

# *What motivates the ‘green’ transition: Russian and European perspectives*

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# **What motivates the ‘green’ transition: Russian and European perspectives**

## **Abstract**

This paper considers the challenges of the ‘green’ transition and analyses to what extent political motivations weigh in the decision to replace fossil fuels by renewables in the energy mix. While the environmental reasons for the transition have been thoroughly explored in the literature, the influence of political factors on the decision to promote renewables remains underexplored. The EU’s active mobilisation against Russian oil and gas imports after the 2022 hostilities in Ukraine is but the latest indication of the growing impact of political considerations on energy decision-making. We use qualitative methods based on expert interviews triangulated with an analysis of energy mixes to determine the main factors behind the choice to develop and actively promote renewables. A comparative analysis of the European Union and Russia reveals that the motivation to reach or preserve energy independence guides both countries dependent on energy imports and fossil fuel exporters in their agenda regarding renewables, but results in different policy choices. The paper also provides an analytical framework to assess energy independence, highlights some of the social and economic risks related to the green transition, and offers recommendations on robust policy-making on energy mixes under conditions of uncertainty.

## **Key words**

Energy transition, just transition, renewables, sanctions, energy dependence, robust policy-making.

## **Highlights**

- The ‘green transition’ to renewable energy is motivated by political as well as environmental concerns.
- The desire for energy independence guides the energy policies of O&G importers and fossil fuel producers and should be recognised as a legitimate governmental goal.
- The transfer to renewables presents underestimated social and economic risks.
- The prospective ban on Russian fossil fuels in the EU may negatively impact economic growth and the transition to renewables.

## **1- Introduction**

“The stone age did not end because the world ran out of stones, and the oil age will end, but not for lack of oil.” This maxim penned by Sheikh Zaki Yamani, Minister of Petroleum and Mineral of Saudi Arabia from 1962 to 1986 sums up the complexity and unpredictability of energy transitions which occur as a result of disruptive technological innovations, market mechanisms and, more recently, political decision-making. Defined as ‘the switch from an economic system dependent on one or a series of energy sources and technologies to another’ (Fouquet and Pearson 2012), energy transitions are characterised by the progressive shift from one type of energy source to a different one, which has a long-term social, economic and political impact on the whole of society.

Historically, energy transitions have shared a number of common traits: they were spontaneous, gradual, brought about by economic and technological development, enhanced the wellbeing of the population and led to a lesser dependence on natural phenomena such as the weather. The ‘green’ energy transition represents a rupture in this trend as it is government-led, promotes a less efficient and technologically immature form of energy (renewables), renders countries more reliant on the climate and the weather and may result in a short-term decrease in the

economic wellbeing of the population. Climate change presents a new life-threatening challenge to humankind, forcing governments to engage in proactive state interventionism in energy markets.

This paper considers the challenges and benefits of the ‘green’ transition to renewables and addresses the following research question: To what extent do political motivations weigh in on the decision to transition to ‘green’ energy production? While the environmental reasons for the transition have been thoroughly explored (Delafield et al. 2021), the influence of political factors in the decision to promote renewables remains underexplored (Romanova 2021). We employ qualitative research methods to identify the main factors behind the choice to develop and actively promote renewables. This paper offers a comparative analysis of Western Europe (particularly EU countries) and Russia.

The study considers data from 30 original expert interviews conducted in 2021-2022 with experts in energy and environmental issues. The findings are triangulated with quantitative data on fossil fuel dependency and the development of renewables extracted from the 2021 Statistical Review of World Energy by BP. This approach sheds light on the correlation between energy dependence and the use of renewables, and presents expert insights on political motivations to transition to renewables. The findings indicate that although environmental concern remains a major motivation to transition to a ‘green’ energy mix, it is political considerations regarding the choice to not rely on fossil fuel imports from a number of large ‘undesirable’ suppliers that inform the Western energy policy agenda. The EU’s active mobilisation against Russian oil and gas imports after the 2022 hostilities in Ukraine represents an inflection point and testifies to the growing impact of political considerations on energy decision-making. This paper also shows that oil and gas exporting countries have taken some cautious measures venturing slowly out of the fossil fuel path dependence on their own terms, aiming to develop renewables while preserving energy independence by imposing Local

Content requirements on the production of wind turbines, solar panels and other renewables infrastructure. The authors also offer, building on the literature on robust decision-making, policy recommendations on the benefits of diversifying energy mixes and the risks of market interventions aimed at forcibly promoting immature renewable technology, with implications both for developed and developing countries.

