International Oil Extraction Levy

Design recommendations and impact analysis

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The work presented here constitutes an independent study undertaken by the authors. The views, interpretations, conclusions, and recommendations expressed in this report are solely those of the authors. They do not necessarily reflect the official positions, policies, or opinions of the Global Solidarity Levies Task Force, its secretariat, its members, its observers or its affiliated institutions and partner organizations.

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Global Solidarity Levies Task Force

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Abbreviations

BIT	Bilateral Investment Treaty
CAT	Climate Action Tracker
CPIC	Carbon Pricing Incidence Calculator
ECF	European Climate Foundation
EIA	Energy Information Administration
GDP	Gross Domestic Product
IEA	International Energy Agency
IISD	International Institute for Sustainable Development
ISDS	Investor–State Dispute Settlement
NZE	Net Zero Emissions Scenario (IEA)
OECD	Organisation for Economic Co-operation and Development
STEPS	Stated Policies Scenario (IEA)
tCO_2	Tons of Carbon Dioxide

1 Introduction

The **urgency of securing additional finance to address the environmental and climate crisis** has become increasingly evident. Substantial funding is needed to support global climate mitigation and adaptation efforts—enabling countries not only to meet their commitments under the Paris Agreement, but also to address loss and damage and advance sustainable development. (Bhattacharya et al., 2024; Watkiss et al., 2023; World Bank Group, 2023). At the same time, major gaps in development finance continue to hinder progress towards the Sustainable Development Goals, particularly in developing countries (United Nations, 2024). Climate finance remains a central topic in international negotiations, with growing recognition that more substantial funding is needed.

In response to this challenge, the Global Solidarity Levies Task Force was launched at COP28 in November 2023 to explore new and innovative revenue streams for climate and development finance. The task force is particularly focused on **international taxation mechanisms** that can generate additional funding for sustainable development and climate action. Against this backdrop, **this report examines the impacts of an international oil extraction levy as a potential financing instrument**.

The assessed levy places a price on the embedded CO_2 in extracted crude oil, increasing production costs and likely raising end-consumer oil prices. Rooted in the polluter pays principle, the levy internalizes part of the external costs of fossil carbon emissions. Unlike most existing carbon pricing mechanisms which are applied downstream to emissions**, this levy is applied upstream** and targets the point of extraction. It would oblige crude oil producers to pay, thus encompassing both fuel-related and non-energetic uses, such as petrochemical production.

This report assesses the **revenue-generation potential** of an international oil extraction levy across different implementation scenarios, including variations in rate, country participation, and production volumes. Additionally, it **analyzes distributive effects on a macroeconomic level**, including potential cross-border spillover effects. Furthermore, it examines the **implications for consumer prices and distributive effects on a household level** in a set of representative countries reflecting different income levels and development stages. Lastly, the report considers the design of an **alternative consumption-based** levy on oil, outlining key distinctions between this and the extraction-based approach.

There have been limited studies exploring the potential impacts of an extraction tax for fossil fuels. The most prominent study is the 'Climate Damages Tax' study by Sharma & Hillman (2024), which assesses the revenue generation potential of an extraction tax on oil, coal, and gas, applied to OECD countries. They find that a tax of $5 per ton of CO_2 increasing by $5 per ton each year, would raise $900 billion from 2024 until 2030. From this, $720 billion (80%) contributes to an international fund for compensating loss and damages from climate change, while the remaining $180 billion (20%) stays with the OECD countries as a domestic dividend to help them transition their economies. The study also estimates that if this tax was scaled up to the global level, it would raise $3.5 trillion. To test the feasibility of this proposal, they identified several countries that already require companies to make volume-based extraction payments. This shows that a volume-based extraction levy is feasible, and that there are already extensive uses of volume-based extraction levies.

Measures to reduce greenhouse gas emissions in most cases aim to reduce the consumption of fossil fuels, for instance by incentivizing switching to clean energy technologies. However, the production side of fossil fuel use is increasingly recognized, and some authors have emphasized the potential for supply-side climate policies (Lazarus & Van Asselt, 2018; P. Newell & Daley, 2024; Piggot et al., 2020). Although the oil extraction levy discussed in this study is primarily intended as a revenue-raising policy, it would also have significant implications for oil production and use—aligning closely with supply-side climate policy efforts.

To assess the impacts of levies applied to oil production, it is essential to understand global oil market dynamics. We build on existing estimates of price elasticities of oil supply and demand (i.e. how production and consumption of oil responds to changing world market prices) to model how the market equilibrium would be affected by a levy on oil extraction under different scenarios. The academic literature on oil price scenarios generates a large range of estimates, depending on the method used and the time horizon under study. A critical review of this literature suggests that both supply and demand are relatively inelastic – that is, quantities respond only slightly to changes in global market prices (Kilian, 2022). In this paper, we rely on recent estimates of elasticities derived from a structural model of the oil industry, which is based on production data from individual oil fields embedded in a general equilibrium model of the world economy (Bornstein et al., 2023). In the next section, we assess the revenues that could be generated by a levy on oil extraction implemented in certain countries. We also analyze the distributional consequences of changing world market prices for oil on the level of countries and consider distributional implications on the household level for selected countries.

In terms of scope and structure, the document begins with this **Introduction** and short background on existing research and theoretical foundations. **Section 2** outlines the key scenarios and assumptions used for the impact analysis. The quantitative results are provided and discussed in **Section 3**, including estimates of the revenue generation potential of the levy, as well as assessing distributional effects at both the macroeconomic and household levels, including consumer price implications. **Section 4** discusses **Political Feasibility**, considering economic, social, and strategic factors influencing the implementation of different levy options. In this section, we also assess possible designs and key differences of implementing a consumption-based levy as an alternative. Finally, **Section 5** presents **Conclusions and Design Recommendations**, summarizing key findings and offering policy guidance for an effective and equitable levy framework.

2 Scenarios and assumptions

We analyze the effects of a levy on the extraction of crude oil. The levy rate is applied as a carbon price on the embedded CO_2 within extracted crude oil, increasing over time. The tax is applied based on the location of extraction and legal incidence of oil extracting companies. We assume that the levy is introduced in 2027, and we assess the impacts also in 2030 and 2035. For all scenarios we assume that the levy rate rises in equal increments, until they reach a levy rate cap of $100 per ton of CO_2[1]. Changes in future extraction levels are based on IEA scenarios outlined in its World Energy Outlook 2024 (p.137), particularly its stated policies (STEPS) and net zero emission (NZE) scenarios.

[1] This rate is associated with pathways capable of limiting global temperatures to below 2 degrees above pre-industrial times (World Bank, 2017). Moreover, this rate applied at the global level represents a realistic maximum contribution.

Which oil producers might participate in an oil extraction levy highly depends on the respective governments and leadership in each country. To get a sense of the range of possibilities, we suggest three scenarios for participation based on World Bank income classifications and Climate Action Tracker scores of climate ambition. Our analysis covers the top 31 oil producers (who represent 96% of global production). Figure 1 provides an overview of the key scenario choices involved.

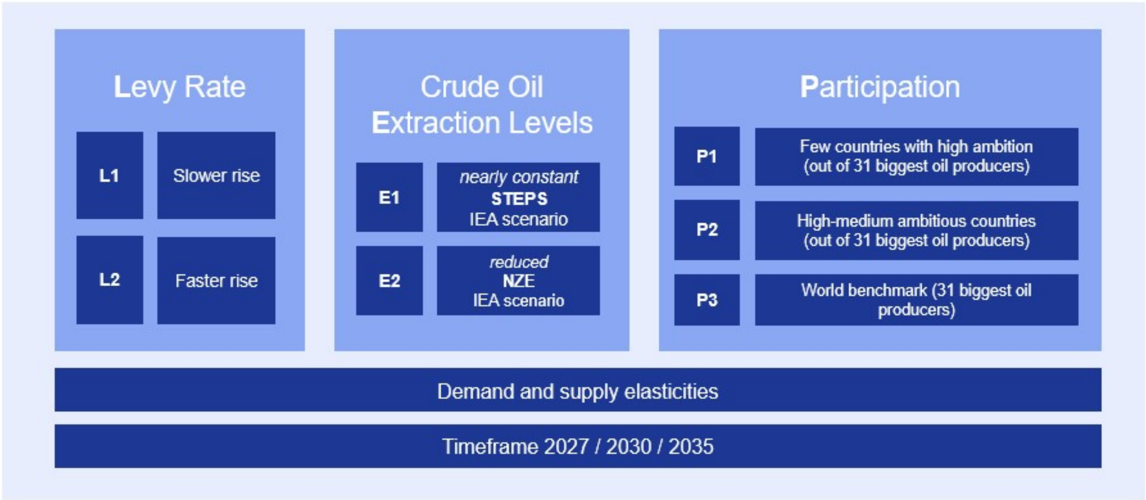


Figure 1 Graphic overview of scenario options and underlying assumptions

While 12 different scenarios based on different combinations of levy rates, oil extraction and participation are possible, many of them are either unrealistic or somewhat inconsistent (e.g. high levy by all and constant oil supply). We assess three key scenarios:

1. **A benchmark scenario** (S1: L1.E1.P3) with universal participation, low rates and nearly constant extraction: Serves as a global **baseline reference** featuring a moderate levy, in which crude oil extraction follows **current policy trends** with only limited reductions in extraction volumes. This scenario helps quantify the additional impact of climate policies.

