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Manon François, Carlos Oliveira, Bluebery Planterose, Gabriel Zucman

November 2022

NOTE

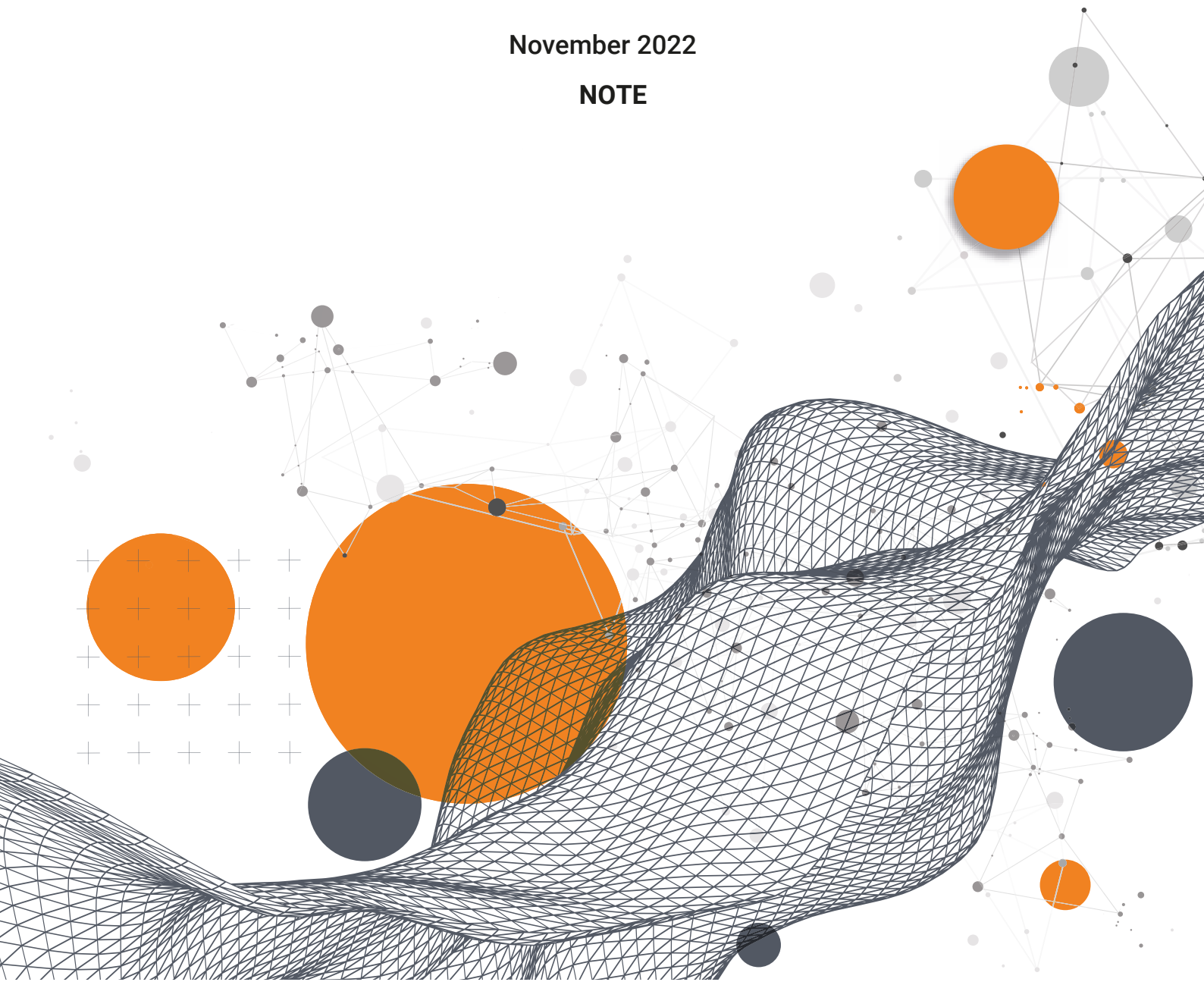


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- ABSTRACT -

This note presents a new way to tax excess profits. We propose to tax the rise in the stock market capitalization of companies that benefit from extraordinary circumstances, such as energy firms following the invasion of Ukraine in February 2022. Targeting the rise in stock market capitalization (which is easily observable) makes the tax much harder to avoid than standard excess profit taxes, and allows to capture rents irrespective of where multinational companies book their profits. We apply this proposal to energy companies that are headquartered or have sales in the European Union. We estimate that taxing the January 2022 to September 2022 valuation gains of energy firms at a rate of 33% would generate around €65 billion in revenue (0.3% of GDP) for the European Union. We discuss implementation practicalities and compare our proposals to other plans made to tax excess profits.*

*This note updates and extends the EU Tax Observatory working paper n°5 by the same authors. This note has received funding from the European Union (GA No. TAXUD/2022/DE/310) and the Research Council of Norway (GA No. 325720). The views expressed in this note are those of the authors, and do not necessarily reflect the views of the the European Commission. We thank Emmanuel Saez for helpful discussions.

1 Introduction

The invasion of Ukraine by Russia in February 2022 and the ensuing war have brought hardship to the global economy, and to the economy of the European Union in particular. The upsurge in energy prices has dramatically increased firms' input costs and households' energy expenditures. For some companies, however, this conflict has come as an opportunity. Many energy firms have seen their profits and stock prices rise, earning rents from the increase in oil and gas prices.

In this note, we propose and quantify the revenues of a modern excess profit tax that would efficiently redistribute windfall profits from the war in a simple manner. We propose to tax the rise in the stock market capitalization of energy companies that are headquartered or have sales in the European Union. We estimate that a 33% tax on the January 2022 to September 2022 valuation gains of these energy firms would generate around €65 billion in revenue (0.3% of GDP) for the European Union. If fully and equally redistributed to all EU households, this one-off tax could fund a transfer of €145 per person, almost €600 for a family of four. With a 50% tax rate, the transfer would approach €900 for a family of four.

Our proposal modernizes traditional excess profit taxes and adapts them to the economic realities of the 21st century. Excess profit taxes have been successfully used in the past, especially in wartime.¹ But the organization of global economic activity has changed substantially since World War II. Today, a large share of output is produced by multinational companies that can shift profits to subsidiaries in low-tax territories. Tørsløv, Wier and Zucman (2022) estimate that 36% of the profits made by firms in countries other than their headquarters are shifted to tax havens. This shifting has dramatically increased since the 1970s (Wier and Zucman, 2022) and complicates the taxation of profits. Meanwhile, financial markets have developed. Ratios of stock market capitalization to GDP exceed 100% in many countries.² Even though some are still closely held, the vast majority of large energy companies are publicly traded. This makes targeting market capitalization appealing.

Our proposal has two main advantages relative to standard excess profit taxes. First, because stock market capitalization is observable and hard to manipulate, the tax we propose would be easy to enforce. Companies would not be able to avoid it by shifting profits to tax havens. Second, this tax would capture all rents earned by energy firms, including those earned from oil and gas extraction (upstream activities), as opposed to only rents on refining and other downstream activities.³ This is in contrast to the excess profit taxes currently discussed in the European Union, such as the temporary solidarity contribution proposed by the European Commission in September 2022, which would tax profits booked in the European Union, i.e., primarily downstream activities. For a given tax rate, the excess valuation tax we propose would generate about three times as much revenue as the solidarity contribution proposed by the European Commission: €65 billion vs. €25 billion with a tax rate of 33%, for example.