The rest of the paper proceeds in five parts. The literature review on energy transitions and decision-making in Western Europe and Russia is followed by a presentation of the research design used for the study. The findings section reveals the main reasons why political motivations trump environmental ones in the decision to develop renewables. The last part discusses the implications of the findings for policy-making in Western Europe and Russia on energy issues.

## **2- Literature review**

### *2.1 Characterising energy transitions*

Understanding the current transition requires a retrospective perspective on what an energy transition is and how past transitions unfolded. General concern with climate change, which is currently framed as an emergency, has prompted international commitments and national efforts to reach carbon neutrality, particularly the 2015 Paris Agreement. The idea of a sustainable energy transition lacks clarity, as the final outcome of transitions is rarely known when they are underway. The vagueness in the terminology currently allows policymakers from all countries to argue that they are engaged in an energy transition. The expert literature, when defining the energy transition, focuses on technical and economic processes related to energy production and frequently neglects the social aspects such as consumer behaviour

(Millot and Maizi 2021, Shove and Walker 2007). For example, Fouquet and Pearson define the energy transition as ‘the switch from an economic system dependent on one or a series of energy sources and technologies to another’ (2012). We define energy transitions as a progressive shift from one type of energy to another which has a long-term social, economic and political impact on society as a whole. A historical study of transitions reveals similarities and differences between past energy transitions and the current one. Energy has been recognised as the main motor for human technological development, from the control of fire 400 thousand years ago to the wide use of biomass (from 1500), the advent of coal (from 1800) and oil/natural gas (from 1870) (Smil 2017). The notion of ‘transition’ has itself been criticised for implying that the appearance of a new form of energy leads to the disappearance of previous sources of energy (Sovacool 2016), when historically they co-exist for long periods of time. Coal had only been partially replaced by oil and gas in the 20<sup>th</sup> century and it still represents in 2020 27% of the world’s total energy generation (compared to oil 33% and gas 24%) (Ritchie and Roser 2021). The transition to coal which started in the UK has been explained by market mechanisms and the need to overcome the limitations of biomass sources (Kander et al. 2014). The second major energy transition was related to the deployment of oil and the rise in energy consumption during the 20<sup>th</sup> century which were both driven by technological innovation, particularly the emergence of the automobile industry and the widespread deployment of electricity (Atkeson and Kehoe 2001). These two transitions were spontaneous, there was no predefined objective and the change in the energy mix was unmanaged, but led to an improvement in living conditions (Millot and Maizi 2021). More recent and country-specific transitions, like shale gas in the United States, were similarly driven by the market, with small entrepreneurs and improvements in fracking technology playing a decisive role in the emergence of shale (Dernbach and May 2015). Governments played no role in initiating or guiding these transitions.

Studies of past energy transitions reveal the specific nature of the new ‘green’ transition: it is caused by environmental concern rather than economic and technological development, it emerged in an artificial way rather than spontaneously, the government plays a leading and decisive role, there is an active involvement of the expert community of all scientific fields and it aims to exclude dominant forms of energy (fossil fuels) from the energy mix in a short period of time. These differences, summarised in table 1, reveal that past experiences offer little guidance regarding upcoming challenges and raise questions about the feasibility of the transition. The literature shows that the decarbonisation initiative is exogenous to the existing economic system, and that all steps of the new transition depend on the government’s intervention (Hu et al. 2022, Pearson 2018). Existing renewable technologies, despite significant technological advances, still struggle to compete on their own against fossil fuels without strong subsidising so the transition will likely be protracted (Li & Ho 2022, Kander et al. 2014). The green transition offers individuals few tangible benefits but is designed to mitigate a high-intensity collective problem. Citizen motivation and commitment to a common global challenge are necessary conditions for a transition that is costly to all members of a society. While previous transitions improved the welfare of the population, providing cheaper and more reliable forms of energy; the current one (under conditions of urgency) runs the risk in the short term of increasing the price of energy, requiring a reduction in its consumption or making energy supply less reliable. In addition to these aspects, citizen motivation to embrace renewables may be undermined by classic economic challenges, including the dilemma of free-riding and the need to overcome vested interests (Nordhaus 2015). Historically, major transitions have taken centuries to unfold while the current transition, dictated by urgency, should take place within a few decades according to some estimates (Delina 2018).

