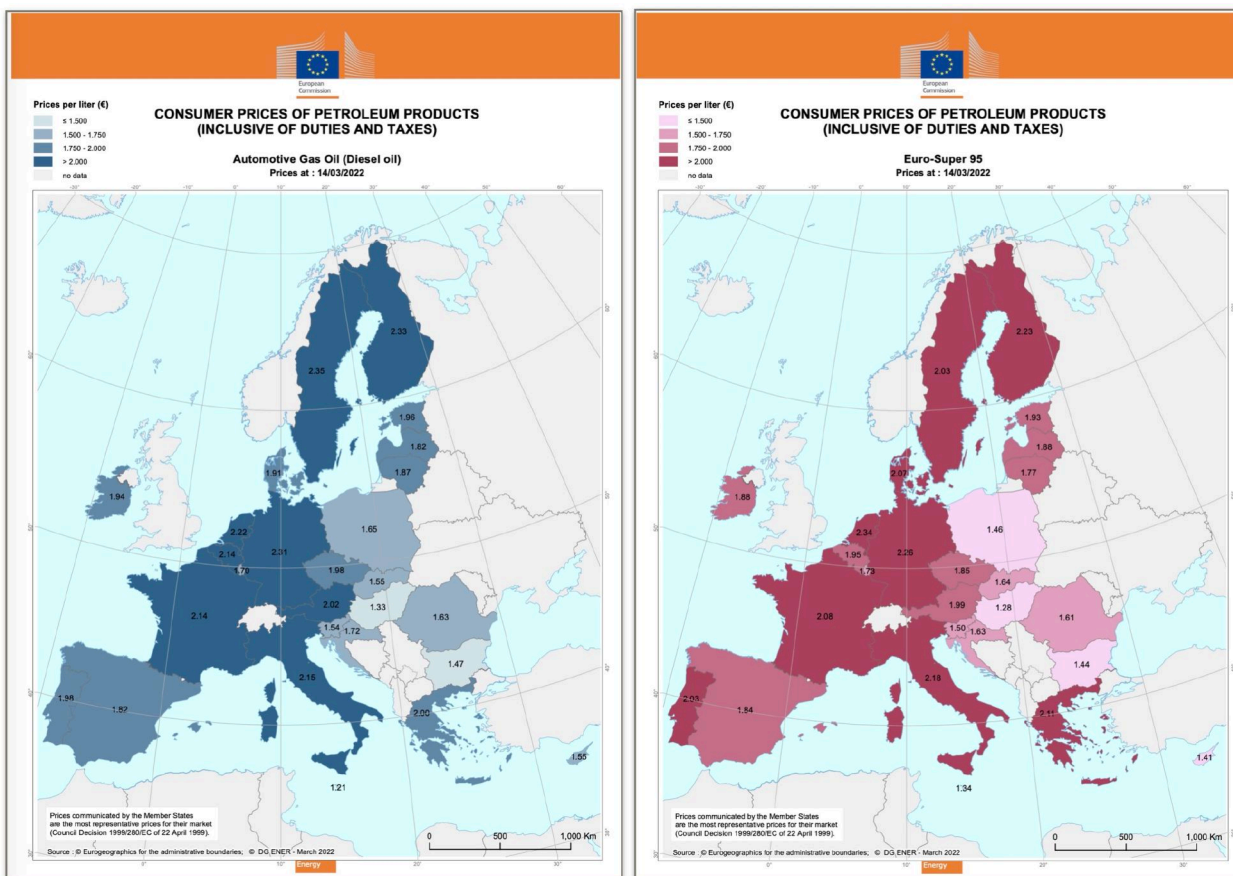


Oil Profits in Times of War

An EU-wide analysis of higher margins on the sale of diesel and petrol since the beginning of the Ukraine war



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1. Introduction

Why this study?

A few days after the launch of Russia's war against Ukraine on February 24, there was a massive increase in gas station prices in the EU. They quickly climbed to unprecedented levels. Diesel prices jumped above €2.30/litre (diesel) in some EU countries in March.

Refinery profits also surged in March. The IEA/KBC Refinery Indicator shows how average refinery margins multiplied in just a few weeks. Margins were even higher for Russian Urals Crude, the most important crude stream in the EU, as it could only be sold at deep discounts since the start of the war (source: IEA: Oil Market Report, March 2022, Paris 2022).

These trends indicate that gas station prices have moved far away from their main cost base, i.e. from crude oil prices. The accusation of "windfall profits", "war profits" or "extra profits" is in the air.

This short study makes an attempt **to quantify these extra revenues of the oil industry: Per litre and for total fuel sales in the EU.**

How did we calculate the extra revenues of the oil industry?

We **compare** the situation before the Ukraine war (**January 2022**) with the first weeks of the war (**March 2022**). How did the profit margins change during this period?

We focus on the **margins** in the so-called downstream sector: that is, **from crude oil tanker to gas station**. If the price spread (gross margin) between these two points is greater in March than in January, then gross margins have increased.

Does that also mean higher profits? In practice, pre-tax profits are probably growing faster than gross margins in the current situation (more details in chapter 2d) but we choose to err on the side of caution.

