RUSSIAN OIL SANCTIONS EXPLAINED

DECEMBER 2022

INTRODUCTION

- In 2021, the oil industry in Russia represented 15% GDP, 40% of exports and 45% of federal budget.

- Currently there is no full world-wide embargo of Russian oil. The US and UK stopped buying Russian oil early this year.

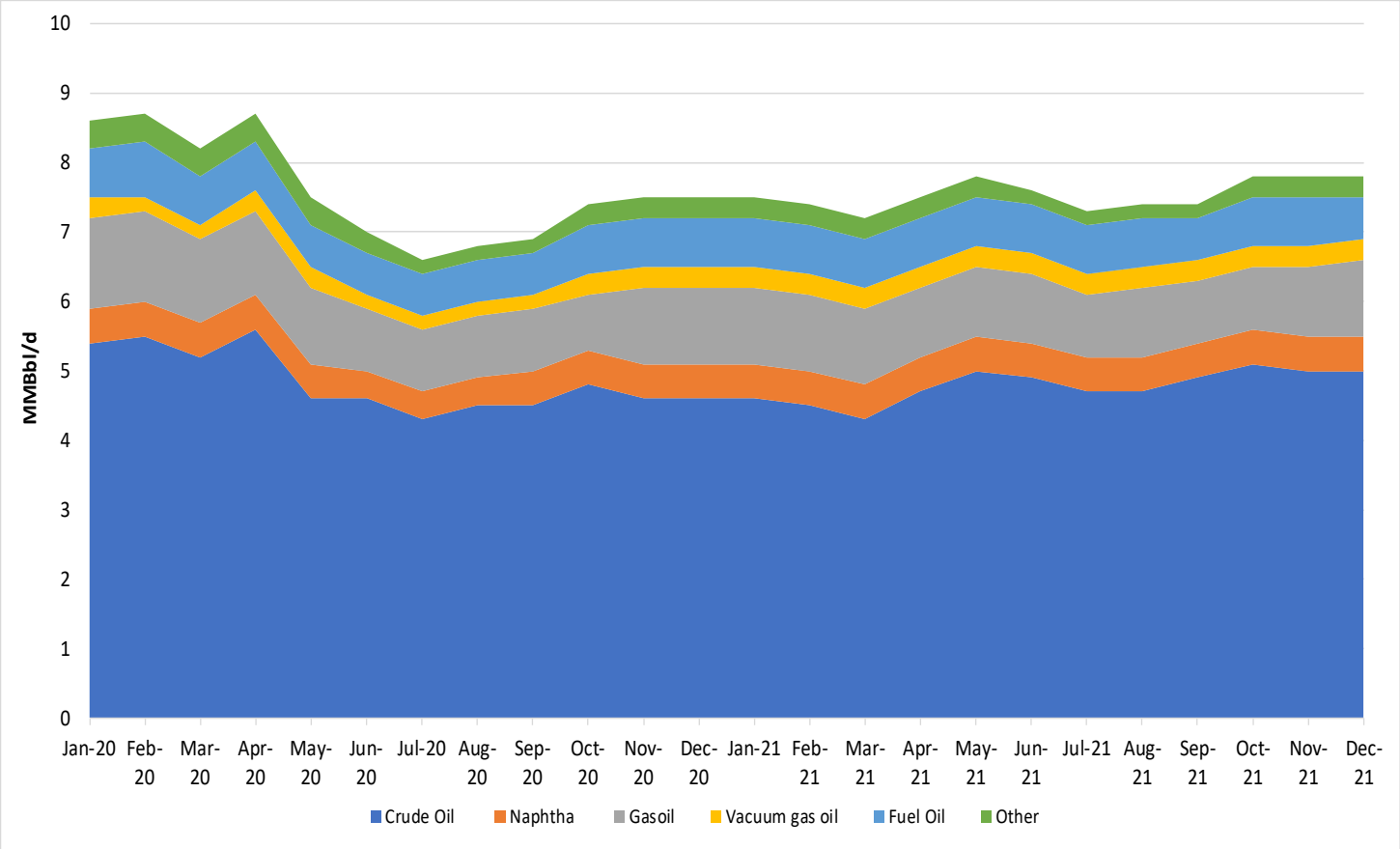
- EU implemented a ban on marine transportation services related to Russian crude oil delivered by tankers starting December 5, 2022. Similar ban for services related to marine transportation of Russian petroleum products is expected to start on February 5, 2023.

- In December 2022, the G7 and EU announced an initial price cap on Russian oil of USD $60/Bbl. According to the plan, jurisdictions that purchase seaborne Russian oil at or below the price cap is permitted.

- In 2021, Russia exported about 3.1 MMBbl/d of crude oil to Europe , 0.75 MMBbl/d /d was exported via Friendship pipeline.
- Russia also exported 1.3 MMBbl/d of oil products to Europe. Total crude oil and petroleum export from Russia in December 2021 was 7.8 MMBbl/d.
- Russia exported 1.6 MMBbl/d of oil to China. Approximately half of this amount moves by pipeline and half by tankers.

INCORRYS

RUSSIAN OIL EXPORT WORLDWIDE

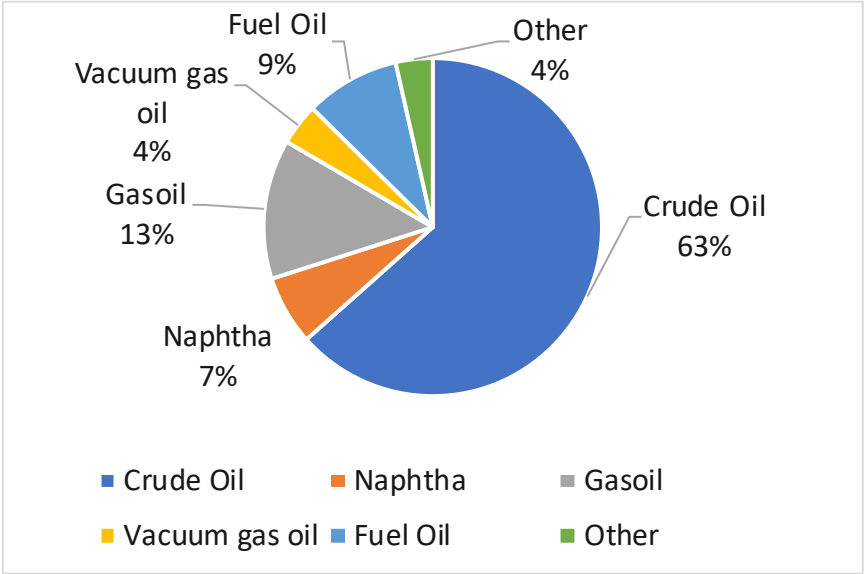


- Crude oil represented 63% of Russian exports in 2021, the rest are petroleum products.

