

The Russian economy and world trade in energy:

Dependence of Russia larger than dependence on Russia

Executive Summary

- Russia's **total exports** amounted to about **EUR 420 bn (28% of GDP)** in 2021, exceeding total imports by far and rendering a **trade surplus of EUR 160 bn (11% of GDP)**.
- **Energy exports** accounted for almost **50% of total exports, thus 14% of GDP**.
- Thereof, **crude oil and oil products** make the lion share: **10% of GDP, 36% of total exports and 72% of all energy exports**.
- **Natural gas** exports play a far less important role: **2% of GDP, 8% of total exports and 16% of all energy exports**.
- The **EU receives** about 50% of Russian **crude oil** exports and 50% of Russian (refined) **oil products** exports, and **other G7 (plus Korea) receive** further 11% and 18%, respectively, while **China** receives almost a third of crude oil exports.
- The **EU's share** in Russian **natural gas** exports is higher, reaching 70%.
- The **EU paid three times more for crude oil and oil products from Russia** than for natural gas from Russia in 2021, according to the Russian export statistics.

Russian exports and imports in 2021, by goods and countries

	Total (vis-a-vis world):				Thereof:					
	EUR bn	% of GDP	% of total exports	% share	EU27		Other G7+Korea		China	
	EUR bn	% of GDP	% of total exports	% share	EUR bn	% share	EUR bn	% share	EUR bn	% share
Goods exports	419	28	100							
Goods imports	257	17								
Trade balance	162	11								
Memo: Nominal GDP	1507	100								
Thereof: Energy exports:										
Total	205	14	49	100	103	50	26	13	37	18
Coal (incl. Lignite)	16	1	4	100	4	22	4	24	3	18
Crude oil	91	6	22	100	44	49	10	11	29	31
Oil products	57	4	14	100	29	50	10	18	3	5
Natural gas	32	2	8	100	23	70	1	3	1	2
LNG	8	1	2	100	4	49	1	11	3	31

Source: Rosstat, authors' calculations.

Note: Shares proxied by using 2020 volume shares, and counterparts' share of crude oil for counterparts' share of LNG.

- **Russia's importance in the world economy** is limited to being a commodity exporter, as its total exports account for **only 2% of total world exports**, while its **share in world exports reaches 34% for natural gas**, 15% for crude oil, 18% for wheat, 13% for fertilizers and 14% for nickel & nickel ware.

- The fact that the **share of bilateral trade between Russia and EU/G7/Korea in total world trade is far higher for natural gas than for crude oil & oil products** indicates that the leeway to shift to alternative sources of supply is substantially larger in the case of crude oil & oil products also in economic terms – in addition to technical reasons that make such a shift very likely easier for oil than for gas.
- **To gauge the dependence on Russian energy exports and resulting vulnerability of importing countries' energy supply**, we focus on “**net imports**”: The direct import from Russia of a particular type of fuel is reduced by all exports of the respective type of fuel. This approach allows calculating **the share of the import from Russia of a particular type of fuel (net of all exports of this type of fuel) in total energy supply** (that is, the total supply of all types of fuel) for domestic use, with **total energy supply (TES)** being defined as the sum of domestic production plus net volumes from storage plus imports minus exports.
 - **According to this measure**, in the case of **coal**, in 2020 several non-EU countries were far more reliant on imports from Russia than EU economies, with **Morocco** having a (net) share of **more than 25% of TES**.
 - In the case of **crude oil**, a handful of EU MS were particularly exposed to crude oil imports from Russia in 2020, with **Lithuania outstanding with a (net) share of 67% of TES**, followed by Slovakia (35%), Finland (30%) and the Netherlands, while Austria had quite a low exposure of below 5%.
 - In the case of **natural gas**, in 2020 **Moldova was the country most dependent** on natural gas import from Russia (**28% of TES**), followed by Slovakia, Latvia, Croatia and Hungary (17%-23%), while **Austria showed a slightly above-average** degree of dependence (about 7% of TES) but clearly lower than Italy, Germany and the Czech Republic. This finding contrasts with the frequent highlighting of Austria's dependence by referring to ca. 80% share of imports of gas from Russia in gross imports.
 - Taking these **fossil energy sources (excl. oil products)** together, in 2020 the dependence on fossil energy import (excl. oil products) from Russia was **highest in Lithuania (74% of TES), Slovakia (61%), Finland (37%), Hungary (32%), Moldova, Morocco and Greece**. These high-ranking positions reflected mostly crude oil imports in case of Lithuania and Finland, both crude oil and natural gas imports in Slovakia, Hungary and Greece, mostly natural gas in Moldova and mostly coal in Morocco.
 - **Including oil products would lower the degree of dependence** of most countries partly even sharply; particularly of most that are highly dependent in terms of fossil energy excl. oil products (**e.g. Lithuania and Slovakia**), as they have higher total exports of oil products than imports of oil products from Russia. Including oil products will likely **not substantially lower the dependence of the EU aggregate**, as part of EU member states' exports of oil products go to other member states. **Yet**, it shows that the overall exposure to Russia is **less heterogenous**.

For each type of fuel, the **share of imports of a particular type of fuel** (e.g. coal) **from Russia** net of all exports of this type of fuel **in total energy supply** for domestic use **results from** two factors: (1) the **share of the total supply of this type of fuel in total energy supply** (comprising all types of fuel) for domestic use, and (2) the **share of the import** of this type of fuel from Russia net of all exports of this type of fuel **in the total supply of this type of fuel** (Annex 2).

This note consists of two parts. First, it provides basic facts on:

- The structure of Russian exports
- The role of Russian exports in world trade

Second, a special focus highlights the role of Russian energy exports for the energy supply of importing countries.

I The structure of Russian exports and their role in world trade

The following Table 1 summarizes main features of Russian foreign trade by highlighting its **energy export goods and corresponding export destinations**.