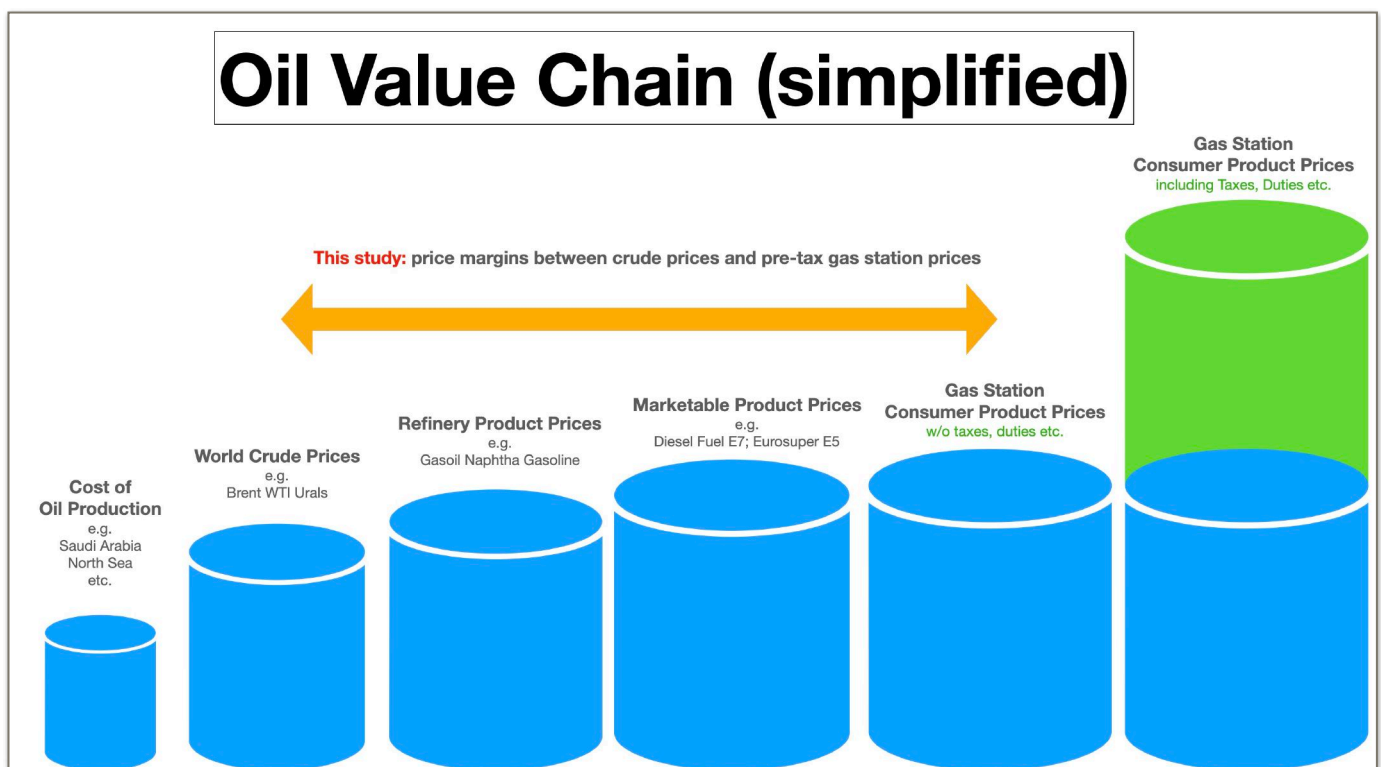
For further guidance, please refer to the Methodology chapter at the end of this brief study. The editorial deadline was April 1, 2022.

1. European Oil Trade and Russian Oil

Fossil Oil is still the most important energy source in the world today. Around 100 million barrels are consumed every day. That is the equivalent of 1157 barrels per second, or two supertankers per hour.

This volume passes through a long supply chain with numerous players and processes before it arrives at the gas stations in the EU.

- The largest profit margins already occur in the oil producing country, because the costs of oil production are far below international crude oil prices in most regions of the world.
- Crude oil is then transported by tanker or pipeline to the refineries. They clean the crude oil mixture (e.g. desulfurization) and crack or recombine the hydrocarbons in the crude oil until they become intermediate or end products. This processing requires enormous amounts of energy.
- Refinery operators live off the price differential (price spread, gross refinery margin) between crude oil prices and product prices. Refinery margins fluctuate widely, depending on market conditions and price trends.



- The refinery products are then blended or processed into final products. Diesel and petrol (gasoline) fuels receive various additives. Also, biofuels are blended into the mix (biodiesel or bioethanol).
- The end product is then transported to the service stations via intermediate storage facilities.

This study focuses on the **price spread between crude prices and gas station prices (w/o taxes, duties)** as shown in the diagram above. An increase of this price spread represents a good proxy of extra revenues of the oil industry. Assuming no major changes in other costs (see chapter 2d below), it is also a **good proxy for rising pre-tax profits**.

While it is clear that the oil industry as a whole benefits from rising margins, the distribution among industry players will differ between individual supply chains.

The number of beneficiaries may be small assuming, for example, a Shell-owned oil field supplying a Shell-owned refinery which delivers diesel or gasoline to Shell-owned gas stations.

There are also more complex cases. Russian Urals Crude is often sold to commodity traders. They resell the volumes to oil companies, or directly to refineries. Or they may ship Russian oil to large tank storage locations in Rotterdam or Singapore. Another trader may pick up this (blended) oil volume and sell it to a refinery a few weeks later. Finally, refineries may supply independent local traders which, in turn, deliver diesel or petrol to a local gas station chain.