**Table 1 Comparative characteristics of energy transitions**



	<b>Past</b>	<b>Current</b>
<b>Cause</b>	Economic	Environmental
<b>Emergence</b>	Spontaneous	Artificial
<b>Regulation</b>	Only market mechanisms	Policies, some market mechanisms
<b>Government role</b>	Minimal governmental intervention, always for economic reasons	Government-led, not for economic reasons
<b>Experts role</b>	Little to no involvement of expert community	Active involvement of expert community
<b>Goal</b>	An energy mix to satisfy needs at the best cost	Excluding fossil fuels from the energy mix
<b>Timeframe</b>	Centuries	Decades
<b>Welfare</b>	Improved	Challenged

Source: Author compilation

## *2.2 Policy-making and 'just transitions'*

Decarbonization has become a central issue in the global political discourse, in national policy-making as well as in the academic literature in a variety of fields including Management and International Relations. The 2015 Paris Agreement and the 2030 Agenda for Sustainable development set specific targets to mitigate climate change by reducing greenhouse gas emissions, including to keep the rise in temperature below 1.5 degrees compared to pre-

industrial levels. The Sustainable Development Goals address the issue of climate change in the context of a wider discussion on inequality with a focus on the consequences of environmental degradation for different communities and the costs of the transition to renewable energy for developing countries (Banister 2019). A compatibility is assumed between poverty reduction and sustainable development, with the premise that a low carbon world could be more equitable (Delafield et al. 2021). The energy transition is theorised not only as needing to be just, but also as global and participative (Fuso Nerini et al. 2018). Decarbonization is an international issue requiring global involvement, not only because countries that abstain could counterbalance the positive measures adopted by the rest of states but also due to the possible consequences of the transition to renewable energy. Net zero targets reached in isolation could lead to conflicting strategies and to a loss in biodiversity (Delafield et al. 2021, Holland et al. 2019).

The concept of a 'just transition' has also been considered at a local level, with studies revealing 'justice gaps' not only between regions within a country but even between households. The likeness of a house being equipped with solar panels is seven times lower than average in non-white, low-income and renting households according to a study carried out in Vermont, an American state recognised as being a leader in energy transitions (Keady et al. 2021). This raises the question whether the concept of 'just transition' is scalable and whether justice can be achieved in the energy transition between countries, if the transition is discriminative at a local level. The focus on justice in the energy debate is motivated by the high risks of marginalization of the most vulnerable and the possible consequences of an unequitable roll-out of renewable energy infrastructure in the transition process. A study of Mexico's policy agenda revealed that wind infrastructure was being installed disproportionately in poorer areas (Baker 2020). The concept of justice has been explored as a policy strategy to protect those who might be 'left behind'. In this light, being the last to make the transition is considered to