   - **Levy rate**: L1: starting with a $5 levy per embedded ton of carbon in 2027, $5 annual increase. Based on the emissions factor of crude oil, this translates into a per barrel levy starting at $2.15, increasing by $2.15 annually.
   - **Extraction levels**: E1: STEPS (conservative, nearly constant extraction levels).
   - **Participation**: P3: All of the top 31 largest oil producers apply the levy, to demonstrate the potential of the instrument.

2. **A 'realistic' scenario** (S2: L1.E1.P1) in which only countries with high ambition participate with relatively low levies and near constant extraction. A limited but feasible starting point, where only a few frontrunner nations implement a moderate levy. Oil extraction remains relatively stable, allowing for phased policy introduction. This represents our central scenario, while the others provide sensitivity checks for varying ambition outcomes.

- **Levy rate**: L1: starting with a $5 levy per embedded ton of carbon in 2027, $5 annual increase. This translates into a per barrel levy starting at $2.15, increasing by $2.15 annually.
- **Extraction levels**: E1: STEPS (conservative, nearly constant extraction levels).
- **Participation**: P1: Countries classified by the World Bank as high-income countries AND insufficient or better score in the Climate Action Tracker (CAT)[2]. This covers 6 countries: Australia, Canada, EU[3], Norway, United Kingdom, and the United Arab Emirates.

3. **An 'ambitious' scenario** (S3: L2.E2.P2) in which countries with medium and high ambition participate with relatively high levies and rapidly decreasing extraction volumes. This scenario represents a **more ambitious outcome for climate action**, with **a high levy rate** applied to high- and medium- ambition countries, and oil production falling rapidly in alignment with a **Net Zero pathway**. This scenario maximizes emissions reductions and transition financing.

    - **Levy rate**: L2: starting with a $10 levy per embedded ton of carbon in 2027, $10 annual increase. This translates into a per barrel levy starting at $4.30, increasing by $4.30 annually.
    - **Extraction levels**: E2: NZE (Net Zero Emission, strong decrease towards 2050).
    - **Participation**: P2: Countries classified by the World Bank as high- and upper-middle income countries AND highly insufficient or better score in the CAT. This covers 11 countries: Australia, *Brazil*, Canada, *China*, *Colombia*, EU, *Kazakhstan*, Norway, United Kingdom, *United States* and the United Arab Emirates.

3 Results and Discussion

3.1 Revenue generation potential

An international oil extraction levy could raise around $85 billion in levy revenues annually by 2035, under our 'realistic' scenario (S2), which is characterized by limited participation (only six high-income countries with relatively high climate ambition), near-constant extraction volumes over time and a low carbon price. Levy revenues could be expected to increase from $9bn in 2027 to $85bn in 2035, rising over time to reflect relatively constant future extraction volumes and a carbon price rising in $5/t$CO_2$ annual increments from 2027. Revenues would rise even higher if additional countries were to participate in the levy, or if the carbon price rose in steeper increments. By 2030, for example, levy revenues of $40-264 billion are possible under these three scenarios. By 2035, levy revenue potential ranges from $85-571bn in our three scenarios.

For the most part, levy revenues increase over time as the carbon price applied under the levy increases. For the baseline scenario (S1), including all major oil producers, revenues rise from

[2] For the purposes of this exercise, a CAT 'insufficient' rating is considered relatively strong, especially relative to lower ratings such as 'highly insufficient' or 'critically insufficient' (CAT, 2025).
[3] The EU is not classified according to the World Bank income categories; however, we assume it to be high-income.

\$60bn in 2027 when the levy is implemented (with a carbon price of \$5/tCO_2) to \$571bn in 2035 (with a carbon price of \$45/tCO_2). In our 'ambitious' scenario with steeper carbon price increases, S3, levy revenues are estimated to increase from \$54bn in 2027 to \$230bn in 2035. If the scenarios were to be extended from 2035 towards 2050, it could be expected that levy revenues start to decline under the ambitious scenario, as global oil production decreases in the NZE scenario.

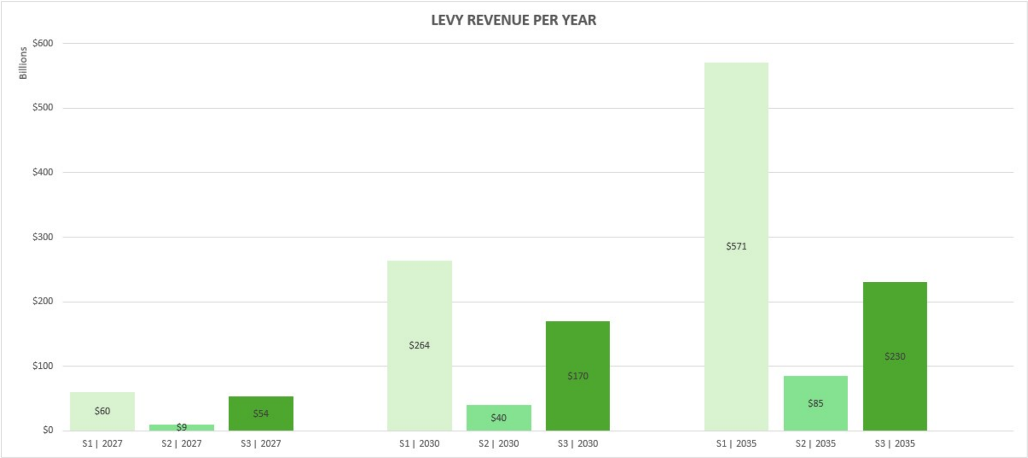


Figure 2 Levy revenue per year for all scenarios and yearsFigure 3

Figure 3 demonstrates how this levy revenue is broken down by income groups. In the 'realistic' scenario (S2), only high-income countries participate and therefore levy revenues are raised only from these countries. In the ambitious scenario (S3), the additional countries that participate (with relatively high climate ambition) are either high-income in the case of the US, or in the upper-middle income category (Brazil, China, Colombia and Kazakhstan)—these upper-middle income countries account for approximately one quarter (26%) of the revenue raised. The benchmark scenario includes contributions of 31% from upper-middle income countries and 13% from lower-middle income countries that are major oil producers.

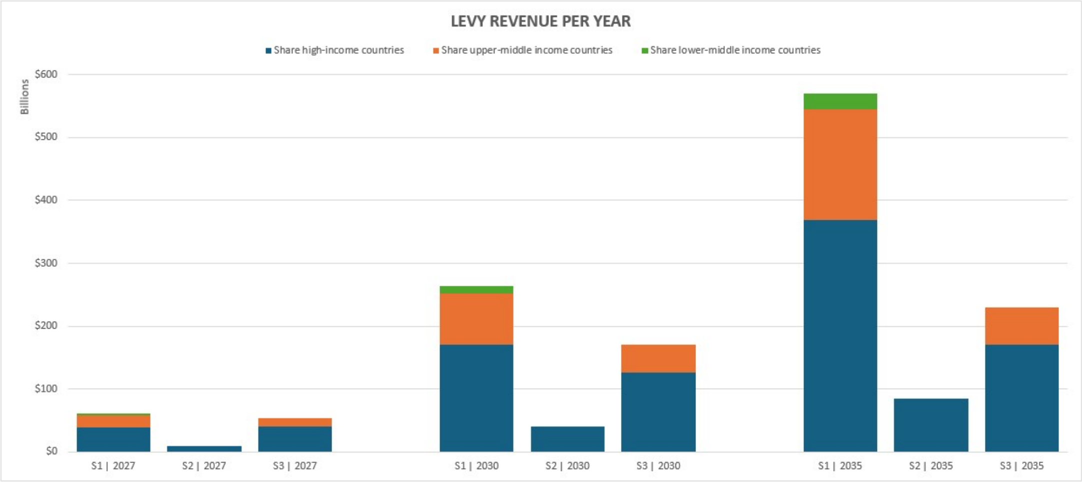


Figure 3 Levy revenue per year for all scenarios and years, broken down by income groups

An international oil extraction levy could be expected under these three scenarios to reduce global oil production by approximately 0.5-6% by 2035 relative to the expected levels with no levy. At the lower end of the spectrum, the realistic scenario is expected to reduce global oil production by merely 0.5%. This is due to a combination of factors including a low elasticity of supply (price changes have a small impact on production levels), but also due to the lower carbon price trajectory being applied (reaching only $45/tCO_2$) and low global emissions coverage of the six participating countries (15%). At the upper end, a 6% reduction is projected. Achieving larger reductions beyond this level would require a substantially steeper carbon price trajectory to exert stronger downward pressure on oil production. Hence, while the oil extraction levy holds significant financial potential for raising climate finance, it is only a partial solution to reducing fossil fuel emissions that must be combined with other national and international climate policies.

