

**TWO
YEARS**

**FINANCING
PUTIN'S
WAR**



**Average EU citizen
has paid more than EUR 400 for
Russian fossil fuels since invasion**



Average EU citizen has paid more than EUR 400 for Russian fossil fuels since invasion**23 February 2024****Authors**

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About CREA

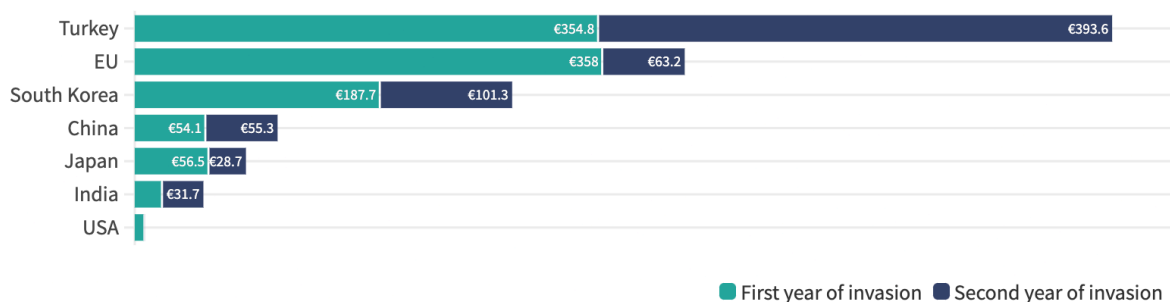
The Centre for Research on Energy and Clean Air (CREA) is an independent research organisation focused on revealing the trends, causes, and health impacts, as well as the solutions to air pollution. CREA uses scientific data, research, and evidence to support the efforts of governments, companies, and campaigning organisations worldwide in their efforts to move towards clean energy and clean air, believing that effective research and communication are the key to successful policies, investment decisions, and advocacy efforts. CREA was founded in December 2019 in Helsinki and has staff in several Asian and European countries.

Our work is funded through philanthropic grants and revenue from commissioned research. In our statement of support for Ukraine, CREA absolutely condemns the Russian military's unprovoked and unjustified attack against another sovereign nation, Ukraine. The assault goes against the fundamental values of human well-being, safety, and dignity that our organisation seeks to advance. We urgently call for an end to the assault and stand in solidarity with the Ukrainian and Russian people calling for just peace.

Average EU citizen has paid more than EUR 400 for Russian fossil fuels since invasion

Per capita contribution to Russian fossil fuels (by region)

Avg spend on Russia fossil fuels in two years since invasion



Source: CREA analysis



Key Findings:

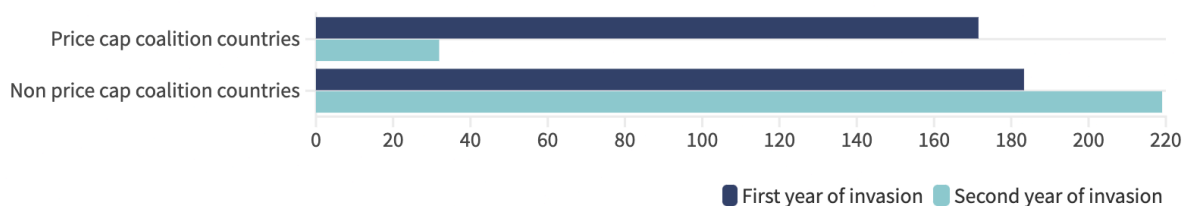
- Since the beginning of the war, the EU has paid Russia EUR 420 per capita for fossil fuels.
- Existing sanctions entailing the EU & G7 import bans and the oil price cap have cut Russian revenues from fossil fuels by 12%, approximately EUR 3.4 bn per month.
- Russia's total revenues from fossil fuel exports dropped 29% (EUR 104 bn) in the second year of the invasion. Earnings from coal and oil targeted by sanctions witnessed a year-on-year decrease of 19% (EUR 48 bn). Russia's earnings from gas exports fell by 59% in the second year of the invasion despite a lack of sanctions. The EU's reduced consumption of Russian gas played a huge part in this — underscoring Russia's reliance on the bloc for gas exports.
- The EU bought EUR 28.1 billion of Russian fossil fuels in the second year of the invasion, equivalent to more than double the Union's annual [financial support to Ukraine](#).

- Revenues from fossil fuel exports to countries that have not joined the oil price cap increased 19% (EUR 36 bn) in the second year of the invasion.
- The refined oil loophole continues to bolster Russia's crude oil trade to third countries, who subsequently export products made from Russian crude to sanctioning countries. In 2023, there was a 44% year-on-year increase in sanctioning countries' volume of oil product imports from Russian crude.
- Russia remains heavily reliant on EU/G7 owned or insured tankers for its fossil fuel exports. 'Shadow' tankers transported 40% of the total volume of Russian oil in the second year of the invasion, but their proportion has increased over time.
- The EU and G7 have the ability to constrain Russia's export revenues much more through further sanctions on Russian pipeline gas, LNG, pipeline oil and refined oil products. These additional sanctions, combined with a lowered and enforced price cap of USD 30, can cut Russia's export earnings by an additional 32% (EUR 6.8 bn per month).

Russia's export revenues cut by EUR 104 bn in the second year of the invasion

Russian revenues from Fossil fuels

Year-on-year comparison of revenue | EUR Billion



Source: CREA analysis



After half a year of hand-wringing, when EU/G7 countries implemented bans on imports of coal, crude oil and oil products, they expected Russian revenues to be minimised and cut funds for the country's full-scale invasion of Ukraine. In addition, the import bans¹ and oil price cap policy was introduced to sustain oil sales in the global market while limiting the

¹ The EU/G7 ban on coal came into effect in August 2022 followed by import bans on crude oil (December 2022) and oil products (February 2023). The sanctions also [capped the price of Russian crude sales to third countries](#) at USD 60 when transported on tankers owned or insured in countries that implemented the policy.

country's export receipts and fiscal revenues. So far, both these efforts have proven to be only partially effective.