Source: IEA

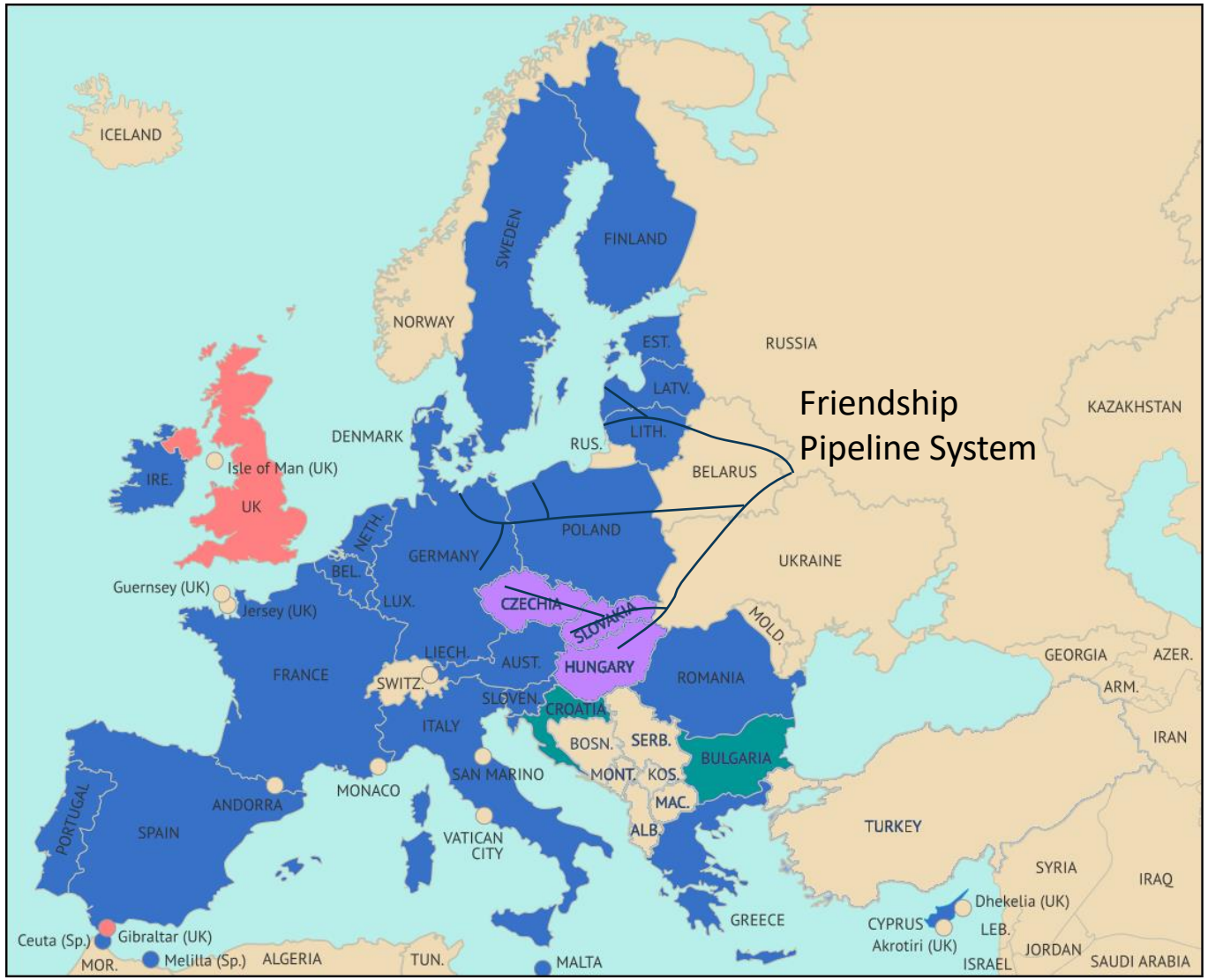
- Russian oil exports fell to 7.4 MMBbl/d from 8 MMBbl/d at the start of the year.
- Crude and oil product flows to the US, UK, EU, Japan and Korea have dropped by about 2.2 MMBbl/d since March 2022, although 1.5 MMBbl/d have been rerouted to other markets.
- Russian export revenue fell from $21B in June to $19B in July due to reduced volumes and lower oil prices.

Russian Exports in 2021



INCORRYS

SUMMARY OF EU BAN ON RUSSIAN OIL



- EU banned Russian crude oil delivered by tankers effective December 5, 2022.
- Ban on oil Russian petroleum products is expected to start on February 5, 2023.
- Import by Friendship pipeline by Central European Countries such as Hungary, Slovakia, and the Czech Republic is allowed, but they cannot resell Russian oil and oil products.
- Croatia can continue imports until the end of 2023 and Bulgaria until the end of 2024.
- UK stopped buying Russian oil early 2022.
- EU bans insurance and reinsurance of ships caring Russian oil.

Ban Russian oil

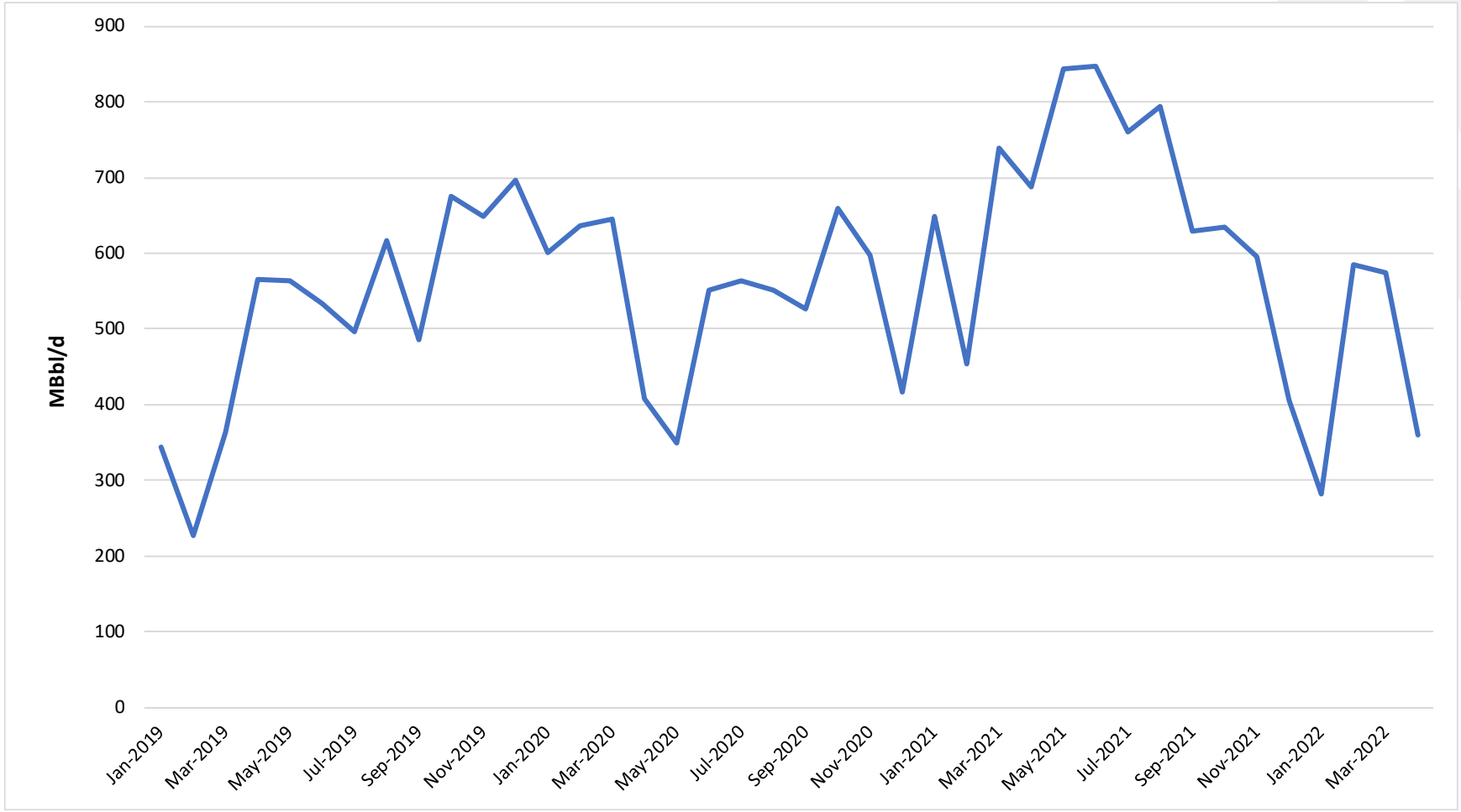
Can receive Russian oil by pipeline

Temporary Exception

Ban Russian oil early 2022

INCORRYS

U.S. IMPORTS OF RUSSIAN OIL & PETROLEUM PRODUCTS



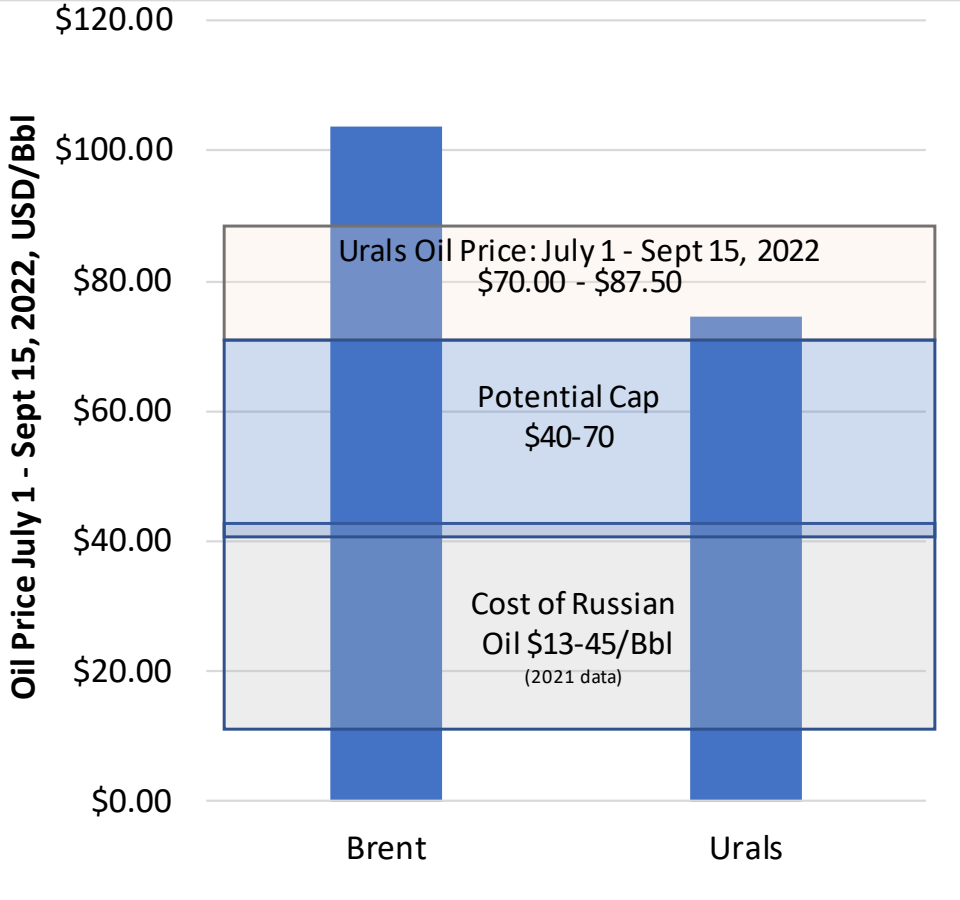
Source: Energy Information Administration EIA