Box: Effects with or without the United States

We decided not to include the US in our realistic scenario, despite it being a high-income country assessed with a relatively high CAT climate ambition score akin to other countries selected for this scenario (Australia, Canada, EU, United Kingdom, and UAE). This exclusion reflects the political reality that, under a Trump presidency lasting until 2029, US participation in an international oil extraction levy starting in 2027 appears unlikely. Excluding the US has profound implications for the revenue generation potential of the levy. Since the US is the world's largest oil producer, its production is roughly equivalent to the combined production of the other six countries included in this scenario. Hence, if we were to include the US in the central scenario (S2), levy revenues would be expected to increase by 53-55%, equivalent to $184bn per year by 2035. In the more ambitious scenarios, where more countries are assumed to participate (including the US), the impacts of a US withdrawal diminishes: revenues would be about 31% lower by 2035 in the ambitious scenario (S3) and 10% lower in the benchmark scenario (S1).

Potential domestic dividend design

The previous discussion has shown levy revenues for different scenarios of participating countries, the levy rate and future oil demand. Some part of these revenues could be used in the form of international climate finance, and some of it could be spent in the countries where the levy is applied. Keeping some of the revenues within the country can help ease political resistance against on oil levy, as it creates interest groups in favor of the policy. For low- and middle-income countries, a ''domestic dividend'' that remains within the country generating the revenues also might also be justified from a fairness perspective.

Based on our analysis of revenues by country, it is possible to clearly distinguish the allocation of funds between domestic climate action and international contributions. The figure below illustrates this division, assuming that low-income countries retain 100% of the levy revenues as a domestic dividend, middle- and upper-middle-income countries retain 75%, and industrialized countries 50%. This approach aligns Sharma & Hillman (2024), who recommended the use of domestic dividends in their climate damages tax proposal. Domestic dividends can enhance the political acceptability of such policies by directing revenues toward compensating low-income households for the financial impact of the levy, or by supporting investments in the energy transition, environmental monitoring, and research and innovation.

For S1, the scenario in which the levy is applied by the 31 largest oil producers, about 60% of revenues accrue as domestic dividend and 40% be channeled to other countries. For instance, in this scenario, the domestic dividend in 2030 amounts to $158bn and the international share to $106bn. For S2, which only includes high-income countries, the division between domestic and international revenue use is obviously half-half for all scenarios, i.e. the domestic as well as the international revenues in 2030 are $20bn. Finally, in the S3 scenario with increased ambition, the domestic share is 56% and the international share 44%, with the former amounting to $96bn and the latter to $74bn in 2030.

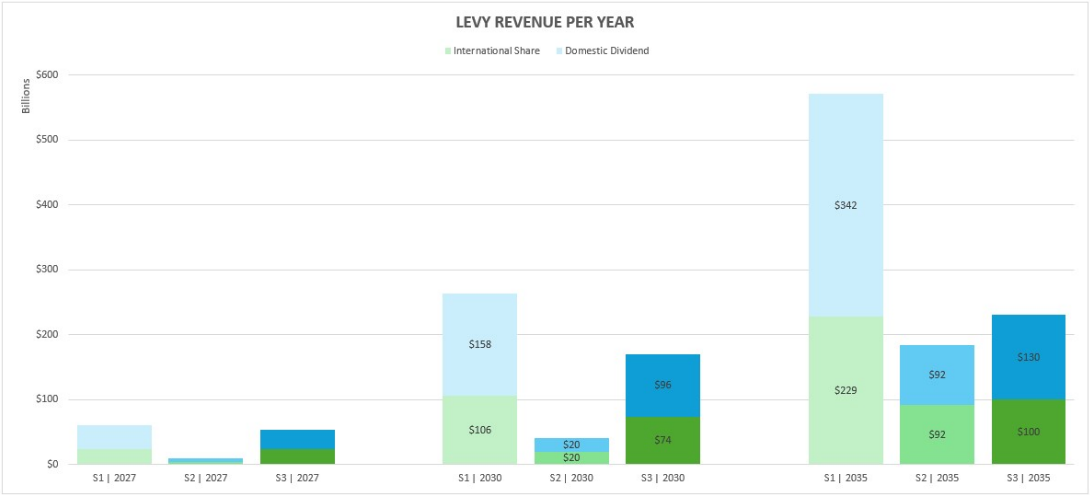


Figure 4 Levy revenues including a domestic dividend, where the revenues are returned to the country implementing the levy, 50% for high-income countries, 75% for upper-middle income countries, and all revenue is returned to lower-middle or low-income countries.

Box 2: Revenue Recycling in Brazil

Oil royalties in Brazil serve as financial compensation paid by companies extracting oil and natural gas, ensuring that society benefits from the exploitation of these **exhaustible** resources. These royalties are calculated based on **three factors**: **the royalty rate** (ranging from 5% to 15%), **the monthly production volume**, and the **reference price of hydrocarbons**. Companies pay these amounts monthly to the government, who then distributes the funds across different levels of administration. The existence of oil royalties in Brazil demonstrates that a built-in, institutionalized framework is already in place to monitor and tax hydrocarbon extraction—enabling the transformation of natural resource wealth into strategic social investments.

The revenue from oil royalties is **allocated to the federal government, states, and municipalities.** At the national level, the funds are directed toward strategic programs such as the **Social Fund** (focused on education and health), **research and innovation initiatives** by the Ministry of Science, Technology, and Innovation, **maritime defense** managed by the Navy, and **environmental monitoring** by agencies like the Brazilian National Agency for Petroleum, Natural Gas and Biofuels (ANP) and the Brazilian Institute of Environment and Renewable Natural Resources (IBAMA) (Chan & Karim, 2023; Rodrigues & Araujo, 2023). For states and municipalities, the allocation depends on their role in oil production, with producing regions receiving a larger share. Since 2012, legislation has expanded the distribution to include all states and municipalities, even those without direct oil production. A constitutional amendment mandates that **at least 75% of these resources fund education and 25% support healthcare services** (Trojbicz & Segatto, 2020).

In addition to monthly royalties, Brazil also collects **Special Participations**, which are extraordinary quarterly payments levied on highly productive or profitable oil and gas fields. These funds are distributed among key institutions: 40% to the Ministry of Mines and Energy for **energy infrastructure development**, 10% to the Ministry of the Environment for **environmental oversight**, and 20% to oil-producing states and municipalities for **local investments in infrastructure and public services** (Frankenfeld, 2013).

Overall, **oil revenues play a vital role in financing Brazil's strategic agendas**, particularly in education and healthcare. In **developing countries facing fiscal challenges and high social demands**, these resources provide essential public investments, strengthening social infrastructure, reducing inequality, and promoting sustainable development. In terms of magnitude, according to official ANP data, **Brazil collected BRL 100 ($18) billion from oil royalties and special participations in 2024**, an all-time record.

3.2 Distributional effects: Macroeconomic level

The changes in the crude oil revenues per country provides insight into the macroeconomic effects, including where revenue and production shifts occur. As demand and supply are not very responsive to price changes, oil production is not affected by much due to the introduction of the levy. For example, the demand elasticity of –0.15 that we use for our estimates means that a 10% increase of the oil price (i.e. about $6.5 per barrel at the current oil price) will lower production by 1.5%. Hence, even if all major oil producers were to participate in the levy, significant reductions in production and consumption would only occur at high carbon prices. With more limited participation, such as in our realistic or ambitious scenarios, even carbon prices of $100 per ton of CO_2 would have only a relatively small influence on global oil production and use. For this reason, changes in revenues are mostly determined by changing oil prices and, for participating countries, the levies paid. As the levy results in some reductions in global oil production, it will raise the world market price of oil, thus generating windfall profits for non-participating countries.

We assess the changes in production quantities and oil profits for participating and non-participating countries for our central realistic scenario (S2) in 2035, where there is a levy of $45 per ton of CO_2 in embedded oil. In this scenario, global oil production declines by 0.5%, because production decreases by 6% for the countries that participate in the levy, while production conversely increases for non-participating countries. As a result of these changes, and the oil market price increase from $79 to $81 per barrel due to the levy, oil production revenues for participating countries decrease by 26%, while they increase for all other countries that do not participate by 3%. The revenue gains from the extraction levy are largest in the countries that produce the most oil.

We find that the profits of participating countries decrease by 37% in 2035 in the realistic scenario. For non-participating countries, they received increased profits of 4% compared to the case in which no levy is implemented. The windfall profits on offer for non-participants, up to $12bn for the US and $9bn for Russia and Saudi Arabia, are of significant concern for the political feasibility of this mechanism.