Table 1:

Russian exports and imports in 2021, by goods and countries										
	Total (vis-a-vis world):				Thereof:					
	EUR bn	% of GDP	% of total exports	% share	EU27		Other G7+Korea		China	
	EUR bn	% of GDP	% of total exports	% share	EUR bn	% share	EUR bn	% share	EUR bn	% share
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Source: Rosstat, authors' calculations.

Note: Shares proxied by using 2020 volume shares, and counterparts' share of crude oil for counterparts' share of LNG.

- Russia's **total exports** amounted to about **EUR 420 bn (28% of GDP)** in 2021, exceeding total imports by far to render a **surplus of EUR 160 bn (11% of GDP)**.
- **Energy exports** accounted for almost **50% of total exports, thus 14% GDP**.
- Thereof, **crude oil and oil products** make the lion share: **10% of GDP, 36% of total exports and 72% of all energy exports**.
- **Natural gas** exports play a far less important role: **2% of GDP, 8% of total exports and 16% of all energy exports**.

- The **EU receives** about 50% of Russian **crude oil** exports and 50% of Russian **oil products** exports, and **other G7 (plus Korea)** receive further 11% and 18%, respectively, while **China** receives almost a third of crude oil exports.
- The **EU's share** in Russian **natural gas** exports is higher, reaching 70%.
- The **EU paid three times more for crude oil and oil products from Russia** than for natural gas from Russia in 2021, according to the Russian export statistics.

Pie-charts in **Annex 1** show Russia's export destinations for each of these energy goods, as well as for iron & steel and wheat:

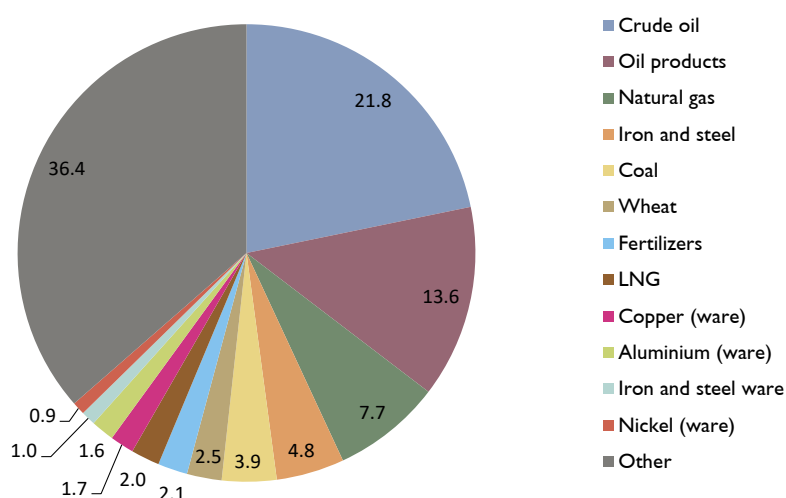
- In addition to the **export destinations for Russian energy export goods** shown in Table 1, **Turkey and Taiwan** are important for coal, **Belarus** for crude oil, Turkey for oil products and both Belarus and Turkey for natural gas.
- For Russian **iron & steel exports**, the main purchasing countries are the **EU27, Turkey, Taiwan**, Belarus and Kazakhstan.
- For Russian **wheat exports**, **Egypt and Turkey** stand out, followed by Bangladesh, Azerbaijan, Sudan and Pakistan.

The following Chart 1 shows **Russia's export structure by main commodities**, putting the relevance of these export goods into context. The position "other" comprises inter alia most notably precious metals, further chemical products (other than fertilizers), wood & wood ware and plastic & plastic products. Moreover, it includes arms and munitions the export share of which can be estimated at around 3% of total exports.

Chart 1:

Russia's export structure by main commodities

in % of total exports, 2020



Source: Rosstat, CBR.

The following Chart 2 shows the **share of Russia’s exports in the global export** of main commodities, highlighting the fact that Russia’s involvement in the world economy is very limited as it accounts for only 2% of total world exports.

Obviously, Russia’s importance in world trade consists **primarily** in being a **commodity exporter**:

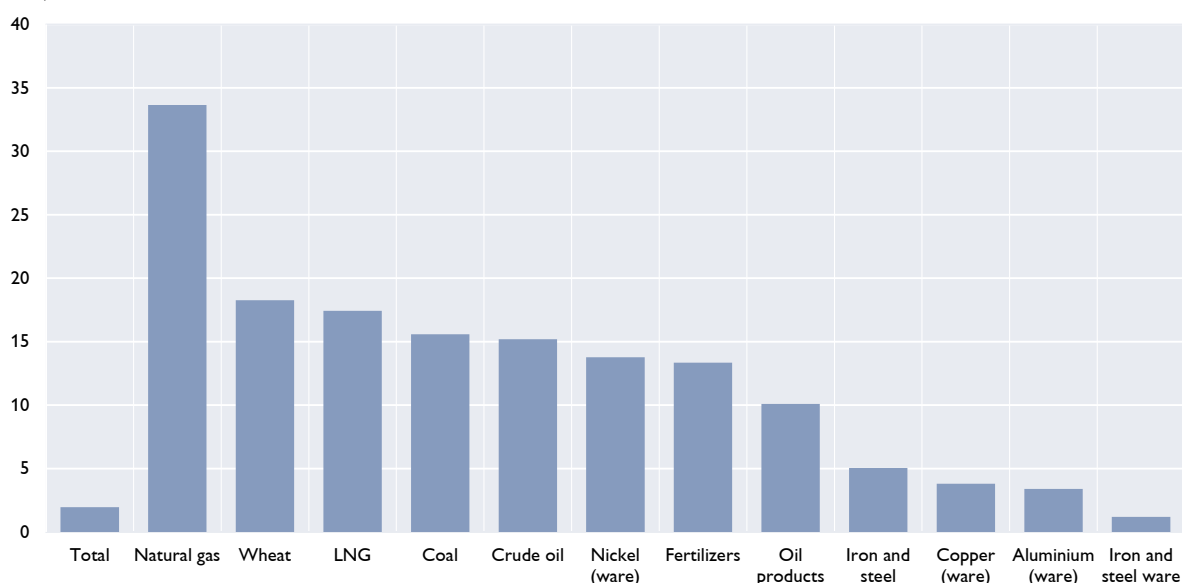
- Its share in world exports of **natural gas** is outstanding at 34%.
- Also, its shares in world exports of **other energy goods**, like LNG (17%), coal (16%), crude oil (15%) and oil products (10%) are sizeable.
- Highly relevant are also its shares in world exports of **agriculture-related goods**, wheat (18%) and fertilizers (13%).
- On top of this, Russian exports hold significant shares in world exports of **certain base metals**, like nickel & nickel ware (14%).