¹For example, the United States introduced an excess profit tax in 1940, in force until 1950; "adjusted excess profit tax net income" was taxed at a rate of 95% (Avi-Yonah, 2020). See Hebous, Prihardini and Vernon (2022) for a review of past excess profit taxes.

²See World Federation of Exchange database, available at <https://data.worldbank.org/indicator/CM.MKT.LCAP.GD.ZS>.

³Many countries tax economic rents from fossil fuel extraction. See Baunsgaard and Vernon (2022) for a review of the fiscal instruments targeting extractive companies.

We stress that both the traditional and the modern excess profit tax we propose have strengths of their own. Both would affect firms differently (e.g., some companies may have large excess profits but little or no rise in stock market capitalization, or vice versa). Risks of double taxation are limited, because excess profit taxes capitalize into stock prices, reducing valuation (and thus the base of the tax we propose) accordingly. For these reasons, policymakers could consider using both instruments simultaneously. In that case, a tax on the rise in market capitalization could be seen as a minimum effective excess profit tax, ensuring that firms in specific sectors pay a minimum amount of additional tax as long as their stock price rose, even if they managed to shift profits to tax havens.

Concretely, the tax we propose would work as follows. For energy companies headquartered in the European Union, 100% of the increase in market valuation since the beginning of 2022 would be subject to taxation in the European Union. For energy companies headquartered outside of the European Union, the rise in market valuation would be apportioned to the EU proportionally to the fraction of global sales made in the EU. For example, if the market valuation of a non-EU gas producer rose by €100 billion and the company makes 20% of its sales in the European Union, then €20 billion would be subject to taxation in the European Union. Thus, the tax would apply not only to EU firms, but also to companies that extract oil and gas outside of the European Union and sell to EU consumers. This is critical to effectively redistribute windfall profits and address the hardships caused by surging energy prices. Because all large firms (including those headquartered outside of the European Union) must produce country-by-country breakdowns of their sales, apportioning excess valuation based on sales is feasible.

The proposal builds on Saez and Zucman (2022), who present a proposal for an annual tax on corporations' stock. They detail the merits and practicality of such a tax. It is straightforward to administer: it could be collected by Securities and Exchange commissions in each country, which already collect fees on listed companies. It is hard to avoid, because market capitalization is readily observable. It complements existing profits tax, as companies can become very valuable even before making taxable profits (e.g., Amazon). We extend this idea to a temporary tax on the increase in market capitalization of energy companies. Our proposal has the same enforcement and administrative strengths as the annual tax described by Saez and Zucman (2022), while addressing the specific issues and needs arising from the war context. Because it is a one-time tax, it is even harder to avoid.

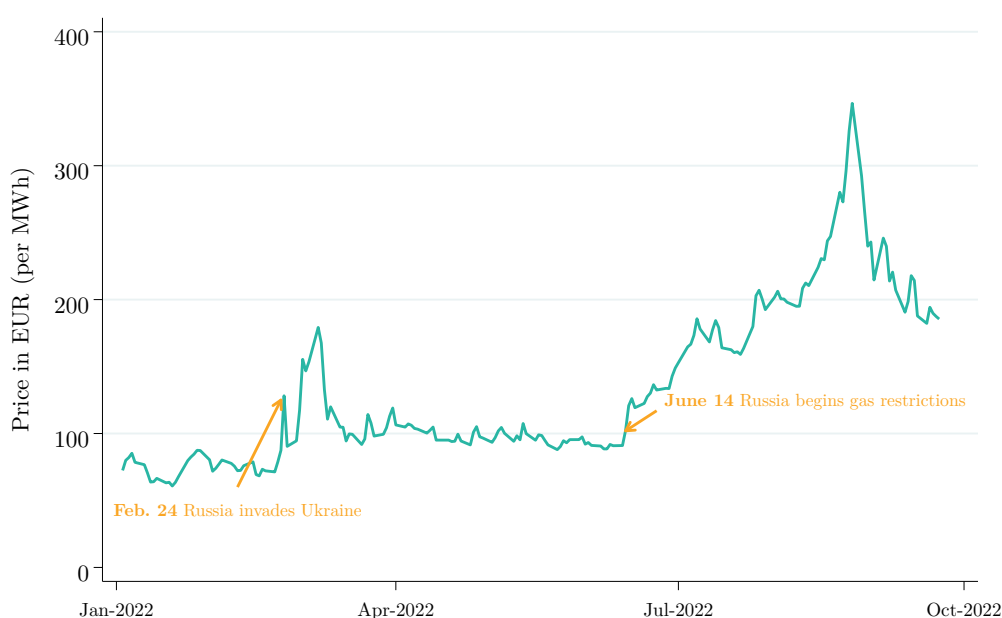
The rest of this paper proceeds as follows. Section 2 describes the context and rationale of the tax we propose. In Section 3, we discuss implementation issues. In Section 4, we estimate the revenue potential of our proposal. In Section 5, we provide estimates for an alternative excess profit tax for non-EU and EU energy firms, targeting worldwide profits instead of market capitalization. Finally, Section 6 concludes.

2 Excess Valuation Tax: Context and Rationale

Energy prices had been increasing in Europe for over a year before the Russian invasion of Ukraine in February 2022, but the situation substantially worsened after the invasion. Oil prices rose from an average of about \$70 in 2021 to a high of \$120 in June 2022, before falling back to about \$80 in September 2022. European gas prices first increased following the invasion of Ukraine, and then surged after Russia began restricting gas exports to the European Union in June 2022 (see Figure 1). Since many power plants are gas-fired, the lower supply induced an increase in prices which greatly benefited energy companies. Coal prices rose sharply after the invasion of Ukraine and remained at a high level in the following months.

FIGURE 1

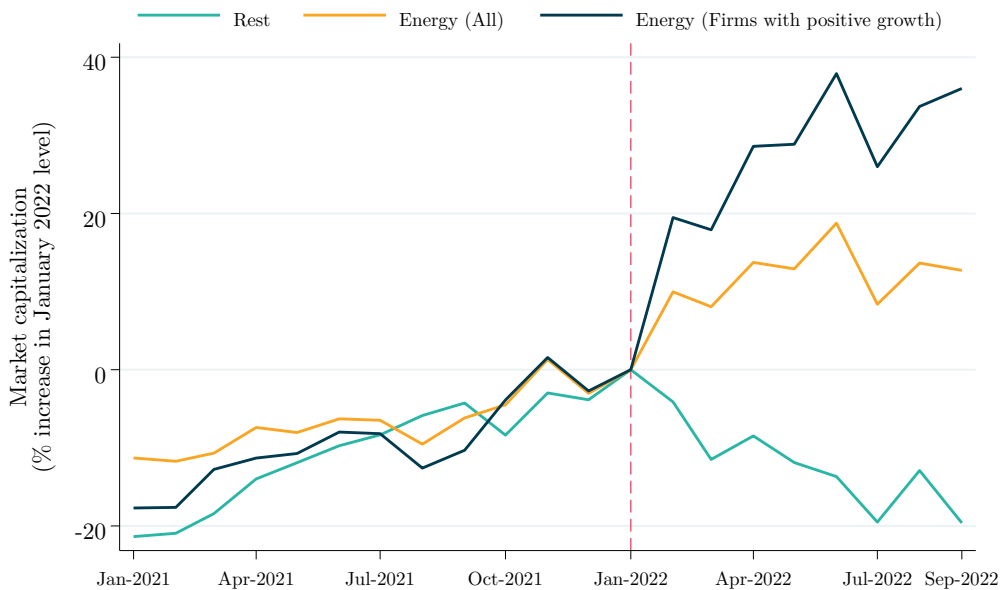
Natural Gas Prices Since January 2022



Note: This figure reproduces a figure from a *New York Times* article titled *Why Europe's Electricity Prices Are Soaring* published on August 25, 2022. It shows the evolution of the prices of benchmark European natural gas contracts using Dutch T.T.F. natural gas futures data.