Oil Consumption in Europe and Russian Oil

Europe (OECD Europe) consumed 12.57 mb/d (million barrels per day) of oil products in January 2022, according to preliminary IEA estimates. This amount corresponds to 13% of the total global consumption. Diesel und gasoline are in first place:

- 4,37 mb/d Diesel
- 1,79 mb/d Gasoline
- 1,64 mb/d Other Gasoil
- 1,10 mb/d LPG/Ethane
- 0,90 mb/d Jet/Kerosene
- 0,80 mb/d RFO (Residual Fuel Oil)
- 2,21 mb/d Other

Source: IEA: Oil Market Report March 2022, Paris 2022

There is not a single major oil producing country in the EU. In the whole of Europe, only Norway is a major oil country with 2.0 mb/d. UK volumes are about half of that.

By far the most important oil supplier to the EU has traditionally been Russia, followed by the US, Kazakhstan, Saudi Arabia, Iraq, Nigeria and other countries in a monthly changing order.

Russia is the world's second-largest oil producer after the U.S. and ahead of Saudi Arabia. The country produced about 11.3 mb/d at the end of 2021, or nearly 12% of global oil consumption. Of this, 7.8 mb/d was exported in December 2021, in the form of crude oil (5.0 mb/d) or oil products (2.8 mb/d) (source: <https://www.iea.org/reports/russian-supplies-to-global-energy-markets/oil-market-and-russian-supply-2>).

Of this 7.8 mb/d of exports, about 4.5 mb/d flowed to Europe before the Ukraine war. The current volume is likely to be similar, as pre-war supply contracts will be worked off only by April. In the months to come, the trend is less clear.

There is no embargo on Russian oil in the EU. Some oil traders, tanker companies, oil companies and refineries are shunning Russian oil supplies because of the Ukraine war but the large majority of the oil industry continues to buy, process and sell Russian oil.

Urals Crude is by far the most important Russian oil grade. It is being offered at deep discounts of 30 per cent to Brent crude in March. However, the situation can change at any time.