In 2020, **Russian exports to EU27 and other G7 (plus Korea) together** accounted for about **24% of world exports** in the case of **natural gas** (about 20% of world exports in the case of the aggregate of natural gas and LNG) and **7-9% of world exports** in the case of **coal, crude oil, and oil products**, respectively. This large difference in the shares of bilateral trade between Russia and EU/G7/Korea in total world trade between natural gas on the one hand and crude oil & oil products on the other hand indicates that the **leeway to shift to alternative sources of supply is substantially larger in the case of crude oil & oil products also in economic terms** – in addition to technical reasons that make such a shift very likely easier for oil than for gas.

Chart 2:

Russia’s share in world exports by main commodities

in %, 2020



Source: UN Comtrade, Rosstat, CBR.

2 The role of Russian energy exports for the importing countries' energy supply

Assessing the **dependence on Russian energy exports**, the share of imports from Russia in total imports of a particular type of fuel, e.g. natural gas, by countries attracts most of the attention. Often this reflects a “mercantilist” view, implicitly assuming that these imports (or at least most of these imports) serve exclusively to cover domestic needs. However, most modern economies are intra-sectoral trading economies, having both imports and exports of the same or very similar goods.

This note focuses on “**net imports**” to gauge **dependence on Russia and resulting vulnerability**: The import from Russia of a particular type of fuel is reduced by all exports of this type of fuel.

This approach allows focusing more straightforward on the **role of imports from Russia of a particular type of fuel in total energy supply** (that is, the total supply of all types of fuel) **for domestic use**. Generally, total energy supply (TES) of a country is defined as the sum of domestic production plus net volumes taken from storage plus imports minus exports.

Methodologically, note that looking at **gross imports**, the **dependence** on imports of energy (e.g. coal) from Russia may be **overestimated**, as all exports of that type of fuel (e.g. coal) are ignored. Therefore, looking at “**net imports**” of this type of fuel from Russia, that is, imports of this type of fuel from Russia net of *all* exports of this type of fuel provides a more accurate picture of the effective degree of dependence.

At the same time, the dependence of any EU member state on imports of energy (e.g. coal) from Russia may be higher than measured by **direct imports only**. For instance, imports from another EU member state that are labelled as such may constitute re-exports of energy previously imported from Russia by that other EU member state. Note that this **potential underestimation of dependence** of any single EU member state is irrespective of whether one looks at gross imports or net imports.

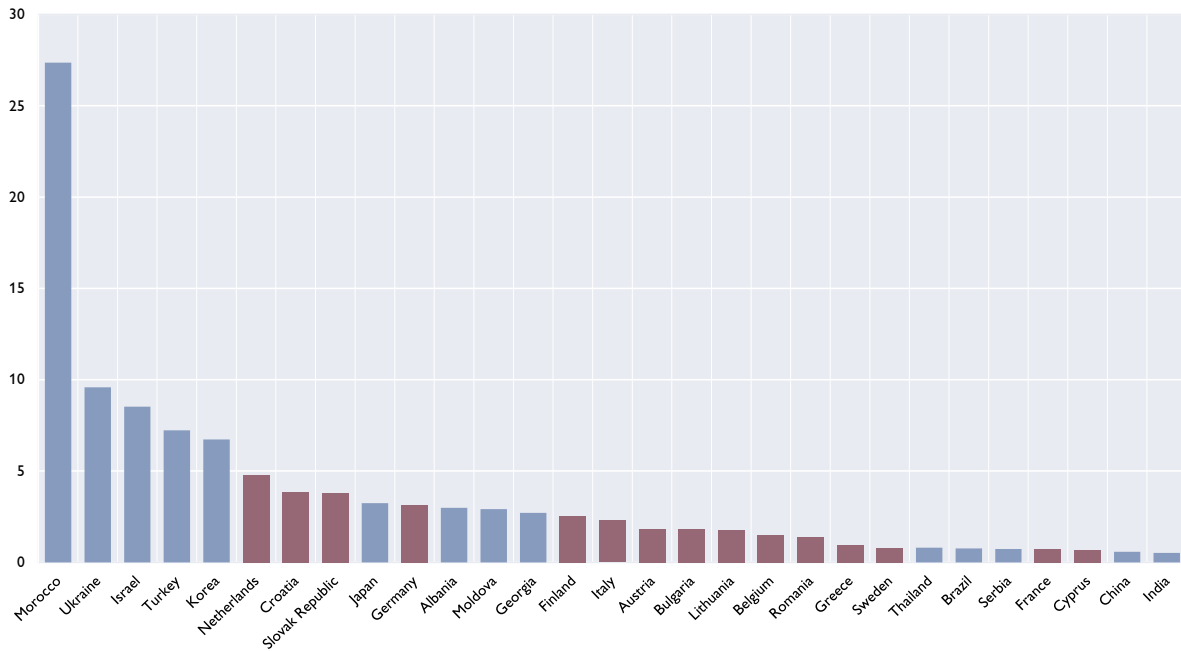
However, looking at “**net imports**” would imply an **additional underestimation for the EU aggregate value**, as EU imports of a particular type of fuel from Russia (as the sum of direct imports from Russia by all EU member states) would be reduced by all EU exports of this type of fuel (as the sum of all exports of this type of fuel by all EU member states) – including those exports that go into another EU member state and thus remain within the EU aggregate. Therefore, without having a split between intra-EU and extra-EU exports by each EU member state for each type of fuel readily available, no EU aggregate figures are provided under the net import approach for the time being.