The increase in energy prices was reflected in a rise in the market valuation of energy companies. We illustrate this phenomenon by studying the change in the market capitalization of the companies composing the Stoxx Europe 600 index, which includes 600 European companies (including some non-EU companies) accounting for approximately 90% of the capitalization of the European stock market. While the capitalization of European companies outside the energy sector declined, on average, by around 20% between January and September 2022, the valuation of energy companies grew by close to 15%. For energy companies with stock price increases, market valuation rose by 35% (see Figure 2).⁴

⁴Energy companies are not the only ones experiencing gains in market capitalization. Armament and defense companies have also seen sharp increase in their stock price since the beginning of the war, in a context of rising international military tensions. See Appendix A for a discussion of defense companies.

FIGURE 2**Growth in Market Capitalization for Stoxx Europe 600 Companies**

Note: This figure shows the monthly evolution of the total market capitalization of the firms composing the Stoxx Europe 600 index, between January 2021 and September 2022, expressed as a percentage change relative to January 1, 2022. *Energy (all)* includes all 36 energy companies included in the Stoxx 600, whether their market valuation rose or fell in 2020. *Energy (firms with positive growth)* includes only the 18 energy firms whose market capitalization rose in 2022. Rest corresponds to the 564 firms in the Stoxx 600 which are not in the energy sector. Market capitalization for each firm is converted to euro using daily exchange rate (the vast majority of Stoxx 600 companies are listed in euros).

As shown in Appendix Figure A, in absolute terms, total market capitalization for Stoxx 600 firms outside the energy sector decreased from €12.4 trillion in January 2022 to €9.9 trillion in September 2022. Meanwhile, market capitalization for Stoxx 600 energy sector firms rose from €785 billion to €894 billion. Of course, there is heterogeneity within sectors. Some energy companies did not benefit from the current situation and saw their market capitalization fall. For example, Enel—an Italian energy company—saw its market capitalization fall by €26 billion between January and September 2022. The tax we propose would not affect firms that experienced a decline of their market capitalization. However, these firms could be affected by standard excess profit taxes (to the extent they have excess profits), highlighting the complementarity between the two instruments. In total, 18 energy firms in the Stoxx 600 saw their market capitalization increase since January, while 18 experienced losses. In addition, as shown by Appendix C Table B, 283 global energy firms outside of the Stoxx 600 had valuation gains from January to September 2022.

3 Feasibility and Implementation

We propose to tax energy companies based on the increase in their market capitalization between January 1st 2022 and December 31st 2022. For our benchmark estimates, we consider a tax rate of 33%, the same rate as the one proposed by the European Commission in September 2022 for its solidarity contribution on excess profits. For firms headquartered in the European Union, 100% of the rise in market capitalization would be taxable in the EU. For non-EU companies that have sales in the European Union and whose market capitalization rose in 2022, the market capitalization increase would be apportioned to the European Union using the fraction of the sales these companies made in the EU.

Taxation of non-resident multinationals. To illustrate how the taxation of non-EU firms would work, consider the following example. Suppose the market capitalization of a UK oil firm increased by €100 billion between January and December 2022, and that this firm made 50% of its 2022 sales in the EU. Then in our benchmark proposal this firm would pay a tax of $33\% \times €100 \times 0.5 = €16.5$ billion. This can be seen as a form of destination-based excess profit tax. A destination-based principle to tax non-resident multinationals has also been proposed by Hebous, Prihardini and Vernon (2022) in the context of standard excess profit taxes.

Who would collect the tax. The tax we propose could be collected by the European Commission and be used for the European Union's own resources. Alternatively, the tax could be collected by the tax authority of each member state. In that case, the apportionment of the market valuation gains of non-resident multinationals would be applied at the country-level, based on the fraction of global sales made in each country. For instance, if a UK energy multinational has 5% of its sales in France, then France would tax 5% of the increase in the market capitalization of this firm. The tax authorities of the different member states have the information necessary to compute the tax owed by non-resident multinationals, because they receive country-by-country reports from all large multinationals (including a country-by-country breakdown of sales).

Double taxation issues. A potential concern is the risk of double taxation between the tax we propose and the solidarity contribution on excess profits proposed by the European Commission in September 2022 (European Commission, 2022). However, the risk of such double taxation is limited because standard excess profit taxes capitalize into stock prices and reduce stock market valuation. For example, if a company has to pay a standard excess profit tax of €1 billion on its 2022 profits, then everything else equal, this reduces its market capitalization—and hence the 2022 rise of its market capitalization, i.e., the base of the tax we propose—by €1 billion. There is no double tax. From that perspective, the tax we propose would complement the temporary solidarity contribution proposed by the European Commission.

Another potential double taxation problem exists if all countries applied the mechanism we describe. There would be double taxation if the increase in market capitalization was taxed both by the headquarter country and the sales countries. In that case, one has to define priority rules. A possibility would be to give priority to sales countries, i.e., to allow any tax paid to sales countries to be creditable against the tax owed in the headquarter country. The headquarter country would thus merely play the role of tax collector of last resort, meaning it would only collect revenue to the extent that some sales countries have chosen not to collect their share of the tax.

Liquidity concerns. A potential concern with the tax we propose is that firms experiencing large gains in their share price might not have enough liquidity to pay the tax out of current profits. In practice, however, this concern is unlikely to be an issue because the tax we propose applies to listed firms only and listed firms can always issue shares to raise cash. Because liquidity issues would only affect firms that experienced a large increase in their stock price, these firms would raise funds at a high valuation, minimizing dilution for existing shareholders.

Investment concerns. Another concern relates to how investment might be affected by the tax we propose. Because the tax we propose is a retrospective one-off tax, it should have limited effects on investment decisions, as these decisions were taken before knowing that windfall profits would be generated and taxed. More broadly, because the tax we propose is retrospective (e.g., governments could announce at the beginning of 2023 that they will tax the 2022 rise in market valuation), the tax base is fully known at the time of announcement and not elastic, so that mechanical revenues are likely to be very close to actual revenues. In particular, share prices might drop at the time of announcement but this does not reduce the 2022 rise in market valuation, i.e., the base of the tax.

Unlisted firms. We do not propose to tax unlisted energy companies, for two main reasons. First, the vast majority of large energy firms globally are listed, including the world's largest oil producers (e.g., Saudi Aramco, listed in 2019; PetroChina, listed in 2000) and most large European and American energy firms. Among the top 40 (nonstate-owned) energy firms by turnover in the Orbis database, 37 are listed and only 3 are closely held. Second, because the tax we propose is temporary, the risk that some listed firms might try to avoid it by choosing to become private is very limited.