Russia's total revenues from fossil fuel exports saw a year-on-year drop of 29% (EUR 104 bn) in the second year of the invasion. Revenues from oil and coal, which are targeted by sanctions, witnessed a year-on-year decrease of 19% (EUR 48 bn). These losses have also cascaded into limiting the Kremlin's federal budget, around 30% of which was reliant on tax revenues from oil and gas in 2023, according to data from the [Ministry of Finance of the Russian Federation](#) between January and September. In 2023, tax revenues from oil and gas dropped by 38%, amounting to EUR 62 bn. This drop forced Russia to fill its military budget — expected to increase by 29% to EUR 126 bn in 2024, from EUR 75 bn in 2023 — by taking on more state debt and increasing the tax burden on other sectors.

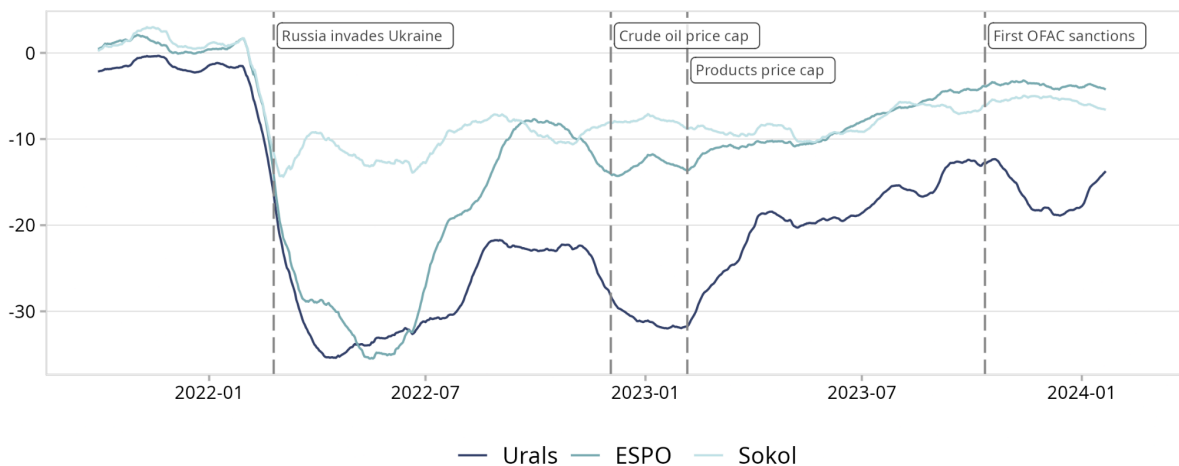
The EU still imports significant quantities of Russian gas through pipelines and as LNG, regardless of price fluctuations, thus continuing to fund the Kremlin's war chest. Since the beginning of the war, the EU's per capita contribution to Russian fossil fuel revenues has been an astonishingly high EUR 420.

The EU's per capita spending on Russian fossil fuels lowered from EUR 356 to EUR 63.2 in the second year of the invasion — still a significant amount due to continued consumption of Russian gas. In the second year of the invasion, lagging government energy policies, [despite recommendations](#) and an attempt to shift [the onus on individuals](#), has not resulted in a shutdown of Russian fossil fuels. Citizens in countries like Slovakia (EUR 525), Hungary (EUR 440), Belgium (EUR 188), Czech Republic (EUR 188) and Austria (EUR 185) — considered allies of Ukraine — have continued to contribute heavily to the Kremlin's war chest. It is clear evidence of how Russian fossil fuels continue to not just fund Putin's invasion of Ukraine but also devalue and slow down the EU's green energy transition.

Global prices unaffected by sanctions

Discount of Russian oil prices to Brent over time

Discount of oil (USD/bbl) with 30 day rolling average



Source: oilprice.com | Negative price is a discount to Brent



Putin’s invasion of Ukraine was followed by a swift reduction in Russian oil prices, mainly due to the discount they were forced to offer buyers for their oil. This discount peaked in the months after Russia invaded Ukraine and widened again after the implementation of the EU oil import ban and the price cap. The value of Russia’s exports of oil and oil products dropped 9% (EUR 18.5 bn) in 2023, compared to the previous 11 months since the beginning of their invasion of Ukraine. The price of Russian oil fluctuated throughout the year — albeit from July through November, it was traded well above the price cap of USD 60 per barrel for crude oil.

A market anomaly — caused by the anticipation of sanctions — resulted in the global average oil prices being lower in 2023 compared to the previous year. General nervousness and a lack of clarity on the effect of the war on Russia’s oil production and Ukraine’s allies’ response led to a spike in oil prices in 2022. OPEC+ countries’ decisions to cut oil production also influenced price variations. However, [global oil prices predominantly declined throughout the year](#), disproving fears that sanctions would destabilise the market, with the benchmark Brent annual price in 2023 reaching USD 80 per barrel, an 18% decline compared to 2022.

Russia reduced its discounts as it found new buyers for its oil, contributing to the rebound of oil prices in the second half of 2023. New buyers also quickly realised there was a lack of enforcement and monitoring of the oil price cap policy.