It is a limitation of our study that we had to use the average cost of extraction for all countries, as profits are largely determined by these costs, which vary across regions. For countries that participate in the levy, it might not be economical to produce at the most expensive sites, whereas for countries that do not participate, it might be worthwhile exploiting oil fields that were hitherto economically unattractive. Hence, average extraction costs are affected by the extraction levy. However, since the levy is unlikely to significantly impact oil production and use, any error resulting from this assumption is expected to be small.

3.3 Distributional effects: Household level

An oil extraction levy would raise the world market price of oil. This would have implications for the distribution of incomes on households. The distributional impacts on households are estimated for selected countries by deploying the *Carbon Pricing Incidence Calculator* (CPIC - MCC Berlin), which allows assessment of the distributional effects of carbon pricing. For this exercise, we assume that the increase in crude oil prices is fully passed on to final consumers. This enables us to translate the rise in crude oil prices into an equivalent increase in the carbon price and, in turn, assess household-level impacts using the CPIC tool.

Distributional impacts on households (full cost pass-through)

To analyze how a higher oil price resulting from an oil extraction levy might affect households, we build on the publicly available Carbon Pricing Incidence Calculator (CPIC) tool. The CPIC is based on survey data on household consumption in combination with national input-output tables. Input-output tables represent the flows of economic resources between economic sectors and allow determining the amount of oil, coal and gas used to produce one dollar of output in a particular economic sector. Matching consumption survey data to input-output tables provides information on the amount of oil, coal and gas that has been used to produce the goods and services consumed by a particular household.

The analysis in this subsection considers that case in which oil price increases are fully passed through to final consumers, which are (irrespective of whether the country in which they reside applies the oil extraction levy and whether it is an oil importer or exporter). The next subsection complements this analysis by discussing the case in which final consumers are shielded from changes in global oil market by price controls, which affect the government budget.

In the following, we show additional expenses that households would need to incur to maintain their current consumption. As this approach does not account for possibilities to substitute away from oil, the numbers presented should be regarded as an upper-bound estimate of the distributional effects of oil price increases resulting from the levy.

To keep the analysis tractable, we show the average costs relative to household income across income quintiles (each quintile represents 20% of the population, ranging from poorest to richest). At the end of this subsection, we provide a brief overview of how costs are spread within the lowest income groups in each of the countries under consideration.

We include countries encompassing different world regions and income groups in our analysis. Our results show distributional consequences for Ethiopia, Mozambique, Nigeria, Vietnam, Indonesia, Brazil, Canada and the UK. We consider an oil price increase of $5 per barrel, which corresponds to the increase projected in the benchmark scenario as well as the scenario with ambitious action in the year 2030. In our realistic scenario by 2035, the increase in the oil price is only $2, hence the impacts assessed here would be significantly lower. As we analyze additional costs for households for their current consumption patterns, distributional impacts display a linear relationship with price changes. For this reason, the effect of alterative price scenarios can easily be inferred (for instance, an oil price increase of $20 would have an absolute effect that is four times as large as the one we assess without changing the relative impacts on different income groups). Figure 5 depicts the results of this analysis, showing the additional costs arising from a higher oil price relative to household income per quintile.

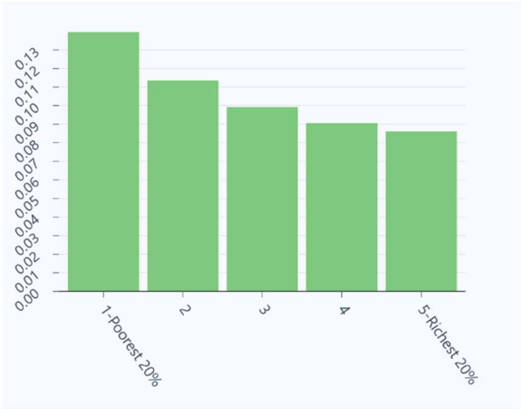
This analysis underscores that the distributional implications of fossil energy prices can show substantial variation even across countries in the same region or that have similar per-capita incomes. For instance, higher oil prices would have a regressive effect on the income distribution in Ethiopia but progressive in Mozambique and Nigeria. That is, in Ethiopia rising oil prices would affect poorer households more strongly than richer ones relative to their income, and vice versa in Mozambique and Nigeria.

However, there are also substantial differences regarding the magnitude of the distributional effects between these three countries. Whereas for Mozambique and Nigeria a levy which increases the oil price by $5 per barrel would reduce disposable household income by 0.25% and 0.3%, respectively, income losses in Ethiopia would only be around 0.1%. That is, in Ethiopia rising oil prices can be expected to be regressive but have a relatively small impacts on the poorest segments of society. In Mozambique and Nigeria, on the other hand, rising oil prices would likely be progressive but still impact the poorest people significantly.

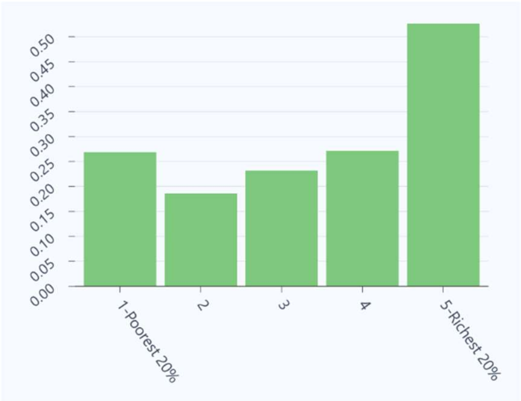
For Canada, rising oil prices would be mildly regressive. For the poorest 20%, a $5 per barrel higher oil price could mean an income loss of about 0.4% whereas for the richest 20%, the respective number is only about 0.35%. By contrast, in the UK such an oil price increase would have very similar effects on the highest and the lowest quintile than in Canada, but a slightly more pronounced impact on the middle-income quintiles (with income losses of about 0.5%).

In Vietnam, Indonesia and Brazil slightly regressive effects can be expected – especially in Brazil the lowest 20% would bear a higher relative burden than all other income groups. Interestingly, the overall effect in Vietnam is only about 0.1% of total household income for all income groups. By contrast, for Indonesia and Brazil effect sizes range from 0.6% to 0.8%

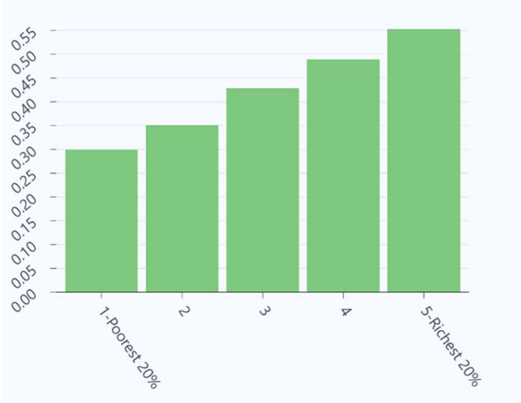
For oil price increases on the lower end of the scenarios considered, distributional impacts might be substantially more pronounced. For instance, an oil extraction levy of $100 per ton of CO_2 applied in the ambitious scenario would raise the global oil price by more than $20. With current consumption patterns, this would reduce household incomes of the poorest segments of society by almost 3% in Brazil and Indonesia. One should, however, also account for the fact that the scenario featuring the high oil price increase is only plausible in a world in which ambitious steps for decarbonization are undertaken. In this case, households' consumption patterns will have changed and the share of spending on fossil fuels, and consequently the exposure to higher oil prices, will be lower.