The following Charts 3a to 3d show the **results for the most dependent countries**, ranked by the share of the import of a particular type of fuel from Russia (net of all exports of this type of fuel) in total energy supply for domestic use.

Coal: Chart 3a shows that in 2020 several non-EU countries are far more reliant on coal imports from Russia than EU economies, with **Morocco in an outstanding position**.

Coal import from Russia net of total coal export

in % of total energy supply (for domestic use), 2020

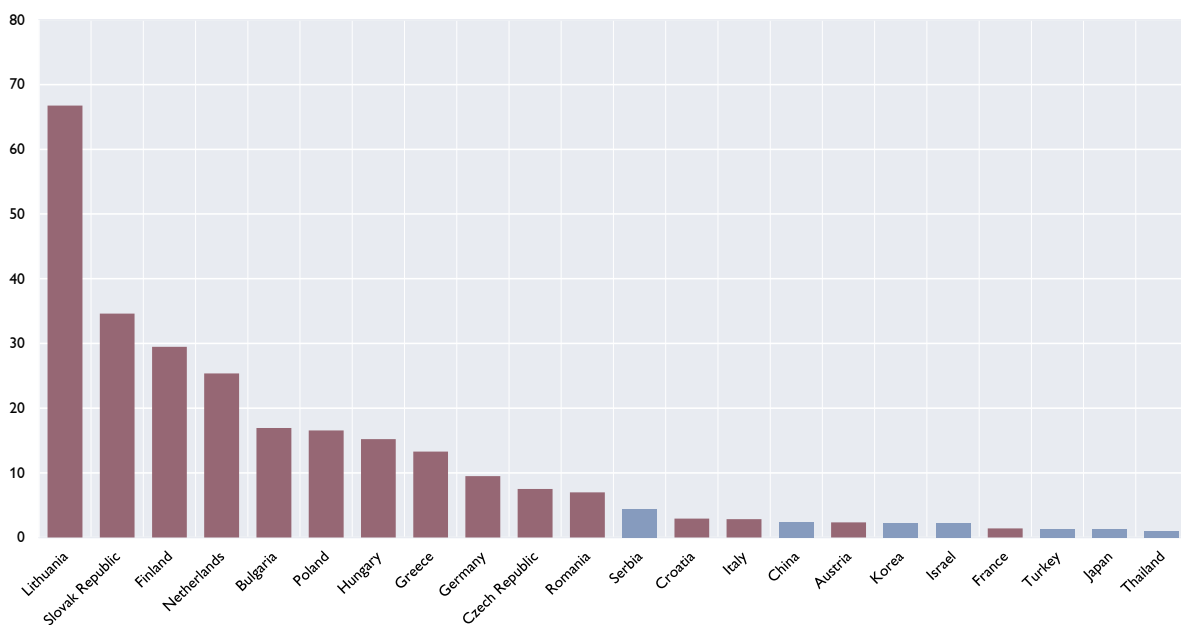


Source: Eurostat, IEA, Rosstat, UN Comtrade.

Crude oil: Chart 3b shows that in 2020 a handful of EU countries were particularly exposed to crude oil imports from Russia, with **Lithuania outstanding**, followed by Slovakia, Finland and the Netherlands, while **Austria had a below-average** exposure.

Crude oil import from Russia net of total crude oil export

in % of total energy supply (for domestic use), 2020

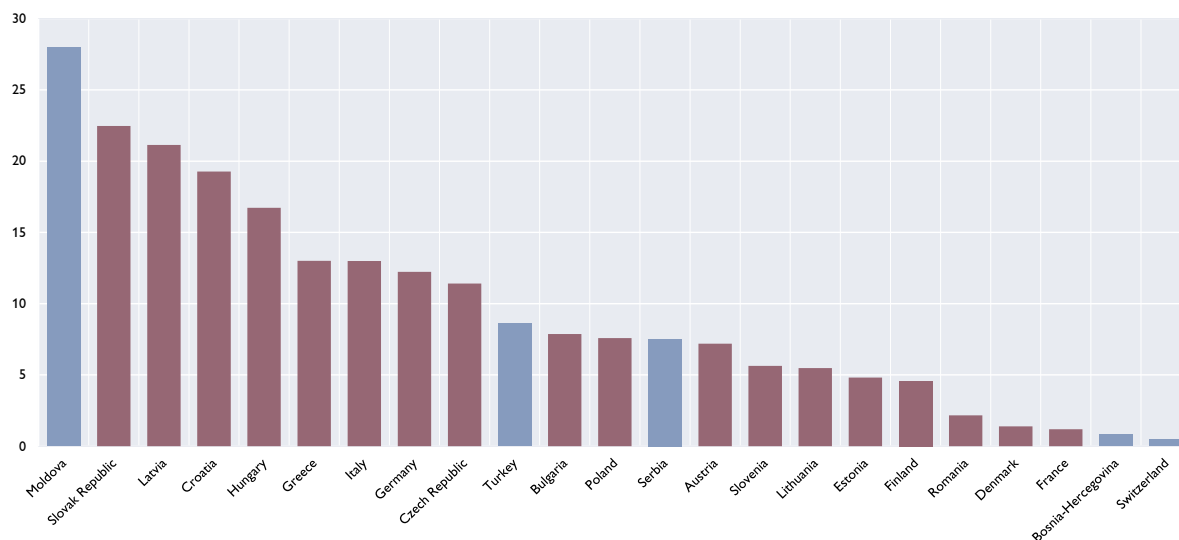


Source: Eurostat, IEA, Rosstat, UN Comtrade.

Natural gas: Chart 3c shows that in 2020 **Moldova was the country most dependent** on natural gas import from Russia, followed by Slovakia, Latvia, Croatia and Hungary, while **Austria showed slightly above-average** degree of dependence but clearly lower than Italy, Germany and the Czech Republic.