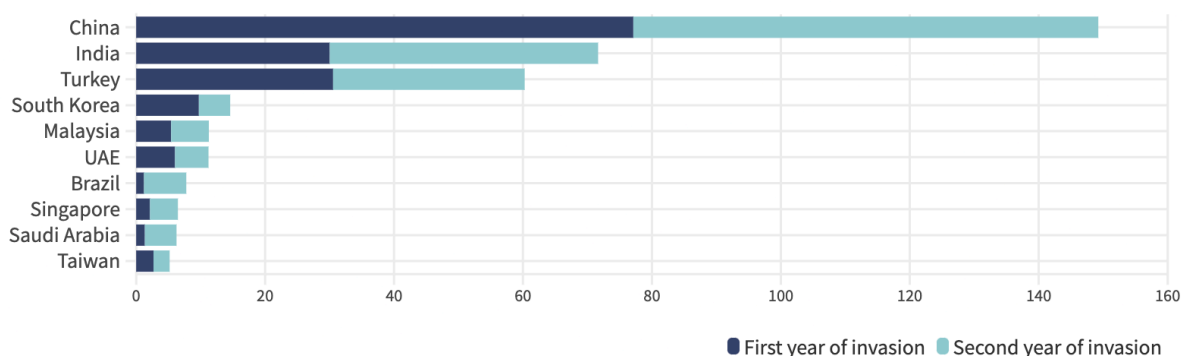
The legal ‘refining’ loophole allowing price cap coalition (PCC) countries to import third countries’ oil products made from Russian crude has helped further shrink the discount, allowing Russia to fill its war chest. Refined oil products produced from Russian crude in countries like India, China and Turkey and subsequently exported to PCC countries pushed up the global demand and price for Russia’s crude.

On 10 October 2023, the US Office of Foreign Assets Control (OFAC) [announced that they had added several vessels to their sanctions list](#) for violations of measures. The threat of more stringent sanctions monitoring led to the discount dropping again. Additionally, OFAC’s secondary sanctions on foreign financial institutions issued in December 2023 have raised the risks for banks in third countries processing payments that violate sanctions on Russian oil. Banks in the UAE have [reportedly rejected payments from Russia](#), widening the price discount to factor in the higher risks and complications that come with trading Russian oil.

Russian fossil fuels find new markets in second year of invasion

Russian revenues from countries outside the price-cap coalition

Year on year comparison of export revenues | EUR Billion



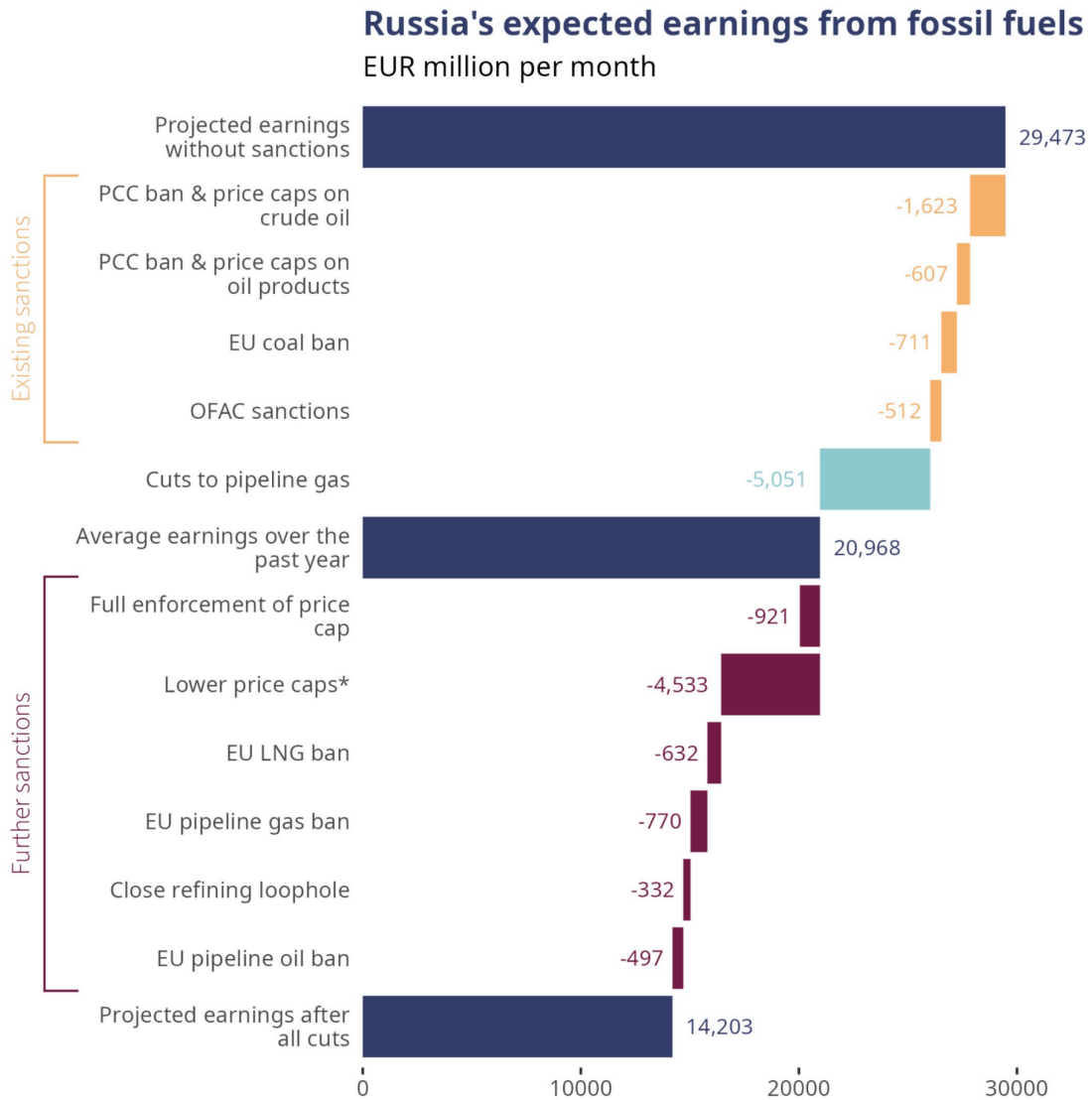
Source: CREA analysis

As revenues from exports to price cap coalition countries fell by 81% or EUR 139.5 bn in the second year of the invasion, Russia was forced to look for new buyers globally. At the same time, Russia's revenues from exports to non-price cap countries increased by 19% (EUR 36 bn). The same period also saw the volume of Russian exports to countries outside the Price Cap Coalition increase by 24% — a case of new buyers being attracted by the huge discounts on Russian oil. Despite these increased exports to non-price cap countries, Russian revenues never bridged the losses incurred from sanctions and embargoes.