- President Joe Biden announced on March 8, 2022, that the U.S. will ban imports of oil from Russia, along with refined petroleum products, natural gas and coal.
- According to the EIA, in 2021, Russia provided 8% of U.S. imports of crude oil and petroleum products and only 3% of crude oil imports.
- The primary source of US petroleum imports is Canada: 51% of all US imports
- Banning Russian oil had minor consequences for U.S. refineries. Russian oil destined for the U.S was redirected to other countries.

INCORRYS

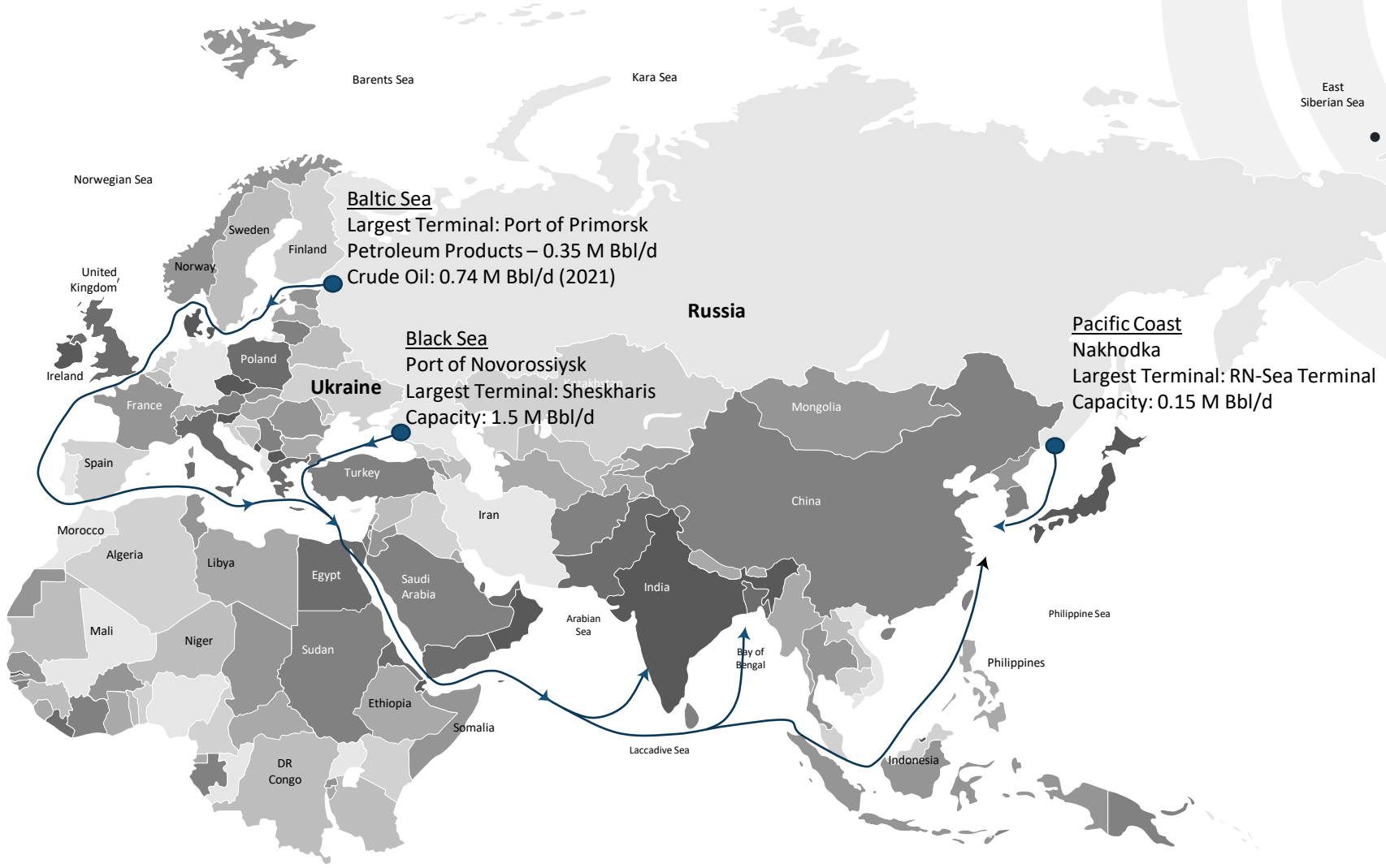
PRICE CAP FOR RUSSIAN OIL

- In December 2022, the U.S. and allies imposed a USD $60/Bbl price cap on Russian. Incorrys expects future changes to the cap will be range bound between $40-$70/Bbl with the goal to reduce funds flowing to Russia.
- In the case of a cap, total oil supply will not be reduced, and global oil prices will not be affected as much as sanctions *prohibiting* buying of Russian oil. The cap would also help to reduce prices for consumers.
- There are significant challenges and opposition to implementation of the cap.



INCORRYS

SHIPPING RUSSIAN OIL



- Russia exports crude oil from four main areas: the Baltic Sea, Black Sea, Pacific Coast and the Arctic.
- Russia has about 64 oil terminals although only a few of them are considered large export facilities.

Oil Transit Time from Russia to:

- Northern Europe: 2-4 days
- Europe Average: 8 days
- West Africa: 25 days
- Latin America: 30 days
- India: 22-30 days*
- China: 37-45 days*

*Depends on where cargo is loaded (Baltic or Black Sea) and the destination.

Average additional transportation cost:

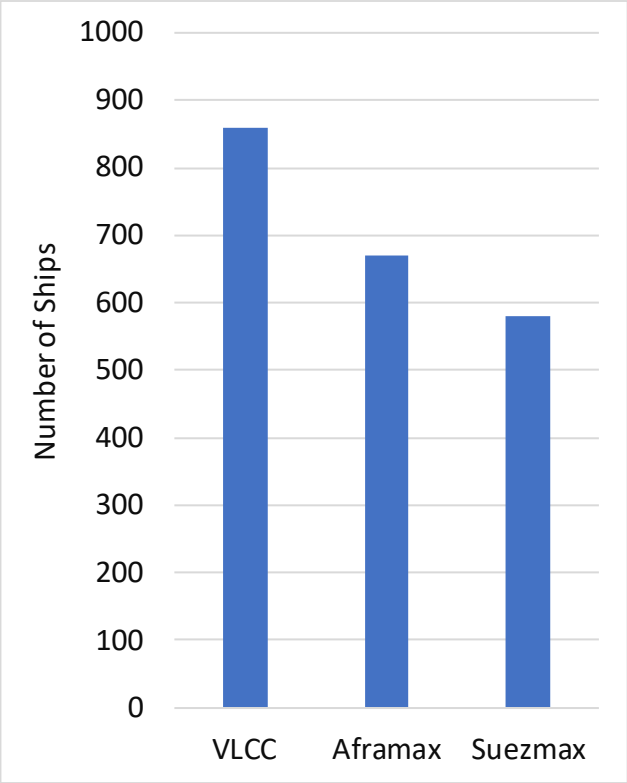
To India: $0.80 - $1.07

To China: $1.65 - $2.20

INCORRYS

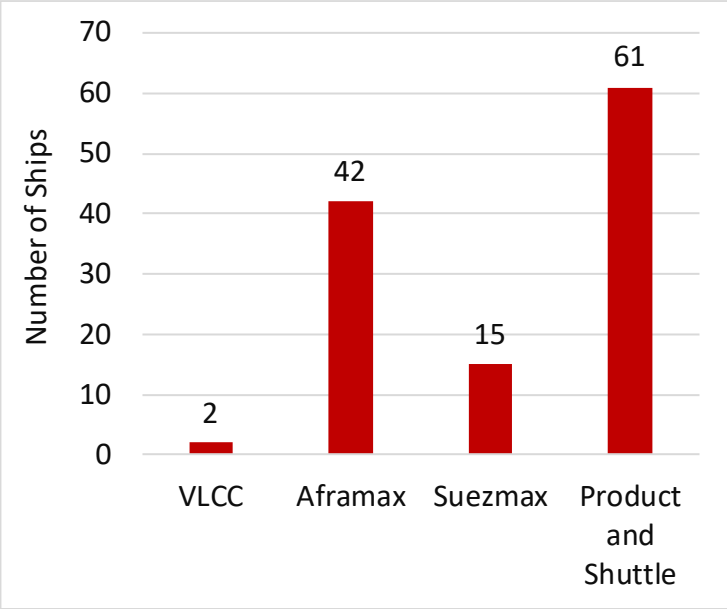
TANKER FLEET TO REDIRECT RUSSIAN OIL FROM EUROPE TO ASIA