Natural gas import from Russia net of total natural gas export

in % of total energy supply (for domestic use), 2020

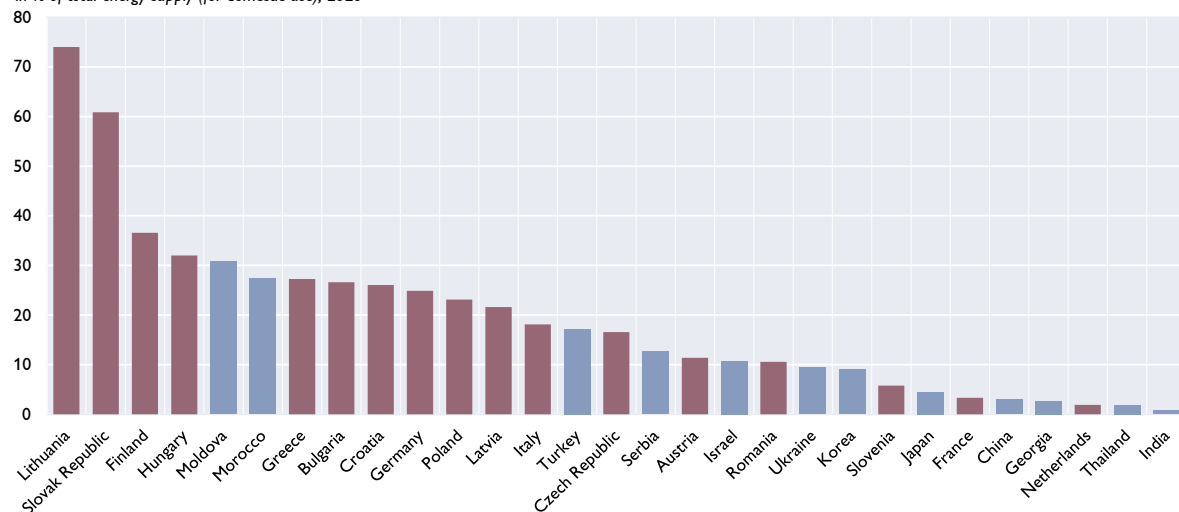


Source: Eurostat, IEA, Rosstat.

Fossil energy (excl. oil products): Chart 3d shows that in 2020 the dependence on fossil energy import (excl. oil products) from Russia was **highest in Lithuania, Slovakia, Finland, Hungary, Moldova, Morocco and Greece** reflecting mostly crude oil imports in case of Lithuania and Finland, both crude oil and natural gas imports in Slovakia, Hungary and Greece, mostly natural gas in Moldova and mostly coal in Morocco. Austria showed a below-average degree of dependence.

Fossil energy import from Russia net of total fossil energy export (fossil energy excl. oil products)

in % of total energy supply (for domestic use), 2020



Source: Eurostat, IEA, Rosstat, UN Comtrade.

Note that **including oil products would further lower the degree of dependence** shown in chart 3d, as several countries have significantly higher total exports of oil products than imports of oil products from Russia. In particular, most highly dependent countries according to chart 3d would see their degree of dependence decline, partly even dramatically (like in the cases of Lithuania and Slovakia), while Moldova and Morocco would see their dependence slightly rising.

Annex 2 provides detailed tables for coal, crude oil and natural gas, highlighting that **for each type of fuel the share of the import of a particular type of fuel (e.g. coal) from Russia** (net of all exports of this type of fuel) **in total energy supply** (comprising all types of fuel) for domestic use **results from** two factors:

- the **share of the total supply of this type of fuel in total energy supply** (comprising all types of fuel) for domestic use (including non-energy use e.g. of coal for industrial processes), and
- the **share of the import** of this type of fuel from Russia (net of all exports of this type of fuel) **in the total supply of this type of fuel** for domestic use.

For instance, in Morocco, the high share of coal import from Russia (net of coal export) in total energy supply stems from both a relatively high share of coal in total energy supply and the high share of coal import from Russia in the total coal supply.

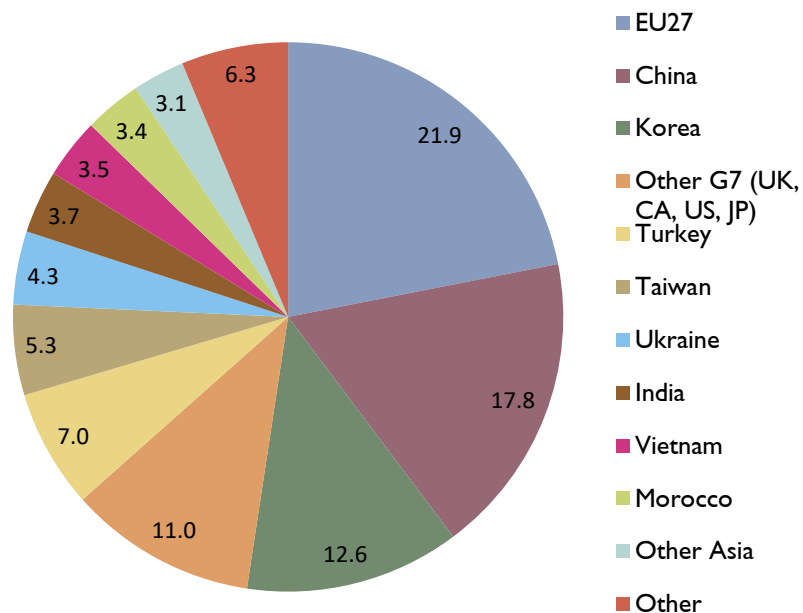
In addition, each table shows the share of imports in gross and “net imports”.