It is worth noting that if policymakers wanted to introduce an annual tax on corporations' stock then it would be important to include large private firms, as to limit incentives for firms to stay private or to delist. As discussed in Saez and Zucman (2022), valuing private firms could be done by using the valuation multiples of similar listed firms, such as the price/earnings, price/sales, and price/book ratios of listed firms of the same size in the same sector.

Comparison with other excess profit taxes. The increase in oil, gas, and coal prices, and the resulting exceptional profits for energy firms have led to calls for the introduction of temporary excess profit taxes globally. International organizations such as the International Monetary Fund have supported the introduction of such mechanisms. A number of countries have already introduced such taxes. Greece and Romania introduced temporary taxes on electricity generators in late 2021 and 2022. Hungary introduced a temporary tax on certain electricity generators for 2022 and 2023. Spain also introduced an excess profit tax on large firms. In March 2022, Italy introduced a windfall profit tax of 25% on some energy companies. For a company to be taxed, the increase in profits between 1 October 2020 to 30 April 2021 and 1 October 2021 to 30 April 2022 must be at least €5 million with an increased profit margin of at least 10%. The United Kingdom also introduced an Excess Profits Levy in May 2022 which taxes company profits from production activities at 25 percent, on top of the usual 40% tax rate on oil and gas companies operating in the UK and the UK Continental Shelf. It thus increases the headline tax rate on those profits from 40% to 65%.

In her State of the Union address delivered in September 2022, the President of the European Commission Ursula von der Leyen announced a proposal for a temporary solidarity contribution on excess profits generated from activities in the oil, gas, coal and refinery sectors, on which member states agreed on September 30, 2022. The tax would be at a rate of 33% on 2022 (or 2023) profits above a 20% increase on the average profits of the previous four years for energy companies incorporated in the European Union (European Commission, 2022).

The main difference with our proposal is that the levy we describe would tax the increase in market capitalization as opposed to excess profits. This removes the need to precisely define what excess profits are (e.g., the reference period for the computation of normal profits). Because market capitalization is perfectly observable, avoidance is nearly impossible.⁵ Corporations cannot avoid the tax by shifting profits to low tax countries. Last, market capitalization captures all sources of rents, whether from downstream or upstream energy activities, and are thus more comprehensive than taxes based on profits booked in specific territories.

Since it would affect different firms and tackle different rents, both types of taxes could be used simultaneously. In that case, the tax we propose would work as a minimum effective profit tax, that ensures that firms that experienced an increase in market capitalization contribute, even if they are not subject to the solidarity contribution because they managed to shift profits.

⁵ Avoidance is all the more unlikely since the tax we propose is a one-time tax. If the tax was permanent, firms could try to avoid it by, e.g., becoming or staying unlisted. See Saez and Zucman (2022) for a discussion of potential tax avoidance issues.

4 Revenue Estimation

To score our proposal, we collected data on Stoxx Europe 600 companies and on the largest energy companies in terms of market capitalization globally.⁶ We identified 289 listed energy companies that experienced an increase in market valuation between January and September 2022.⁷ When computing the increase in market capitalization for these firms, we neutralize the effect of exchange rate movements. Specifically, we first compute the increase in market capitalization in local currency and then convert this increase into euros using September exchange rates. As a result, firms that experienced no valuation gain in local currency pay no tax (even if the currency in which they are listed depreciated against the euro).

As of September 1, 2022, the 289 energy companies included in our analysis had a total market capitalization of €7.5 trillion. Their capitalization had grown by €1.1 trillion since January 2022.

We apportion the gross increase in market capitalization of non-EU firms to the EU proportionally to the share of sales made by these firms in the EU. To compute this share, we use the public country-by-country reports and most recent public financial statements of 11 large non-US energy multinationals: BP, Chevron, ConocoPhillips, Ecopetrol, Equinor, Exxon Mobil, Occidental Petroleum, Petrobras, Saudi Aramco, Shell, and SSE. These 11 firms account for about 55% of the total increase in market capitalization of all non-EU energy multinationals. For other non-EU energy multinationals, we assume that 10% of their sales are made in the European Union, roughly the fraction observed for the 11 large firms for which we have detailed data. Because the share of sales made in the European Union varies significantly at the firm level, firm-level results for these non-EU multinationals should be interpreted with caution. Aggregate estimates are likely to be accurate, however, since our 10% assumptions (once combined with the observed values or the other energy firms in our sample) implies a share of the European Union in global energy consumption in line with available data.

We then simulate different revenue scenarios based on varying the tax rate (Table 1). A number of results are worth noting. First, the tax we propose has significant revenue potential. We estimate that a tax rate of 33% would generate about €65 billion in revenue, equivalent to 0.3% of the GDP of the European Union. To more concretely assess the amounts involved, note that there are about 447 million inhabitants in the European Union. If the revenues from the tax were fully and equally redistributed to households, each inhabitant (including children) would receive about €145, i.e., a family of four would receive almost €600. Second, about 80% of the revenues would originate from multinationals incorporated outside of the European Union but with sales in the EU (e.g., Shell, Exxon Mobil, Equinor, Saudi Aramco). This highlights the importance of taxing non-EU multinationals, which derive significant rents from oil and gas exports to the EU.

⁶We gathered data for all Stoxx Europe 600 companies, as well as the other energy companies from the following list of the 415 largest energy companies by market capitalization <https://companiesmarketcap.com/energy/largest-companies-by-market-cap/>. We then matched this list with a list of 194 energy firms from FinBox (<https://finbox.com>) with a market capitalization greater than \$3 billion, as of September 2022. This resulted in 19 additional companies in our dataset.

⁷20 firms, for which we were not able to retrieve market capitalization data, were excluded from the analysis. We also exclude EDF, that was nationalized by the French government in 2022.

TABLE 1**Revenues from a Tax on the Increase in Market Capitalization of Energy Firms**

	Market Capitalization Growth (billions EUR)		Tax Revenue (billions EUR)		
	Gross	AppORTioned to EU	20%	33%	50%
Non EU Firms	1,211.1	156.3	31.3	51.6	78.2
EU Firms	39.3	39.3	7.9	13	19.7
Total	1,250.4	195.7	39.1	64.6	97.8

Note: This table displays the January 2022 to September 2022 market capitalization growth (in billion EUR) of EU and non-EU energy firms in our sample, and the revenue potential from taxing this increase in capitalization. *Gross* corresponds to the gross increase in market capitalization between January and September 2022, *AppORTioned to EU* corresponds to this gross increase apportioned to the EU using our apportion rule described in the text, 20%, 33%, and 50% correspond to the estimated tax revenue using either a 20%, 33%, or 50% tax rate.

Third, we can see that there is a wide range of potential revenue depending on the tax rate applied. With a rate of 20% the tax would generate about €39 billion in revenue, while with a rate of 50% the tax would generate about €98 billion, the equivalent of almost €220 euros per EU inhabitant (€900 euros for a family of four). It is worth emphasizing that the tax only concerns energy companies that experienced a rise in their share price over the year 2022, so that even with a 50% rate the shareholders of these firms would still be significantly better off than in January 2022. One could also consider a 100% tax on the rise in capitalization, leaving shareholders no worse off than in January 1, 2022. Revenues would exceed €195 billion, i.e., about 1.2% of EU GDP.

