipments may be violating the G7 price cap of USD 45 per barrel, companies must verify actual transaction prices and documentation to avoid fines and sanctions violations during the transition away from Russian imports. Consider the approach taken by South Korean refiners who ceased Russian imports to avoid regulatory risks and penalties for imported Russian oil products above the price cap.

Conclusions

Taiwan's continued reliance on Russian fossil fuels represents a critical vulnerability that undermines both its energy security and its positioning as a reliable partner aligned with Western values. Over three years into Russia's full-scale invasion of Ukraine, Taiwan has imported USD 11.2 bn of Russian fossil fuels—over 220 times more than the USD 50 mn in total bilateral aid it has provided to Ukraine.

While Taipower, Taiwan Cement Corporation, and state-owned CPC have demonstrated that phasing out Russian fossil fuels is both technically feasible and economically viable, Formosa Plastics Group has moved in the opposite direction. FPCC's Mailiao complex has increased its Russian naphtha dependence from 9% before the full-scale invasion to 90% in the first half of 2025, creating an extreme concentration risk that threatens Taiwan's petrochemical supply chains — the very foundation of its semiconductor and electronics industries. Similarly, as an island that still relies on coal to produce 35.7% of its electricity, Taiwan has given the Kremlin leverage to exploit.

Taiwan stands at a crossroads. It can continue allowing private companies to fuel Russia's war economy while exposing itself to mounting economic, diplomatic, and security of supply risks, or it can mandate concrete timelines for Formosa Plastics and other private importers to phase out Russian fossil fuels, following the successful examples set by Taipower, TCC, and CPC. Every month of delay Taiwan sends another estimated USD 260 mn to the Kremlin's war chest for the importation of Russian coal and naphtha. Reliance on Russian coal and naphtha could pose risks to Taiwan's strategic alliances and introduce unnecessary volatility to its energy and industrial sectors.

Annex

Company Profiles

Naphtha Suppliers

Novatek is Russia's largest independent natural gas producer and a major petrochemicals exporter. The company has been under US sectoral sanctions since 2014, with restrictions

significantly expanded following Russia's full-scale invasion of Ukraine. Novatek faces comprehensive sanctions from the US, EU, and UK targeting its Arctic LNG projects, technology access, and 'shadow' fleet operations.

Rosneft is Russia's state-owned oil giant and one of the world's largest publicly traded petroleum companies. The company has been under US and EU sanctions since 2014, with measures targeting its financing, technology access, and senior executives. Rosneft is directly controlled by the Russian government and plays a key role in funding the Kremlin's war chest.

Sibur is Russia's largest petrochemicals company, producing plastics, synthetic rubbers, and other chemical products. The company has been subject to US sanctions since 2018, with additional measures imposed by the EU and UK following the invasion of Ukraine. Several of Sibur's key shareholders and executives are also individually sanctioned.

Gazprom is Russia's state-controlled energy monopoly and the world's largest natural gas company. While the parent company avoided direct sanctions initially, many of its subsidiaries and executives have been sanctioned by the US, EU, and UK. History shows that Russia has used Gazprom as a foreign policy tool, leveraging other countries' dependence on its gas to push its ambitions.

KNGK-INPZ is a Russian oil refining company operating facilities in the Krasnodar region. The company does not appear to be sanctioned.

Lukoil is Russia's second-largest oil producer and one of the few major Russian energy companies that remained privately held. However, the company has faced increasing sanctions pressure, with the EU and UK sanctioning Litasco (the international trading, shipping and marketing company of PJSC LUKOIL) and the US have targeted various subsidiaries and operations.

Coal Suppliers

Suek is Russia's largest coal producer and exporter, controlling significant mining operations across Siberia. The company's founder Andrey Melnichenko was sanctioned by the UK in March 2022 for SUEK's strategic significance to the Russian government as well as by the EU too. SUEK was designated under the U.S. Executive Order 13662 in January 2025,

exposing foreign entities that conduct significant transactions with the company to mandatory secondary sanctions.

Carbo One is a coal trading company involved in Russian coal exports. Extremely limited public information is available about the company's ownership structure. Carbo One is identified as KRU's coal sales vehicle, which was officially owned by two businessmen — Makhmudov and Bokarev. Makhmudov, Bokarev, and their Russian company, *Transmashholding*, are sanctioned by the United States, the United Kingdom, Australia, and New Zealand.

Phaethon is a Dubai-based commodities trading company involved in coal and other energy commodities. The authors have not identified this entity as remaining under sanctions.

East Mining Company (EMCO), written in Russian 'Vostochnaya Mining Company' (VGK) is a major coal mining enterprise in Sakhalin Region. Despite owning coal mines that have reserves of 300 million tonnes, East Mining Company does not appear sanctioned.

Elgaugol, is a Russian company that owns and operates the Elga coal which is the largest coking coal deposit in Russia, its reserves are 2.2 billion tonnes. The company and its entire network of subsidiaries were sanctioned by the U.S. Department of State in June 2024 under Executive Order 14024, with all U.S. assets frozen and transactions prohibited.

MRI, is based in Switzerland and typically trades metals and minerals, petroleum products, bulk and freight. It has not been found on international sanctions lists.

Formosa Plastics Group (FPG), is a prominent Taiwanese industrial conglomerate founded in 1954. Headquartered in Kaohsiung, Taiwan, FPG has grown into one of Asia's largest privately held enterprises, with diversified operations spanning petrochemicals, electronics, biotechnology, and more. Formosa Plastics Group appears to be the largest buyer of both Russian coal and naphtha since the start of Putin's full-scale invasion of Ukraine until the end of June 2025.