Annex I: Russia's export destinations by main export goods

Coal

Russian export structure for coal

% of total Russian export volumes, 2020

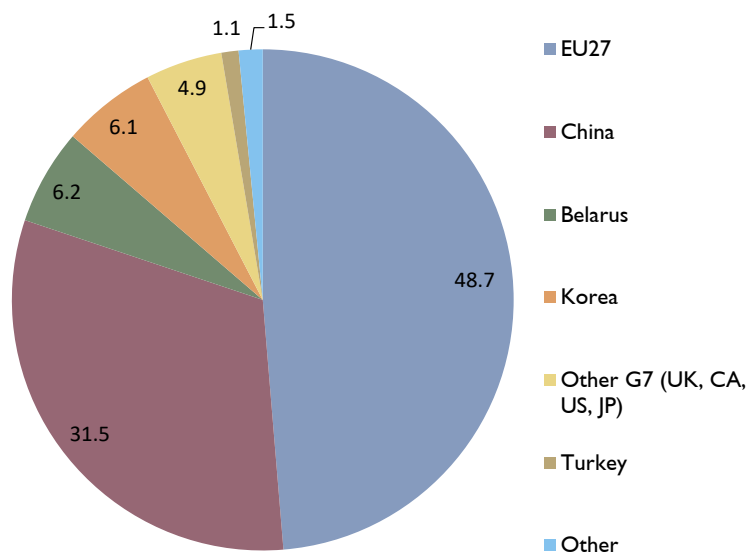


Source: Rosstat.

Crude oil:

Russian export structure for crude oil

% of total Russian export volumes, 2020

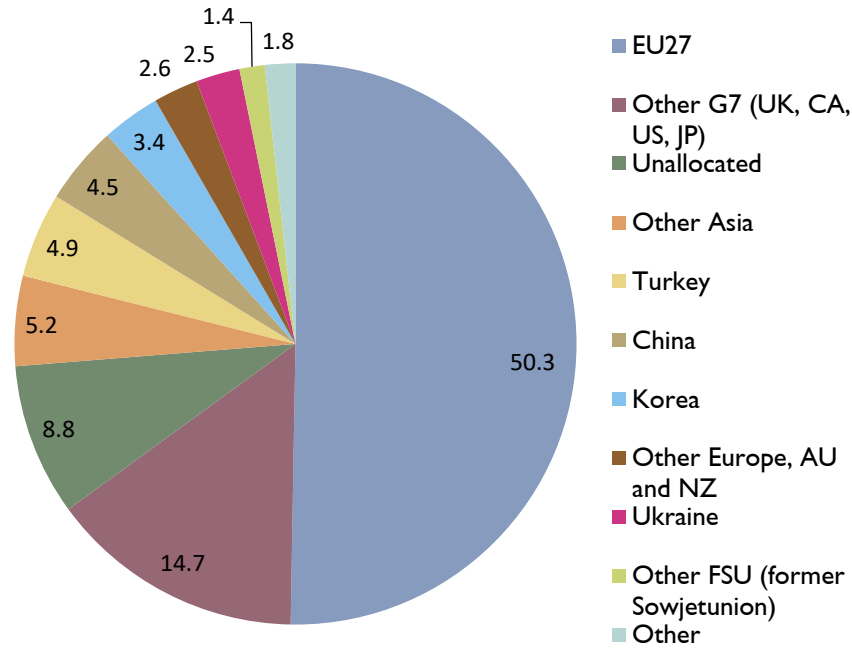


Source: Rosstat.

Oil products:

Russian export structure for oil products

% of total Russian export volumes, 2020

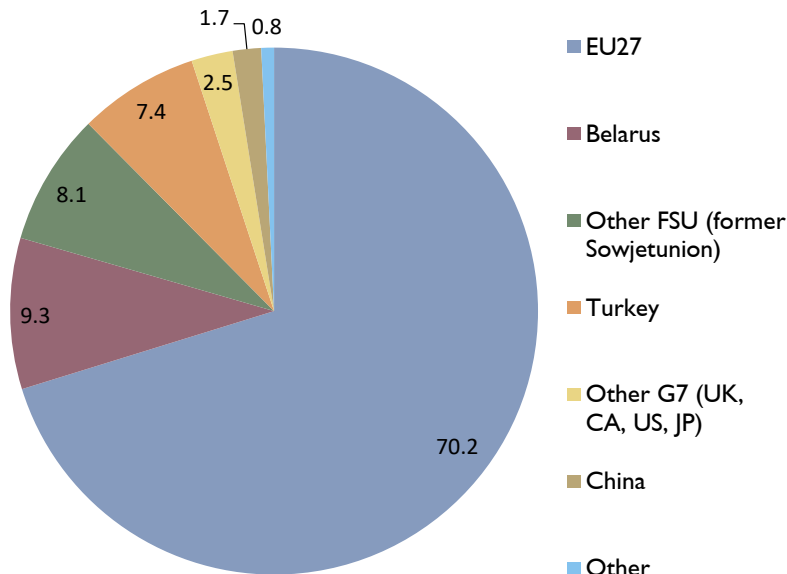


Source: Rosstat.

Natural gas (excl. LNG):