Ukraine's Asian allies, Japan and South Korea, have continued to import Russian fossil fuels in the second year of the invasion. Most of South Korea's imports consist of coal (EUR 2.8 bn) and oil products worth EUR 1.3 bn). Meanwhile, 87% (EUR 2.6 bn) of Japan's imports are Russian Liquefied Natural Gas (LNG).

On the whole, Russian export revenues from crude oil dropped 27% (EUR 35.8 bn) in the second year of the invasion. India and China contributed 85% of Russia's export revenue from crude oil. India's year-on-year imports of Russian crude rose by 47%, whilst China topped the list of Russian crude oil buyers, purchasing large quantities through their pipelines and via sea.

Impact of sanctions and potential for stronger measures



Source: CREA analysis based on Kpler, COMTRADE, Eurostat, Oilprice.com
 * crude: 30 USD; low value: 25 USD; premium: 35 USD.

Effects of existing sanctions

CREA analysis indicates that roughly 12% of the overall drop in fossil fuel export revenues can be attributed to existing sanctions, equivalent to a drop of EUR 3.5 bn per month.

The EU/G7 ban on Russian crude and the introduction of the price cap policy in December 2022 has cut Russian revenues from crude oil by 17% (EUR 23.7 bn) — equivalent to EUR 1.6 bn per month — till the second anniversary of the invasion. The ban on oil products and associated price caps implemented in February 2023 cut Russian export revenues from oil products by 18% (EUR 8.9 bn) — equivalent to EUR 607 mn per month.

Since the EU's ban on coal imports (August 2022) Russian revenues from coal exports have reduced by 23% (EUR 13.3) — equivalent to EUR 711 mn per month.

Tighter enforcement of the oil price cap on sanctioned vessels by the Office of Foreign Assets (OFAC) has affected Russia's ability to conduct trade via 'shadow' tankers and consequently limited their earnings. By deepening the discount of Russian oil prices compared to international benchmark prices, these sanctions and investigations have cut Russian crude oil export earnings by 5% (EUR 512 mn per month) from October 2023 to the second anniversary of the invasion. Additionally, about [half of the 50 tankers](#) sanctioned by the US Treasury have not successfully loaded cargo since they were blacklisted on October 10, 2023. This provides strong evidence that enforcement agencies can and must investigate entities that have likely violated sanctions. Publicly adding tankers, traders or insurers to designation lists can further impact Russia's export earnings.

Russia's energy blackmailing

Putin's use of energy blackmailing, by cutting gas exports to Europe, led to an 11% increase in Russian pipeline gas prices in the three-month period after Nord Stream-1 flows to Europe were halted compared to the previous three months. Energy giant Gazprom's decision to halt natural gas via Nord Stream-1 in August 2022 raised concerns about gas supply issues influenced by the Kremlin's actions. This led to European Dutch Title Transfer Facility (TTF) day-ahead prices [hitting a record of over EUR 300/MWh \(megawatt-hours\)](#). Notably, the cut-off in Russian pipeline gas to Europe — caused partly by [damage to the pipeline](#) and a general reluctance to restart flows — in August 2022

shrunk Russian gas export earnings by 48% (EUR 60.6 bn) in the following 12-month period.

Effects of future sanctions

While the sanctions in themselves have had a positive impact on reducing Russian revenues, Ukraine's allies have the potential to further constrain the Kremlin's war chest. For example, a ban on LNG flows and pipeline gas to the EU could cut Russian export revenues by blocking their access to the EU market, which is worth 32% (EUR 632 mn per month) and 29% (EUR 770 mn per month) of their total sales, respectively.

Russia has consistently traded oil above the price cap using Western-owned or insured tankers. This, combined with limited enforcement of sanctions, severely negates the impact of the price cap policy. In some months, such as October 2023, "[almost none](#)" of Russia's seaborne crude oil was traded below the cap. CREA's analysis shows that [32% of Russian seaborne oil was transported on UK-insured tankers](#) in the same month.

Since introducing the crude oil sanctions until the second anniversary of the invasion, full enforcement of the USD 60 price cap would have slashed Russia's seaborne oil revenues by 7% (EUR 921 mn per month). Lowering the price cap for crude oil down to USD 30 (still above Russia's production cost that [averages USD 15 per barrel](#)), USD 35 per barrel for premium products and USD 25 per barrel for low-value products, would have cut their revenues from seaborne oil by 27% (EUR 4.5 bn per month). Lowering and fully enforcing the oil price cap policy is estimated to have the most significant impact on cutting Russian fossil fuel export revenues.

The refined oil loophole remains a critical gap in the sanctions, which, if fixed, would cut off 4% (EUR 332 mn per month) of Russia's crude oil export revenues. Sanctioning countries must close the loopholes swiftly, as the quantum of oil produced from Russian crude and traded has risen significantly in the second year of the invasion compared to the prior year.