Table 2 details the growth in capitalization (and potential tax revenues) for the largest EU and non-EU energy multinationals. We can see that market capitalization has increased massively for a number of non-EU firms (e.g., Shell, Exxon Mobil, Saudi Aramco), by more than €100 billion (an order of magnitude more than for EU energy multinationals with the largest gains). This explains why these firms would contribute significant amounts of revenues, even though only a small fraction (sometimes very small) of the increase in their valuation would be apportioned to the European Union. Appendix C Table B provides similar information for the full list of companies included in our analysis.

TABLE 2**Revenue Estimates from a Tax on the Increase in Market Capitalization – Details**

	Growth in Market Capitalization (billions EUR)	Share of Sales in the EU	Tax Revenue (billions EUR)		
			20%	33%	50%
Panel A: EU Firms					
TotalEnergies	12.7		2.5	4.2	6.4
EnBW Energie	4.9		1	1.6	2.5
ČEZ Group	4.1		0.8	1.3	2
Neste	2.6		0.5	0.9	1.3
Repsol	2.5		0.5	0.8	1.2
Others	12.6		2.5	4.2	6.3
Total	39.3		7.9	13	19.7
Panel B: Non-EU Firms					
Shell	51.6	45%	10.3	17	25.8
Exxon Mobil	11.5	10%	2.3	3.8	5.8
Equinor	9.8	22%	2	3.2	4.9
Saudi Aramco	9.8	6%	2	3.2	4.9
BP	5	30%	1	1.6	2.5
Others	68.6		13.7	22.7	34.3
Total	156.3		31.3	51.6	78.2

Note: Panel A displays the growth in market capitalization (in billion EUR) between January and September 2022, as well as the potential tax revenues (for 4 different potential tax rates) for the five EU companies with the largest growth in market capitalization. Row *Others* includes results for all other liable EU companies. Panel B displays the growth in market capitalization (in billion EUR) between January and September 2022, the share of sales they made in the EU, as well as the potential tax revenues (for 3 different potential tax rates) for the five non-EU companies with the largest growth in market capitalization. Row *Others* includes results for all other liable non-EU companies.

5 An Alternative Excess Profit Tax

Another option for taxing firms that benefited from the war and that would also be robust to tax avoidance would be a tax on worldwide excess profits (see, e.g., Neidle (2022)). The advantage of a tax based on worldwide profits is that firms cannot avoid it by shifting profits to low-tax countries.

We consider excess profits as defined in the European Commission proposal, that is any profits 20% above the average profits in the past four years. We consider 1,300 firms in the energy sector and retrieve their global profits from Compustat. We approximate the 2022 profits by multiplying the first semester profits by 2.⁸ For non-EU firms, worldwide profits are apportioned to the EU based on sales just as above. We estimate that such a tax, at a 33% rate, would raise approximately €75.1 billion (Table 3). Under this scenario, half of the revenue would stem from EU firms such as TotalEnergies, ENI SPA or Engie (Table 4).

If several countries were to implement a tax of this kind, priority could be given to sales countries. Headquarter countries would, as in the previous section, play the role of tax collectors of last resort.

TABLE 3

Revenues from a Tax on the Worldwide Excess Profits of Energy Firms

	Excess Profits (billions EUR)		Tax Revenue (billions EUR)		
	Gross	Apportioned to EU	20%	33%	50%
Non EU Firms	917.3	111.9	22.4	36.9	55.9
EU Firms	115.8	115.8	23.2	38.2	57.9
Total	1,033.1	227.7	45.5	75.1	113.9

Note: This table displays estimated 2022 annual excess profits (in billion EUR), and the revenue potential from taxing these excess profits. 2022 excess profits are estimated as 2 times the profits reported in the first semester of 2022, minus 1.2 times the average annual profits made in 2018, 2019, 2020, and 2021. *Gross* corresponds to worldwide excess profits, *Apportioned to EU* corresponds to this gross flow apportioned to the EU using our apportionment rule described in the text, 20%, 33%, and 50% correspond to the estimated tax revenue using either a 20%, 33%, or 50% tax rate.

⁸Firms typically published their first semester financial statements in July.

TABLE 4

Revenue Estimates from a Tax on Worldwide Excess Profits: Details

	Growth in Market Capitalization (billions EUR)	Share of Sales in the EU	Tax Revenue (billions EUR)		
			20%	33%	50%
Panel A: EU Firms					
TOTALENERGIES SE	25		5	8.3	12.5
ENI SPA	18.5		3.7	6.1	9.3
ENGIE SA	16.1		3.2	5.3	8.1
REPSOL SA	8.3		1.7	2.7	4.2
OMV AG	7.8		1.6	2.6	3.9
Others	40		8	13.2	20
Total	115.8		23.2	38.2	57.9
Panel B: Non-EU Firms					
SHELL PLC	53.2	45%	4.8	7.9	12
EQUINOR ASA	54.6	22%	2.4	4	6
PETROBRAS	42.9	20%	1.7	2.8	4.3
SAUDI ARAMCO	120.6	6%	1.4	2.3	3.4
EXXON MOBIL	49.2	10%	1	1.7	2.6
Others	596.8		11.1	18.2	27.6
Total	917.3		22.4	36.9	55.9

Note: Panel A reports estimated annual worldwide excess profits in 2022 (in billion EUR), as well as potential tax revenues (for 4 different potential tax rates) for the five EU companies with the largest estimated excess profits. Row *Others* includes results for all other liable EU companies. Panel B displays estimated 2022 excess profits (in billion EUR), the share of sales made in the EU, as well as the potential tax revenues (for 3 different potential tax rates) for the five non-EU companies with the largest excess profits. Row *Others* includes results for all other liable non-EU companies.

6 Conclusion

This note presents a proposal to tax the increase in the market capitalization of companies benefiting from exceptional circumstances, such as energy companies following the invasion of Ukraine in February 2022. All energy firms headquartered in the European Union or with sales in the EU would be liable if their market capitalization rose in 2022. With a rate of 33%, this tax could raise around 0.3% of EU GDP in revenue and easily be collected and administered. This scheme would allow to tax windfall profits from the war easily and efficiently by preventing firms to manipulate their profits to avoid taxation. Because both EU and non-EU firms would be subject to the tax (to the extent they have sales in the EU, i.e., benefit from the common market), the mechanism would ensure a level playing field between EU and non-EU firms. It is often in time of war that innovative tax instruments have been developed. The tax we propose in this note responds to the specific circumstances of the current crisis and the practical challenges of taxing multinational companies in a globalized world.

References

Avi-Yonah, Reuven S (2020). Taxes in the Time of Coronavirus: Is It Time to Revive the Excess Profits Tax? *University of Michigan Public Law Research Paper*, 671: 20–008.

Baunsgaard, Thomas, and Nate Vernon (2022). Taxing Windfall Profits in the Energy Sector. IMF Note No 2022/002. *International Monetary Fund*.

European Commission (2022). Proposal for a Council Regulation on an emergency intervention to address high energy prices. EC.

Hebous, Shafik, Dinar Prihardini, and Nate Vernon (2022). Excess Profit Taxes: Historical Perspective and Contemporary Relevance. IMF Working Paper WP/22/187. *International Monetary Fund*.

Neidle, Dan (2022). How to design a £30bn windfall tax on the energy sector. Tax Policy Associates. <https://www.taxpolicy.org.uk/2022/09/05/designingwindfalls/>.

Saez, Emmanuel, and Gabriel Zucman (2022). A Wealth Tax on Corporations' Stock. *Economic Policy*, 37(110): 213–227.