Russian export structure for natural gas

% of total Russian export volumes, 2020

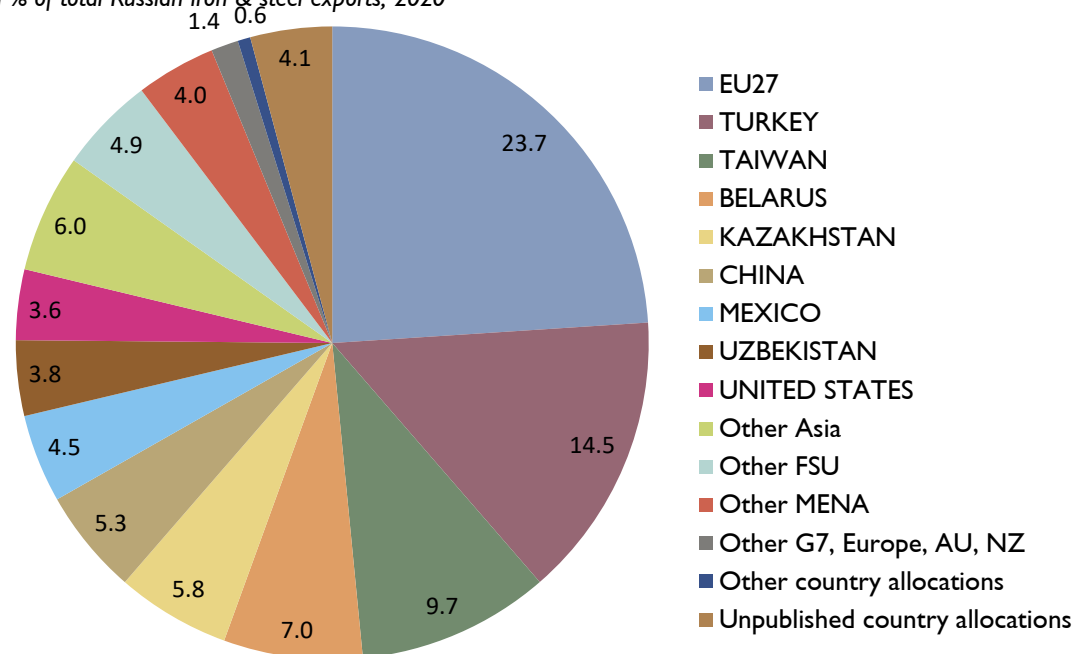


Source: Rosstat.

Iron and steel

Russian export structure for iron & steel

in % of total Russian iron & steel exports, 2020

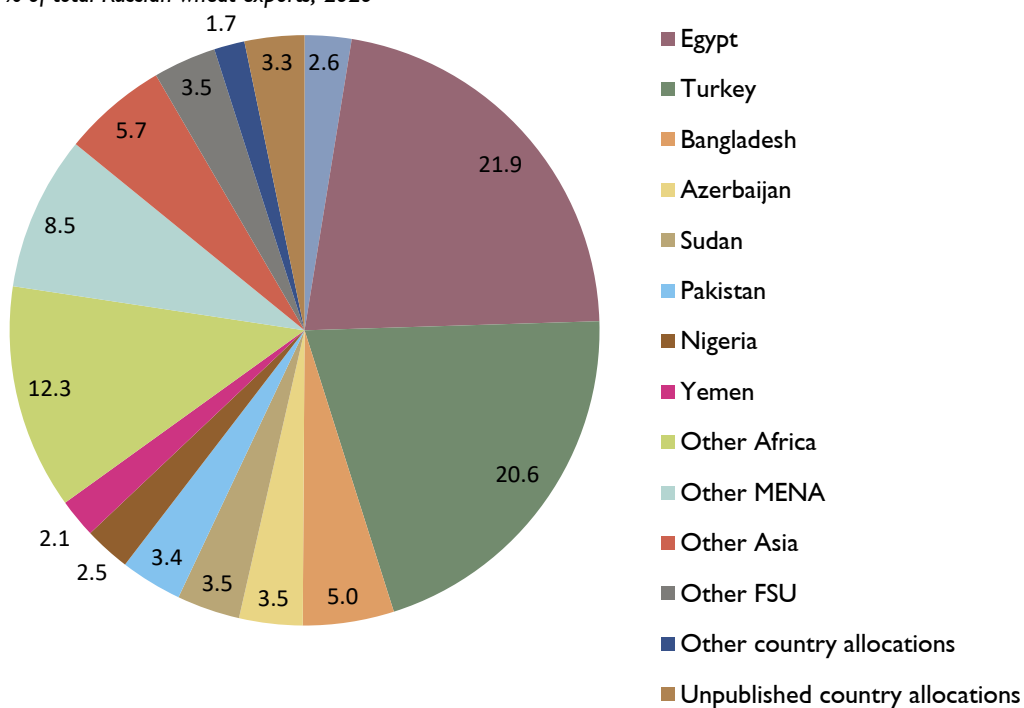


Source: Rosstat.

Wheat:

Russian export structure for wheat

in % of total Russian wheat exports, 2020



Source: Rosstat.

Annex 2

Role of Russian coal exports for individual countries' total energy supply					
	0_gross	0_net	1a (= 2a * 3a)	2a	3a
	Coal import from Russia in % of total coal import	Coal import from Russia net of total coal export in % of total coal net import	Coal import from Russia net of total coal export in % of total energy supply (for domestic use)	Total coal supply (for domestic use) in % of total energy supply (for domestic use)	Coal import from Russia net of total coal export in % of total coal supply (for domestic use)
Morocco	91.2	91.2	27.4	30.0	91.4
Ukraine	75.5	75.4	9.6	26.4	36.3
Israel	38.8	38.8	8.5	21.3	40.0
Turkey	42.6	42.1	7.2	27.2	26.5
Korea	25.5	25.5	6.7	27.5	24.5
Netherlands	88.0	87.4	4.8	5.9	80.4
Croatia	82.9	82.9	3.8	4.4	87.9
Slovak Republic	32.8	31.7	3.8	13.5	28.0
Japan	13.4	11.6	3.2	28.0	11.5
Germany	49.2	45.4	3.1	15.6	20.1
Albania	79.5	79.5	3.0	7.0	42.9
Moldova	100.0	100.0	2.9	2.8	103.2
Georgia	76.4	76.4	2.7	4.3	62.8
Finland	49.9	46.9	2.5	9.0	28.2
Italy	72.6	71.3	2.3	3.4	66.4
Austria	26.1	25.3	1.8	7.5	24.5
Bulgaria	81.9	81.3	1.8	24.2	7.5
Lithuania	100.0	100.0	1.7	2.1	85.2
Belgium	37.6	30.3	1.5	4.8	30.7
Romania	57.8	57.8	1.4	10.9	12.9
Greece	100.0	100.0	1.0	8.7	11.2
Sweden	25.4	24.6	0.8	3.5	23.1
Thailand	8.0	7.8	0.8	11.8	6.8
Brazil	18.8	18.8	0.8	4.9	15.6
Serbia	24.7	22.6	0.7	49.9	1.5
France	31.4	31.2	0.7	2.5	29.2
Cyprus	100.0	100.0	0.7	0.6	105.4
China	16.9	12.6	0.6	61.1	0.9
India	4.1	3.7	0.5	44.6	1.2
Latvia	100.0	100.0	0.5	0.5	86.0
Ireland	28.1	26.3	0.4	6.3	7.1
Spain	51.8	16.2	0.3	2.5	9.9
Norway	12.0	8.5	0.2	2.9	7.8
North Macedonia	6.0	5.7	0.2	29.3	0.6
Slovenia	5.9	5.9	0.2	16.4	1.1
Chile	1.7	1.0	0.2	16.1	1.0
Luxembourg	7.2	7.2	0.1	1.3	7.2
Hungary	22.5	2.4	0.1	6.3	1.1
Switzerland	8.6	8.6	0.0	0.4	7.9
United Kingdom	26.3	1.1	0.0	3.3	0.6
EU27	52.3	n.a.	n.a.	10.8	n.a.
WB-6	23.8	n.a.	n.a.	47.0	n.a.