2. Margins Rising: Extra Revenues in March

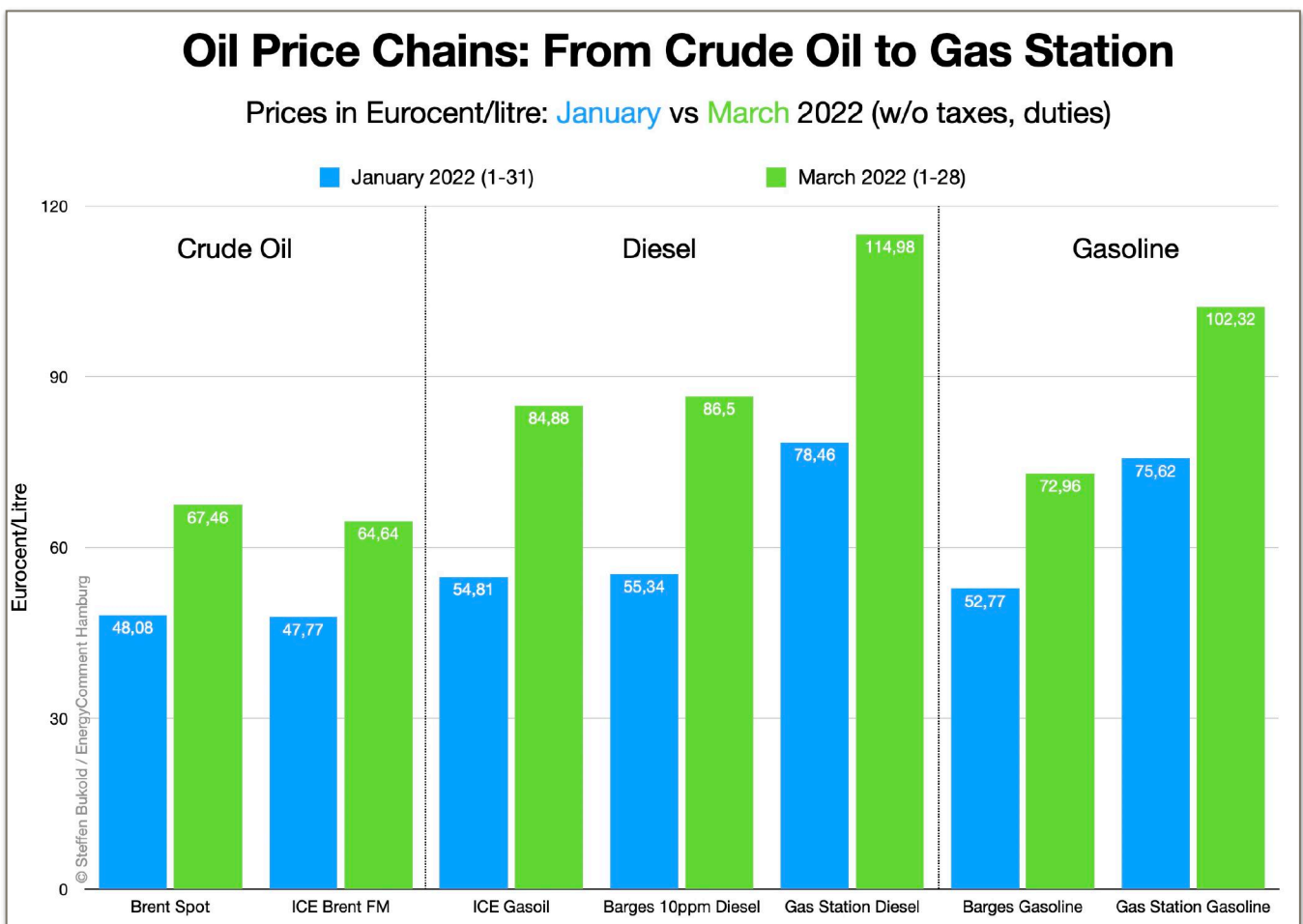
Step 1: Prices

The diagram below shows **EU-wide average prices for January and March** (1-28) along the oil value chain. For further details on data sources please see chapter 3.

There are monthly average prices for crude oil (Brent Spot, ICE Brent), refinery products (ICE gasoil, diesel barges, gasoline barges) and for prices at gas stations, excluding taxes and duties.

Barge prices refer to refinery products in the Rotterdam region. Rotterdam is the centre of European oil product price formation and the Rhine is an important transport route for oil products in the EU supplying core consumption areas.

We can see that all prices have increased over the past two months, as expected. But did they rise at the same speed?



Step 2: Margins

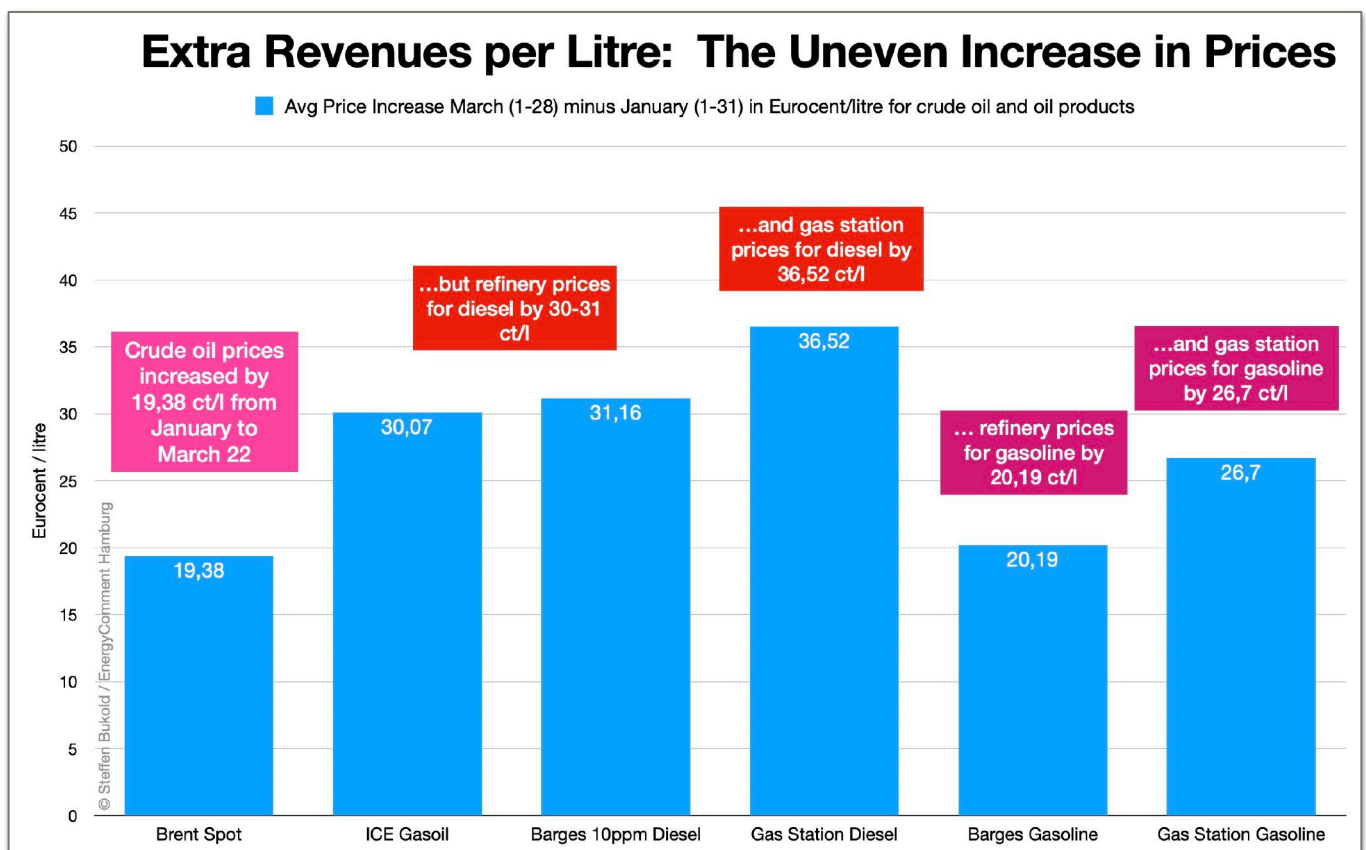
Apparently not: Crude prices climbed by 19,38 ct/l (Eurocent/litre), refinery products for diesel in the Rotterdam area by around 30-31 ct/l and diesel gas station prices in the EU by 36,52 ct/l. The gasoline/petrol value chain shows a similar, albeit weaker, trend.