Tørsløv, Thomas, Ludvig Wier, and Gabriel Zucman (2022). The Missing Profits of Nations. *The Review of Economic Studies*. forthcoming.

Wier, Ludvig, and Gabriel Zucman (2022). Global Profit Shifting, 1975–2019. UC Berkeley Working Paper.

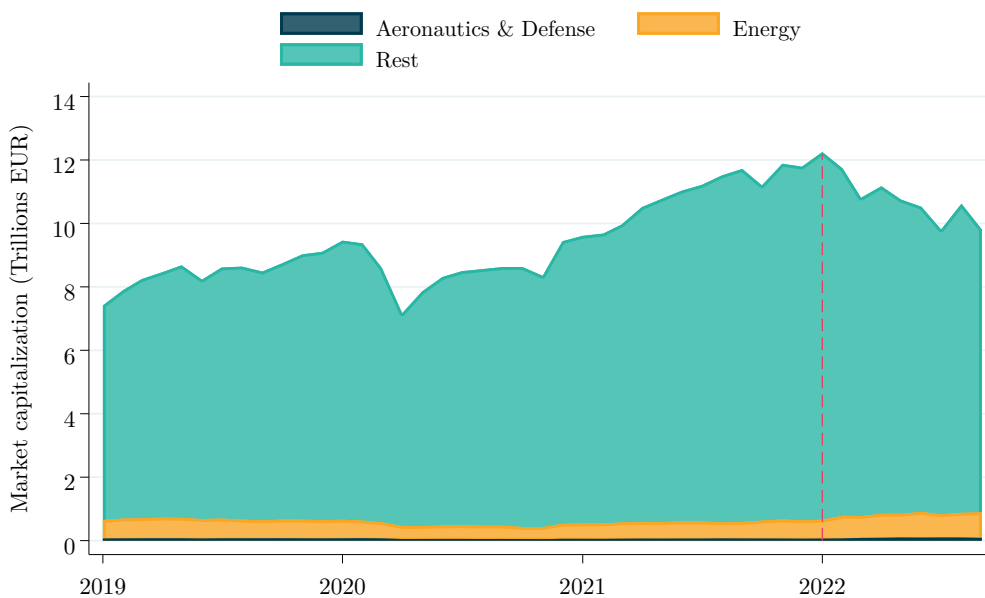
Appendix

A Defense Companies

Energy companies are not the only ones benefiting from the war situation. Armament and defense companies have also seen sharp increases in their stock prices since the beginning of the war, in a context of rising international military tension. One could consider extending the excess profit tax to this sector, i.e., to socialize some of the gains that currently accrue to the private shareholders of defense companies, as has typically been done in war contexts historically. Revenues could be used, e.g., to support the defense and reconstruction of Ukraine. The revenues from such a tax would be relatively modest, however, as EU defense companies have a much lower market capitalization than EU energy firms (see Figure A).

FIGURE A

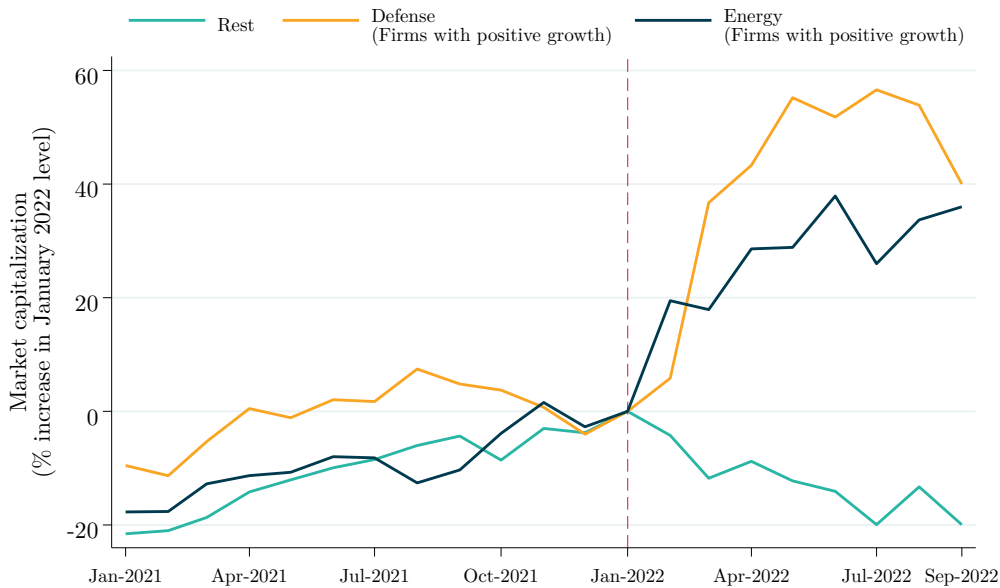
Evolution of Total Market Capitalization for Stoxx Europe 600 Firms per Sector



Note: This figure shows the monthly evolution of total market capitalization of the firms composing the Stoxx Europe 600 index, between January 2019 and September 2022, in absolute values. *Aeronautics & Defense* and *Energy* correspond to the evolution of firms in those sectors that grew positively between January 2022 and September 2022. *Rest* corresponds to all firms in all other sectors.

FIGURE B

Growth in Market Capitalization for Stoxx Europe 600 Firms per Sector in January 2022 Base – Energy and Defense



Note: This figure shows the monthly evolution of the total market capitalization of the firms composing the Stoxx Europe 600 index, between January 2021 and September 2022, expressed as percentage increase compared to January 1, 2022 level. *Energy (firms with positive growth)* includes only energy firms whose market capitalization rose in 2022. *Defense (firms with positive growth)* includes only defense firms whose market capitalization rose in 2022. Rest corresponds to all firms in all other sectors. Market capitalization for each firm is converted to euro using daily exchange rate (the vast majority of Stoxx 600 companies are listed in euros).

B Alternative Measure of Increase in Market Capitalization

Our benchmark results shown in Table 1 are sensitive to the specific beginning and ending date chosen to compute the growth in market capitalization. We therefore reproduce the exercise considering the increase of market capitalization between the mean capitalization in January and the mean capitalization in September. This allows to avoid capturing highs and lows of market capitalization. As of September 2022, the 289 energy companies included in our analysis had a total market capitalization of €8.1 trillion (including the increase in market capitalization during the whole month of September). Their capitalization had grown by €0.9 trillion since January 2022. The results are shown in Table A. We can see that with a 33% tax rate, this tax would allow to raise €51.2 billion, almost €15 billion less than our benchmark proposal.

TABLE A**Revenues from a Tax on the Increase in Market Capitalization of Energy Firms (Mean)**

	Market Capitalization Growth (billions EUR)		Tax Revenue (billions EUR)		
	Gross	Apportioned to EU	20%	33%	50%
Non EU Firms	1,039.1	130.9	26.2	43.2	65.4
EU Firms	24.3	24.3	4.9	8	12.2
Total	1,063.4	155.2	31	51.2	77.6

Note: This table displays the mean of January 2022 to mean of September 2022 market capitalization growth (in billion EUR) of EU and non-EU energy firms in our sample, and the revenue potential from taxing this increase in capitalization. Gross corresponds to the gross increase in market capitalization between the mean of January and mean of September 2022, *Apportioned to EU* corresponds to this gross increase apportioned to the EU using our apportion rule described in the text, 20%, 33%, and 50% correspond to the estimated tax revenue using either a 20%, 33%, or 50% tax rate.

