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# When do oil autocracies formally commit to climate change mitigation?

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**ABSTRACT**

Existing literature suggests that there is an autocratic disadvantage in climate change mitigation commitment, even amongst oil-rich countries. Yet, evidence suggests that there is no universal disadvantage of autocracies, as some hydrocarbon-rich exporting autocracies are more formally committed to climate change mitigation than other hydrocarbon-rich exporting autocracies. I find that hydrocarbon-rich exporting autocracies with lower hydrocarbon rent dependence are more likely to be formally committed to climate change mitigation than hydrocarbon-rich exporting autocracies with higher dependence. I also find that the negative impact of hydrocarbon rent dependence on climate change mitigation policy output weakens or disappears at lower levels of international investment ties and higher levels of international diplomatic ties. While IOs, NGOs and ESG investors must understand that formal climate change mitigation commitment does not mean successful implementation, my research can help policymakers and investors identify aiding factors in the policy intention to mitigate climate change.

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Autocracies; oil and gas; climate change mitigation; renewable energy policy; dependence on hydrocarbon rents

## Introduction

Through climate summits such as the Annual Conference of Parties of the United Nations Framework Convention on Climate Change, the international community is increasingly demanding oil and gas- (hydrocarbon) rich exporting economies to phase out hydrocarbon production to meet the net-zero carbon emissions target for 2050. In particular, the energy transition away from oil and gas leaves hydrocarbon-rich exporting autocracies institutionally vulnerable. This is because hydrocarbon wealth permits autocrats to resist democratisation by spending on patronage to coopt regime insiders and political opposition; and by spending on boosting internal security apparatuses to repress citizens' rights (Ross, 2001; Ulfelder, 2007; Wright et al., 2013). Various studies provide evidence that democracies are more committed to protecting the environment and/or mitigating against climate change than autocracies (Bättig & Bernauer, 2009; Cao & Ward, 2015; Congleton, 1992; Neumayer, 2002; Winslow, 2005). The importance of democratic institutions in climate change mitigation is further highlighted in the study of Tadadjeu et al. (2023). They find that dependence on oil rents reduces the stringency of climate change policies, through its diminishing effect on democracy, suggesting that more accountability and political competition in oil-rich countries increases the incentive to use oil proceeds for tackling climate change (Tadadjeu et al., 2023: 27). This additionally implies an autocratic disadvantage in tackling climate change in oil-rich countries. However, evidence suggests that there is no universal disadvantage of hydrocarbon-rich exporting autocracies, as some hydrocarbon-rich exporting autocracies are more formally committed to climate change mitigation than their hydrocarbon-rich exporting autocratic peers. For example, since the inception of the Kyoto Protocol in 2005 up to 2019 before the Covid-19 pandemic, Vietnam adopted 37 renewable energy policies, Kuwait adopted six and Sudan adopted none, showing that there is wide variation even amongst hydrocarbon-rich exporting autocracies (see Figure 1). This prompts advancing the research of Tadadjeu et al. (2023) by investigating why some hydrocarbon-rich exporting autocracies are more formally committed than their peers despite having weak political institutions.

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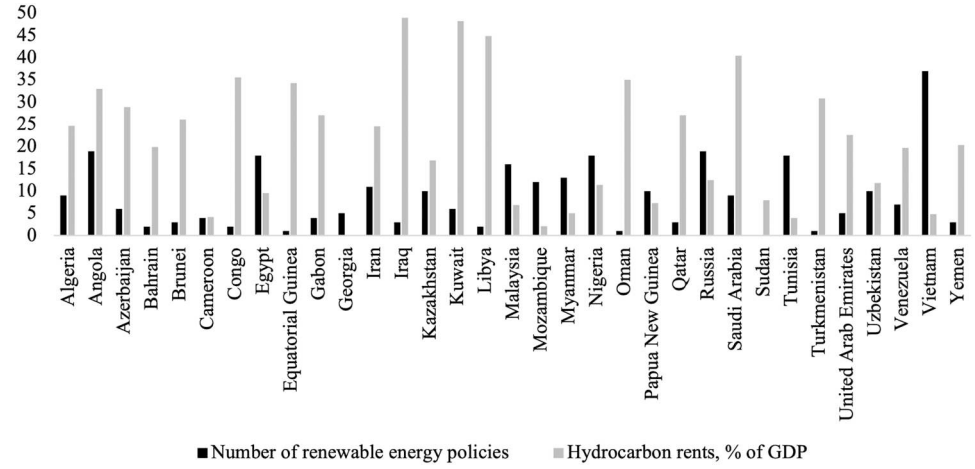


**Figure 1.** Number of renewable energy policies and dependence on hydrocarbon rents by country over 2005–2019 (Source: Grantham Research Institute on Climate Change and the Environment, 2024; NewClimate Institute, 2024; International Energy Agency, 2024; World Bank, 2024a, 2024b).

By examining this, I address a critical gap in environmental politics literature which largely compares the climate change mitigation commitment of autocracies and democracies (Battig & Bernauer, 2009; Cao & Ward, 2015; Congleton, 1992; Povitkina, 2018; Neumayer, 2002; Winslow, 2005), ignoring the nuanced variation in formal climate change mitigation commitment amongst autocracies, particularly hydrocarbon-rich exporting autocracies which are institutionally vulnerable to the global energy transition. This gap in the literature has been highlighted by Wurster (2013: 90), stating that 'Even more attention should also be given to the differentiation of regime subtypes'. While Eichhorn and Linhart (2022) have done this by comparing royal dictatorships, military dictatorships, hegemonic autocracies and competitive authoritarian regimes, I focus on hydrocarbon-rich exporting autocracies as a subset of the broader autocratic regime category. For robustness checks, I disaggregate autocracies into electoral autocracies such as Nigeria and Malaysia and closed autocracies such as Saudi Arabia and Vietnam. This is the first study to explore the effect of dependence on oil and gas rents on formal climate change mitigation commitment in hydrocarbon-rich exporting autocracies, therefore advancing the resource curse literature into the environmental political economy field. This differs from Tadadjeu et al. (2023) which analyses the effect of dependence on oil rents on the stringency of climate change mitigation policies in developed and developing countries.

My theoretical argument is threefold. First, I explain that some hydrocarbon-rich exporting autocracies are more formally committed to climate change mitigation than their hydrocarbon-rich exporting autocratic peers because they depend on lower hydrocarbon rents. As oil and gas reserves are finite and prices are volatile, lower dependence on hydrocarbon rents encourages some autocrats to increase formal commitments to climate change mitigation. It gives such states an opportunity to adopt more climate change mitigation policies with potential profitability, such as renewable energy policies, in effort to develop a new and profitable renewable energy sector as an alternative source of revenue. This is to hedge against supply and demand shocks in hydrocarbon rents and use this alternative source of revenue to maintain their autocratic power.

Second, I expect that amongst hydrocarbon-rich exporting autocracies, the impact of hydrocarbon rent dependence on climate change mitigation policy output is moderated by international investment ties, such that the negative effect of hydrocarbon rent dependence weakens or disappears at lower levels of international investment ties. Fewer international investment ties means that these countries are likely less exposed to international oil companies, and therefore face less pressure to maintain or expand their hydrocarbons industry at the expense of the energy transition towards climate change-mitigating renewable energy sources.

Third, I argue that amongst hydrocarbon-rich exporting autocracies, the impact of hydrocarbon rent dependence on climate change mitigation policy output is moderated by international diplomatic ties, such that the negative effect of hydrocarbon rent dependence weakens or disappears at higher levels of international diplomatic ties. This is because countries with higher levels of international diplomatic ties face more reputational risks, as not formally committing to the mitigation of climate change – which affects the entire world – may depict them as uncooperative, reducing international trust. Otherwise, they

may lose the material benefits of their ties or diminish the certainty of future cooperation. Such countries therefore face more international diplomatic pressures to ensure that they adhere to international climate agreements, through their domestic climate change mitigation policy output.

To examine these theoretical arguments, I analyse panel data on 33 hydrocarbon-rich exporting autocracies' adoption of renewable energy policies between 2005 and 2019. I focus on the period between the enforcements of the Kyoto Protocol and Paris Agreement to understand formal climate change mitigation commitment prior to the structural impacts of global events such as the global Covid-19 pandemic and the war in Ukraine. I find that hydrocarbon-rich exporting autocracies with lower dependence on hydrocarbon rents are more likely to be formally committed to climate change mitigation than hydrocarbon-rich exporting autocracies with higher dependence. Also, the negative effect of hydrocarbon rent dependence weakens at lower levels of international investment ties and disappears at higher levels of international diplomatic ties.