Russian pipeline oil revenues would be cut by 13% (EUR 497 mn per month) if the EU cut off their flows to countries within the bloc, mainly Hungary, Slovakia and the Czech Republic.

These further sanctions, combined with a lowered and fully enforced price cap of USD 30 per barrel for crude oil and a reduced price level for oil products, would cut Russian revenues from these sources by 32% (EUR 6.8 bn per month).

Practical implications of sanctions on Russia's oil drilling

Another key indicator reflecting the outlook for the oil market in Russia is drilling activity, which has reached, [according to Bloomberg](#), a record high for a second consecutive year. These statistics encompass various drilling activities, including exploration drilling, drilling new wells, and developing existing wells.

Russia's current record drilling activity is primarily attributed to the depletion of old wells, a situation familiar to the country. However, the impact of sanctions is evident in the development of fewer new fields, as they require Western technology. Consequently, Russia is compelled to bring less productive areas into production. The absence of cutting-edge technologies has led to a decrease in drilling efficiency.

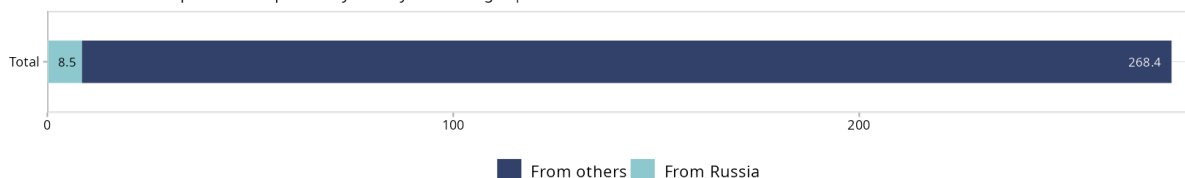
Main loopholes boosting Russian fossil fuel revenues

While many of the current sanctions have impacted Russian revenues heavily, the Kremlin has found various ways — via legal loopholes, circumventions, and outright sanctions' evasions — to counter them and continue to gain significant revenue from fossil fuel exports. These loopholes and a lack of enforcement significantly reduce the impact of sanctions and prevent them from achieving their aim, to stop sending funds to the Kremlin.

Refining loophole widens in the second year of invasion

Total oil products imported by PCC using Russia crude oil

Billion EUR of oil products imported by PCC by crude origin | December 2022 to December 2023 inclusive



Source: CREA analysis using Kpler and Eurostat.



Despite the ban on the import of Russian crude and oil products, price cap coalition countries can still legally import oil products from third countries made from Russian crude. [CREA's analysis has revealed](#) that in 2023, there was a 44% year-on-year increase in sanctioning countries' imports of oil products by volume produced from Russian crude.

One year since the ban on Russian crude imports, refineries in third countries have exploited this loophole to export products made from Russian crude worth EUR 8.5 bn into sanctioning countries — equivalent to [68% of the EU's annual](#) commitment to aid Ukraine between 2024 and the end of 2027. Oil products produced from Russian crude consisted of 3% of sanctioning countries' total imports from December 2022 to December 2023. EUR 4.2 bn of Russian crude oil was used to create these products, generating EUR 1.7 bn in tax revenues for the Kremlin.

In the 13 months since the implementation of the sanctions, the USA imported EUR 1.6 bn worth of oil products produced from Russian crude. EUR 807 mn of Russian crude was used to make oil products exported to the USA — making it the largest importing country. EUR 2.6 bn of Russian crude was used to make oil products for countries in the EU, with the top three being the Netherlands (EUR 590 mn), France (EUR 422 mn), and Italy (324 mn).

Sanctioning countries' biggest imports of oil products produced from Russian crude were from India, Turkey, China and Bulgaria. The Vadinar refinery in India was the third largest exporter of oil products produced from Russian crude oil to sanctioning countries. The refinery is owned by Nayara Energy Limited. Russian energy giant Rosneft — who are on the [UK](#) list of investment ban targets banned entities and [OFAC's list of sanctioned entities](#) — hold a [49.1% share in Nayara Energy Limited](#). Profits made from the export of oil products from this refinery to sanction-imposing countries will, therefore, partially flow

back to the Kremlin. A second such instance is the Lukoil-owned Neftochim Burgas refinery in Bulgaria, [whose imports of Russian crude rose significantly after the EU/G7 sanctions](#).

Bulgaria is a key example showing how reliance on Russian crude will increase significantly when there are no sanctions banning this flow as the Burgas refinery, the largest and main provider of oil to the whole nation, increased its reliance on Russian feedstock from 73% prior to the invasion to 93% in the first ten months of 2023. Following the [Bulgarian Government's measures to end Russian oil](#) imports, to be fully implemented on March 1, 2024, their seaborne oil imports from Russia have decreased to 14% in 2024. This shows that without government bans, businesses and refineries will exploit legally sanctioned loopholes in search of higher profits. The Bulgarian case study also shows that when governments ban the importation of Russian crude, refineries can cope without importing Russian crude oil.

Governments must act fast to ban the refining loophole; otherwise, businesses will continue to exploit it and help raise Russian revenues, which fund the invasion of Ukraine.

Ship-to-ship transfers continue uninterrupted in EU waters

Import bans and sanctions have significantly altered shipment routes, as new willing buyers of Russian oil have popped up around the globe. Consequently, the [logistics of the Russian oil trade have become more complicated](#), and many ships have become reluctant to enter Russian ports, leading to a huge increase in ship-to-ship (STS) transfers of Russian oil in the second year of the invasion. In addition to boosting oil sales, splitting the cargo to multiple buyers and mixing lower-priced Russian oil with non-Russian oil, this rise in STS transfers of Russian oil is also an environmental risk, with some old tankers undertaking STS transfers without insurance in EU waters.