As for the **diesel** value chain, this is a clear indication that gross refinery margins for diesel have increased considerably.

This is just as true for the subsection of **distribution** margins in the diesel sector, as gas station prices have increased even stronger than refinery product prices.

As for **gasoline/petrol**, the increases of crude oil prices and refinery product prices do not differ much. That is an indication that refinery margins for gasoline have been almost unchanged.

Surprisingly, however, gas stations prices have climbed considerably stronger than refinery product prices (26,7 ct/l vs 20,19 ct/l). Apparently, the margins in the **distribution** system of petrol have improved considerably.



Step 3: Extra Revenues

As EU gas station prices (ex taxes, duties) rose much faster than crude import prices, the downstream revenues of the oil industry surged.

If we multiply the extra revenue per litre by sales volumes in the EU we can calculate the total extra revenues from the sale of diesel and petrol at EU gas stations.

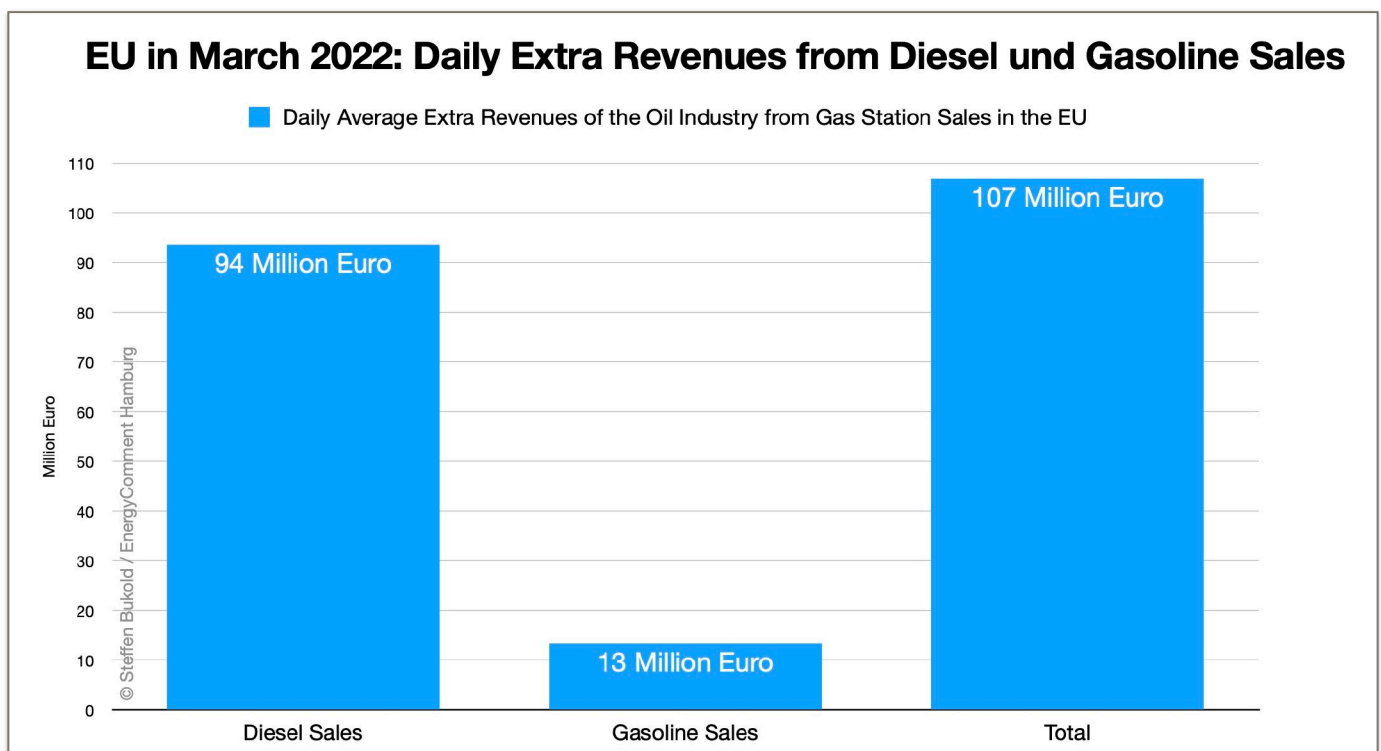
We chose **two different approaches** to provide estimates for these numbers.

a) Monthly Averages

The estimate below uses **monthly average** prices for Brent Spot prices (crude oil) in January and March. We compare these averages to EU gas station prices as provided by the EU Oil Bulletin (see chapter 3 for details).

Using these numbers the average **daily extra revenues** from the sales of **diesel** amount to **€94 million**; from the sales of **petrol** to **€13 million**. The **daily total** is **€107 million**.

Extrapolated to the entire month of March, the extra revenues of the oil industry amount to about €3.3 billion.