## Why do countries adopt climate change mitigation policies?

Physical vulnerability to climate change is an important environmental determinant in countries' political commitment to combat climate change (Eisenstadt et al., 2019; Heggelund, 2007; Sprinz & Vaahtoranta, 1994; Tørstad et al., 2020; Tubi et al., 2012). These scholars theorise that countries most vulnerable to climate change are more politically committed to climate change mitigation as they aim to limit costs and damages from climate disasters because the cost of damages are potentially high (Heggelund, 2007); some countries already have high adaptation costs (Tubi et al., 2012); and they are economically dependent on environmental sources such as water and energy that are exposed to climate disasters (Eisenstadt et al., 2019). While countries have different levels of vulnerability, ultimately, climate change is a global problem requiring collective action through international coordination of climate action (Hormio, 2023).

The global reputational risks of defaulting on international climate pledges moreover encourage adoption of climate change mitigation policies (Fankhauser, 2016: 323). This is because not supporting mitigation policies reduces a country's credibility as an international partner, increasing the risk of losing material benefits or limiting the security of future cooperation (Al Doyaili & Wangler, 2017, p. 18). Although, this depends on the number of non-compliant countries and the country's level of sensitivity to international criticism (Falkner, 2016, pp. 1121–1122), suggesting that when there is widespread compliance and the country is very sensitive to criticism, this creates the incentive to adopt climate change mitigation policies in line with international climate agreements. Fankhauser (2016) find that international political factors such as legally binding international climate commitments and hosting high-profile international climate summits also influence the passage of domestic climate change legislation, reflecting the pressure of maintaining positive international standing.

Climate change mitigation policies are also diffused from one country or a group of countries to another. This means that countries adopt such policies through mechanisms such as learning, emulation or imitation, and peer pressure (Busch & Jörgens, 2005, p. 865; Fankhauser, 2016, p. 322). Kammerer and Namhata (2018) go into much greater detail, explaining that there are two diffusion mechanisms through which a country ends up adopting climate change mitigation policies. The first is the *interaction* mechanism which means that countries are more likely to adopt climate policies when they directly interact – through official meetings, diplomatic communications and policy knowledge exchanges at international forums – with other countries who have already adopted such policies (Kammerer & Namhata, 2018, p. 479, 483). The second is the *interaction similarity* which means that countries are more likely to adopt climate policies if other countries with similar economic, political, geographic or demographic structures, or with similar international relations, have already adopted such policies because they either have similar incentives or compare themselves with each other (Kammerer & Namhata, 2018, p. 479, 484).

The adoption of a country's climate change mitigation policies is additionally determined by national public opinion (Agone, 2007; Anderson et al., 2017; Weaver, 2008). Public support for environmental policies has a greater effect on the adoption of such policies when the opinion is amplified by protests because protests raise the salience of public environmental concerns to policymakers (Agone, 2007). Governments are also likely to adopt more environmental policies on the basis that the public have expressed willingness and support for making financial and/or lifestyle sacrifices for these policies to be enacted (Weaver, 2008). Examining European democracies, Anderson et al. (2017, pp. 3–4) argue that democracies create room for

public opinion to influence environmental policy output because democratic politicians care about votes, so they will align their policy positions with the opinions of the median voter.

This adds to the school of thought that democracy facilitates the adoption of climate change mitigation policies. Citizens in democracies are permitted to express their environmental preferences via freedom of press, speech, association and vote, which pressurises leaders to commit themselves to environmental protection to maintain their elected position in government (Neumayer, 2002, p. 140, 145). Battig and Bernauer (2009) further highlight the benefits of democratic freedoms by arguing that citizens have more freedom to access information and communicate and share ideas on climate risks which makes them more aware of climate problems, likely increasing their demand for climate change policy, and in turn, the supply of climate change policy to increase chances of re-election. This feeds into the idea that democracies are more accountable to the public, which disincentivises the pursuit of deriving personal benefits from environmental degradation (Winslow, 2005, p. 772). Public involvement in the policymaking process of democracies also raises the chance of environmental issues being resolved through policy (Winslow, 2005, p. 772). Furthermore, democracies tend to have more durable regimes compared to autocracies, making the time horizons of leaders relatively long and creates concern about the long-term payoff of the ruling party, which incentivises them to enact environmental policies for the public good (Cao & Ward, 2015; Congleton, 1992). Democracies also tend to have a combination of long-time horizons, great state capacity and large winning coalitions which in tandem – rather than separately – encourage environmental provision (Cao & Ward, 2015). These studies provide evidence that democracies are more committed to protecting the environment and/or mitigating against climate change than autocracies (Battig & Bernauer, 2009; Cao & Ward, 2015; Congleton, 1992; Neumayer, 2002; Winslow, 2005).

Although, when autocracies deem climate change mitigation a salient policy issue, they are perceived to be more effective in generating climate policy output than democracies (Shen, 2024). This is because policymaking powers is limited to those with scientific expertise, which raises the efficiency of climate policy generation more than in democracies where ideological, electoral and partisan considerations constrain policy output relatively more (Shen, 2024, p. 489). The limitation of civil and political liberties in order to curb environmentally-unfriendly behaviour, the non-participatory approach to environmental policymaking, and the small concentration of power in the hands of the climate-conscious to improve environmental outcomes have been dubbed 'environmental authoritarianism', 'authoritarian environmentalism' or 'authoritarian climate governance' (Beeson, 2010; Gilley, 2012; Mittiga, 2022).

Still, the importance of democratic institutions for climate change mitigation is further highlighted in the study of Tadadjeu et al. (2023). They find that dependence on oil rents reduces the stringency of climate change policies as there is more opposition from the oil and gas industry – which represent a strong lobby in oil-rich countries – against the implementation of mitigation policies aiming to reduce carbon emissions from production and consumption of oil and gas (Tadadjeu et al., 2023). However, they also find that dependence on oil rents through its adverse effect on democracy reduces the stringency of climate change policies (Tadadjeu et al., 2023). It reflects the work of Ross (2001) who argues that oil wealth reduces democracy by limiting political accountability as governments rely less on taxes as a source of income; and reduces democratic pressures through excessive spending on patronage and bolstering of internal security. This suggests that by increasing accountability and political competition, oil-rich countries will have more incentive to use their remaining oil proceeds for climate change mitigation (Tadadjeu et al., 2023: 17), indicating that oil-rich democracies on average are more committed than oil-rich autocracies in tackling climate change.

However, evidence suggests that there is no universal disadvantage of hydrocarbon-rich exporting autocracies, as some hydrocarbon-rich exporting autocracies are more formally committed to climate change mitigation than other hydrocarbon-rich exporting autocracies. For example, since the inception of the Kyoto Protocol in 2005 up to 2019 before the Covid-19 pandemic, Vietnam adopted 37 renewable energy policies, Kuwait adopted six and Sudan adopted none, showing that there is wide variation even amongst hydrocarbon-rich exporting autocracies. The resource curse literature suggests that resource-rich countries that permit unproductive, rent-seeking activities to compete against productive activities have 'grabber friendly institutions' characterised by poor governance and weak political institutions (Mehlum et al., 2006). These weak institutions are often authoritarian; the absence or limited presence of effective political competition and challengers creates space for governments to trade pro-growth and pro-welfare policies for bribes from resource-extractive firms (Bulte & Damania, 2008). Such trade-off is at the expense of

generating new wealth for society that would have otherwise been created through industrialisation and diversification of the economy (Bulte & Damania, 2008). Auty (2001) calls this the 'staple trap' because political elites pursue access to resource rents instead of investing in other sectors. Hydrocarbon-rich exporting autocracies are especially vulnerable to climate change mitigation via the energy transition away from fossil fuels as it poses not only an economic risk but also a political risk, given that the survival of their authoritarian regimes depends on hydrocarbon wealth (Ross, 2001; Ulfelder, 2007; Wright et al., 2013). Indeed, hydrocarbon wealth permits autocrats to resist democratisation by spending on patronage to coopt regime insiders and political opposition; and by spending on boosting internal security apparatuses to repress citizens' rights (Ross, 2001; Ulfelder, 2007; Wright et al., 2013). Against this theoretical backdrop, why are some hydrocarbon-rich exporting autocracies more formally committed to climate change mitigation than their peers despite their weak political institutions?