be a disadvantage. An energy transition supporting the most vulnerable is required not only between states but also at local and regional levels. The Whole-of-Society approach argues that policy-making should involve all stakeholders including governments, the business community and civil society (Dube et al. 2014). A holistic perspective is often considered the only viable solution for dealing with global emergencies and imminent threats and has guided the literature focused on phenomena such as pandemics, terrorism and more recently, climate change. This multi-directional approach is deemed applicable to the energy transition, not only because of the climate situation being framed as a global crisis threatening humankind and requiring a united response but also because energy is portrayed as a social system of which the technical infrastructure only represents a minor part (Ellis & Ferraro 2016). The fossil fuel industry is dominated by state decision-making, which in O&G producing countries is reinforced by subsidised energy prices for citizens and Local Content policies aimed at ensuring a redistribution of wealth (Kalyuzhnova & Nygaard 2008) leading to dependent rather than participative forms of energy decision-making and management. Renewable energies entail different societal processes and make governments more sensitive to the values and reactions of the population. The social acceptance or rejection of wind energy among host communities has been shown to determine the outcome of the transition to renewables, with opposition campaigns having a strong impact on decision-making (Ellis & Ferraro 2016). The economic and social costs entailed by a transition to renewable forms of energy require a highly mobilized civil society ready not only to back up but also to lobby for these changes. While for some countries the energy transition can be grafted on popular ideas such as energy security and greater independence from fossil fuel providers, for others it may appear as counter-intuitive to trade reliable sources of energy for uncertainty (Lin & Raza 2020). The energy transition is described as participatory with terms such as ‘energy democracy’, ‘energy citizenry’, ‘prosumer’ conferring upon the population at large the power to decide on future energetic and

environmental outcomes (Ryghaug et al. 2018). ‘Community energy’ has been defined as projects where geographically close communities or communities of interest have ownership and/or exercise control on the energy production and distribution process and benefit from the results in a collective way (Seyfang et al. 2013). New technologies such as smart grids allow energy users to produce, store and share energy with other grid users, empowering them in the energy transition (Gharavi 2012).

### *2.3 Uncertainty and policy-making*

The energy transition, while it has been studied in detail regarding its local components, still remains characterised by a deep uncertainty, with factors such as fuel prices, future demand and climate change all being highly unpredictable (Castrejon-Campos et al. 2020). Public policy decisions regarding R&D, energy provision and infrastructure all have long-lasting effects, but are made in rapidly-changing conditions (Kalra 2014). Policy decisions may not be suited to changing circumstances and the new infrastructure designed to support the energy transition may not be adapted to meeting future needs and runs the risk of being outperformed by a cleaner, cheaper and more effective technology. Making policy decisions that are able to withstand changes in economic, social, political and environmental conditions is seen as the principal challenge for policy-makers today (Herman 2015). The future of renewables is dependent on the transition to electricity, to which many technological, institutional and structural barriers still persist (Castrejon-Campos et al. 2020). Renewable power generation fluctuates and storage remains a major challenge, with energy storage systems currently struggling to meet market demands in many areas (Schmidt 2019). Optimal storage systems have been described as affordable, energy efficient, environmentally benign, having a long life-

span, able to withstand different climate conditions and to store large amounts and are currently not available on the market (Rahman et al. 2012).

Policy-making is essential not only in terms of ensuring a just transition, as previously discussed, but in overcoming these barriers. Studies of the most resilient policy mixes for energy transitions point to the need for specific policy instruments to meet the needs of all stakeholders. Yet decision-making in conditions of deep uncertainty is characterised by profound disagreements not only regarding the ways to solve a problem but in defining the nature of the problem itself (Kwakkel 2016). Predictive models and approaches aim to aid policymakers in making their decisions more resilient and adapt to a range of possible conditions. Our capacity to predict the long-term environment is extremely limited due to our inability to imagine or time unexpected events. Predictions made in the early 1970s on the future of US primary energy use reveal the limitations of such models: the real consumption in 2000 was half to a fourth of what was presented in the model, mainly because the 1973 oil shock led to an increase in the efficiency of energy (Hallegatte 2012). Even short-term forecasts such as ten-year projections of in the sphere of energy frequently become irrelevant within months of having been made (Davis 2018). The onset of Covid 19 and the 2022 armed-conflict in Ukraine have made the majority of predictions in most spheres appear completely off the mark. Climate change reinforces unpredictability as we not only ignore what the future level of greenhouse gas emissions may be (as they are linked to policy and demographic factors), but we also are unsure how much a change in these levels will affect the climate and how the climate's natural variables may evolve. In the face of these difficulties, the World Bank has developed a number of recommendations aimed at reducing risks of inadequate policy-making resulting from climate-related uncertainty. The goal in this case is less to predict the future than to create adaptable policy solutions. In conditions of uncertainty, decision-making should focus on robustness, resistance and resilience over optimality (Walker et al. 2013). This means that

rather than looking for the best outcome for each evolution scenario, we should privilege options that perform well over the largest number of possible scenarios and that can be adapted to new conditions without a long recovery period. The focus has also been put on the development of ‘policy mix frameworks’ with sustainability objectives that are stable in a dynamic setting and the benefits of considering policy-making as a learning process with flexible variables (Rogge & Reichardt 2016, Howlett et al. 2009).