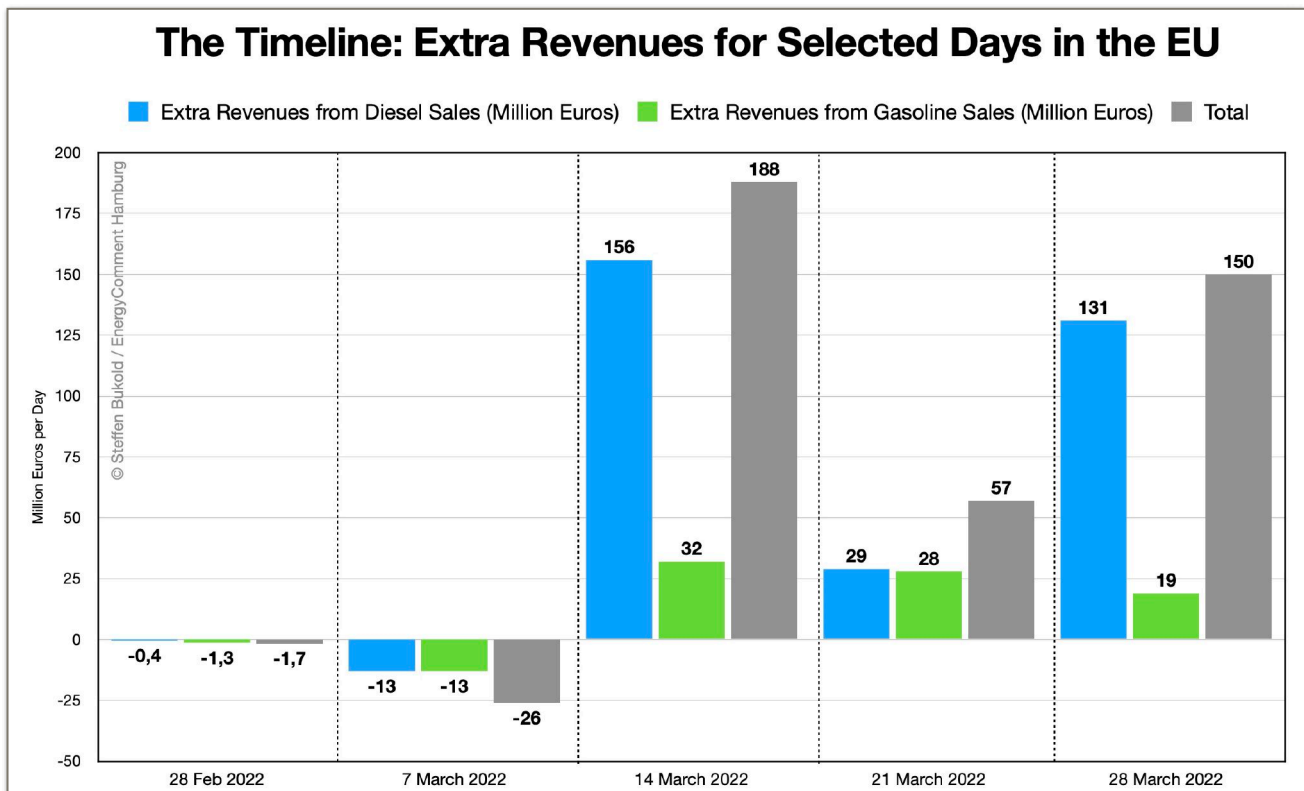


b) Daily Approach: The Timeline

In a second approach we use **daily price assessments** for crude prices and for gas station prices. That is a snapshot that does not necessarily provide a realistic assessment of physical processes as crude oil purchases and refinery production occur a few days, weeks or even months earlier than the fuel sales at gas stations.

If we choose such a „**synchronicity approach**“ for February 28, March 7, March 14, March 21 and March 28 (the publication dates of EU Oil Bulletins) we can calculate specific daily extra revenues:

- **28 February 2022:** There are hardly any changes compared to January. The margins remained more or less the same.
- **7 March 2022:** Gas station prices were unable to keep pace with rising crude prices. Compared to January, the extra revenues were **negative** (€26 million).
- **14 March 2022:** Gas station prices in Europe quickly climbed to their March peaks, whereas crude prices stabilized. This situation created very high extra revenues amounting to €188 million, mainly thanks to diesel sales (€156 million).



- **21 March 2022:** Gas stations prices came down whereas crude prices climbed. The extra revenues collapsed to €57 million, evenly split between diesel und gasoline.
- **28 March 2022** Crude prices came down again whereas gas station remained on a high level. Daily extra revenues recovered to €150 million, with the focus on diesel sales.