## The logic of hydrocarbon-rich exporting autocracies adopting climate policy

There is wide variation in the level of formal climate change mitigation commitment amongst hydrocarbon-rich exporting autocracies. I argue that some hydrocarbon-rich exporting autocracies are more formally committed to climate change mitigation than their peers because they depend on less hydrocarbon rents. As oil and gas reserves are finite and prices are volatile, lower dependence on hydrocarbon rents encourages some autocrats to increase formal commitments to climate change mitigation. It gives such states an opportunity to adopt more climate change mitigation policies with potential profitability, such as renewable energy policies, in effort to develop a new and profitable renewable energy sector as an alternative source of revenue to hedge against supply and demand shocks in hydrocarbon rents. Indeed, Tambari et al. (2024) find that declines in global oil prices increased investment in the renewable energy sectors in Nigeria in the long run between 1990 and 2020. However, the difference between hydrocarbon-rich exporting autocracies and democracies in this regard is that while there may be less hydrocarbon rents for autocratic survival, autocracies may adopt renewable energy policies due to being motivated by the idea of using renewable energy as an alternative source of revenue to maintain their regime stability. This could be through coopting the new renewable energy economic elites in order to expand their regimes' support network beyond oil and gas elites and balance the competing factions within the regime. I therefore hypothesise that:

> **H1**: Amongst hydrocarbon-rich exporting autocracies, climate change mitigation policy output is more likely in countries with lower dependence on hydrocarbon rents than in countries with higher dependence.

International oil companies (IOCs) that operate or own majority or minority stakes in the oil and gas fields of hydrocarbon-rich exporting autocratic countries are likely to prioritise profit maximisation over environmental sustainability. It has been found that renewable energy resources are less profitable than hydrocarbons, implying increased financial incentive from IOCs to resist transitioning to renewable energy (Hansen, 2022). In this regard, there is less international investment pressure on hydrocarbon-rich exporting autocracies to create a policy environment for climate change mitigation. Intuitively, I argue that fewer international investment ties means that hydrocarbon-rich exporting autocracies are likely less exposed to international oil companies, and therefore face less pressure to maintain or expand their hydrocarbons industry at the expense of the energy transition towards climate change-mitigating renewable energy sources. As such, I make the following hypothesis:

> **H2:** Amongst hydrocarbon-rich exporting autocracies, the impact of hydrocarbon rent dependence on climate change mitigation policy output is moderated by international investment ties, such that the negative effect of hydrocarbon rent dependence weakens or disappears at lower levels of international investment ties.

Meanwhile, more international diplomatic ties mean that hydrocarbon-rich exporting autocracies are more vulnerable to the perceptions of the international community. Not formally committing to the mitigation of climate change – which affects the entire world – may depict them as uncooperative. This reduces trust from other governments, international organisation and non-governmental organisations. Such countries therefore face more diplomatic pressures to ensure that they adhere to international climate agreements, through their domestic climate change mitigation policy output. Otherwise, they may lose the material benefits of their ties or diminish the certainty of future cooperation (Al Doyaili & Wangler, 2017, p. 18).

For example, Vietnam's signing of the Copenhagen Accord in 2009 which requires governments to outline frameworks for 'nationally appropriate mitigation actions', has encouraged the country to adopt climate change mitigation policies in order to attract climate finance and a larger proportion of it than the country's regional peers (Zimmer et al., 2015: 26). Some Vietnamese policymakers have even stated that climate change mitigation policies boost Vietnam's global reputation as a 'reliable partner', increasing the country's international trade and investment position (Zimmer et al., 2015: 27). Comparably, Saudi Arabia's G20 membership has prompted the government to at least implement a 5% VAT on fuel as part of fossil fuel subsidy reform efforts, given that the G20 itself advocates for the phasing out of fossil fuel subsidies (Climate Action Tracker, 2025; Krane & Monaldi, 2017, p. 28). To summarise, I consider the following hypothesis:

> **H3:** Amongst hydrocarbon-rich exporting autocracies, the impact of hydrocarbon rent dependence on climate change mitigation policy output is moderated by international diplomatic ties, such that the negative effect of hydrocarbon rent dependence weakens or disappears at higher levels of international diplomatic ties.

## Empirical approach

Recall, the purpose of this study is to find if the dependence on hydrocarbon rents explains the variation in formal climate change mitigation commitment between hydrocarbon-rich exporting autocracies. It focuses on renewable energy policies adopted – from 2005 to 2019, the period between the enforcements of the Kyoto Protocol and Paris Agreement – as a measure of formal commitment. The choice of this period is motivated by the need to understand climate change mitigation policy output prior to the structural impacts of global events such as global Covid-19 pandemic and the war in Ukraine. The analysis of this paper uses panel data, with a sample of 33 hydrocarbon-rich exporting autocratic countries[1] which I define as countries with electoral or closed autocratic regimes according to the Regimes of the World Index, have typically generated oil and gas revenue larger than USD1000 per capita each year, in accordance with the definition of Ashford (2022, p. 5), and have been net exporters of either oil, gas or both for more than half of the period between 2005 and 2019 as per information from the Observatory of Economic Complexity.

### *Dependent variable*

For this analysis, the main variable of interest is formal commitment to climate change mitigation, operationalised by the number of renewable energy policies adopted as renewable energy produces little to no greenhouse gas emissions, making it the antithesis of oil and gas (Namrata et al., 2024, p. 43). The minimum number of renewable energy policies in a given year is 0 and maximum is 6 (see Table 1). I triangulate renewable energy policy data from the Climate Change Laws of the World (CCLW) database by the Grantham Research Institute on Climate Change and the Environment; the Climate Policy Database by the NewClimate Institute and the Policy and Measures database by the International Energy Agency (IEA). This is to capture all the renewable energy policies that were missing in either of the data sources, enhancing the comprehensiveness of the data.

### *Independent variable*

The independent variable is dependence on hydrocarbon rents which I measure by using the oil and gas rents as a percentage of GDP indicator from the World Bank as it indicates how much oil and gas rents account for the size of the economy. In my sample over 2005–2019, the greatest share of oil and gas rents is 66.0% and the smallest is 0.02%. This is lagged by 1 year to reduce the risk of endogeneity.

### *Interactive variables*

I measure international investment and diplomatic ties using the KOF Globalisation Index (Financial Globalisation (de jure) and Political Globalisation (de jure) dimension). The index dimensions are on a scale of 1–100, where the higher the score, the more financially and politically globalised a country is. The Financial Globalisation (de jure) dimension accounts for the prevalence of foreign ownership and regulations in international capital flows, capital account openness and the number of bilateral investment agreements and treaties with investment provisions. Meanwhile, the Political Globalisation (de jure) dimension

**Table 1.** Summary statistics.

| Variables | Obs | Mean | Std Dev. | Min. | Max. | Source |
|---|---|---|---|---|---|---|
| Renewable energy policy | 495 | 0.58 | 1.01 | 0.00 | 6.00 | IEA, Grantham Institute on Climate Change and the Environment, NewClimate Institute |
| Dependence on hydrocarbon rents | 490 | 21.09 | 16.01 | 0.02 | 66.03 | World Bank |
| Dependence on oil rents | 490 | 18.73 | 16.02 | 0.02 | 65.16 | World Bank |
| Dependence on gas rents | 489 | 2.37 | 3.93 | 0.00 | 34.87 | World Bank |
| International investment ties | 495 | 49.06 | 15.77 | 18.12 | 82.13 | ETH Zürich |
| International diplomatic ties | 495 | 67.22 | 14.08 | 30.89 | 96.06 | ETH Zürich |
| Hydrocarbon rent abundance (ln) | 487 | 14.16 | 2.16 | 7.99 | 17.89 | US Energy Information Administration, Our World In Data |
| Oil rent abundance (ln) | 470 | 14.26 | 2.03 | 7.98 | 17.89 | US Energy Information Administration, Our World In Data |
| Gas rent abundance (ln) | 454 | 10.53 | 2.39 | 2.42 | 15.40 | US Energy Information Administration, Our World In Data |
| Political stability | 495 | −0.53 | 0.96 | −3.18 | 1.39 | World Bank |
| GDP per capita (ln) | 483 | 9.45 | 1.14 | 6.49 | 12.00 | World Bank |
| Vulnerability | 495 | 0.42 | 0.07 | 0.32 | 0.61 | ND-GAIN |

*Notes*: Independent and control variables are all lagged by 1 year. Hydrocarbon rent abundance, oil and gas rent abundance and GDP per capita are entered as a logarithmic function. Based on data covering the period 2005–2019.

accounts for the number of international intergovernmental organisations in which a country is a member of, the international treaties signed between two or more states and ratified by the highest legislative body of each country since 1945, and the number of distinct treaty partners of a country with bilateral investment treaties. These variables are lagged by one year. I also control for them to test H1.