C Supplementary Results

We provide below a list of the 289 energy companies we identified as being headquartered in the European Union or having sales in the European Union, and that experienced increases in their market valuation between January and September 2022. Table B provides the contribution of each firm based on the apportionment rule we defined in the text.

TABLE B**List of Energy Firms**

Firm	Country	Share sales in EU	Growth in Market Capitalization (billions EUR)
3R Petroleum	BRA	10%	0.09
Adani Green Energy	IND	10%	20.14
Adani Power	IND	10%	14.17
Adani Total Gas	IND	10%	24.93
Adani Transmission	IND	10%	28.99
Adaro Energy	IDN	10%	2.65
Advantage Energy	CAN	10%	0.47
AES	USA	10%	0.91
AGL Energy	AUS	10%	0.48
Aker BP	NOR	10%	10.5
Albioma	FRA		0.5
Allego	USA	10%	0.49
Alliant Energy	USA	10%	0.3
Alpha Metallurgical Resources	USA	10%	1.28
AltaGas	CAN	10%	0.36
Ameren	USA	10%	1.43
American Electric Power	USA	10%	7.14
Amplify Energy	USA	10%	0.13
Ampol	AUS	10%	0.54
Antero Midstream	USA	10%	0.03
Antero Resources	USA	10%	5.68
Apache Corporation	USA	10%	1.96
ARC Resources	CAN	10%	1.74
Archaea Energy	USA	10%	0.44
Array Technologies	USA	10%	0.97
ATCO	CAN	10%	0.32
Baker Hughes	USA	10%	2.76
Baytex Energy	CAN	10%	0.98
Beach Energy	AUS	10%	0.47
Berry Corporation	USA	10%	0
Birchcliff Energy	CAN	10%	0.93
Black Stone Minerals	USA	10%	0.89
Bloom Energy	USA	10%	1
Boralex	CAN	10%	1.05
Borr Drilling	USA	10%	0.55
BP	GBR	29.95%	16.56
Brigham Minerals	USA	10%	0.43
Brookfield Renewable	USA	10%	0.25
Brookfield Renewable Partners	USA	10%	0.32
Cameco	CAN	10%	2.13
Canadian Natural Resources	CAN	10%	10.87
Capital Power	CAN	10%	0.99
Cemig	BRA	10%	0.54

Firm	Country	Share sales in EU	Growth in Market Capitalization (billions EUR)
Cenovus Energy	CAN	10%	9.61
CenterPoint Energy	USA	10%	2.46
Centrais Electricas Brasileiras	USA	10%	9.63
Centrica	GBR	10%	0.21
ČEZ Group	DEU		4.06
Chandra Asri Petrochemical	IDN	10%	2.79
Cheniere Energy	USA	10%	11.8
Chennai Petroleum	IND	10%	0.32
Chevron	USA	2%	66.84
China Coal Energy Company Limited	CHN	10%	1.53
China Shenhua Energy	CHN	10%	19.46
Chord Energy	USA	10%	2.72
Chubu Electric Power	JPN	10%	1.15
Civitas Resources	USA	10%	1.01
CMS Energy	USA	10%	0.91
CNOOC	HKG	10%	12.79
Coal India	IND	10%	5.53
Colbún	CHL	10%	0.41
Comstock Resources	USA	10%	2.17
ConocoPhillips	USA	13.1%	35.49
CONSOL Energy	USA	10%	1.44
Consolidated Edison	USA	10%	4.61
Constellation Energy	USA	10%	9.59
Continental Resources	USA	10%	7.1
ContourGlobal	GBR	10%	0.48
Cosan	USA	10%	0.04
Coterra Energy	USA	10%	7.29
CPFL Energia	BRA	10%	1.88
Crescent Point Energy	CAN	10%	0.84
Crestwood EQUITY Partners	USA	10%	0.97
CrossAmerica Partners	USA	10%	0.04
DAQO New Energy	USA	10%	1.79
DCP Midstream	USA	10%	1.89
Delek Group	ISR	10%	0
Delek Logistics Partners	USA	10%	0.7
Delek US	USA	10%	0.61
Denbury	USA	10%	0.23
Devon Energy	USA	10%	12.35
Diamondback Energy	USA	10%	2.6
Diversified Energy	GBR	10%	0.17
Dominion Energy	USA	10%	4.57
Doosan Enerbility	KOR	10%	1
Dorchester Minerals	USA	10%	0.26
DT Midstream	USA	10%	0.55
DTE Energy	USA	10%	2.35
Duke Energy	USA	10%	3.34

Firm	Country	Share sales in EU	Growth in Market Capitalization (billions EUR)
Earthstone Energy	USA	10%	0.84
EDP Renováveis	PRT		1.92
Enbridge	USA	10%	3.19
EnBW Energie	DEU		4.92
Encavis	DEU		0.82
Enel Chile	CHL	10%	0.08
ENEOS Holdings	JPN	10%	2.01
Energix Renewable Energies	ISR	10%	0.46
Energy Transfer Partners	USA	10%	8.4
Energy Vault	USA	10%	0.4
Enerplus	CAN	10%	0.82
Eneti	USA	10%	0.03
ENGIE Brasil	BRA	10%	0.38
EnLink Midstream	USA	10%	1.23
Entergy	USA	10%	1.27
Enterprise Products	USA	10%	6.84
Enviva	USA	10%	0.06
EOG Resources	USA	10%	14.55
Equatorial Energia	BRA	10%	0.89
Equinor	NOR	21.93%	44.72
ERG	ITA		0.44
Evergy	USA	10%	0.48
Eversource Energy	USA	10%	0.71
Excelerate Energy	USA	10%	0.01
Exterran	USA	10%	0.05
Exxaro Resources	ZAF	10%	1.18
Exxon Mobil	USA	10.5%	109.55
FirstEnergy	USA	10%	0.45
Fluence Energy	USA	10%	0.16
Forum Energy Technologies	USA	10%	0.05
GAIL	IND	10%	0.17
Galp Energia	PRT		1.6
GasLog Partners	USA	10%	0.06
Gaztransport & Technigaz SA	FRA		1.37
Genesis Energy	NZL	10%	0.07
Genie Energy	USA	10%	0.09
Gibson Energy	CAN	10%	0.14
Glencore	GBR	10%	7.72
Global Partners LP	USA	10%	0.12
Golar LNG	USA	10%	1.22
Gran Tierra Energy	CAN	10%	0.18
Gulf Island Fabrication	USA	10%	0
Hallador Energy Company	USA	10%	0.11
Halliburton	USA	10%	4.28
Hanwha Solutions	KOR	10%	2.32
Harbour Energy	GBR	10%	0.91