Methodology

Volume of fossil fuel exports

We use the Kpler database to track the seaborne fossil fuel exports from Russia. Kpler uses a variety of sources and metrics, including historical and live automatic identification system (AIS) data as well as customs data. Kpler implements their own models to estimate volumes and commodities exported on each shipment. More details on our data methodology for Russia's fossil fuel exports can be found here.

Price data on Russian fossil fuels

For this analysis, we used CREA's price data, which models the price of Russian coal and naphtha exported to Taiwan, and combined it with Kpler's shipment data on volumes to estimate the value of Russian fossil fuel exports to Taiwan. CREA's data offers detailed information on ports of departure and arrival, buyers and sellers, exact shipment dates, and many other variables. CREA's data contains far more data points than Taiwanese customs data, enabling more accurate and detailed analysis required for this report. Therefore, in order to examine in more detail where Russian fossil fuels are going and who is buying or selling them, we have used CREA's data rather than customs data in our analysis.

Information about CREA's price modelling can be found here.

Price of petrochemical products/intermediates from Mailiao refinery

To estimate the value of petrochemical exports from the Mailiao refinery, we calculated quarterly average prices for each product (styrene, paraxylene, orthoxylene, aniline, isoprene) using price indices from Business Analytiq. We did not have access to price data on vinyl chloride monomers (VCMs) so we used the price of styrene as a proxy. The price of VCMs can differ from the price of styrene, however, both chemicals are monomers and are the closest comparators available. Additionally, the Mailiao refinery exported only one shipment of 4 thousand tonnes of VCM between the EU ban on Russian oil products

implemented in February 2023 and the end of June 2025, which means that any pricing error for VCM has minimal impact on the overall analysis.

Biggest buyers and sellers of Russian coal and naphtha

When multiple companies are involved in a single shipment due to ship-to-ship transfers, we attribute the entire sale to the first buyer of the Russian fossil fuel to avoid double-counting transactions. We used an array of different datasets including Kpler and multiple customs data providers to identify companies that are buying, selling, and trading Russian coal and naphtha. These customs data providers include Export Genius and Taiwanese customs data.

Tracking companies that are purchasing and importing coal is a tricky task as the buying company listed in the customs data may be an energy trader located far away from the importing and exporting countries. For example, a lot of energy traders are located in the United Arab Emirates far away from Russia and Taiwan. Secondly, companies have multiple subsidiaries or names such as buyers of Russian coal listed in customs data as "Formosa Plastics Corporation", "Formosa Petrochemical Corporation" and "Formosa Taffeta Co Ltd" to name a few. Due to this complication, we have identified companies that purchased Russian fossil fuels from potentially sanctioned suppliers but did not provide a detailed analysis of the proportion or value of each company's imports because of the many company names and subsidiaries. The purpose of this analysis is to provide evidence of the companies that are at risk of facing payment restrictions from international sanctions or facing security of supply issues rather than showing a breakdown of the companies at highest risk.

Conversion of crude oil to naphtha

Naphtha is typically obtained by heating and distilling crude oil. Nothing is added during this process, so the mass is conserved in the refining process. CREA's estimates of the volume of crude used to produce the naphtha that have been exported to Taiwan are all based on metric tonnes rather than barrels of oil. This means that the different conversion factors of crude oil to naphtha due to different fuel densities are not relevant. Therefore,

CREA estimates that the 6.8 million tonnes of naphtha that Russia exported to Taiwan since the start of Russia's full-scale invasion required 6.8 million tonnes of crude oil to produce.

Estimating Russian tax revenues from the crude oil used to produce exported naphtha

CREA exclusively estimates the mineral extraction tax (MET) that the Kremlin earned from the crude oil used to produce naphtha exports to Taiwan for this report. Due to the announced abolition of export duty throughout various periods over the last few years, our conservative calculations are based solely on MET. This methodology directly reflects the payments made by Russian companies for extracting and exporting fossil fuels, offering a clear view of the fiscal impact on the Russian federal budget. Data was gathered from publicly available sources, including the Russian Ministry of Finance.

About CREA

The Centre for Research on Energy and Clean Air (CREA) is an independent research organisation focused on revealing the trends, causes, health impacts, and solutions to air pollution. CREA uses scientific data, research, and evidence to support the efforts of governments, companies, and campaigning organisations worldwide to move towards clean energy and clean air, believing that effective research and communication are the keys to successful policies, investment decisions, and advocacy efforts. CREA was founded in Helsinki and has staff in several Asian and European countries.

About Environmental Rights Foundation

Environmental Rights Foundation (ERF) is an NPO based in Taiwan. Its mission is to protect environmental rights as stipulated in the country's Constitution, the Basic Environment Act and other environmental laws. ERF focuses on three key areas: environmental rights protection, community empowerment, and democracy deepening. The foundation provides legal assistance to affected communities domestically and abroad, advocates the right to participate in the decision-making process of environmental matters, and seeks to achieve environmental justice.

About Ecodefense

Established in 1989, Ecodefense is one of the oldest environmental groups in Russia. Ecodefense campaigns for the climate, safe energy and the protection of nature. After Russia started the full-scale invasion in Ukraine in 2022, Ecodefense relocated to Europe where they are campaigning for peace and climate issues. The group has won a number of international awards including the Right Livelihood and the Baltic Sea Award. Ecodefense is funded by charitable non-governmental grants.