### *Control variables*

In line with existing literature, I control for five other factors that may have a significant effect on the formal climate change mitigation commitment, thereby accounting for possible alternative explanations for why some hydrocarbon-rich exporting autocracies are more formally committed to climate change mitigation than others. All control variables are lagged by one year.

First, I control for hydrocarbon rent abundance, measured by the natural logarithm of the total value of oil and gas production per capita, just as Ross (2009) and Tadadjeu et al. (2023). This is because the value of oil and gas endowment measured this way is not just influenced by economic size or exports (Ross, 2009, pp. 3–4), and a hydrocarbon-rich country may have a diversified economy (Tadadjeu et al., 2023, p. 5). I disaggregate this into oil rent and gas rent abundance for robustness checks.

Second, I control for political stability which I measure using the World Bank's Political Stability and Absence of Violence/Terrorism indicator, in which the higher the score, the more politically stable or peaceful a country is. Political stability has been found to improve environmental outcomes (Adebayo et al., 2022; Anser et al., 2021; Mrabet et al., 2021; Purcel, 2019; Su et al., 2021). This may be due to stability creating more space for governments to attend to environmental policies, enhancing government capacity to implement such policies and limiting delay in doing so (Anser et al., 2021, p. 48018; Mrabet et al., 2021, p. 42; Purcel, 2019, p. 76). Political stability may also contribute to more income, increasing citizens' demand for environmental protection, in turn, adding pressure on policymakers to implement more environmental policies (Su et al., 2021, p. 6).

Third, just as Fredriksson and Neumayer (2013), Cao and Ward (2015), Tørstad et al. (2020), Tadadjeu et al. (2023), I control for national economic wealth which I measure by using the natural logarithm of real GDP per capita, purchasing power parity (current prices in international dollar) from the World Bank. This reflects the environmental Kuznet curve theory which suggests that in the first stage of industrialisation, people are more concerned about their economic wellbeing than the environment and cannot afford to protect it, but as incomes rise later, demand for environmental protection increases and environmental regulation may increase (Dasgupta et al., 2002; Grossman & Krueger, 1996).

Fourth, like Ang and Fredriksson (2021) and Tadadjeu et al. (2023), I control for the vulnerability to the physical impact of climate change, measured by the vulnerability component of the ND-GAIN Vulnerability Index from the Notre Dame Global Adaptation Initiative. It looks at a country's exposure, sensitivity and

adaptive capacity to climate change. The index is on a scale of 0–1 where the lower the score, the more vulnerable a country is.

Table 1 shows the descriptive statistics of the variables. In my sample, dependence on hydrocarbon rents has a mean value of 21.1% of GDP and when disaggregated into oil rents and gas rents, there are means of 18.7% and 2.4% respectively, which shows that oil rents have a greater share in terms of a country's GDP and therefore accounts for the bulk of dependence on hydrocarbon rents. Iraq was the most dependent on hydrocarbon rents with an average of 49.0% of GDP over 2005–2019, while Georgia was the least dependent on hydrocarbon rents with an average of 0.1%. The average number of renewable energy policies across the panel data is 1, with 6 policies being the maximum number of policies a country has had in a given year across 2005–2019 and 0 being the minimum. Over the 15-year period, Vietnam had the most renewable energy policies, totalling 37, while Sudan had the least with no renewable energy policies.

There is a negative correlation between dependence on hydrocarbon rents and the number of renewable energy policies. The correlation analysis of the variables can be found in the Appendix (see Table A1).

## Empirical findings

To test the hypothesis on the commitment to climate change mitigation of hydrocarbon-rich exporting autocracies, I employ a Poisson regression model for modelling the relationship between the predictor variable and a count variable (Ciaburro, 2018, p. 298). In the case of my study, dependence on hydrocarbon rents, international investment and diplomatic ties are the predictor variables and the number of renewable energy policies is the count variable.

Table 2 summarises the results of the impact of hydrocarbon rent dependence and the impact of the interaction between hydrocarbon rent dependence and international investment and diplomatic ties on renewable energy policy.

In Model 1, I find that the coefficient associated with dependence on hydrocarbon rents is negative and statistically significant at the 1.0% level. This suggests that there is evidence to support H1 that hydrocarbon-rich exporting autocracies with lower dependence on hydrocarbon rents are more formally committed to

**Table 2.** Effect of dependence on hydrocarbon rents and its interaction with international investment and diplomatic ties.

| | Dependent variable | |
|---|---|---|
| | Renewable energy policy | |
| | (1) | (2) |
| Hydrocarbon rent dependence | −0.027*** | −0.066** |
| | (0.008) | (0.033) |
| Hydrocarbon rent dependence*International investment ties | | −0.001* |
| | | (0.0003) |
| Hydrocarbon rent dependence*International diplomatic ties | | 0.001** |
| | | (0.0004) |
| International investment ties | −0.021*** | −0.011 |
| | (0.005) | (0.008) |
| International diplomatic ties | 0.045*** | 0.031*** |
| | (0.007) | (0.009) |
| Hydrocarbon rent abundance (ln) | 0.016 | 0.048 |
| | (0.073) | (0.073) |
| Political stability | 0.457*** | 0.460*** |
| | (0.095) | (0.094) |
| GDP per capita (ln) | 0.046 | 0.049 |
| | (0.148) | (0.150) |
| Vulnerability | 4.342*** | 4.206*** |
| | (1.605) | (1.597) |
| Constant | −4.469*** | −4.239*** |
| | (1.597) | (1.621) |
| Observations | 474 | 474 |
| Log Likelihood | −471.435 | −468.183 |
| Akaike Inf. Crit. | 958.869 | 956.365 |

*Notes*: *$p < 0.1$; **$p < 0.05$; ***$p < 0.01$. Robust standard errors in parentheses. Independent, interactive and control variables are all lagged by 1 year. Hydrocarbon rent abundance and GDP per capita are entered as a logarithmic function. Based on data covering the period 2005–2019.

climate change mitigation than hydrocarbon-rich exporting autocracies with higher dependence. In Model 2, I find that the coefficient associated with the interaction between hydrocarbon rent dependence and international investment ties is negative and statistically significant at the 10.0% level, and the coefficient size is reduced. This supports H2 that amongst hydrocarbon-rich exporting autocracies, the impact of hydrocarbon rent dependence on climate change mitigation policy output is moderated by international investment ties, such that the negative effect of hydrocarbon rent dependence weakens at lower levels of international investment ties. I also find that the coefficient associated with the interaction between hydrocarbon rent dependence and international diplomatic ties is positive and statistically significant at the 5.0% level. This is in line with H3 that amongst hydrocarbon-rich exporting autocracies, the impact of hydrocarbon rent dependence on climate change mitigation policy output is moderated by international diplomatic ties, such that the negative effect of hydrocarbon rent dependence disappears at higher levels of international diplomatic ties.

### *Robustness checks*

To confirm the main results, I perform several robustness tests in the Appendix. First, I disaggregate the main independent variable into dependence on oil rents and dependence on gas rents. This is to test if dependence on oil and gas rents separately have the same effects as in the original model (see Table A2 in the Appendix). Second and third, I disaggregate autocracies into electoral autocracies and closed autocracies to test if the aggregated and disaggregated dependence on hydrocarbon rents still holds in different types of autocracies (see Tables A3 and A4 in the Appendix). The results of the robustness checks are similar to the main results but there are some nuances. Analysis of the robustness checks are shown in the Appendix.

## Discussion

The aim of this study is to understand why some hydrocarbon-rich exporting autocracies are more formally committed to climate change mitigation than other hydrocarbon-rich exporting autocracies.