Tanker fleet worldwide



Sovcomflot Tanker Fleet

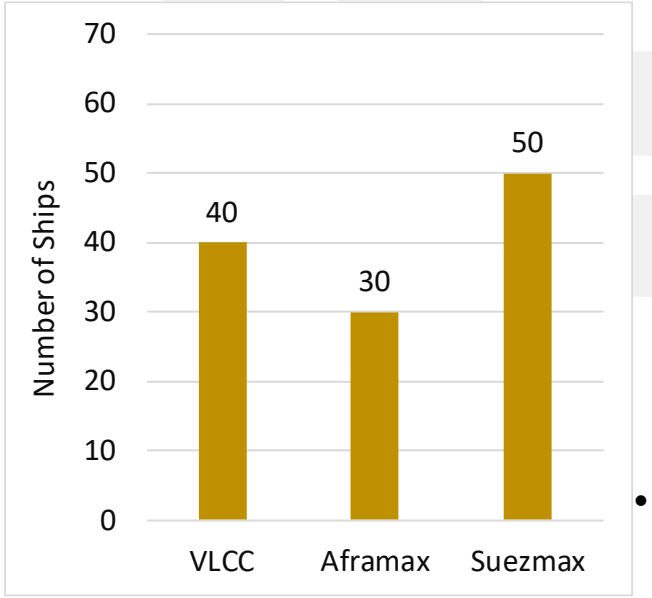
(Estimate for Summer 2022)



According to the Sovcomflot web site, the actual number of ships can be lower as some ships have either sold or in the process of being sold.

Does not include LNG carriers and icebreakers.

Additional Fleet Required



120 additional tankers required if sanctioned oil needs to be redirected to Asia (primarily China and India). Source: IHS.

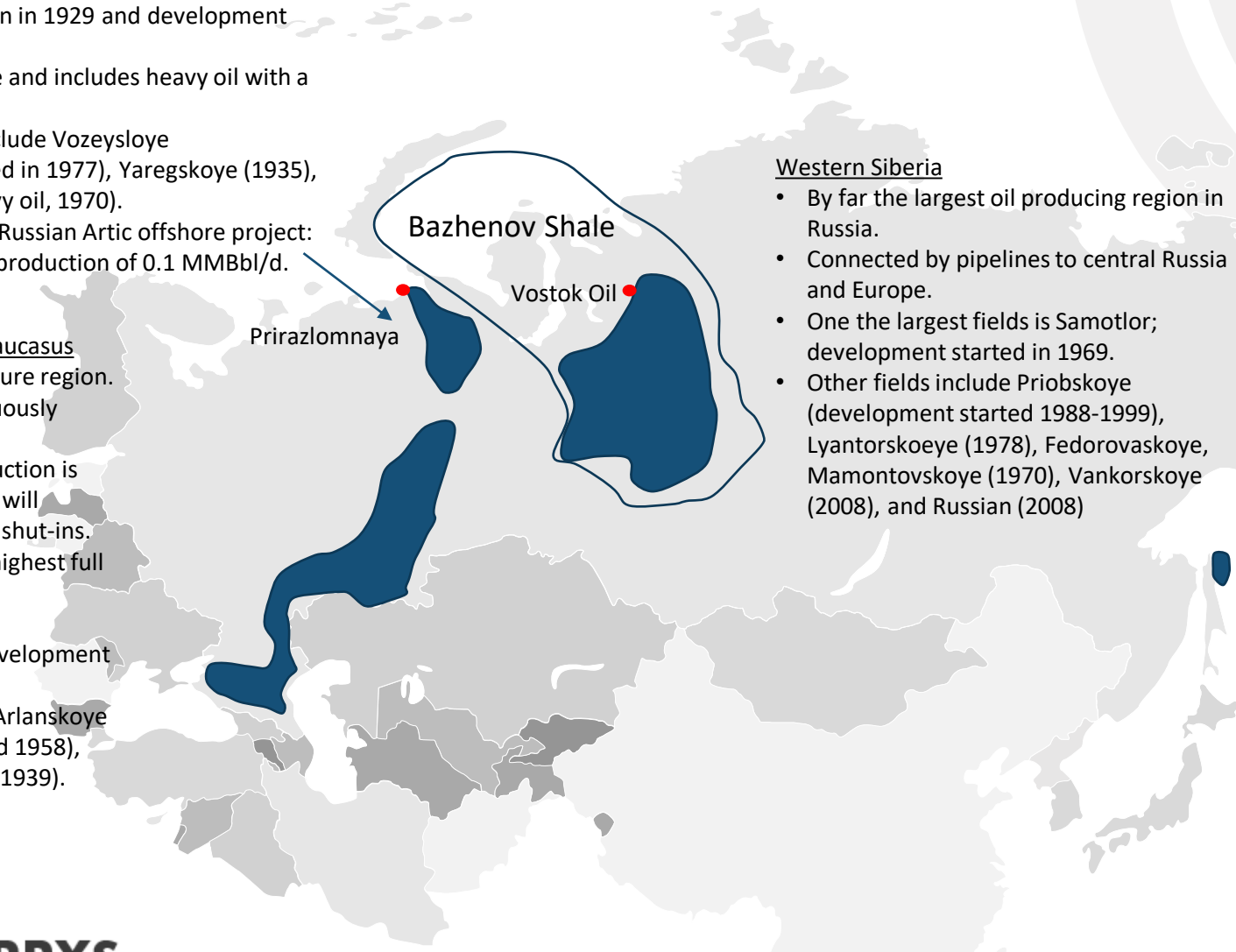
- As part of the sanctions against Russia, the EU is banning insurance and reinsurance of ships carrying Russian oil. Classification organizations, such as Lloyds and ABS, have refused to provide services to Russian clients.
- Although insurance and reinsurance sanctions will not stop the redirection of Russian oil away from Europe to Asia, it will reduce volumes, increase costs, and reduce Russian oil revenue.

INCORRYS

RUSSIAN OIL PRODUCTION BASINS

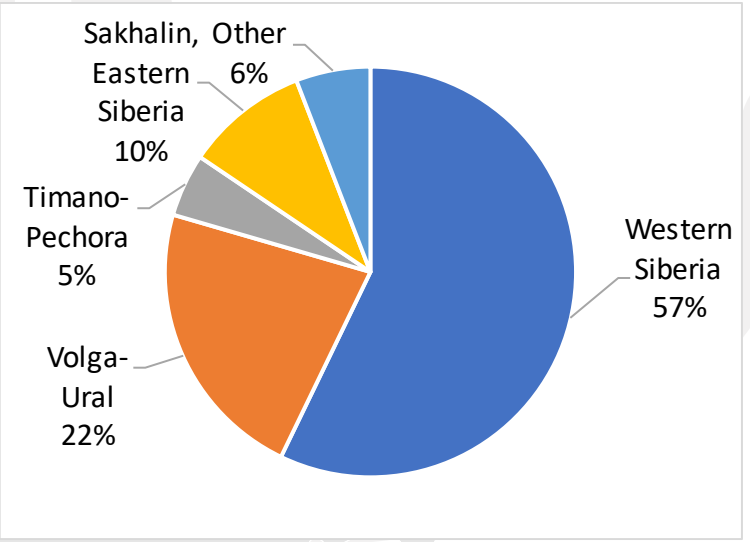
<u>Timano-Pechora</u>
- Exploration started in in 1929 and development started in 1930.
- The region is mature and includes heavy oil with a high full cycle cost.
- The largest fields include Vozeysloye (development started in 1977), Yaregskoye (1935), and Usinskoye (heavy oil, 1970).
- Region has the only Russian Artic offshore project: Prirazlomnaya with production of 0.1 MMBbl/d.

<u>Volga-Ural and North Caucasus</u>
- Oldest and most mature region.
- Production is continuously declining.
- If total Russian production is curtailed, this region will experience the most shut-ins.
- This Region has the highest full cycle cost in Russia.
- The largest field is Romashkinskoye; Development started in 1952.
- Other fields include Arlanskoye (development started 1958), and Tuymazinskoye (1939).