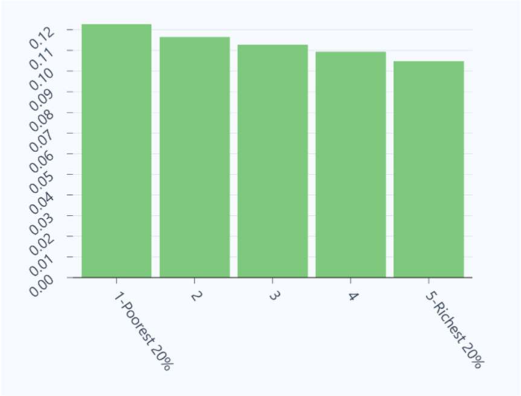
Ethiopia



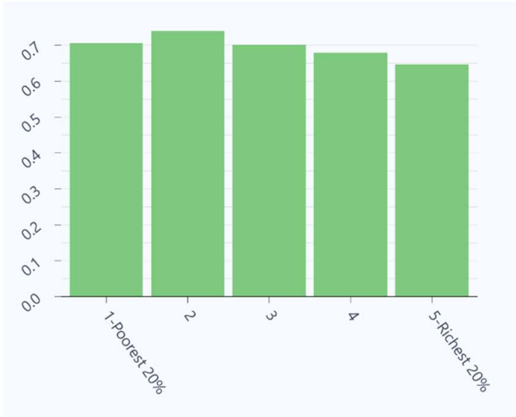
Mozambique



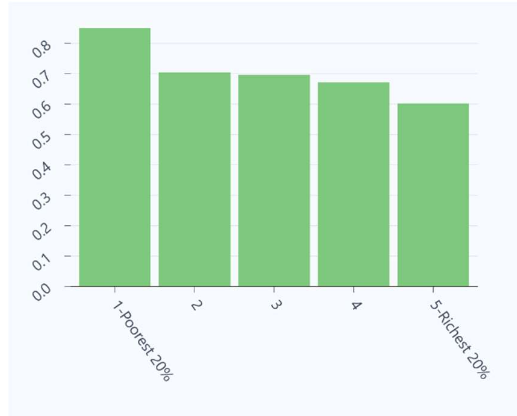
Nigeria



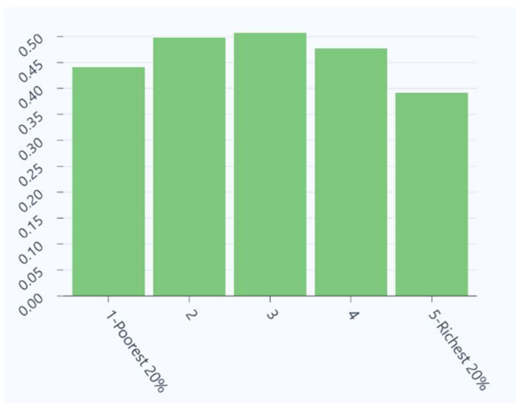
Vietnam



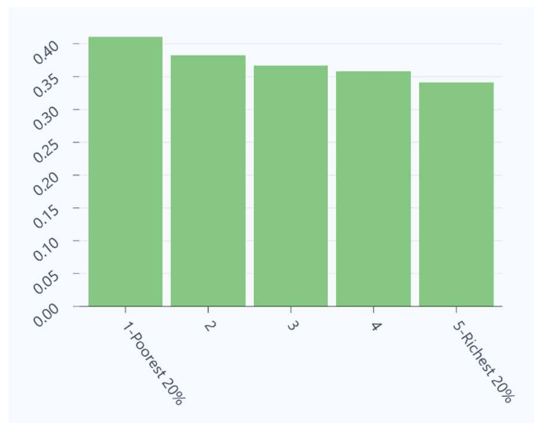
Indonesia



Brazil



UK



Canada

Figure 5 Distributional impacts for households. Proportion of income required to sustain current consumption patterns after the tax.

The most important concern is that rising oil prices could affect the most vulnerable segments of society. People with similar incomes are affected by rising oil prices in different ways due to different energy use patterns, which depend, for instance, on the types of buildings they inhabit and the kind of transportation they use.

For this reason, Figure 6 takes a closer look at the range of impacts within the lowest income quintile in each of the eight countries discussed above by providing the share of income lost for the 25% most and 25% least affected (again analyzing an oil price increase of $5 per barrel).

For Ethiopia, Mozambique, Nigeria, Vietnam and Brazil, income losses for the first quintile would be moderate even for the most severely affected households. In most cases, income losses are below 1% except for Nigeria and Brazil, where for the most affected income losses would be 1.4% and 1.1%. respectively. For all these countries, the least affected households in the lowest income quintile would face relatively modest income losses of less than 0.5%.

A very different picture results for Indonesia, the UK and Canada. For Indonesia, the most affected households in the first quintile would lose roughly 3.4%. For the UK the respective numbers are 2.1% and for Canada 1.8%. For Indonesia, even the least affected in the poorest quintile would face income losses of about 0.9%. Interestingly, a different picture emerges for the UK, where income losses for the least affected people in the lowest quintile amount to less than 0.2%.

To protect low-income households from higher energy prices, some form of financial compensation might be mandated. Ideally, this compensation should be handed out in ways that encourage shifting away from oil use, e.g. by supporting access to clean energy sources, which not only helps to reduce emissions but also lower exposure to higher oil prices.

For Ethiopia, Mozambique and Vietnam, moderate sums of $0.3, $1.1 and $1 per households per year would be required to fully compensate all people within the first income quintile for higher oil prices. Overall, for Ethiopia and Mozambique it would cost about $1.5mn and $1.7mn per year to compensate all households in the lowest income quintiles, in Vietnam compensation of about $5.1mn would be required.

Much larger sums would be needed to cover the extra costs in countries with higher per capita incomes and larger expenditure shares on oil products. For example, in Canada and the UK the costs of covering additional costs of all households in the first quintile would amount to almost $414mn and to $460mn. In Brazil the total costs would amount to about $267mn, in Indonesia to $116mn and in Nigeria to $38mn.

How compensation to protect low-income households can be financed depends on the specific country-context. Countries that are oil producers would benefit from windfall profits from a higher oil price and can channel some of these additional revenues to measures that address social hardships. For low- and middle-income countries that impose an oil levy, a domestic dividend as discussed in the previous section could provide the required financial means. By contrast, high-income countries that are oil importers will need to find ways to mobilize additional compensation payments for low-income households. In addition, all countries will need to ensure that of compensation payments are well targeted to be able to identify low-income households and to make sure they effectively receive financial assistance. This will be a central requirement for successfully dealing with the social dimension of a transition away from fossil fuels, not restricted to oil levies.

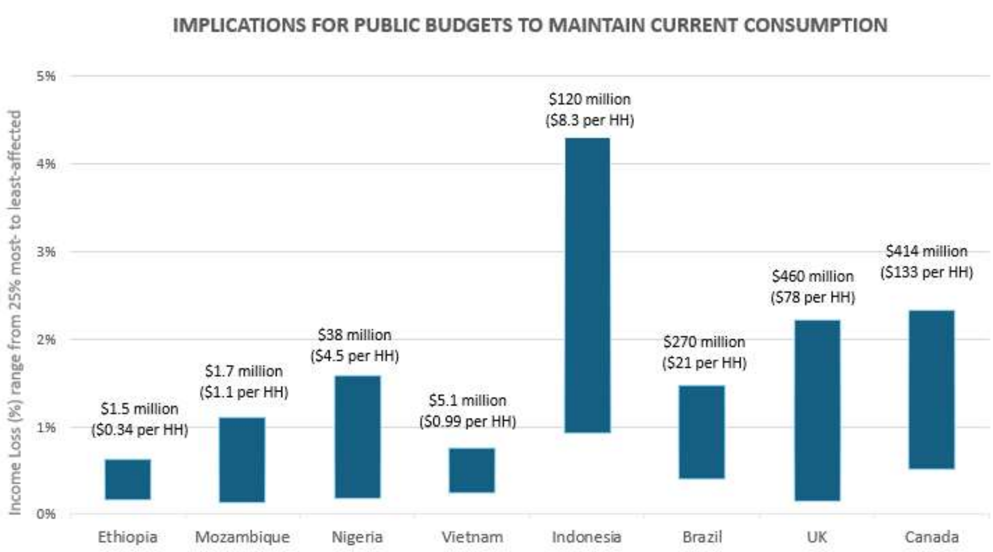


Figure 6 Implications for public budgets to cover the costs of maintaining current consumption levels after a $5 increase in the oil price (no cost pass-through), in absolute terms and also per household

The above analysis has considered a case in which higher oil prices are fully passed through to final consumers. However, changes in world market prices for oil do not directly translate into commensurate increases in prices for final consumers. One reason for such incomplete pass-through is market structure with imperfect competition. In such settings, vendors of oil products prefer to absorb some of the higher costs to alleviate the decline in sales volumes. For instance, one recent study for the US finds that about 50% of oil price increases are passed through to final consumers in the long run (Yilmazkuday, 2021). The rate of pass-through, however, varies across countries with different market structures (Apergis & Vouzavalis, 2018; Gullì & Chernyavs'ka, 2013). Furthermore, it is not clear to which extent results of empirical studies of fluctuations of oil prices resulting from changing supply and demand conditions can be applied to a situation in which oil prices increase as a result of targeted policies. In any case, it is conceivable that oil price increases due to an oil levy are not fully passed through to final consumers, so that the above estimates of distributional implications for households should be understood as an upper bound.

Pass-through rates of oil prices also depend on the regulatory environment. In many countries, energy prices are to some extent subject to government intervention. In 2023, subsidies for fossil fuel consumption amounted to about $616bn, of which almost $236bn were for oil products (IEA, 2023)[4]. The most salient case of such interventions are price controls that fix prices of oil products at a certain level so that consumers are not directly affected by oil price increases. Other subsidies for fossil fuels include tax breaks, such as exemptions from value-added taxes for certain fuels. Nevertheless, measures to decrease prices of oil products impose costs on the government budget. In the case in which prices are set below the world market price, increasing prices will directly affect public finances. Governments in importing countries will need to mobilize financial resources to cover increased costs of oil imports by raising taxes, cutting spending on other activities or incurring additional public debt. The distributional implications of this will depend on the specific details of how governments respond to rising budgetary pressures. For oil exporting countries, fixed prices result in an opportunity cost, as they do not benefit from the windfall profits they would otherwise derive from increasing world market prices.