In line with H1, I find sufficient evidence to suggest that hydrocarbon-rich exporting autocracies with lower dependence on hydrocarbon rents are more likely to be formally committed to climate change mitigation than hydrocarbon-rich exporting autocracies with higher dependence. More specifically, amongst hydrocarbon-rich exporting autocracies, higher number of renewable energy policies is more likely in countries with lower dependence on hydrocarbon rents than in countries with higher dependence. When dependence on hydrocarbon rents is disaggregated, I find sufficient evidence to suggest that countries with lower dependence on oil and gas rents, separately, are more likely to have renewable energy policies. This is consistent with the findings of Tadadjeu et al. (2023) that dependence on oil rents has a negative and significant effect on the stringency of climate change policies. The negative and statistically significant result offers evidence to suggest that renewable energy is the antithesis of oil and gas (Namrata et al., 2024: 43). It is also consistent with the resource curse literature, lending support to Auty (2001)'s claim that resource-rich countries enter a 'staple trap' as their access to vast resource rents reduces the incentive to invest in industrialisation, and in the case of my study, climate change mitigation. As these countries tend to be undemocratic (Bulte & Damania, 2008; Mehlum et al., 2006), my results suggest that hydrocarbon-rich exporting autocracies with lower dependence on hydrocarbon rents may perceive climate change mitigation commitment through adopting renewable energy policies, as less of a threat to their profitability and autocratic survival. This is because such policies allow them to develop new and profitable renewable energy sectors as an alternative source of revenue to the hydrocarbon revenue that has been used for maintaining the stability of their autocratic regimes through spending on patronage and boosting internal security apparatuses (Ross, 2001; Ulfelder, 2007; Wright et al., 2013). The result also indicates that hydrocarbon-rich exporting autocracies that are less dependent on hydrocarbon rents than their peers may be less 'grabber friendly' as Mehlum et al. (2006) describes. There may be less incentive for autocrats in hydrocarbon-rich exporting countries to access and capture oil and gas rents, providing more room for the promotion of renewable energy policies than their counterparts with higher dependence.

Similarly to Tadadjeu et al. (2023), there is enough evidence to suggest that dependence on hydrocarbon rents and hydrocarbon rent abundance have opposite effects. Indeed, unlike dependence on hydrocarbon rents, hydrocarbon rent abundance has a positive – though insignificant effect contrary to Tadadjeu et al. (2023) – on the number of renewable energy policies. This suggests that dependence on hydrocarbon rents is associated with rent-seeking behaviour from political elites, undermining the adoption of renewable energy policies (Tadadjeu et al., 2023: 15).

Meanwhile, amongst closed hydrocarbon-rich exporting autocracies, when hydrocarbon rent dependence is aggregated, there is a negative and statistically significant relationship with renewable energy policy, but the effect is positive and statistically insignificant when hydrocarbon rent dependence is disaggregated. This may suggest that when dependence on collective oil and gas rents decline, oil and gas economic elites' joint political influence weakens, providing more room for pro-climate elites to push for renewable energy policies. However, individually, the insignificant effect oil and gas rent dependence have on renewable energy policies might imply that there are limited political actors engaged in oil and gas rent-seeking so the impact of dependence might be trivial, and gas itself may be promoted as a transitional fuel in these autocracies (Marques & Pires, 2019). Furthermore, the irregularity of elections in closed autocracies may not prompt incumbents to respond to the climate change concerns of the public, rendering the individual negative effects of dependence on oil and gas rents on renewable energy policies insignificant.

I also find evidence to suggest that the impact of hydrocarbon rent dependence on climate change mitigation policy output is moderated by international investment ties, such that the negative effect of hydrocarbon rent dependence weakens at lower levels of international investment ties, in line with H2. This adds to the idea that IOCs are more willing to generate profit than protect the environment (Hansen, 2022), so hydrocarbon-rich exporting autocracies with lower levels of international investment exposure to them likely face less pressure to resist the energy transition. Although, there has been a shift towards integrating environmental principles into business and investment strategies since the mid-2010s and early 2020s (Passas, 2024). IOCs are increasingly recognising the financial risk of hydrocarbons becoming stranded assets due to growing societal awareness of climate change causing future hydrocarbon demand or investment to fall (Vieira et al., 2023, p. 1255). Hence, they are investing more in renewable energy (Pickl, 2019). However, this does not necessarily encourage IOCs to pressure hydrocarbon-rich exporting autocracies to create a policy environment for renewable energy, as demand for oil and gas has not yet peaked.

In line with H3, I find evidence to suggest that amongst hydrocarbon-rich exporting autocracies, the impact of hydrocarbon rent dependence on climate change mitigation policy output is moderated by international diplomatic ties, such that the negative effect of hydrocarbon rent dependence disappears at higher levels of international diplomatic ties. This substantiates the findings of Fankhauser (2016) that international political factors such as the signing of international climate treaties also influence the passage of domestic climate change legislation, reflecting the pressure of maintaining positive international standing. Beyond the reputational risk coming from diplomatic ties, it can also be inferred that some hydrocarbon-rich exporting autocracies are not isolated from climate diplomacy despite the importance of non-renewable energy in their political economy. This might be because they still interact with other countries that are formally committed to climate change mitigation through official meetings, diplomatic communications and policy knowledge exchanges at international forums, causing mitigation policy diffusion (Kammerer & Namhata, 2018, pp. 479, 483).

However, amongst electoral hydrocarbon-rich exporting autocracies, I find insufficient evidence to suggest that at lower levels of international investment ties decrease and higher levels of international diplomatic ties increase, the negative impact of hydrocarbon rent dependence (whether aggregated or disaggregated) on renewable energy policy weakens or disappears. The presence of elections keeping leaders responsive to public climate change concerns, even if it is only symbolic, may diminish the effect that pressure from international investors and diplomatic partners has. Also, amongst closed autocracies, I find insufficient evidence to suggest that at higher levels of international diplomatic ties, the negative impact of hydrocarbon rent dependence (whether aggregated or disaggregated) on renewable energy policy weakens or disappears. On the other hand, I find evidence to suggest that at higher levels of international investment ties, the negative impact of aggregated hydrocarbon rent dependence and oil rent dependence

on renewable energy policy weakens. This contrast could reflect closed hydrocarbon-rich exporting autocracies having significantly closer ties to foreign investors, particularly IOCs, than diplomatic partners so when they are less exposed to IOCs, the effect of the level of international investment ties is more profound on their formal commitment to climate change mitigation.

## Conclusion and implications

This study contributes to the literature on the political economy of natural resources by illustrating how dependence on hydrocarbon rents explains why some hydrocarbon-rich exporting autocracies are more formally committed to climate change mitigation than other hydrocarbon-rich exporting autocracies. It sheds new light on how climate change mitigation commitment is related to dependence on hydrocarbon rents, advancing the resource curse literature towards the field of environmental political economy. My findings, based on the analysis of 33 hydrocarbon-rich exporting autocracies in 2005–2019, support the following expectations. First, hydrocarbon-rich exporting autocracies with lower dependence on hydrocarbon rents are more likely formally committed to climate change mitigation than hydrocarbon-rich exporting autocracies with higher dependence. Second and third, the negative impact of hydrocarbon rent dependence on climate change mitigation policy output weakens at lower levels of international investment ties, and disappears at higher levels of international diplomatic ties.

While my findings do not imply that hydrocarbon rent dependence and its interaction with international investment and diplomatic ties have an impact on actual mitigation efforts, they still have implications for the understanding of political institutions on environmental policy. The results shed new light on how there is no homogenous disadvantage of autocracies in climate change mitigation policy output by showing how varying levels of dependence on hydrocarbon rents combined with levels of international ties, impact formal commitments to climate change mitigation. Furthermore, although international organisations, non-government organisations and sustainability-aligned investors must understand that formal climate change commitment does not mean successful implementation, my study can still help international policymakers and investors identify aiding factors in the policy intention to mitigate against climate change.

That said, my empirical results should be considered in light of a few limitations. First, this study has focused exclusively on hydrocarbon-rich exporting autocracies, limiting the variation necessary to test whether hydrocarbon rent dependence reduces formal climate change commitment. Further research could go into expanding the sample of countries to include hydrocarbon-rich exporting democracies or hydrocarbon-poor importing autocracies and democracies. Similar research could additionally focus on the effect of dependence on coal rents on climate change mitigation commitment in democracies and autocracies, compared to dependence on oil and gas rents. Second, this study has treated climate change mitigation policy output as a proxy for formal commitment to climate change mitigation rather than focusing on policy outcomes indicating real mitigation efforts. Future research could therefore look at implementation indicators such as greenhouse gas or carbon emissions reduction, the rate of extraction of existing fossil fuel reserves, the phasing out of fossil fuel subsidies, and installed renewable energy capacity. Addressing both limitations simultaneously, future research could also investigate whether climate change mitigation policy implementation gaps vary across levels of fossil fuel rent dependence and political accountability.

## Note

1. Sample of hydrocarbon-rich exporting countries: Algeria, Angola, Azerbaijan, Bahrain, Brunei, Cameroon, Congo, Egypt, Equatorial Guinea, Gabon, Georgia, Iran, Iraq, Kazakhstan, Kuwait, Libya, Malaysia, Mozambique, Myanmar, Nigeria, Oman, Papua New Guinea, Qatar, Russia, Saudi Arabia, Sudan, Tunisia, Turkmenistan, United Arab Emirates, Uzbekistan, Venezuela, Vietnam, Yemen.