c) Extra Revenues in Individual EU Member States

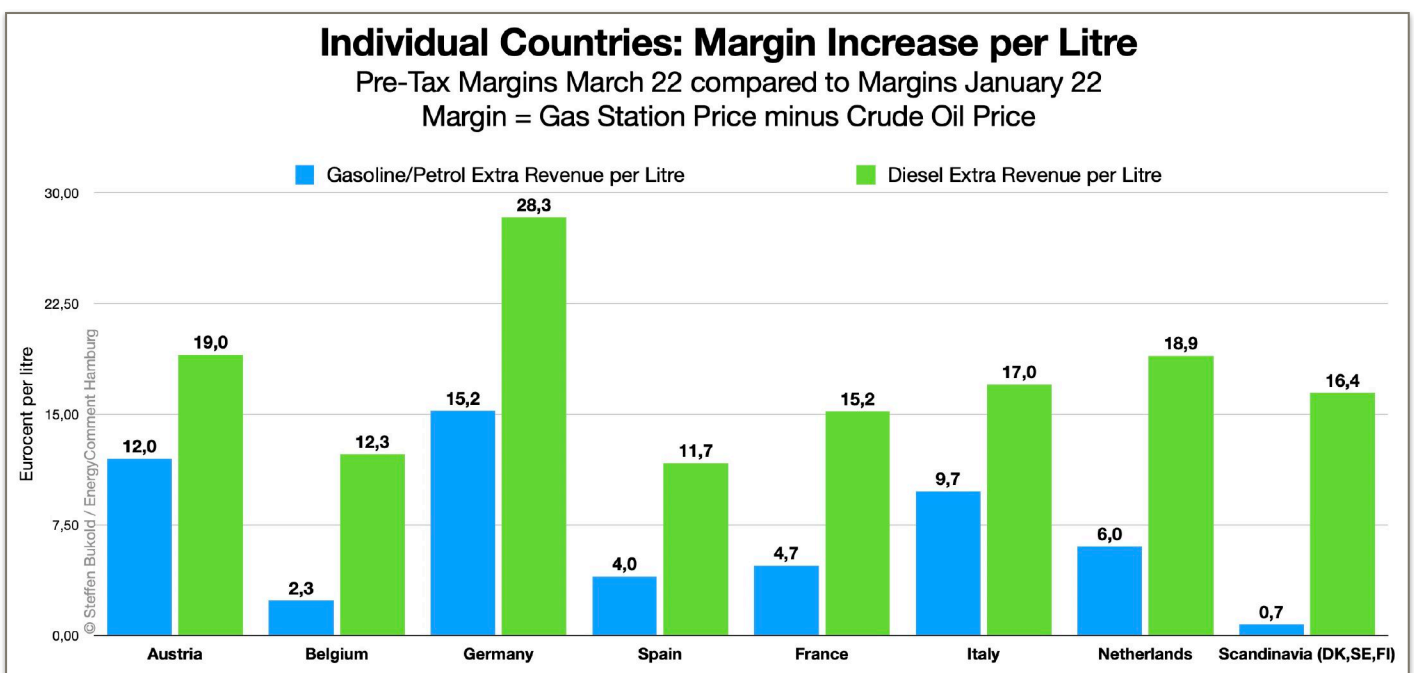
The next two charts show the margin growth in individual countries. By how much faster have gas station prices risen compared with crude oil prices, if you compare January 2022 with March 2022, the month of war?

Depending on the purchasing power of customers and the competitive situation in the market, significant regional differences can be seen.

The **first chart** shows the **margin growth per litre**, in each case for gasoline and for diesel fuel.

Gasoline/Petrol: Margins increased above all in Germany, Austria and Italy. In the other countries shown here, the increases were small, and in Scandinavia they were even close to zero.

Diesel: Margins increased significantly more in all countries. At 28.3 ct/l, Germany is in the top spot followed by Austria, the Netherlands and France.