#### *2.4 Energy policy-making in Russia and Western Europe*

While the environmental reasons for the transition have been thoroughly explored, the political factors weighing in the decision to promote renewables remain understudied. Only a limited portion of the literature touches upon this subject, pointing out the politization of energy relations by the EU and the risks it takes by privileging what was referred to as ‘economically unreasonable options’ over market mechanisms (Romanova 2021). Russia’s perspective on energy is often described as realist, as it considers energy independence a major asset, even a bargaining chip in world politics and expresses concern over the consequences of Western Europe’s energy transition which threatens its fossil fuel exports (Stoddard 2013). Structural barriers are associated with countries being locked into fossil-fuel dependent paths, decision-making being subject to vested interests and citizens being uninterested in participating in the deliberation process (Rogge 2017). The EU originally was associated with a liberal approach on energy, based on an acceptance of inter-dependence and a reliance on market mechanisms (Kuzemko 2014, Finon & Locatelli 2008). The literature on the energy transition for a large part still implies that Western Europe is guided by a neoliberal worldview and explains the choice to develop renewables and wean off fossil fuels by commitments to reverse climate change but also to promote energy justice and improved governance in the world (Fuso Nerini

et al. 2018). Likewise, intervention in market mechanisms are formally justified by the urgency of climate change and the need to empower energy citizens (Ryghaug et al. 2018). However, this realist-liberal dichotomy is losing its relevance, with the EU promoting realist arguments like the need for energy independence and Russia starting to view energy as a commodity (Romanova 2021, Siddi 2018, Romanova 2017). The energy interdependence between Western Europe and Russia did not lead to an improvement in relations even before 2022 and the fear of asymmetry in the future has created a security dilemma, by which each side tries to minimise its exposure, leading to competitive foreign policies (Krickovic 2015). The EU's internal disagreements and its evolving position regarding multilateral energy governance based on an analysis of the Nord Stream 2 project revealed the politicisation of the energy transition over the last twenty years (Siddi & Kustova 2021). The 2022 hostilities in Ukraine and ensuing sanctions have widened the rift between the EU and Russia, making it a policy priority for Western leaders to stop importing Russian energy and cut the country off from any income from oil and gas exports. The desire for energy independence, once a discreet, medium-term goal, has now become the first priority on the EU agenda (European Commission 2022).

Western European countries plan to rapidly increase the proportion of renewables in their energy mix as reflected by the EU's Green Deal aimed at achieving carbon-neutrality by 2050 but also some countries have become more open to the need to increase the production of nuclear energy and even reopen coal mines to face the current energy deficiency dilemma. Russia shows no intentions of decarbonising its economy in the short to medium term, with renewables not expected to exceed 1% of the country's energy balance by 2040 (Mitrova & Melnikov 2019). Russia is currently the fourth country in the world in terms of primary energy consumption and greenhouse gas emissions and the 'systemic leakage' of carbon along the fossil fuel commodity chain is responsible for many social, political and environmental problems.

### **3- Research Design and Methodology**

The research is designed to address a gap in the scientific literature and in public debates about how political factors have motivated and accelerated Western Europe's 'green' transition.

This paper sets out to answer the following research question: To what extent do political motivations weigh in the decision to transition to 'green' energy production? We seek to explore what type of political reasons have an impact and assess the extent of their influence. In order to do so, we determine the main factors behind the choice to develop and actively promote renewables. This paper focuses on Europe, offering a comparative analysis of Western, Central and Eastern Europe (particularly EU countries) and Russia.