<u>Western Siberia</u>
- By far the largest oil producing region in Russia.
- Connected by pipelines to central Russia and Europe.
- One the largest fields is Samotlor; development started in 1969.
- Other fields include Priobskoye (development started 1988-1999), Lyantorskoeye (1978), Fedorovaskoye, Mamontovskoye (1970), Vankorskoye (2008), and Russian (2008)

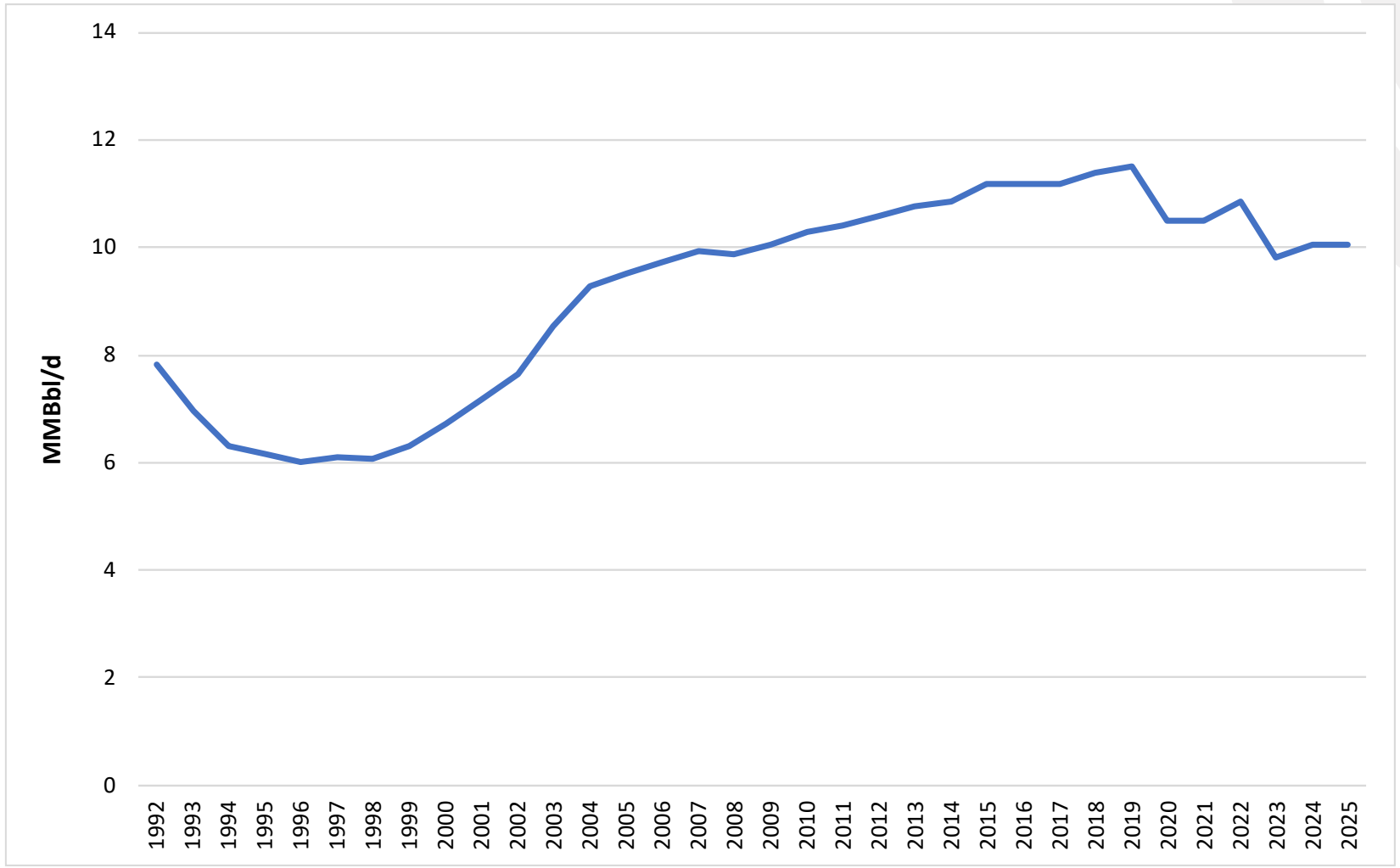
Russian Oil Production by Region



<u>Sakhalin</u>
Includes:
- Sakhalin I – was joint venture with Exxon Mobile (0.25 MMBbl/d)
- Sakhalin II – was joint venture with Shell (0.4 MMBbl/d)
- Both companies left the projects. Russian oil companies will operate the project without foreign partners

INCORRYS

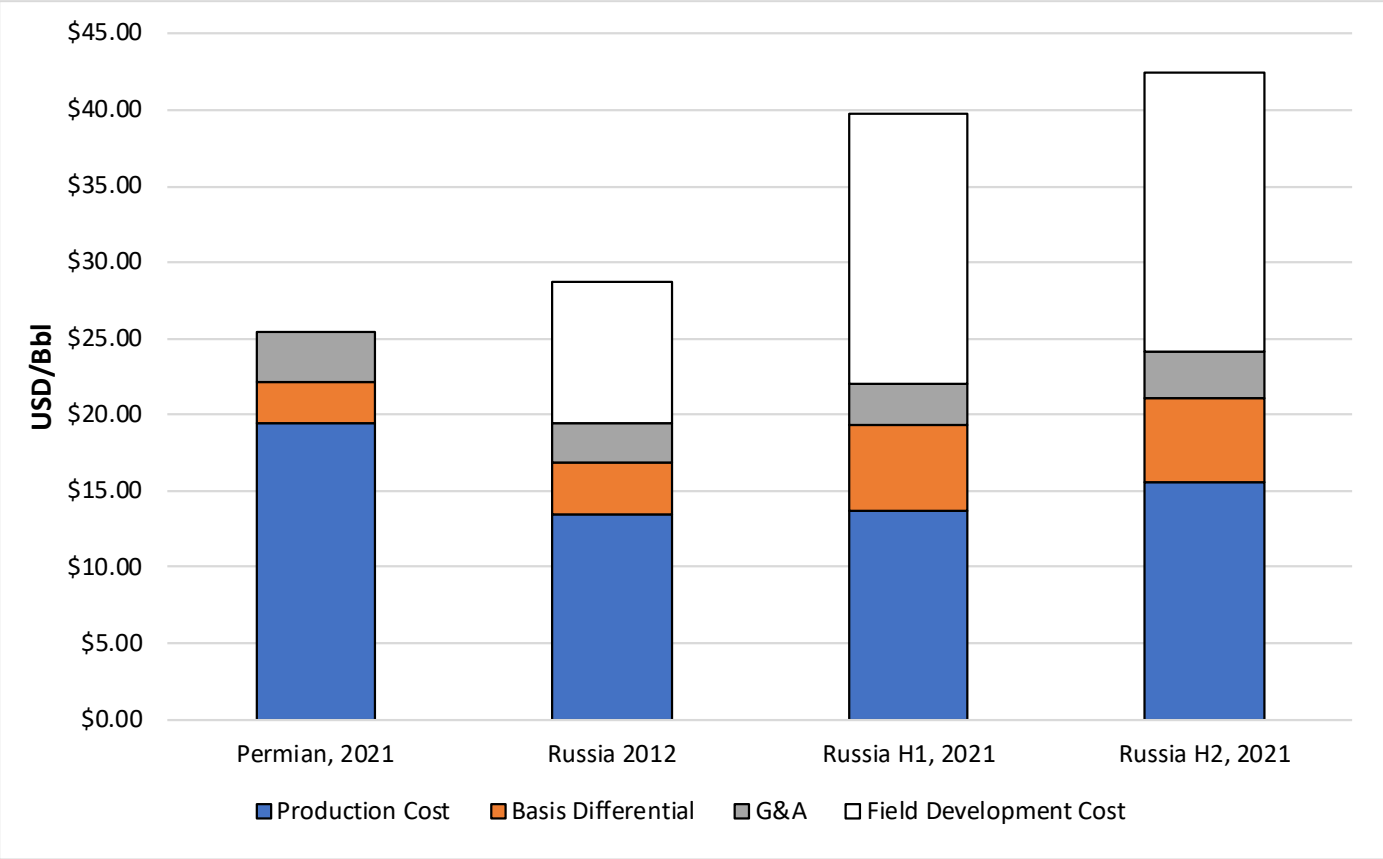
RUSSIAN OIL PRODUCTION



- Russian oil production decreased significantly (-25%) in early 1990's due to a structural crisis in the Russian economy.
- Production started to grow after 1998 and reached its peak of 11.5 MMBbl/d in 2019.
- In 2016, when oil prices were low, Russia and 9 other oil producers joined OPEC+; OPEC+ produces 40% of all the world's crude oil.
- The recent drop in Russian oil production is due to the Covid-related slowdown in global oil demand. This drop was coordinated with OPEC+.