STS transfers of Russian oil within EU waters shot up by 150% in the first year of the invasion. In the second year, this number fell by 27% (from 999 to 727). This slight drop in the number of STS transfers detected of Russian oil in EU waters could be influenced by the [11th sanctions package](#), which prohibits access to EU ports or vessels if they do not notify competent authorities in advance. It could also be due to increased STS transfers going undetected when ships turn off their Automatic Identification Systems (AIS) transponders.

[An analysis by S&P Global](#) found that STS transfers of Russian oil by vessels turning off their AIS transponders tripled in the second quarter of 2023. In 2023, over half of the STS transfers happened off the coast of Greece, specifically at the Kalamata Lightering zone. The rest were near Malta, Ceuta (Spain), Constanta (Romania) and Augusta Lightering (Italy).

The EU has enabled STS transfers of an estimated 24 mn tonnes of Russian oil (equivalent to EUR 30 mn per day) in its waters since the implementation of oil sanctions in December 2022. This is a considerable proportion of Russia's seaborne oil exports, with 5% of total seaborne Russian oil undertaking STS transfers in EU waters in the second year of the invasion.

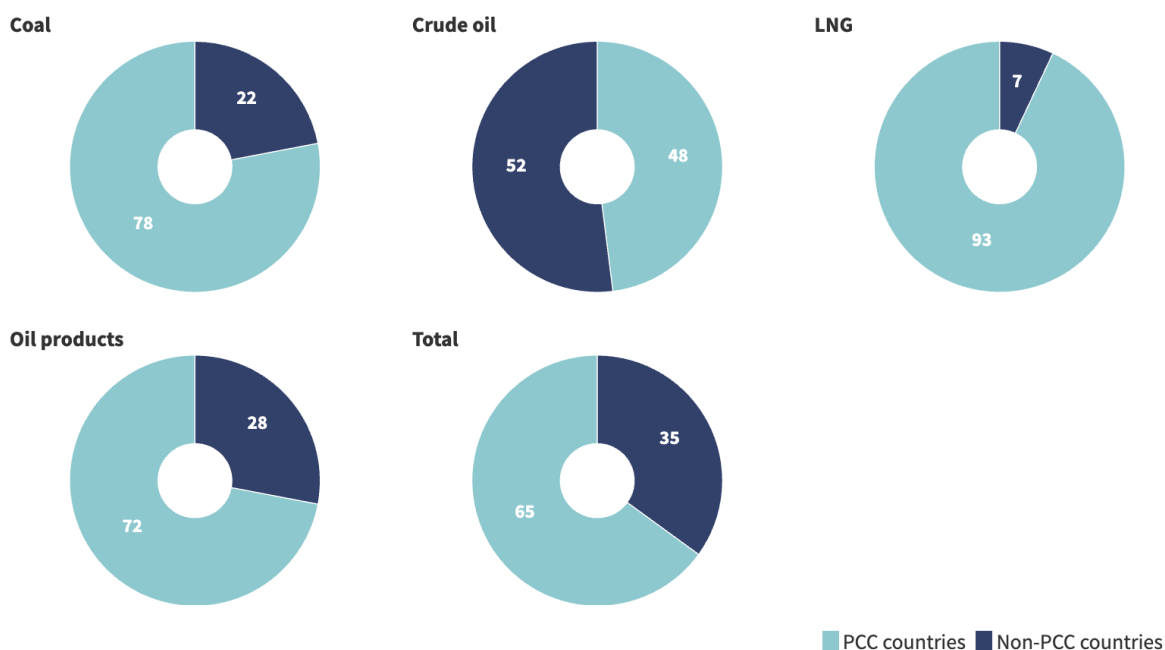
Russia is undertaking STS transfers of its oil in EU waters for two reasons. By obfuscating the origin of the oil they transport, traders and other entities sell these commodities illegally to sanction-imposing countries. Furthermore, Russia uses EU waters to help ship its oil to customers across the globe by splitting quantities transported on larger vessels into smaller ones that deliver to different ports.

‘Shadow’ tankers threatening effect of sanctions

Seaborne fossil fuel shipments from Russia by vessel insurance and ownership

The second year of a full-scale invasion

Value in percent



Source: CREA analysis



In the first year of the invasion, ships insured by the Price Cap Coalition transported 85% of Russia's fossil fuels. The second year has seen this decline to 65%, valued at EUR 120 bn. This reduction displays that Russia's strategic acquisition of old tankers is aimed at circumventing the oil price cap policy that dictates and suppresses the price that Russia receives for its oil when transported on G7/EU-owned or insured tankers.

While Russia's fossil fuel exports remain heavily reliant on PCC countries, there has been a noticeable rise in the use of 'shadow' tankers, responsible for one-third of total Russian oil exports. These tankers transported 20% of Russia's total volume in the first year of the invasion, which escalated to 40% in the second. The shift reflects Russia's strategic pivot from high-risk energy weaponisation to low-risk price cap sanction circumvention, bolstering their export revenues. However, the growth in the 'shadow' tankers'

transportation of Russian oil also presents environmental hazards and [accountability](#) ambiguities due to [unclear](#) ownership and insurance coverage.

The average age of these ‘shadow’ tankers departing from Russia's Baltic Sea ports is 18 years; a third are 20 years or older. These vessels pose ecological threats as they navigate territorial waters, where responsibility for accidents and clean-up efforts remains uncertain. In one such instance, [an old tanker caught fire off the coast of Malaysia in May 2023](#).

The proliferation of ‘shadow’ tankers and their circumvention of subsequent sanctions highlight the multifaceted challenges of limiting Russia's fossil fuel export earnings. The Price Cap Coalition’s dominance as maritime insurance providers gives the coalition considerable leverage to limit the Kremlin’s revenues. However, EU/G7 shipping service providers have also been involved in voyages that violate sanctions, necessitating further investigation and more robust enforcement.