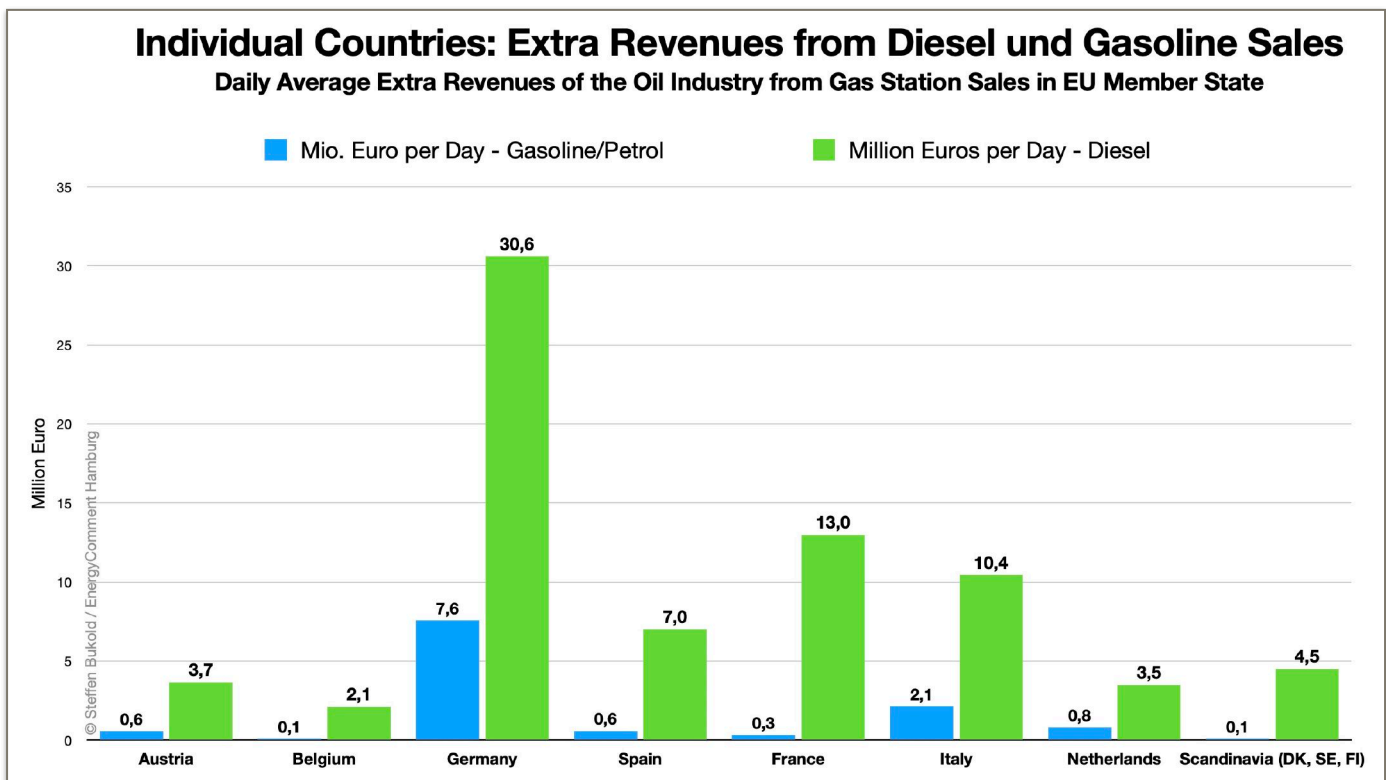


The second country chart combines the margin growth just mentioned with the sales volume at gas stations. This allows the total extra revenue per country to be estimated.

Once again, the extra revenues in Germany stand out. Here, high margin growth and a high sales volume at the gas stations come together. Every day, the oil industry generates 30.6 million euros in extra revenue from the sale of diesel at gas stations. For gasoline, the figure is 7.6 million euros.

This means that German consumers pay just under 36% of the EU-wide extra revenue (107 million euros).

The other major countries in our list follow by a wide margin: France, Italy and Spain. However, the picture is the same everywhere: diesel margins in particular have increased sharply.



d) Extra Revenues vs Extra Profits

The approaches above capture **extra revenues** of the oil industry from the sales of diesel and gasoline fuels. This should not be confused with the concept of **extra operational profits** (EBITDA).

There is, however, a **strong correlation** between the two as long as costs remain stable.

1. Since the summer of 2021, refinery costs have increased significantly due to skyrocketing **natural gas prices**. Natural gas is an important cost factor, especially for hydrogen production in refineries.

A potential increase in refinery costs in the relatively short period between January and March 2022 is difficult to quantify and probably limited. It remains unclear to what extent refineries in the EU are exposed to short-term natural gas price fluctuations.

It is clear, however, that this (potential) cost increase cannot offset the very substantial additional revenues thanks to higher gross margins. Moreover, many refiners are owned by integrated oil companies such as Shell, BP, Total, etc. They also produce and trade natural gas. Higher natural gas prices in this integrated business environment do not change the bottom line of the group.

2. In contrast to this factor, other trends have an additional strong positive impact on refining margins. Chief among these is the discount on Urals Crude, the most important single crude stream in the EU. It averaged \$27 per barrel against Brent Crude in March (see <https://www.neste.com/investors/market-data/urals-brent-price-difference#bd502b8c>).

Refiners using such heavily discounted crude have, of course, been able to earn much higher extra revenues in March.

In summary, therefore, **it can be assumed that the extra revenues calculated in this short study err on the cautious side.**

The numbers will be reflected just as strongly or even more strongly in higher operational profits (Ebitda).

3. Methodology

General Approach:

1. Price spreads between gas station prices in the EU (weighted average, ex tax, ex duties) and EU crude import prices, with some intermediary prices (gasoil, barges) for further detail.
2. Comparison between March 2022 spreads and January 2022 spreads to determine extra revenues in March 2022.
3. EU gasoline/petrol and diesel consumption figures (litres/day) to determine total extra revenues in million euros per day or per month.

Crude prices:

Data source: IEA, EIA.

While there are price differences between EU import crude streams, with a negative spread (e.g. Urals Crude) or a positive spread (e.g. Kazakh crude) to Brent, Brent Spot Prices (or Dated Brent) are a good proxy for EU crude import prices. Both IEA CIF import price assessments and German BAFA numbers (Amtliche Mineralölstatistik 2021) show a very strong correlation.

ICE Brent front month future contracts are more widely used in media. They tend to be close to Brent Spot in normal market situations but spreads increase in turbulent times, such as in March 2022. We therefore used Brent Spot as our EU crude price proxy.

Gasoil, diesel/gasoline barge prices

Data source: ICE, Global Energy Briefing

Gas station prices (Diesel, Gasoline/Petrol):

Data source: Weekly Oil Bulletin (European Commission).

https://energy.ec.europa.eu/data-and-analysis/weekly-oil-bulletin_en

Prices w/o taxes and duties; January (3/10/17/24/31), February (28) and March (7/14/21/28).

Consumption (Gasoline/Petrol and Diesel) for EU27 and individual countries

Starting point: 2020 Eurostat per country figures: https://energy.ec.europa.eu/data-and-analysis/weekly-oil-bulletin_en.

First assessments for late 2021 and early 2022 (*IEA: Oil Monthly Report, Paris 2022; February 2022 and March 2022 editions; OPEC: Monthly Oil Market Report March 2022, Vienna 2022; IEA: Monthly OECD Oil Statistics, Paris 16 March 2022*) indicate a slightly higher demand level than 2020 averages (latest EU publication). We adjusted 2020 demand figures by +9.2% for gasoline and +0.8% for diesel consumption. In the next step we deducted biofuel volumes based on the latest available figures: minus 5.2% for gasoline and minus 7.0% for biodiesel (*EurObserv'ER: The State of Renewable Energies in Europe, Edition 2021, Paris 2021*).

Currency:

Euro (ECB Fixing used for USD-EUR conversion)