INCORRYS

COST OF RUSSIAN OIL



1. **Average production cost** of Russian oil in H2, 2021 was USD $15.60/Bbl, up from USD $13.50 in 2012 and USD $13.70 in H1, 2022.
2. **Weighed Average Basis Differential** reaches USD $5.44/Bbl in H2, 2021, up from USD $3.34/Bbl in 2012 and is expected to widen in 2022. The Weighed Average Basis Differential is estimated based on pipeline tolls for three production regions (excluding Sakhalin).
3. **Weighed Average Total Cost of Russian** oil reaches USD $40-45/Bbl. In addition to production cost, G&A, and Basis Differential, it also includes cost for development of new fields which reaches USD $18.40/Bbl in H2, 2021. Most new fields are in remote areas of Siberia and require very significant infrastructure investment. If new fields are not developed do to lack of capital and technology, it will lead to an overall decline in production.
4. Total cost of oil in Russia without new field development is compatible with costs in Permian and other US Tight Oil basins.

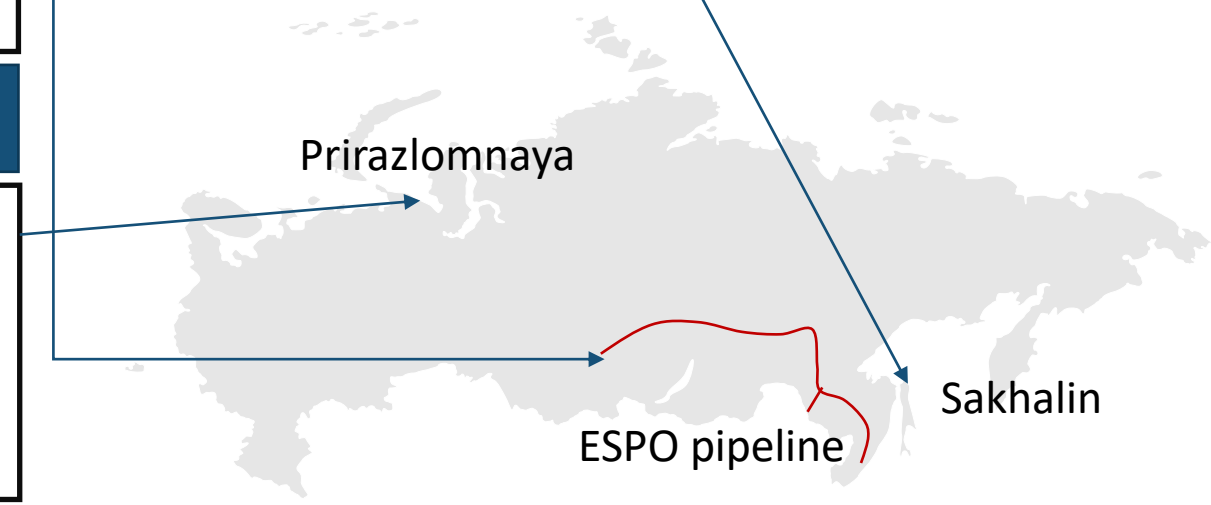
RUSSIAN OIL CRUDES

Light, Low Sulphur Content

Siberian Light	ESPO	Sokol	Vityaz	Sakhalin Blend
Light oil similar to Brent from Western Siberia (Khanty-Mansi district).	Produced in Eastern Siberia; Exported by the Eastern Siberia Pacific Ocean (ESPO) pipeline.	Produced in Sakhalin; traded from De-Kastri terminal	Produced in Sakhalin by Sakhalin Energy; traded from port Prigorodnoye, similar to Oman crude	Blend of crude Vityaz and condensate from Kirinskoye field (Sakhalin)

Heavy, High Sulphur Content

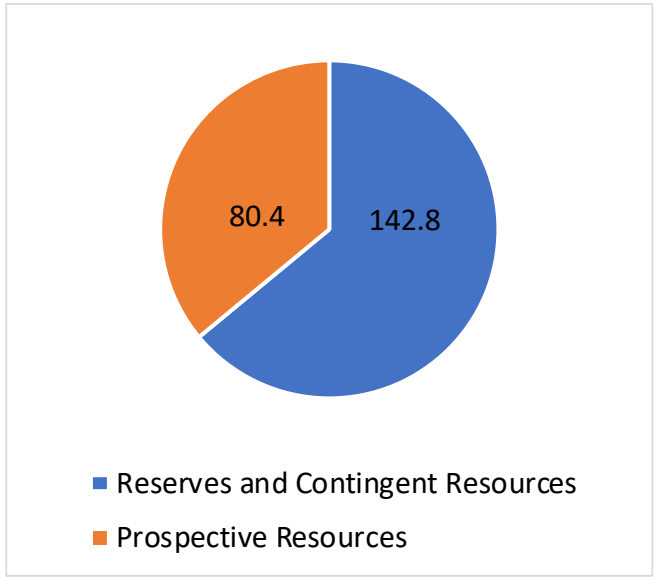
Urals	ARCO
Blend of Siberian Light from Western Siberia and Heavy Oil from Volga-Ural; traded on NYMEX under REBCO	Crude from Prirazlomnaya platform in Artic Shelf



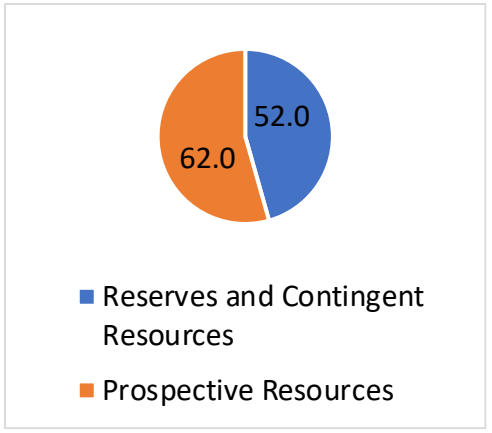
INCORRYS

RUSSIAN OIL RESOURCES

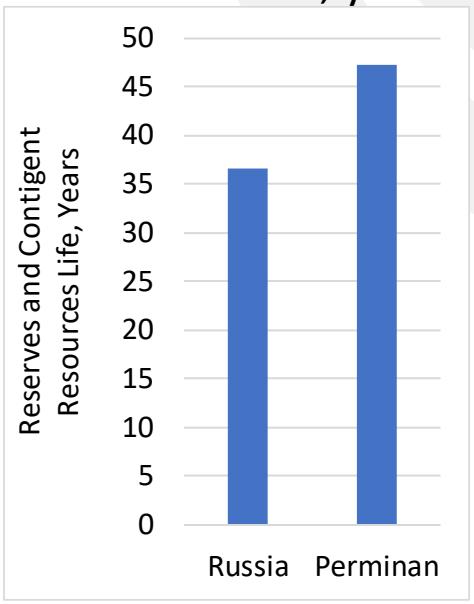
Russian Oil Resources, (B Bbl)



Permian Oil Resources (B Bbl)
(for comparison)