Figure 7 shows additional costs to stabilize consumer prices while world market prices for oil increase because of the levy. The numbers show the additional costs of meeting current oil consumption with a $5 per barrel higher oil market price in relation to countries' GDP and public budgets.

The largest costs relative to GDP would arise for Mozambique, which would need to raise 0.5% of GDP to prevent consumer prices of oil products from rising. Brazil, Indonesia, Nigeria and Vietnam would also experience noticeable effects of more than 0.2% of GDP, while costs for Ethiopia, the UK and Canada range between 0.06% and 0.17% of GDP.

In relation to the government budget, Nigeria can be expected to be most severely affected. Compensating an oil price increase of $5 would mean costs of more than 1.6% of the public budget. For Mozambique, Indonesia, Vietnam and Ethiopia would also have important implications for the government budget with costs exceeding 1% of public spending. For Brazil, Canada and the UK, budgetary pressures would be significantly lower with costs ranging between 0.1% and 0.6%.

[4] These 'explicit' subsidies measure the price gap between the world market price and domestic sales prices. They do not include the social costs of fossil fuel use, for instance related to local health and climate impacts. If these social costs are also accounted for, estimates of 'implicit' fossil fuel subsidies amount to about $7 trillion per year

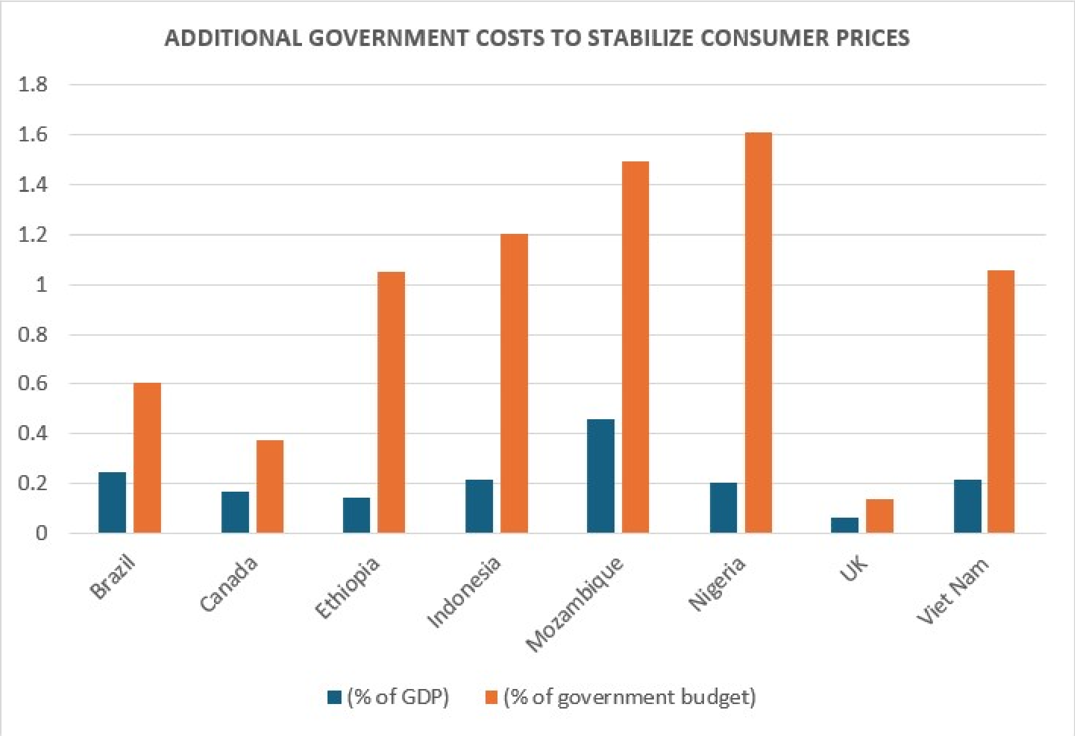


Figure 7 additional costs to governments to stabilize consumer prices if the world market price for oil increases by $5 because of the levy

Other spillover effects

Higher oil prices resulting from an oil levy can have several additional positive as well as negative implications for climate change mitigation.

On the one hand, higher oil prices make it more worthwhile to invest in energy efficiency. There is robust evidence from different countries that increasing energy prices incentivize firms as well as consumers to reduce their energy consumption. One study for the US finds an energy price increase of 10% to reduce the energy intensity (i.e. energy consumption per unit of production) of new market entrants by about 1%. A similar pattern is found for Chinese firms, regardless of whether these are state-owned or private companies and whether they are domestically or foreign owned (Linn, 2008; Tang, 2020). Higher energy prices also incentivize producers of household appliances to include more energy-efficient models in their product portfolio (Cohen et al., 2017; R. G. Newell et al., 1999). There is also evidence that higher energy prices induce technological innovation (Popp, 2002). For example, the oil price spikes in the 1970s are closely related to increased patenting activity in energy efficiency and alternative energy sources (Popp, 2002). There is also some evidence that automobile producers bring forth more patents for clean propulsion systems when fuel prices are high (Aghion et al., 2016). For the case of policies that raise the price of fossil fuels, carbon pricing in the EU has been found to increase low-carbon patenting by about 1% even in a period with relatively low carbon prices (Calel & Dechezleprêtre, 2016).

On the other hand, higher oil prices provide an incentive for additional exploration and drilling. One study finds that a 10% increase in oil prices is related to 4% more drilling activity across the globe (Toews & Naumov, 2015). However, as some oil reserves only become profitable at relatively high oil prices, there is not a linear one-to-one relationship between oil prices and drilling (Khalifa et al., 2017). For instance, a study for the US finds that shale oil reserves are hardly affected by oil price changes as long as the oil price remains below $100 per barrel (Smith & Lee, 2017). It is also conceivable that higher oil prices induce the uptake of carbon-intensive substitutes for oil, such as coal liquefaction and biofuels that are not produced sustainably.

How these knock-on effects might play out in the future crucially depends on the market and policy environment. That is, in a world that is still heavily geared toward fossil fuel use, increasing oil prices are more likely to spark additional carbon-intensive energy production than in a scenario in which there is a credible commitment for a clean energy transition that guides investment decisions away from fossil energy.

4 Political Feasibility

An international levy would require robust systems for monitoring extraction volumes, verifying company-reported data, and enforcing compliance—tasks that are especially challenging in countries with limited institutional capacity or high levels of corruption. Without these foundational systems in place, even the best-designed levies risk being politically unviable due to implementation failures (Benitez et al., 2023; Daniel et al., 2016; IMF, 2019; OECD, 2016). As the Brazil example indicates (see Section 3.3), many countries already have in place the built-in institutionalized framework to monitor and tax oil extraction volumes.

Implementing an oil extraction levy at the international level presents several challenges that go beyond technical or economic considerations. While the idea may align with broader global goals—such as climate change mitigation and fairer resource governance—its feasibility ultimately hinges on how it interacts with national legal systems, economic structures, and political incentives. Some key issues shall be outlined in the following.

4.1. Interactions with existing carbon prices

A fundamental issue that any international taxation initiative will face is that taxation measures must be integrated into national legal frameworks, requiring voluntary adoption by participating countries. 3.3These challenges are particularly evident when considering how an international oil extraction levy would interact with existing national carbon pricing and tax systems (Wood Mackenzie, 2021). For instance, the EU has a carbon price on emissions from stationary sources and will introduce a second emission trading system for transport and heating fuels. The UK also operates an ETS where the national Emissions Trading Scheme (UK ETS) has replaced EU participation post-Brexit. While not an EU country, Norway participates in the EU ETS. Canada operates under a dual-level carbon pricing framework, combining a federal benchmark with province-specific systems such as British Columbia’s carbon tax and Quebec’s cap-and-trade market (Government of Canada, 2021). Finally, Australia’s ‘Safeguard Mechanism’ constitutes an emission trading system for stationary sources.

Hence, there might be some concerns that oil that is extracted in these countries and used for domestic consumption, might be priced twice, namely on the production side by the levy and on the consumption side by the existing carbon price. If policy makers want to prevent this, they may either exclude oil that has been subject to the extraction levy from the domestic carbon price, which would result in lower revenues. Or they might decide to deduct domestic carbon prices from the levy, which would mean lower revenues for international climate finance.

Assessing the exact magnitude of domestic oil extraction that is covered by a carbon price is beyond the scope of this study. Nevertheless, we can provide an upper-bound estimate of the overlap of the revenues from the extraction levy and the existing carbon price if the existing carbon prices covered all oil consumption in the respective country. As shown in Table 1, the EU, UK and Australia consume more oil than they produce, which means that all levy revenues from these countries might be at stake of double pricing. By contrast, Canada's domestic oil consumption is only 35.4% of its production, and for Norway the value is only 9.6%. As the UAE does not have a carbon price for domestic oil use, this problem does not arise there. Overall, if all oil consumption were covered by existing carbon pricing schemes and if these revenues were not available for international climate finance, the amount of finance would be reduced by less than 30% (weighted average of the six countries).