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## Data availability statement

The data that supports the findings of this study are available upon request.

## Notes on contributor

***Winifred Michael*** is a PhD candidate from the University of Essex's Department of Government. Her research interests lie within the intersection of political economy and environmental politics. She aims to contribute to the growing knowledge and discourse surrounding the political economy of decarbonisation in oil and gas-exporting countries.

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## References

Adebayo, T. S., Akadiri, S. S., Uhunamure, S. E., Altuntaş, M., & Shale, K. (2022). Does political stability contribute to environmental sustainability? Evidence from the most politically stable economies. *Heliyon*, *8*(12), e12479. https://doi.org/10.1016/j.heliyon.2022.e12479

Agone, J. (2007). Amplifying public opinion: The policy impact of the U.S. environmental movement. *Social Forces*, *85*(4), 1593–1620. https://doi.org/10.1353/sof.2007.0059

Al Doyaili, S., & Wangler, L. (2017). What drives compliance with international environmental agreements? In M. O. Kayalıca, S. Çağatay, & H. Mıhçı (Eds.), *Economics of International Environmental Agreements* (pp. 15–34). Routledge.

Anderson, B., Böhmelt, T., & Ward, H. (2017). Public opinion and environmental policy output: a cross-national analysis of energy policies in Europe. *Environmental Research Letters*, *12*(11), 114011. https://doi.org/10.1088/1748-9326/aa8f80

Ang, J. B., & Fredriksson, P. G. (2021). Does an early start help or hurt? Statehood, institutions and modern climate change policies. *Energy Economics*, *94*, 105075. https://doi.org/10.1016/j.eneco.2020.105075

Anser, M. K., Syed, Q. R., & Apergis, N. (2021). Does geopolitical risk escalate CO2 emissions? Evidence from BRICS countries. *Environmental Science and Pollution Research*, *28*(35), 48011–48021. https://doi.org/10.1007/s11356-021-14032-z.

Ashford, E. (2022). *Oil, the state and war: The foreign policies of petrostates*. Georgetown University Press.

Auty, R. M. (2001). The political economy of resource-driven growth. *European Economic Review*, *45*(4–6), 839–846. https://doi.org/10.1016/S0014-2921(01)00126-X

Battig, M. B., & Bernauer, T. (2009). National institutions and global public goods: Are democracies more cooperative in climate change policy? *International Organization*, *63*(2), 281–308. https://doi.org/10.1017/S0020818309090092

Beeson, M. (2010). The coming of environmental authoritarianism. *Environmental Politics*, *19*(2), 276–294. https://doi.org/10.1080/09644010903576918

Bulte, E., & Damania, R. (2008). Resources for sale: corruption, democracy and the natural resource curse. *The B.E. Journal of Economic Analysis & Policy*, *8*(1), 1–28. https://doi.org/10.2202/1935-1682.1890

Busch, P. O., & Jörgens, H. (2005). The international sources of policy convergence: explaining the spread of environmental policy innovations. *Journal of European Public Policy*, *12*(5), 860–884. https://doi.org/10.1080/13501760500161514

Cao, X., & Ward, H. (2015). Winning coalition size, state capacity, and time horizons: An application of modified selectorate theory to environmental public goods provision. *International Studies Quarterly*, *59*(2), 264–279. https://doi.org/10.1111/isqu.12163

Ciaburro, G. (2018). *Regression analysis with R: Design and develop statistical nodes to identify unique relationships within data at scale*. Packt Publishing.

Climate Action Tracker. (2025). *Saudi Arabia: Policies and action*. https://climateactiontracker.org/countries/saudi-arabia/policies-action/ (Accessed 10 June 2025).

Congleton, R. D. (1992). Political institutions and pollution control. *The Review of Economics and Statistics*, *74*(3), 412–421. https://doi.org/10.2307/2109485

Dasgupta, S., Laplante, B., Wang, J., & Wheeler, D. (2002). Confronting the environmental Kuznets curve. *Journal of Economic Perspectives*, *16*(1), 147–168. https://doi.org/10.1257/0895330027157

Eichhorn, K., & Linhart, E. (2022). Autocratic heterogeneity in the provision of environmental protection. *Zeitschrift für Vergleichende Politikwissenschaft*, *16*(1), 5–30. https://doi.org/10.1007/s12286-022-00519-7.

Eisenstadt, T. A., Fiorino, D. J., & Stevens, D. (2019). National environmental policies as shelter from the storm: Specifying the relationship between extreme weather vulnerability and national environmental performance. *Journal of Environmental Studies and Sciences*, *9*(1), 96–107. https://doi.org/10.1007/s13412-018-0523-4

Falkner, R. (2016). The Paris Agreement and the new logic of international climate politics. *International Affairs*, *92*(5), 1107–1125. https://doi.org/10.1111/1468-2346.12708

Fankhauser, S. (2016). Do international factors influence the passage of climate change legislation? *Climate Policy*, *16*(3), 318–331. https://doi.org/10.1080/14693062.2014.1000814

Fredriksson, P. G., & Neumayer, E. (2013). Democracy and climate change policies: Is history important?. *Ecological Economics*, *95*, 11–19. https://doi.org/10.1016/j.ecolecon.2013.08.002.

Gilley, B. (2012). Authoritarian environmentalism and China's response to climate change. *Environmental Politics*, *21*(2), 287–307. https://doi.org/10.1080/09644016.2012.651904

Grantham Institute on Climate Change and the Environment. (2024). *Climate change laws of the World*. https://climate-laws.org (Accessed August 5, 2024).

Grossman, G. M., & Krueger, A. B. (1996). The inverted-U: What does it mean? *Environment and Development Economics*, *1*(1), 119–122. https://doi.org/10.1017/S1355770X00000450

Hansen, T. A. (2022). Stranded assets and reduced profits: Analyzing the economic underpinnings of the fossil fuel industry's resistance to climate stabilization. *Renewable and Sustainable Energy Reviews*, *158*, 112144. https://doi.org/10.1016/j.rser.2022.112144

Heggelund, G. (2007). China's climate change policy: Domestic and international developments. *Asian Perspective*, *31*(2), 155–191. https://doi.org/10.1353/apr.2007.0017

Hormio, S. (2023). Collective responsibility for climate change. *WIREs Climate Change*, *14*(4), 4. https://doi.org/10.1002/wcc.830

International Energy Agency. (2024). *Policies database*. https://www.iea.org/policies (Accessed August 5 2024).

Kammerer, M., & Namhata, C. (2018). What drives the adoption of climate change mitigation policy? A dynamic network approach to policy diffusion. *Policy Sciences*, *51*(4), 477–513. https://doi.org/10.1007/s11077-018-9332-6

Krane, J., & Monaldi, F. J. (2017). *Oil prices, political instability, and energy subsidy reform in MENA oil exporters*. Baker Institute for Public Policy, Rice University. https://www.bakerinstitute.org/sites/default/files/2017-09/import/CES-pub-QLC_Subsidies-061317.pdf (Accessed 10 June 2025).

Marques, A. C., & Pires, P. S. (2019). Is there a resource curse phenomenon for natural gas? Evidence from countries with abundant natural gas. *Resource Policy*, *65*, 101466. https://doi.org/10.1016/j.resourpol.2019.101466

Mehlum, H., Moene, K., & Torvik, R. (2006). Institutions and the resource curse. *The Economic Journal*, *116*(1), 1–20. https://doi.org/10.1111/j.1468-0297.2006.01045.x

Mittiga, R. (2022). Political legitimacy, authoritarianism and climate change. *American Political Science Review*, *116*(3), 998–1011. https://doi.org/10.1017/S0003055421001301

Mrabet, Z., Alsamara, M., Mimouni, K., & Mnasri, A. (2021). Can human development and political stability improve environmental quality? Evidence from the MENA region. *Economic Modelling*, *94*, 28–44. https://doi.org/10.1016/j.econmod.2020.09.021

Namrata, K., Saini, R. P., & Kothari, D. P. (2024). *Wind and Solar Energy Systems*. Springer Nature.

Neumayer, E. (2002). Do democracies exhibit stronger international environmental commitment? A cross-country analysis. *Journal of Peace Research*, *39*(2), 139–164. https://doi.org/10.1177/0022343302039002001

New Climate Institute, Wageningen University and Research & PBL Netherlands Environmental Assessment Agency. (2024). *Climate policy database*. https://doi.org/10.5281/zenodo.154329464 (Accessed August 5 2024).