Comparing resource life in Russia and in Permian Basin, years



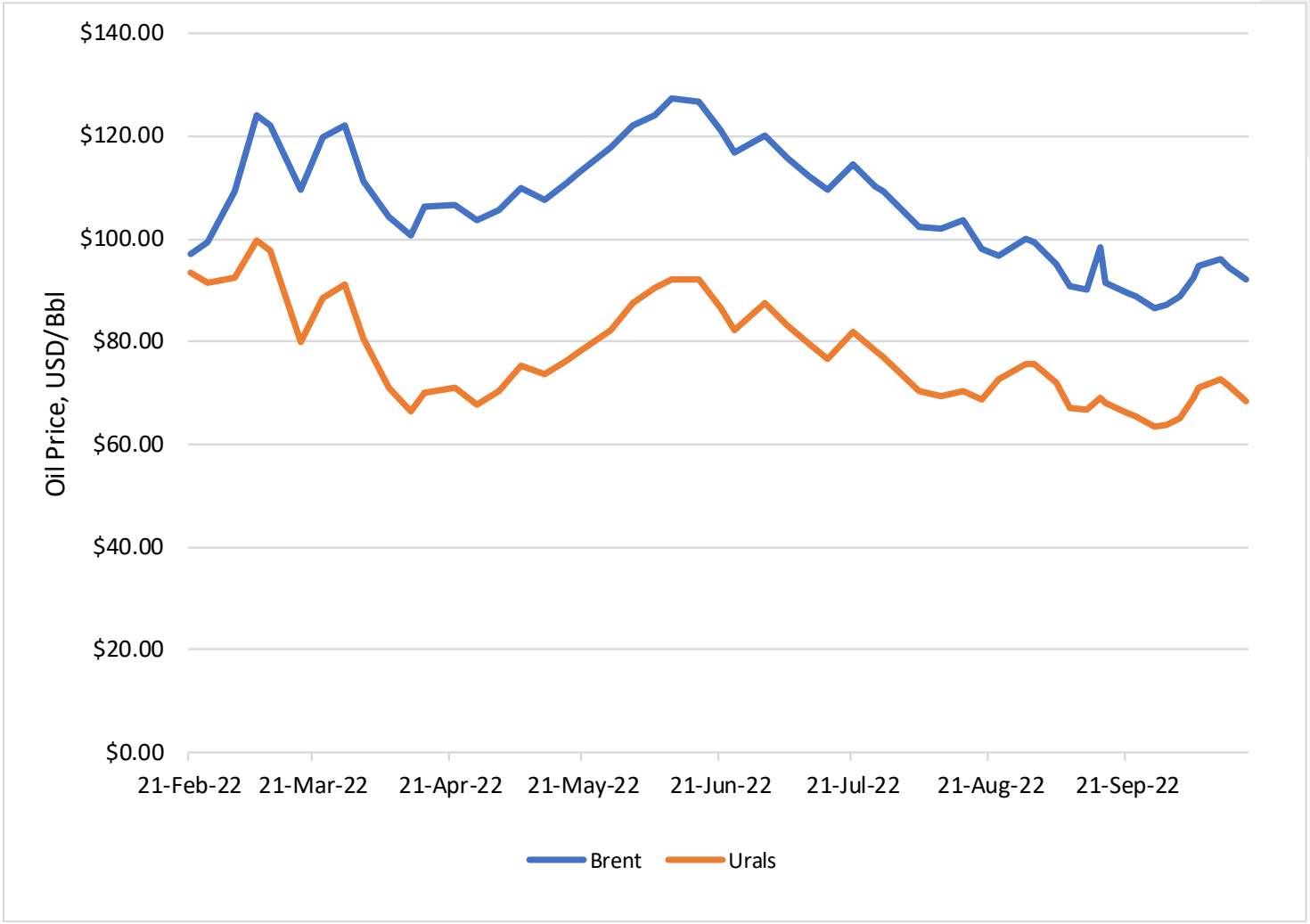
According to the Russian Ministry of Energy, Russia had 223 B Bbls of discovered oil reserves in 2021. Of this amount, 80 B Bbls (36%) are recoverable at 2021 prices.

The resource life for Russian oil is just 21 years as compared to almost 60 years for the Permian Basin.

Shell – existing Sakhalin 2 project; up to $5B loss expected.
BP – existing 20% stake in Rosneft; up to $20B loss expected.
ExxonMobil – existing Sakhalin 1 project; up to $4B loss expected.
Equinor - $1.2B loss expected.
TotalEnergies – will stop buying oil from Russia.

INCORRYS

BRENT / URALS DIFFERENTIAL MARCH-OCTOBER 2022

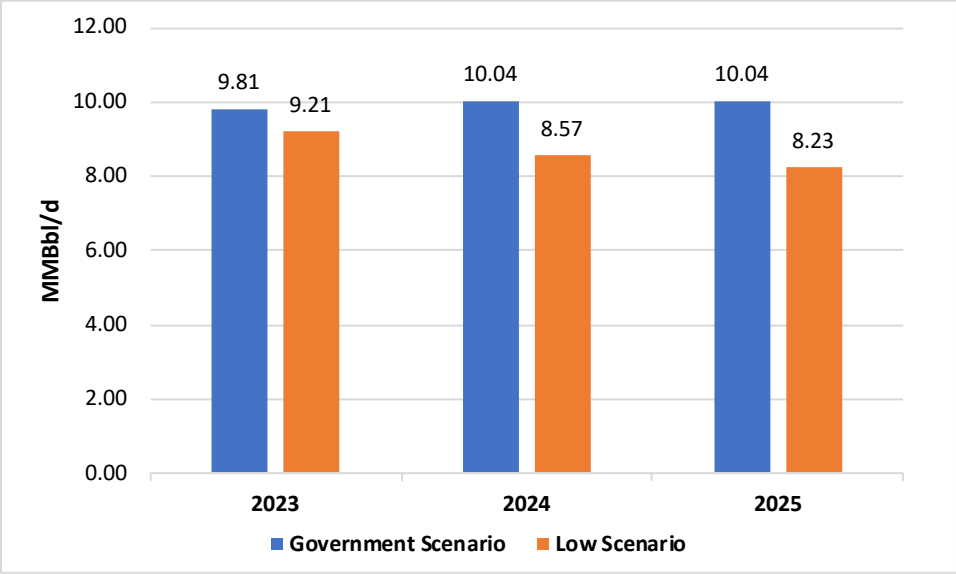


- Brent/Urals started to widen at the end of February 2022.
- Since April 2022, Urals remains 70% lower than Brent. If Brent reaches about $72, Russian oil revenue will be insufficient to balance the Russian budget. If Brent drops below $60, a significant portion of Russian oil production will become uneconomical. This assumes that the Urals/Brent ratio remains around 0.68 - 0.73.
- Incorrys believes that because of European sanctions and redirecting oil to Asia, the ratio will increase slightly.
- This will lead to shut-ins and an overall decline of Russian oil production in 2023.

INCORRYS

RUSSIAN OIL PRODUCTION FORECAST

Russian oil production forecast: Government and Low Scenario



- The EU embargo on Russian crude in December 2022 and product imports that comes into full effect in February 2023 is expected to result in further declines, as some 1 MMBbl/d of products and 1.3 MMBbl/d of crude would have to find new homes.

The main reasons behind production decline:

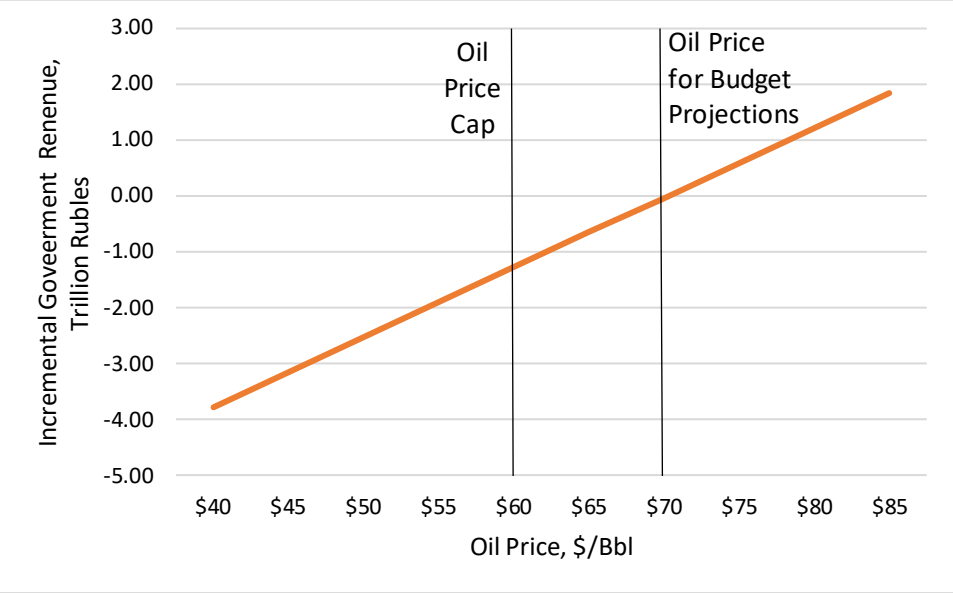
- Very limited investment to exploration and development coupled with significant growth of full cycle cost of Russian oil; this problem started even before Ukrainian war. Existing Russian oil reserves are mature and new development is very limited.
- Major oil and oilfield service companies left Russia and most new reserves require their new technology to develop. Russia can probably develop some technologies and import them from other countries, but the cost will be significantly higher.
- The EU oil ban will require rerouting Russian oil to other markets. Some oil can be sold to mostly Asian markets at discounted prices, but these countries cannot accept all oil coming from Russia. This is critical for refining products which can, and will be, processed mostly in Europe.
- The Cap on Russian oil will affect Russian oil production however, the exact impact of the cap remains to be seen.