Table 1 Levy revenues at stake due to interactions with existing carbon prices

Country	Share of revenues of the oil extraction levy potentially at stake
EU	100%
UK	100%
Norway	9.6%
Canada	35.4%
Australia	100%
United Arab Emirates	0%
Total (weighted average)	**29.7%**

4.2. Fiscal stabilization policies

Countries’ decisions to participate may also be influenced by fossil fuel companies operating within their jurisdictions, as these firms often wield significant political power and can hinder international cooperation.

The risk that fossil fuel interests resist levy proposals is especially high in countries where the sector holds significant economic and political sway (e.g., countries where oil revenues form a substantial part of the public budget). Fiscal stabilization clauses in investment contracts between governments and fossil fuel companies might pose legal risks for attempts to impose levies on oil extraction.

Fiscal stabilization clauses are most common in developing and emerging economies, particularly relevant in the extractive industries. These provisions protect investors by limiting governments’ ability to amend fiscal laws (Christians et al., 2023).

Bilateral Investment Treaties (BITs) also increasingly include investor–state dispute settlement (ISDS) mechanisms, allowing private investors to sue governments in international tribunals if they believe new measures—including taxes—unfairly harm their investments. A notable example is the case of the UK-based oil exploration company Rockhopper, which was awarded €190 after Italy banned offshore drilling within 12 miles of the coast, violating protections under the Energy Charter Treaty (Elton, 2022).

The fossil fuel sector has been particularly active in this arena, accounting for roughly 20% of all ISDS cases to date. However, the fact that countries are increasingly withdrawing from the Energy Charter Treaty, which protects fossil energy investments, might be an indication that there is some political momentum against provisions to protect fossil fuel investments. It seems likely that if policy makers have political will to channel parts of the country's revenues from oil extraction into international climate finance, they will find ways to successfully address the associated legal and administrative challenges.

4.3. Consumption levy as an alternative approach

Alternative policy options to an extraction levy include oil import taxes and consumption levies. While these measures target demand rather than supply, they may be more politically feasible to be introduced by, for example, non-oil-producing countries with higher climate ambition. For these countries, there are fewer risks of clashes with entrenched state-industry alliances. An **import levy** targets demand, pushing developed countries toward cleaner energy. This mechanism is more politically feasible as it distributes responsibility based on consumption rather than production. The **extraction levy** by contrast directly applies to oil extraction, ensuring that the costs of fossil fuel production are somewhat internalized regardless of whether the oil is consumed domestically or exported.

A **consumption** levy provides a comprehensive approach to pricing fossil fuel use by taxing oil consumption regardless of whether it comes from domestic production or imports. This aligns with the polluter pays principle, ensuring that those who consume fossil fuels bear the cost of their environmental and social impacts (OECD, 2021). Unlike an import or production levy, which focuses on trade and extraction, a consumption-based approach directly incentivizes demand-side reductions and investments in clean energy (Stern & Stiglitz, 2021). Taxing consumption is easier because it does not require tracking of fossil fuel flows across borders—difficulties that have become apparent when evaluating sanctions imposed on Russian fossil fuels in recent years. A consumption levy can also be applied at the point of import, therefore it has a higher potential coverage than an import levy.

Politically, a consumption levy could be seen as more equitable, as it distributes costs based on actual usage rather than the country's role in global oil markets. It also allows for differentiated prices by country, aligning with the principle of common but differentiated responsibilities. However, its implementation poses challenges, including the need for robust tracking systems and international coordination to prevent tax evasion or carbon leakage (Baranzini et al., 2017). Despite these complexities, a well-designed consumption levy could play an important role in supporting a just energy transition while ensuring that fossil fuel costs are internalized across economies.

We assessed, for each of three scenarios, which countries could be expected to participate in a consumption levy that is of the same magnitude and covers the same share of global oil as the extraction levy— thus also raising the same amounts of revenues. Like for the extraction levy, we ranked countries by their oil consumption (high to low) and then also marked countries that are both high-income as defined by the World Bank, and that have *insufficient* or better scores as graded by the Climate Action Tracker. For each of our selected scenarios, we provide a comparison of the extraction levy and a consumption levy:

- **Benchmark scenario** (S1): as the extraction levy covers basically all global oil production, universal participation would be required for the consumption levy. All countries use oil, but oil production is concentrated on a relatively small number of large producers. Hence, a consumption levy that covers basically all oil worldwide would require substantially more countries than an extraction levy.
- **'Realistic' scenario** (S2): the extraction levy covers 15% of global emissions in our central scenario. To reach this level of emissions coverage, if we take the largest oil consumers that are both high-income and relatively climate ambitious — a consumption levy could achieve this with the participation of only the EU and Japan. Potentially, this is more feasible than requiring the EU plus five other high-income oil producing countries.
- **Ambitious scenario** (S3): To cover 45% of global emissions, the extraction levy would require 11 participating countries, including some upper-middle-income and/or with lower climate ambition (e.g., China, Colombia, Kazakhstan, the US). In contrast, the same coverage could be met through a consumption levy involving just 7 high-income countries that are relatively ambitious: the EU, Japan, Canada, the UK, Australia, Chile, and Switzerland.

A key advantage of the consumption levy is the larger pool of high-income and climate ambitious countries potentially willing to participate. Still, national implementation remains difficult, as the levy can be perceived as a burden on consumers and may be less effective at directly restricting fossil fuel supply. Measures to minimize distributional impacts would also clearly be necessary for a consumption levy. Furthermore, an additional complication is that all likely participant countries already implement some form of carbon pricing, which may limit the additional revenue available from a new levy.

5 Conclusion and Design Recommendations

This report explores the design and implications of an international oil extraction levy as a mechanism to mobilize new sources of climate finance. Rooted in the polluter pays principle, the levy would be applied upstream on the embedded CO_2 in crude oil, directly targeting extraction—unlike most carbon pricing systems that predominantly focus on downstream emissions.

Our analysis shows that such a levy holds considerable revenue-generating potential. Under the central 'realistic' scenario (S2), where a small group of high-income countries participate and levy rates increase incrementally, **annual revenues could reach $85 billion by 2035**. This amount represents **28% of the $300 billion climate finance target** set at COP29 in Baku. More ambitious scenarios—with full participation and steeper price trajectories—could yield up to **$571 billion annually**. These estimates illustrate the significant financial potential of introducing an oil extraction levy at the global level.

However, **the levy would raise the world market price of oil, passing additional costs onto consumers**. Our estimates suggest that, in most cases, the resulting extra costs for households are relatively modest. If future consumption is less carbon-intensive than what is currently the case, distributional impacts would be even less pronounced. While we find that the **distributional impacts** from the extraction levy **are limited and often even progressive in lower-income contexts, targeted compensation schemes are essential** to improve acceptability of the policy, particularly for vulnerable households in middle- and high-income countries.

Ambitious extraction levies will likely only be implemented if there is overall progress on climate policy. Policy makers will then need to find ways to ensure that climate policy is socially equitable and will have the institutional settings in place required to address distributional impacts of the extraction levy. Furthermore, using the revenues of the levy to promote decarbonization lowers exposure to higher oil prices in general, and revenue recycling can be designed with a focus on reducing costs for the most vulnerable population groups.

Political feasibility remains the most significant barrier. A major concern is the redistributive effects across countries—where non-participants stand to gain windfall profits, undermining fairness and reducing the likelihood for major oil producers to participate in the levy. However, if it can be demonstrated that the revenues effectively contribute to climate change mitigation and adaptation, an oil extraction levy in (at least) high-income oil producers with progressive national climate policies could be conceivable. Given the likelihood of limited initial participation, a coalition of climate-ambitious countries may be best positioned to pioneer the levy. Over time, demonstrating its effectiveness both in terms of revenues raised and domestic benefits, could encourage broader adoption.

Tax sovereignty and the integration of new levies into national legal systems are further barriers. In this context, retaining a share of revenues domestically through a “domestic dividend” could be a key enabler. This approach provides incentives for both low- and high-income oil producers to participate. Furthermore, public and political support could be increased by earmarking part of the domestic dividend for development objectives, such as education, healthcare, or clean energy investments.

Complementary approaches, such as oil import levies, should also be explored in parallel. **As an alternative to the extraction levy, a well-designed consumption levy**, applied at the point of use, **may be more politically feasible** in non-producing, high-income countries and can serve as a pragmatic alternative or bridge toward broader international climate finance efforts. However, these approaches come with additional implementation challenges and are less targeted towards reducing fossil fuel supply compared to the extraction levy.