Recommendations: How Ukraine’s allies can curb Russia’s revenues

Ban imports of Russian LNG to the EU: Russia’s LNG export revenues are heavily reliant on flows to the EU, which comprised half of their export value during the second year of the invasion. Russian LNG is currently not sanctioned by the EU. Implementing an EU ban on Russian LNG would reduce Russian LNG revenues by EUR 632 mn per month. Sanctioning countries could source gas from non-Russian origin in the short term but, more importantly, must invest in electrification and power generation from renewable energy sources.

Further measures could be implemented to cut Russian export revenues from LNG, including a transshipment ban in EU ports for LNG that is re-exported to non-EU nations. Russia relies heavily on EU ports as a logistical stop-off for shipments to non-EU destinations. Therefore, a ban on the transshipment of Russian LNG could raise costs and create logistical hurdles that would cut Putin’s earnings from gas exports.

Ban pipeline flows to EU: Banning Russian pipeline oil and pipeline gas would cut off Putin's access to the EU market, currently worth EUR 770 mn per month and EUR 632 mn per month, respectively. Due to infrastructure constraints, Russia would struggle to make up these sales to new customers.

Closing the refined oil loophole: The first step would be to ban the importation of oil products refined from Russian crude oil in non-sanctioning countries. This would enhance the impact of the sanctions by disincentivising third countries from importing large amounts of Russian crude. It would further cut Russian revenues as exporters would have to find new buyers for this crude oil and, therefore, offer a higher discount. The Price Cap Coalition's relatively low reliance (3%) on [oil products produced from Russian crude](#) means that a ban on these imports would have no significant inflationary pressure on oil prices while cutting Russian export revenues by EUR 332 mn per month.

Lower the price cap: CREA's analysis shows lowering the oil price cap to USD 30 per barrel for crude oil and oil products combined with fully enforcing this policy would cut Russia's fossil fuel export revenues from seaborne oil by 27% (EUR 4.5 bn per month). Lowering the price cap would be deflationary, reducing Russia's oil export prices and inducing more production from Russia to make up for the drop in revenue.

Furthermore, a lower price cap of USD 30 per barrel would still be well above production costs (estimated at [USD 15 per barrel on average](#)), incentivising continued supply while significantly cutting Russia's revenues. The set price cap level for oil products should also be lowered to USD 35 per barrel for premium oil products and USD 25 per barrel for low-value oil products to further ratchet Russia's export revenues.

Tighter enforcement: Vessels owned or insured by G7 countries have persisted in loading Russian oil at all ports within Russia when prices were above the price cap. These occurrences serve as compelling evidence of violations against the price cap policy. Maritime insurers must be required to verify via bank statement that the oil price was paid below the cap to avoid fraudulent attestation documents being used to attain Western insurance; this could significantly improve compliance with the policy. The OFAC, OFSI and European enforcement agencies must step up enforcement and publicly announce sanctioned entities, such as vessels violating the price cap policy. OFAC's sanctioning of 50 tankers that started on October 10, 2023, is estimated to be partially responsible for

widening the discount on Russian oil prices, thereby lowering Russia's oil export earnings by EUR 512 mn per month.

A recent CREA publication revealed that [33% of all Russian oil \(by volume\) was transported on tankers insured in the UK](#) since the sanctions were implemented until early November 2023. Penalties must be imposed on firms that violate sanctions and facilitate Russia in increasing their oil export earnings above the price cap that is then used to fuel the war on Ukraine. Penalties for entities caught violating the oil price cap remain inadequate. Sanctioning countries should ban maritime services in perpetuity for vessels used to transport Russian crude without complying with the price cap.

Introduce spill insurance: The coalition should introduce a spill insurance verification program for vessels traversing their waters. Sanctioning countries should mandate tankers traversing their waters to provide compliant spill liability insurance under international maritime law. This could exclude 'shadow' tankers without spill insurance from travelling through their most travelled route from Baltic ports whilst reducing the risk of environmental catastrophe.

Methodology

Data sources

CREA analysis is based on various data sources, including Kpler, Eurostat, Comtrade, Equasis, P&I providers, Global Energy Monitor and oilprice.com.

Modelling the impact of sanctions on Russian fossil fuel export earnings

CREA estimated the impact of each of the sanctions implemented on Russian fossil fuels and forecasted the impact of recommended further measures.

Russia's projected fossil fuel export earnings in the absence of sanctions

We have predicted Russia's current export earnings in the absence of sanctions as the average earnings over the past 12 months plus the monthly average estimated impact for

each of the existing sanctions, as detailed below. We used this methodology to compare the impact of sanctions to a baseline case that models Russia's export earnings if sanctions were not implemented. We chose this methodology over other alternatives, such as calculating the average monthly earnings in the 12 months before the invasion. The methodology we selected removes the effect of higher global prices since Russia's invasion of Ukraine and excludes the effects of seasonal changes in Russia's fossil fuel exports on our analysis. However, using the last 12 months of earnings doesn't include the effects of the OFAC sanctions for the whole period, causing a marginal overestimation of Russia's potential earnings without sanctions and an underestimation of the impact of sanctions as a percentage of earnings. We consider this a conservative approach to showing the potential impact of sanctions.

Effects of existing sanctions

To estimate the **impact of the crude oil price caps and import bans** by the EU and G7, we calculated the discounted price between Russian crude oil and benchmark global crude spot prices (minus an average discount for each type of Russian crude, in the period before the war). This discount was multiplied on a daily basis, by the volume of exported Russian oil since sanctions were implemented (5 December 2022) until the second anniversary of Russia's full-scale invasion. The impact of the ban and price cap is calculated, therefore, by taking the price impact (the discount of exported Russian crude oil compared to global prices) multiplied by the volume of oil they were able to export in the timeframe of interest. We have excluded the impact of OFAC's sanctioning of vessels and entities from this value.