Source: Eurostat, IEA, Rosstat, UN Comtrade.

Note: Item "coal import from Russia net of total coal export" set equal to zero if negative.

Role of Russian crude oil exports for individual countries' total energy supply					
	0_gross	0_net	1a (= 2a * 3a)	2a	3a
	Crude oil import from Russia in % of total crude oil import	Crude oil import from Russia net of total crude oil export in % of total crude oil net import	Crude oil import from Russia net of total crude oil export in % of total energy supply (for domestic use)	Total crude oil supply (for domestic use) in % of total energy supply (for domestic use)	Crude oil import from Russia net of total crude oil export in % of total crude oil supply (for domestic use)
Lithuania	62.1	62.0	66.8	107.9	61.9
Slovak Republic	97.8	97.8	34.6	36.1	96.0
Finland	79.7	79.7	29.5	37.6	78.5
Netherlands	31.8	30.7	25.4	84.3	30.1
Bulgaria	59.5	59.5	16.9	28.6	59.1
Poland	64.2	63.9	16.6	26.8	61.8
Hungary	66.3	65.1	15.2	27.2	55.9
Greece	10.0	9.7	13.3	135.0	9.8
Germany	31.2	31.2	9.5	31.4	30.3
Czech Republic	48.1	48.1	7.5	15.4	48.7
Romania	29.2	28.9	7.0	35.1	19.9
Serbia	25.5	25.5	4.4	22.7	19.4
Croatia	32.4	12.5	2.9	31.8	9.2
Italy	9.7	7.5	2.8	42.0	6.8
China	16.5	16.4	2.4	20.1	12.2
Austria	9.6	9.6	2.4	26.2	9.0
Korea	4.8	4.8	2.3	48.9	4.7
Israel	3.7	3.7	2.2	59.8	3.7
France	9.4	9.1	1.4	16.0	8.8
Turkey	8.5	6.3	1.3	23.2	5.6
Japan	4.4	4.4	1.3	30.3	4.2
Thailand	6.4	3.5	1.1	46.8	2.3
India	1.1	1.1	0.3	28.7	1.0
South Africa	0.6	0.6	0.1	14.8	0.7
Switzerland	0.3	0.3	0.0	12.8	0.3
EU27	23.2	n.a.	n.a.	36.6	n.a.
WB-6	25.3	n.a.	n.a.	12.0	n.a.

Source: Eurostat, IEA, Rosstat, UN Comtrade.

Note: Item "crude oil import from Russia net of total crude oil export" set equal to zero if negative.

Role of Russian natural gas exports for individual countries' total energy supply					
	Q_gross	Q_net	1a (= 2a * 3a)	2a	3a
	Natural gas import from Russia in % of total natural gas import	Natural gas import from Russia net of total natural gas export in % of total natural gas net import	Natural gas import from Russia net of total natural gas export in % of total energy supply (for domestic use)	Total natural gas supply (for domestic use) in % of total energy supply (for domestic use)	Natural gas import from Russia net of total natural gas export in % of total natural gas supply (for domestic use)
Moldova	100.0	100.0	28.0	28.1	99.5
Slovak Republic	100.0	100.0	22.5	25.4	88.4
Latvia	100.0	100.0	21.1	21.1	100.1
Croatia	91.8	91.6	19.3	30.6	63.0
Hungary	77.8	65.8	16.7	33.5	49.8
Greece	51.5	51.2	13.0	25.2	51.6
Italy	33.5	33.1	13.0	42.4	30.7
Germany	51.0	51.0	12.2	26.9	45.5
Czech Republic	73.2	73.2	11.4	18.1	62.9
Turkey	33.5	32.6	8.6	26.9	32.1
Bulgaria	57.6	57.4	7.9	14.2	55.4
Poland	59.3	55.8	7.6	17.4	43.5
Serbia	75.2	75.2	7.5	12.6	59.9
Austria	77.4	42.2	7.2	23.2	30.9
Slovenia	49.3	49.3	5.6	11.5	49.0
Lithuania	35.2	20.9	5.5	26.5	20.7
Estonia	69.9	69.9	4.8	6.9	69.9
Finland	67.9	67.9	4.6	6.7	68.2
Romania	47.0	43.2	2.2	30.1	7.2
Denmark	71.6	24.8	1.4	13.5	10.3
France	26.0	7.8	1.2	16.1	7.4
Bosnia-Herzegovina	34.2	34.2	0.8	2.4	34.2
Switzerland	3.7	3.7	0.5	12.3	3.7
North Macedonia	2.5	2.5	0.3	10.8	2.5
China	3.0	0.1	0.0	7.3	0.0
EU27	38.3	n.a.	n.a.	25.0	n.a.
WB-6	61.8	n.a.	n.a.	7.9	n.a.

Source: Eurostat, IEA, Rosstat, UN Comtrade.

Note: Item "natural gas import from Russia net of total natural gas export" set equal to zero if negative. Data for natural gas import from Russia are taken from the Russian export statistics provided by Rosstat, as the UN Comtrade database does not provide data on natural gas import quantities for most countries.