Passas, I. (2024). The evolution of ESG: From CSR to ESG 2.0. *Encyclopedia*, *4*(4), 1711–1720. https://doi.org/10.3390/encyclopedia4040112

Pickl, M. J. (2019). The renewable energy strategies of oil majors – From oil to energy? *Energy Strategy Reviews*, *26*, 100370. https://doi.org/10.1016/j.esr.2019.100370

Povitkina, M. (2018). The limits of democracy in tackling climate change. *Environmental Politics*, *27*(*3*), 411–432. https://doi.org/10.1080/09644016.2018.1444723.

Purcel, A. A. (2019).Does political stability hinder pollution? Evidence from developing states. *The Economic Research Guardian*, *9*(2), 75–98.

Ross, M. (2009). *Oil and democracy revisited*. UCLA. https://www.sscnet.ucla.edu/polisci/faculty/ross/papers/working/Oil%20and%20Democracy%20Revisited.pdf (Accessed August 2 2024).

Ross, M. L. (2001). Does oil hinder democracy. *World Politics*, *53*(3), 325–361. https://doi.org/10.1353/wp.2001.0011

Shen, S. V. (2024). Can autocracy handle climate change? *PS: Political Science and Politics*, *57*(4), 487–492. https://doi.org/10.1017/S104909652400026X

Sprinz, D., & Vaahtoranta, T. (1994). The Interest-based explanation of international environmental policy. *International Organization*, *48*(1), 77–105. https://doi.org/10.1017/S0020818300000825

Su, Z. W., Umar, M., Kirikkaleli, D., & Adebayo, T. S. (2021). Role of political risk to achieve carbon neutrality: Evidence from Brazil. *Journal of Environmental Management*, *298*, 113463. https://doi.org/10.1016/j.jenvman.2021.113463.

Tadadjeu, S., Njangang, H., & Woldenmichael, A. (2023). Are resource-rich countries less responsive to global warming? Oil wealth and climate change policy. *Energy Policy*, *182*, 113774. https://doi.org/10.1016/j.enpol.2023.113774

Tambari, I., Failler, P., & Jaffry, S. (2024). Understanding the interplay: Oil price and renewable energy investment in Africa's net oil importing and net oil exporting countries. *Resources Policy*, *91*, 104875 . https://doi.org/10.1016/j.resourpol.2024.104875.

Tørstad, V., Saelen, H., & Standal Bøyum, L. (2020). The domestic politics of international climate commitments: Which factors explain cross-country variation in NDC ambition? *Environmental Research Letters*, *15*(2), 024021. https://doi.org/10.1088/1748-9326/ab63e0

Tubi, A., Fischhendler, I., & Feitelson, E. (2012). The effect of vulnerability on climate change mitigation policies. *Global Environmental Change*, *22*(2), 472–482. https://doi.org/10.1016/j.gloenvcha.2012.02.004

Ulfelder, J. (2007). Natural-resource wealth and the survival of autocracy. *Comparative Political Studies*, *40*(8), 995–1018. https://doi.org/10.1177/0010414006287238

Vieira, L. C., Longo, M., & Mura, M. (2023). From carbon dependence to renewables: The European oil majors' strategies to face climate change. *Business Strategy and the Environment*, *32*(4), 1248–1259. https://doi.org/10.1002/bse.3185

Weaver, A. A. (2008). Does protest behavior mediate the effects of public opinion on national environmental policies? A simple question and a complex answer. *International Journal of Sociology*, *38*(3), 108–125. https://doi.org/10.2753/IJS0020-7659380305

Winslow, M. (2005). Is democracy good for the environment. *Journal of Environmental Planning and Management*, *48*(5), 771–783. https://doi.org/10.1080/09640560500183074

World Bank. (2024a). *Natural gas rents (% of GDP)*. Available athttps://data.worldbank.org/indicator/NY.GDP.NGAS.RT.ZS [Accessed: August 5, 2024].

World Bank. (2024b). *Oil rents (% ofGDP)*. Available at https://data.worldbank.org/indicator/NY.GDP.PETR.RT.ZS [Accessed: August 5, 2024].

Wright, J., Frantz, E., & Geddes, B. (2015). Oil and autocratic regime survival. *British Journal of Political Science*, *45*(2), 287–306. https://doi.org/10.1017/S0007123413000252

Wurster, S. (2013). Comparing ecological sustainability in autocracies and democracies. *Contemporary Politics*, *19*(*1*), 76–93. https://doi.org/10.1080/13569775.2013.773204.

Zimmer, A., Jakob, M., & Steckel, J. C. (2015). What motivates Vietnam to strive for a low-carbon economy? – On the drivers of climate policy in a developing country. *Energy for Sustainable Development*, *24*, 19–32. https://doi.org/10.1016/j.esd.2014.10.003

## Appendix

**Table A1.** Correlation matrix.

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| (1) Renewable energy policy | 1.00 | | | | | | | | | | | |
| (2) Hydrocarbon rent dependence | −0.23 | 1.00 | | | | | | | | | | |
| (3) Oil rent dependence | −0.20 | 0.97 | 1.00 | | | | | | | | | |
| (4) Gas rent dependence | −0.11 | 0.12 | −0.12 | 1.00 | | | | | | | | |
| (5) International investment ties | −0.03 | −0.14 | −0.12 | −0.07 | 1.00 | | | | | | | |
| (6) International diplomatic ties | 0.24 | −0.26 | −0.18 | −0.33 | 0.16 | 1.00 | | | | | | |
| (7) Hydrocarbon rent abundance (ln) | −0.17 | 0.73 | 0.71 | 0.06 | 0.13 | −0.07 | 1.00 | | | | | |
| (8) Oil rent abundance (ln) | −0.15 | 0.71 | 0.71 | 0.01 | 0.11 | −0.09 | 1.00 | 1.00 | | | | |
| (9) Gas rent abundance (ln) | −0.15 | 0.40 | 0.29 | 0.41 | 0.29 | −0.12 | 0.67 | 0.67 | 1.00 | | | |
| (10) Political stability | 0.01 | 0.14 | 0.09 | 0.18 | 0.26 | −0.34 | 0.37 | 0.44 | 0.43 | 1.00 | | |
| (11) GDP per capita (ln) | −0.12 | 0.45 | 0.44 | 0.02 | 0.45 | −0.02 | 0.82 | 0.79 | 0.71 | 0.50 | 1.00 | |
| (12) Vulnerability | −0.01 | −0.17 | −0.10 | −0.28 | −0.15 | −0.24 | −0.45 | −0.40 | −0.57 | −0.42 | −0.63 | 1.00 |

Notes: Independent, interactive and control variables are all lagged by 1 year. Hydrocarbon rent abundance, oil and gas rent abundance and GDP per capita are entered as a logarithmic function. Based on data covering the period 2005–2019.

Table A1 shows the correlation analysis of the variables. The results show a mostly weak correlation between the modelled variables, suggesting a lower likelihood of multicollinearity. There is a negative correlation between dependence on hydrocarbon rents and the number of renewable energy policies, in line with H1. There is equally a negative correlation when dependence on hydrocarbon rents is disaggregated.

**Table A2.** Effect of disaggregated dependence on hydrocarbon rents in hydrocarbon-rich exporting autocracies.

| | Dependent variable: | |
|---|---|---|
| | Renewable energy policy | |
| | (1) | (2) |
| Oil rent dependence | −0.027*** | −0.048 |
| | (0.008) | (0.035) |
| Gas rent dependence | −0.072* | −0.198 |
| | (0.043) | (0.181) |
| Oil rent dependence*International investment ties | | −0.001** |
| | | (0.0004) |
| Oil rent dependence*International diplomatic ties | | 0.001 |
| | | (0.0005) |
| Gas rent dependence*International investment ties | | 0.0003 |
| | | (0.003) |
| Gas rent dependence*International diplomatic ties | | 0.001 |
| | | (0.002) |
| International investment ties | −0.019*** | −0.006 |
| | (0.006) | (0.010) |
| International diplomatic ties | 0.044*** | 0.027** |
| | (0.008) | (0.010) |
| Oil rent abundance (ln) | −0.026 | 0.005 |
| | (0.077) | (0.080) |
| Gas rent abundance (ln) | 0.066 | 0.089 |
| | (0.057) | (0.060) |
| Political stability | 0.407*** | 0.368*** |
| | (0.108) | (0.106) |
| GDP per capita (ln) | 0.013 | 0.030 |
| | (0.179) | (0.182) |
| Vulnerability | 5.920*** | 5.885*** |
| | (1.995) | (2.010) |
| Constant | −4.762** | −4.868** |
| | (2.120) | (2.323) |
| Observations | 424 | 424 |
| Log Likelihood | −423.180 | −418.548 |
| Akaike Inf. Crit. | 866.361 | 865.096 |

Notes: *$p < 0.1$; **$p < 0.05$; ***$p < 0.01$. Robust standard errors in parentheses. Independent, interactive and control variables are all lagged by 1 year. Oil and gas rent abundance and GDP per capita are entered as a logarithmic function. Based on data covering the period 2005–2019.