Firm	Country	Share sales in EU	Growth in Market Capitalization (billions EUR)
Helix Energy Solutions	USA	10%	0.11
Helmerich & Payne	USA	10%	1.42
Hess	USA	10%	11
Hess Midstream	USA	10%	0.28
HF Sinclair	USA	10%	5
HighPeak Energy	USA	10%	1
Houston American Energy	USA	10%	0.02
Hydro One	CAN	10%	1.11
Iberdrola	ESP		0.34
Idemitsu Kosan	JPN	10%	1.23
Imperial Oil	CAN	10%	5.16
Indonesia Energy	USA	10%	0.04
Innergex Renewable Energy	CAN	10%	0.36
Inox Wind	IND	10%	0.1
Inpex	JPN	10%	5.39
Jastrzebska Spółka Weglowa	POL		0.23
Jinko Solar	CHN	10%	9.73
JSW Energy	IND	10%	1.07
Kalpataru Power Transmission	IND	10%	0.05
KEPCO	JPN	10%	1.71
Keyera	CAN	10%	0.37
Kimbell Royalty Partners	USA	10%	0.25
Kinder Morgan	USA	10%	3.46
Kinetik	USA	10%	1.09
KLX Energy Services	USA	10%	0.04
Korea Gas	KOR	10%	0.26
Kosmos Energy	USA	10%	1.15
Laredo Petroleum	USA	10%	0.06
Liberty Energy	USA	10%	0.59
Magellan Midstream Partners	USA	10%	0.58
Magnolia Oil & Gas	USA	10%	0.58
Marathon Oil	USA	10%	3.36
Marathon Petroleum	USA	10%	7.02
Martin Midstream Partners	USA	10%	0.04
Matador Resources	USA	10%	1.99
Maxon Solar Technologies	USA	10%	0.17
MEG Energy	CAN	10%	1.08
MOL Group	HUN		0.29
Montauk Renewables	USA	10%	0.8
MPLX	USA	10%	2.02
Murphy Oil	USA	10%	1.46
Nabors Industries	USA	10%	0.37
National Grid	GBR	10%	0.42
Neoen	FRA		0.35
Neste	FIN		2.61
New Fortress Energy	USA	10%	5.4

Firm	Country	Share sales in EU	Growth in Market Capitalization (billions EUR)
NextDecade Corp	USA	10%	0.45
NexTier Oilfield	USA	10%	1.12
Nine Energy Service	USA	10%	0.06
NiSource	USA	10%	1.13
NLC India	IND	10%	0.23
Noble Corporation	USA	10%	0.26
Northern Oil and Gas	USA	10%	0.64
NOV	USA	10%	0.97
NOW Inc.	USA	10%	0.29
NuScale Power	USA	10%	0.29
NuVista Energy	CAN	10%	0.51
Obsidian Energy	CAN	10%	0.31
Occidental Petroleum	USA	2%	31.11
OPC Energy	ISR	10%	0.41
Origin Energy	AUS	10%	0.74
Ormat Technologies	USA	10%	0.76
Orrön Energy	SWE		0.33
Otter Tail	USA	10%	0.25
Ovintiv	USA	10%	3.41
Pacific Gas and Electric	USA	10%	0.6
Pampa Energía	USA	10%	0.21
Par Pacific Holdings	USA	10%	0.07
Paramount Resources	CAN	10%	0.5
PBF Energy	USA	10%	1.94
PBF Logistics	USA	10%	0.35
PDC Energy/PDCE	USA	10%	0.47
Pembina Pipeline	CAN	10%	2.31
Petro Rio	BRA	10%	1.02
PetroChina	CHN	10%	9.58
Petronet LNG	IND	10%	0.01
PGE Polska	POL		0.11
Phillips 66	USA	10%	7.48
Pioneer Natural Resources	USA	10%	12.12
PKN Orlen	POL		0.8
Plains All American Pipeline	USA	10%	1
Plains GP	USA	10%	0.24
Polenergia	POL		0.54
PrairieSky Royalty	CAN	10%	0.62
ProFrac	USA	10%	0.15
PTT Exploration and Production	THA	10%	4.95
Range Resources	USA	10%	3.26
Ranger Energy Services	USA	10%	0.04
Ranger Oil	USA	10%	0.12
Reliance Infrastructure	IND	10%	0.29
Reliance Power	IND	10%	0.16
Repsol	ESP		2.45

Firm	Country	Share sales in EU	Growth in Market Capitalization (billions EUR)
RGC Resources	USA	10%	0.01
Riley Permian	USA	10%	0.05
Ring Energy	USA	10%	0.05
Romgaz	ROU		0.39
RPC	USA	10%	0.47
RWE	DEU		1.76
S-OIL	KOR	10%	1.11
SandRidge Energy	USA	10%	0.29
Santos	AUS	10%	2.1
Sasol	ZAF	10%	0.62
Saudi Aramco	SAU	5.7%	171.99
Schlumberger	USA	10%	6.84
Sempra Energy	USA	10%	9.55
Shell	GBR	45.12%	114.41
Shoals Technologies	USA	10%	0.36
SilverBow Resources	USA	10%	0.41
Sitio Royalties	USA	10%	0.07
SM Energy	USA	10%	1.19
SolarEdge	USA	10%	0.13
Solaria Energía	ESP		0.45
Southern Company	USA	10%	10.26
Southwestern Energy	USA	10%	2.95
Sprague Resources LP	USA	10%	0.14
Stabilis Solutions	USA	10%	0.02
Suburban Propane Partners	USA	10%	0.08
Suncor Energy	USA	10%	4.55
Talos Energy	USA	10%	0.71
Tamarack Valley Energy	CAN	10%	0.07
Targa Resources	USA	10%	2.81
Tata Power	IND	10%	0.53
TC Energy	CAN	10%	3.6
TechnipFMC	GBR	10%	0.01
Tellurian	USA	10%	0.5
Thai Oil	THA	10%	0.49
Toho Gas	JPN	10%	0.03
Tōkyō Gas	JPN	10%	1.51
Topaz Energy	CAN	10%	0.17
TotalEnergies	FRA		12.71
Tourmaline Oil	CAN	10%	8.39
Tsakos Energy Navigation	DEU		0.27
U.S. Well Services	USA	10%	0.01
United Tractors	IDN	10%	2.66
Unitil Corporation	USA	10%	0.11
Uranium Energy	USA	10%	0.38
Vaalco Energy	USA	10%	0.07
Valero Energy	USA	10%	10.8

Firm	Country	Share sales in EU	Growth in Market Capitalization (billions EUR)
Vector Limited	NZL	10%	0.36
Vermilion Energy	CAN	10%	2.07
Vertex Energy	USA	10%	0.26
Vista Oil & Gas	MEX	10%	0.34
Viva Energy	AUS	10%	0.56
Voltalia	FRA		0.07
Voltamp Transformers	IND	10%	0.1
W&T Offshore	USA	10%	0.33
Whitecap Resources	CAN	10%	0.57
Whitehaven Coal Limited	AUS	10%	3.35
Williams Companies	USA	10%	7.82
Woodside Energy	AUS	10%	26.12
Worley	AUS	10%	1.01
Yancoal	AUS	10%	2.79
YPF	USA	10%	0.56
Zion Oil & Gas	USA	10%	0.02

Note: This table lists the 289 energy companies we identified as being headquartered in the European Union or having sales in the European Union, and that experienced increases in their market valuation between January and September 2022. The first column indicates the headquarter country. The second column notes the observed or assumed fraction of sales made in the EU by firms with headquarters outside of the EU. For 11 non-EU companies (BP, Chevron, ConocoPhillips, Ecopetrol, Equinor, Exxon Mobil, Occidental Petroleum, Petrobras, Saudi Aramco, Shell, and SSE), this fraction is observed in either country-by-country reports or public financial statements; for the other firms we assume this fraction is equal to 10%. The last column notes the growth in market capitalization between January and September, converted to euros using September exchange rates.