While the idea of an **international oil extraction levy has strong normative and environmental appeal**, particularly because it directly addresses fossil fuel supply, its political feasibility depends on a delicate balance between legal compatibility, investor relations, institutional readiness, and public support. **Overcoming these barriers will require not just technical design, but deep political strategy, international cooperation, and sustained policy innovation.**

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Annex

Annex 1 – Methodology for Impact Analysis

This study assesses the revenue-generation potential of an international oil extraction levy across different implementation scenarios, including variations in rate, participation, and future production volumes. We also consider distributive effects on both the micro- and- macroeconomic levels, in terms of impacts on households and countries. We assess impacts for participating and non-participating countries.

For all scenarios, we assume the levy is implemented in 2027, and we estimate impacts at three points in time: 2027, 2030, and 2035.

To assess the impacts of levies applied to oil production, it is essential to understand global oil market dynamics. We build on existing estimates of price elasticities of oil supply and demand (i.e. how production and consumption of oil responds to changing world market prices) to model how the market equilibrium would be affected by a levy on oil extraction under different scenarios. In this paper, we rely on recent estimates of short-run elasticities derived from a structural model of the oil industry, which is based on production data from individual oil fields embedded in a general equilibrium model of the world economy (Bornstein et al., 2023). Elasticities for both oil supply and demand are relatively inelastic, meaning that the change in revenues are driven first and foremost by the magnitude of the price and not the quantity change.

Our analysis covers the 31 (current) biggest oil producers based on IEA production data, covering 96% of production. For estimates of current extraction levels by country we used IEA Energy Balances data on Crude, NGL and feedstocks in 2021 (IEA, 2022). We assume that the global demand equals global supply of crude oil in each year. Where 'global' implies aggregate of 31 biggest producers.

We assume that the 2021 prices and volumes remain constant until levy implementation in 2027. Changes in future extraction levels are based on two IEA scenarios outlined in its 2024 World Energy Outlook (IEA, 2024, p.137), particularly its stated policies (STEPS) and net zero emission (NZE) scenarios: Figure A1 provides an overview of the assumed production levels and prices.

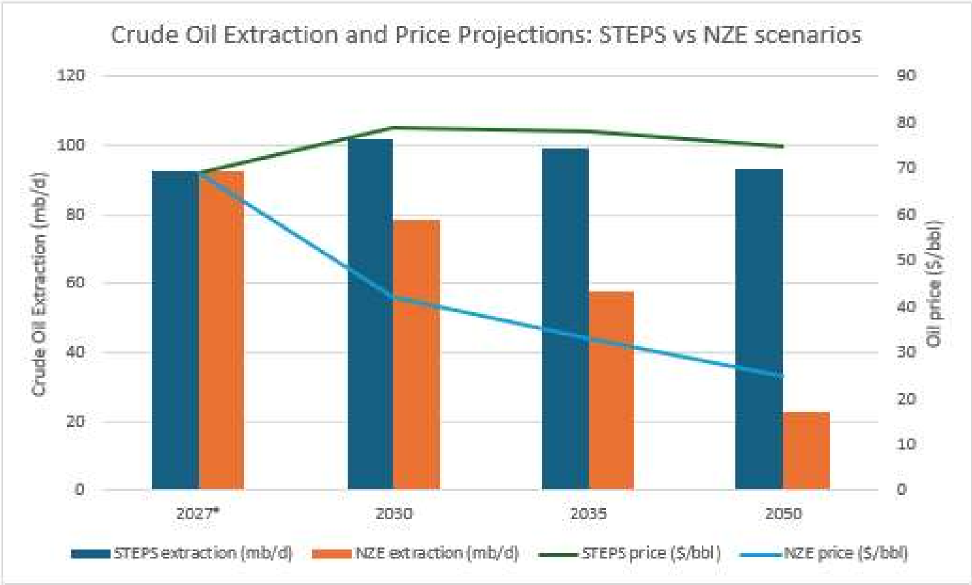

Figure A1: Crude Oil Extraction and Price projections: STEPS vs NZE scenarios

We estimate the levy being applied to the extraction of crude oil. The IEA scenarios, however, provide information on the supply of all oil products. We account for this by assuming that the change in the supply of crude oil changes at an identical rate as the supply of all oil products. That is, to project future crude oil supply, we multiply the current crude oil supply by the rate of change (of supply of all oil products) from the IEA scenarios. We apply changes projected in the IEA scenarios to each individual oil supplier in the absence of the levy, thus assuming that supply increases or decreases in all countries at the same rate.

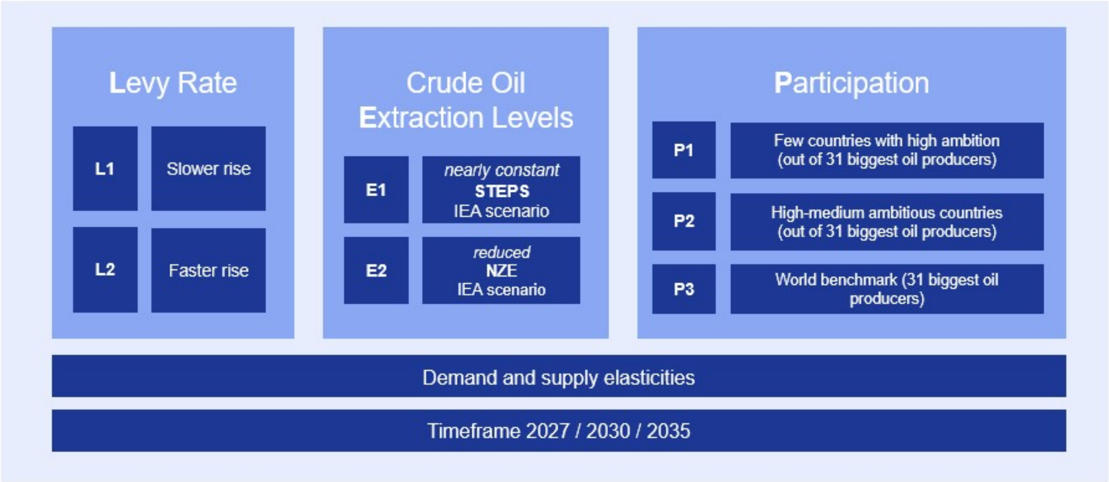

Figure A2: Graphic overview of scenario options and underlying assumptions

Hence, to determine aggregate crude oil extraction for the 31 biggest producers, we calculate:

- Crude oil extraction$_{YEAR}$ = Crude oil extraction$_{2021}$ + [(Crude oil extraction$_{2021}$) x (rate of change between 2021 and YEAR)]

In terms of the levy rate, we assume that it rises in equal increments:

- L1: starting with a $5 levy per embedded ton of carbon in 2027, $5 annual increase
- L2: starting with a $10 levy per embedded ton of carbon in 2027, $10 annual increase

Based on the emissions factor of crude oil (US EPA, 2015), this translates into a per barrel levy rate of:

4. L_E1: starting with $2,15 per barrel of extracted crude oil, $2,15 annual increase
5. L_E2: starting with $4,30 per barrel of extracted crude oil, $4,30 annual increase

For all options, it is assumed that the levy is capped at $100 per embedded ton of carbon, a level associated with pathways capable of limiting global temperatures to below 2 degrees above pre-industrial times (World Bank, 2017). This level applied at the global level represents a realistic maximum contribution.

There is no single clear indicator to determine which oil producers would likely participate in an oil extraction levy. Additionally, it is highly dependent on the respective governments and leadership in each country. Nevertheless, we suggest three scenarios for participation using World Bank income classifications and Climate Action Tracker scoring for the top 31 oil producers (who represent 96% of global production).

To determine the new world market price and production quantities after the levy, we assume:

- Each country's supply curve contributes to the global supply. Hence, the global market price determined the interplay between global demand and supply.
- Imposing a levy shifts the supply curves of the participating countries downward (given the price is on the x-axis and the quantity on the y-axis), reducing global supply and causing the equilibrium price to rise from p_0 to p'.
- Countries that do not impose the levy receive a higher price and thus supply a higher quantity, whereas for a country that applies a levy, they produce and receive less than without the levy due to the reduced margins.
- This allows calculating levy revenues per country as well as changes in crude oil revenues per country (macroeconomic distribution effects).

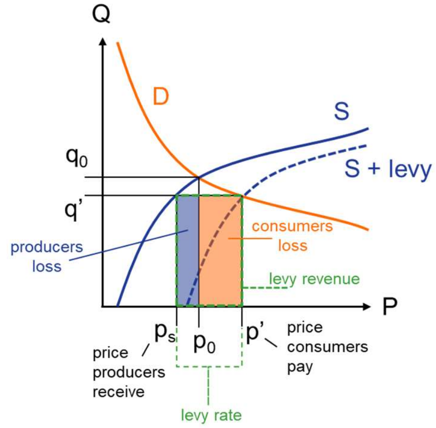

Figure A3: Hypothetical supply and demand curve for a country participating in the oil extraction levy

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