To estimate the impact of an **oil products ban and price cap**, we calculated the price discount of exported Russian oil products using data from COMTRADE: the difference in average export value in euros (weighted by volume traded) comparing the reported exports from Russia to reported exports from other countries. We multiplied this discount on a monthly basis with the volume of oil transported in the first two years since the sanctions were implemented on December 5, 2022. We use the crude oil price cap date as it is not possible to separate the effects of the different bans and price caps.

In **modelling the impact of OFAC's sanctioning of vessels and entities** that have been added to the sanctions list, we calculated the change in the discount between Russian crude oil prices and a global baseline crude price from the date that OFAC started to publish names of entities that had been added to the sanctions list. We assumed that in

the absence of OFAC's sanctioning, the discount of Russia's crude oil to the global baseline would stay fixed; we calculated this fixed discount using the average price over the 7-days preceding the start of the OFAC sanctions (October 10, 2023) and the associated fixed discount price over the period of the sanctions. We calculated the difference between the fixed discount price and the actual value from October 10, 2023, to February 24, 2024, on a daily basis. We multiplied the discount by the quantity of Russian crude oil exported on each day to calculate an estimated value of the impact of OFACs' measures. There will, of course, be additional variables or factors that would have influenced the discount between Russian and global oil prices. These include availability of Russian exporters to Western-owned or insured tankers, which should be considered to caveat this analysis.

To estimate the **impact of the EU's coal ban** on Russia's export earnings, we assumed that in the absence of sanctions:

1. Russia's share of the global coal trade would have stayed at the pre-war levels as the global volume of traded coal decreased over time.
2. Russia's coal would have been traded at the global average price of coal.

We multiplied Russia's expected coal export volumes based on their share of global exports by the average global price per month. We compared that to the actual export value traded by Russia.

Effects of Russia's energy blackmailing

Putin's use of energy blackmail resulted in a cut off of gas exports via pipeline to the EU. In August 2022, Gazprom stated it would halt natural gas via Nord Stream-1, which raised European gas supply concerns. Russian pipeline gas exports plummeted in the summer of 2022 and haven't recovered since. The EU imports of Russian LNG have, however, remained more consistent.

To estimate the impact of Putin's energy blackmail, we calculated the drop in average monthly gas export value to the EU in the one year before the cut in pipeline exports (August 2022) compared to the following year. Our models estimate the impact of Russia's fall in gas export value to be an average of EUR 5.1 billion per month as a result of the

significantly lower export value of Russian pipeline gas that was not offset by a rise in LNG shipments.

Effects of future sanctions

To predict the impact of the **full enforcement of the oil price caps**, our analysis estimated trades of Russian oil transported only on tankers owned or insured in any PCC country during the oil bans and caps. We calculated the difference between the market-traded price of Russia's oil on a daily basis in periods where average prices remain above the price cap level and multiplied this by the volumes that were traded during periods above the cap on PCC-owned or insured tankers. The value of oil trade from Russia at average market prices on tankers owned or insured in PCC countries was calculated to estimate the export value with little or no enforcement. This partially considers that the oil price cap policy may have lowered average Russian export prices. The export value of full enforcement of the oil price cap is estimated as the value of traded Russian oil transported on PCC-owned or insured tankers if sold at the price cap level when prices rose above the cap. Therefore, the impact of a fully enforced oil price cap policy is estimated as the difference between these two values.

To predict the impact of **lowering the oil price caps** we used the same methodology as for full enforcement of the price caps but using the cap values of USD 30 per barrel for crude oil, USD 25 per barrel for low value oil products and USD 35 per barrel for premium oil products. We assumed that all seaborne Russian oil exported on tankers that were owned or insured in PCC countries were sold at the lower modelled price cap levels to estimate the impact of reducing the price cap under full enforcement of the policy.

Estimating the effect of closing the refining loophole: We identified refineries in third countries that have bought Russian crude oil since the implementation of sanctions (5 December 2022) that have also exported oil products to the PCC. We then calculated the proportion of the PCC imported oil products from the refineries that have partially run on Russian crude oil to calculate a proportion of their feedstock crude from Russia. Each identified refinery's reliance on Russian crude is used to estimate the proportion of exported oil products (made from Russian crude oil) to PCC countries. For a detailed explanation of the methodology, please see [here](#).

When providing **modelled estimates of the impact of the EU implementing an LNG, pipeline oil and pipeline gas** ban from Russia, we estimated the value of the average monthly exports that Russia sells to the EU as this is the size of the market that Russia would be cut off from selling to. It is important to note that this is likely to overestimate the impact of further sanctions since Russia will likely be able to partially replace sales of newly banned commodities to non-sanctioning countries, as we have seen with Russia's oil exports. For Russia to replace sales that previously went to the EU with new buyers in non-sanctioning countries, it will likely have to offer a discount to encourage new buyers. Using this methodology, this report estimates that an EU ban on LNG flows and pipeline gas to the EU could cut Russian export revenues by blocking their access to the EU market worth 32% (EUR 632 mn per month) and 29% (EUR 770 mn per month) of their total sales respectively. Russian pipeline oil revenues would be cut by 13% (EUR 497 mn per month) if the EU cut off their flows to countries within the bloc, mainly to Hungary, Slovakia and the Czech Republic.

The average monthly estimated export value of Russian pipeline gas, pipeline oil and LNG to the EU is calculated for the second year of Russia's invasion of Ukraine - from February 24, 2023, to February 24, 2024).