Table A2 presents the results of the robustness checks when I consider the disaggregated dependence on hydrocarbon rents. In Model 1, I find that the coefficient associated with the disaggregated dependence on hydrocarbon rents is negative and statistically significant. In Model 2, I find that amongst the variables of interest, only the coefficient associated with the interaction between oil rent dependence and international investment ties is negative and statistically significant.

**Table A3.** Aggregated and disaggregated effect of hydrocarbon rents in electoral hydrocarbon-rich autocracies.

| | Dependent variable | | | |
|---|---|---|---|---|
| | Renewable energy policy | | | |
| | (1) | (2) | (3) | (4) |
| Hydrocarbon rent dependence | −0.015 | −0.048 | | |
| | (0.011) | (0.049) | | |
| Oil rent dependence | | | −0.027** | −0.075 |
| | | | (0.012) | (0.051) |
| Gas rent dependence | | | −0.221** | −0.475 |
| | | | (0.097) | (0.579) |
| Hydrocarbon rent dependence*International investment ties | | 0.0004 | | |
| | | (0.001) | | |
| Hydrocarbon rent dependence*International diplomatic ties | | 0.0002 | | |
| | | (0.001) | | |
| Oil rent dependence*International investment ties | | | | 0.0002 |
| | | | | (0.001) |
| Oil rent dependence*International diplomatic ties | | | | 0.001 |
| | | | | (0.001) |
| Gas rent dependence*International investment ties | | | | −0.003 |
| | | | | (0.006) |

(*Continued*)

**Table A3.** Continued.

| | Dependent variable | | | |
|---|---|---|---|---|
| | Renewable energy policy | | | |
| | (1) | (2) | (3) | (4) |
| Gas rent dependence*International diplomatic ties | | | | 0.005 |
| | | | | (0.006) |
| International investment ties | −0.002 | −0.008 | 0.001 | 0.002 |
| | (0.008) | (0.012) | (0.008) | (0.017) |
| International diplomatic ties | 0.048*** | 0.044*** | 0.034*** | 0.019 |
| | (0.011) | (0.013) | (0.011) | (0.017) |
| Hydrocarbon rent abundance (ln) | 0.154 | 0.141 | | |
| | (0.104) | (0.104) | | |
| Oil rent abundance (ln) | | | 0.035 | −0.017 |
| | | | (0.134) | (0.153) |
| Gas rent abundance (ln) | | | 0.254** | 0.302*** |
| | | | (0.103) | (0.113) |
| Political stability | 0.314** | 0.287* | 0.039 | 0.036 |
| | (0.144) | (0.155) | (0.163) | (0.177) |
| GDP per capita (ln) | −0.426* | −0.384 | −0.031 | 0.051 |
| | (0.237) | (0.241) | (0.283) | (0.296) |
| Vulnerability | −0.873 | −0.798 | 3.683 | 4.551 |
| | (2.525) | (2.589) | (2.920) | (3.010) |
| Constant | −1.429 | −1.057 | −6.625** | −6.294* |
| | (2.595) | (2.639) | (3.287) | (3.564) |
| Observations | 284 | 284 | 245 | 245 |
| Log Likelihood | −279.189 | −278.846 | −241.370 | −240.376 |
| Akaike Inf. Crit. | 574.378 | 577.691 | 502.740 | 508.753 |

*Notes*: *$p < 0.1$; **$p < 0.05$; ***$p < 0.01$. Robust standard errors in parentheses. Independent, interactive and control variables are all lagged by 1 year. Hydrocarbon rent abundance, oil and gas rent abundance and GDP per capita are entered as a logarithmic function. Based on data covering the period 2005–2019.

Table A3 summarises the results of the robustness checks when I consider the effects of aggregated and disaggregated dependence on hydrocarbon rents in electoral hydrocarbon-rich exporting autocracies. In Model 1, the coefficient associated with the dependence on hydrocarbon rents is negative but not statistically significant. In Models 2 and 4, amongst the variables of interest, none of the coefficients are statistically significant. In Model 3, the coefficients associated with disaggregated dependence on hydrocarbon rents are negative and statistically significant.

**Table A4.** Aggregated and disaggregated effect of hydrocarbon rents in closed hydrocarbon-rich autocracies.

| | Dependent variable | | | |
|---|---|---|---|---|
| | Renewable energy policy | | | |
| | (1) | (2) | (3) | (4) |
| Hydrocarbon rent dependence | −0.046*** | 0.051 | | |
| | (0.013) | (0.059) | | |
| Oil rent dependence | | | −0.017 | −0.043 |
| | | | (0.015) | (0.082) |
| Gas rent dependence | | | −0.008 | −0.477 |
| | | | (0.057) | (0.297) |
| Hydrocarbon rent dependence*International investment ties | | −0.002** | | |
| | | (0.001) | | |
| Hydrocarbon rent dependence*International diplomatic ties | | −0.001 | | |
| | | (0.001) | | |
| Oil rent dependence*International investment ties | | | | −0.001** |
| | | | | (0.001) |
| Oil rent dependence*International diplomatic ties | | | | 0.001 |
| | | | | (0.001) |
| Gas rent dependence*International investment ties | | | | −0.003 |
| | | | | (0.006) |
| Gas rent dependence*International diplomatic ties | | | | 0.011 |
| | | | | (0.007) |
| International investment ties | −0.029*** | 0.002 | −0.009 | 0.028 |
| | (0.008) | (0.016) | (0.011) | (0.019) |
| International diplomatic ties | 0.066*** | 0.054** | 0.012 | −0.053 |
| | (0.012) | (0.024) | (0.020) | (0.039) |
| Hydrocarbon rent abundance (ln) | 0.044 | 0.015 | | |
| | (0.126) | (0.135) | | |
| Oil rent abundance (ln) | | | −0.199 | −0.171 |
| | | | (0.141) | (0.147) |
| Gas rent abundance (ln) | | | −0.700*** | −0.749*** |
| | | | (0.160) | (0.200) |

(*Continued*)

**Table A4.** Continued.

| | Dependent variable | | | |
|---|---|---|---|---|
| | Renewable energy policy | | | |
| | (1) | (2) | (3) | (4) |
| Political stability | 0.548*** | 0.349** | 0.208 | 0.186 |
| | (0.137) | (0.152) | (0.187) | (0.203) |
| GDP per capita (ln) | −0.105 | 0.071 | 0.783** | 1.002** |
| | (0.230) | (0.240) | (0.361) | (0.395) |
| Vulnerability | 5.849** | 6.127** | −7.359 | −3.753 |
| | (2.640) | (2.611) | (4.494) | (5.635) |
| Constant | −4.344* | −6.314** | 5.366 | 4.289 |
| | (2.347) | (2.503) | (3.892) | (5.541) |
| Observations | 190 | 190 | 179 | 179 |
| Log Likelihood | −165.434 | −161.150 | −143.684 | −139.730 |
| Akaike Inf. Crit. | 346.867 | 342.299 | 307.367 | 307.459 |

*Notes*: *$p < 0.1$; **$p < 0.05$; ***$p < 0.01$. Robust standard errors in parentheses. Independent, interactive and control variables are all lagged by 1 year. Hydrocarbon rent abundance, oil and gas rent abundance and GDP per capita are entered as a logarithmic function. Based on data covering the period 2005–2019.

Table A4 summarises the results of the robustness checks when I consider the effects of aggregated and disaggregated dependence on hydrocarbon rents in closed hydrocarbon-rich exporting autocracies. In Model 1, the coefficient associated with the dependence on hydrocarbon rents is negative and statistically significant. In Model 2, amongst the variables of interest, only the coefficient associated with the interaction between hydrocarbon rent dependence and international investment ties is negative and statistically significant. In Model 3, amongst the variables of interest, none of the coefficients are statistically significant. In Model 4, only the coefficient associated with the interaction between oil rent dependence and international investment ties is negative and statistically significant.