INCORRYS

HOW RUSSIAN OIL REVENUE AFFECTS FEDERAL BUDGET

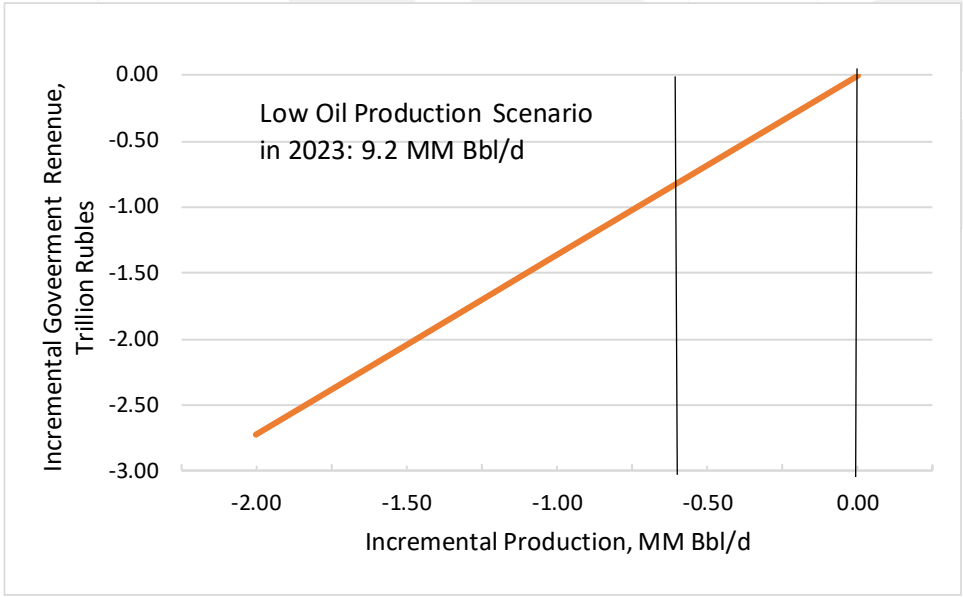
Drop of revenue from oil can occur due to decline in oil prices and production, as well as a related drop of business activities in other industries. Production and especially prices are very uncertain. The charts show how Russian revenue will be affected in different production and price scenarios. In all scenarios the exchange rate is assumed to be 68.3 RUB/USD.

Changes in Russian revenue due to oil prices:



Oil price drop of 1$ will lead to a 0.125 trillion rubbles reduction in Russian Government Revenue.

Changes in Russian revenue due to drop in oil production:



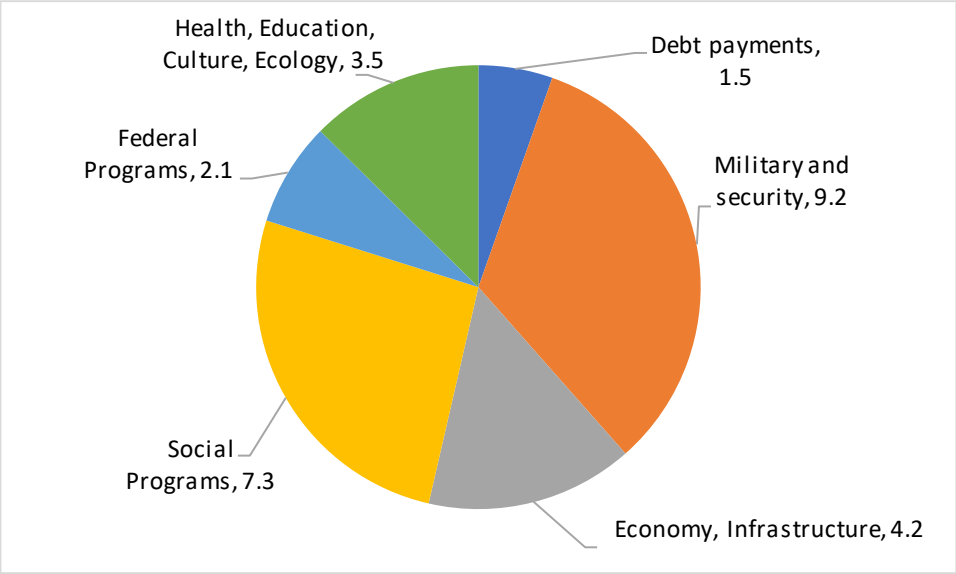
Production drop on 1.0 MMBbl/d will lead to a 1.36 trillion rubbles reduction in Russian Government Revenue.

This assessment includes only the direct effect from production drop and does not include economic impacts from reduction of other related business activities on government revenue.

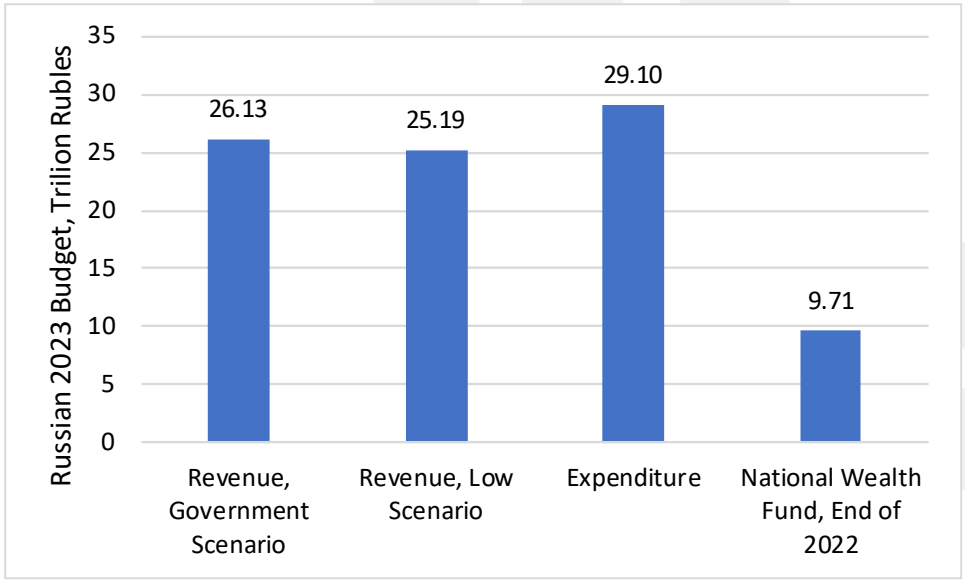
INCORRYS

RUSSIAN BUDGET PROJECTIONS FOR 2023

Russian Expenditure in 2023, Trillion Rubles



Budget Projections in 2023



Russian deficit according to 2023 budget is expected to be approximately 3 trillion rubles. Assumptions:

- Oil price for Russian oil: $70.21/Bbl,
- Exchange rate 68.3 RUB/USD,
- Oil Production 9.81 MMBbl/d

Budget deficit will be financed from National Wealth Fund, which is 9-10 trillion rubles, as well as from borrowing on the domestic market. This is considered an **optimistic** scenario.

Low scenario assumptions: oil price of $60/Bbl and Oil production of 9.2 MMBbl/d. In this scenario, the deficit will increase an additional 2 trillion rubles, or 5 trillion rubles in total. This will lead to a faster depletion of the National Wealth Fund although, it will be sufficient to finance the Russian economy and war efforts in 2023.

The National Wealth Fund is used to finance retirement obligations for Russian seniors and cannot be completely depleted. Borrowing on the domestic market can also be very limited. Therefore, after 2024, financial stability of Russia is uncertain.

INCORRYS

CONCLUSIONS

- Russian oil production in 2023 is expected to drop at least 11% from 2022.
- EU ban on seaborn oil and oil products will have an impact on Russian oil production and revenue however, a significant portion of oil intended for European markets will be rerouted to Asia. Most Russian oil reserves are mature; significant expenditure is required to maintain oil production.
- Full cycle cost of Russian oil continues to increase; costs, including new field development, will reach $45/Bbl
- Price cap on Russian oil will affect Russian oil production although the exact impact remains to be seen.
- Russia is trying to increase its own tanker fleet, and insure it, to be able to redirect oil to Asian markets. However, this fleet will be insufficient to avoid price cap on Russian oil.
- Russian budget deficit will be at least 3-5 trillion rubles, or 10-17% of expenditures, partially due to drop in oil production.
- National Wealth Fund will be sufficient to finance the Russian economy and war efforts in 2023 and perhaps longer. However, financial stability of Russia after 2023 is uncertain.

INCORRYS

WHY INCORRYS INFORMATION SYSTEM

COMPREHENSIVE DATA

Incorrys constantly collects a huge amount of data from multiple public sources worldwide.

ADVANCE ANALYTICS

Incorrys performs advanced data analysis to ensure quality and consistency among different industries and jurisdictions.

ACCURATE FORECASTS

Incorrys employs various forecasting methodologies to ensure accurate forecasts of trends in different industries.

INCORRYS ENTERPRISE SUBSCRIPTION

Enterprise subscription allows all users within the organization to not only access Incorrys Information System (IIS), but also get monthly reports on different subjects related to energy markets, the environment and new technology. In addition, you get direct access to Incorrys's experts, receive regular newsletters, and participation in two custom debriefings per year.

sales@incorrys.com

+1 (347) 741 8219

INCORRYS