The qualitative data underlying this study comes from 30 expert interviews conducted by the authors in two waves between the 3<sup>rd</sup> of September 2021 and the 15<sup>th</sup> of March 2022 with experts in energy and environmental issues. The initial set of 18 interviews was carried out from September to November 2021 before the beginning of the conflict in Ukraine and was updated with 12 interviews conducted in February and March 2022. Respondents include managers of different oil and gas corporations (Gazprom, Lukoil, Tatneft, Rosneft, Enel, BP, Total, Polish Oil Mining and Gas Extraction corporation), of companies specialised in renewables (Unigreen energy, Renewable UK), representatives of NGOs specialised in energy transitions (Greenpeace, WWF), political figures working on energy regulation (EU Commission, French National Assembly deputy, Greek advisor at Foreign Ministry, Deputy of the Polish Sejm, Deputy of Russian Duma), representatives of corporate associations and unions (Union of Oil and Gas Producers of Russia, Russian gas society, German Fuels and Energy Association) and experts from academia of energy issues (Arctic University of Norway, MGIMO University, University of Sofia). The complete list of interviews can be found in



Appendix 1. Respondents were selected from different types of organizations to provide maximum representativeness and a standard semi-structured questionnaire was used for all interviews of the first wave in order to make respondents' answers comparable. Additional questions were included for second wave interviews. Interviews were carried out following ethical best practices, with the research project being presented to respondents before the interview. Interviews notes were anonymised and manually coded to identify overarching themes. Results are presented along with illustrative quotes in the findings section of this paper. The authenticity of the findings was checked using different methods including triangulation, member checking and peer debriefing, as recommended by Creswell (2014). The findings were also correlated with statistical data: a review of fossil fuel production and consumption by country allowed the authors to identify the countries that are the most dependent on foreign energy imports, while an analysis of the development of renewables revealed a correlation between fossil fuel import dependency and the 'green' transition. The primary statistical data comes from the Statistical Review of World Energy that is produced on a yearly basis by BP. This paper aims to offer an objective analysis of the prospects and risks of the energy transition based on expert interviews representing different insights and viewpoints. The breakout of the 2022 armed-conflict in Ukraine has sharply increased the politization of and polarization around energy issues. Attempts were made by the authors to clear the bias when interviewing respondents and writing up the paper. The goal was to reflect all perspectives, not to embrace them, but to increase our understanding of differences in perception. One of the limitations of this study is the anxiety experienced by some of respondents of expressing ideas that could be considered unacceptable for their employer/ country. It was partially overcome by setting up in person meetings in private locations and building up trust through email exchanges.

#### **4- Results**

This section presents the main factors that guide governments in their decision to actively promote the ‘green’ energy transition, based on the qualitative enquiry carried out by the authors. The results confirm that the realist/liberal dichotomy used to qualify the worldviews of Russia and the EU is no longer relevant, and reveals that political concerns and the need for energy security or independence guide the policy agenda on both sides. The different policy choices- to prioritise renewables for Western Europe or to maintain fossil fuels for Russia- both have for primary goal energy independence. Both strategies have been assessed as high risk by actors directly involved, who also underline the stifling of disagreement and discontent with policy choices on both sides.

In 2021, the social and economic cost of removing fossil fuels from the energy mix in Western European countries was assessed as high by a number of respondents, who criticised the lack of open debate and the stigmatisation of political figures who advocate keeping some fossil fuels in the energy mix for upcoming decades. Respondents also noted that the complete transfer to renewables is technologically not possible in the short term and that condemning the oil and gas industry as a whole is counterproductive for societies with growing energy needs.

*Combatting climate change has become a new sort of absolutism and I do not think that France, or Europe for that matter, can afford the new normative burden it has taken on. Moderate solutions have been taken off the table in favour of a radical accelerated transition agenda.*

Respondent 16 Deputy of French National Assembly

*We cannot close all our oil activities overnight and this would not be a solution as even in the most optimistic transition scenarios, fossil fuels remain a part of the global energy mix beyond 2050. The demand is based on a need that will not suddenly go away.*

Respondent 17 Total

*Replacing the earth's energy system is a challenge but we are a part of society and we need to develop clean and reliable energy sources. [...] The fact that BP wrote off 17,5 billion dollars of assets and is halting the development of new sites as it transitions to low-carbon energy reveals the company's new priorities are not greenwashing but serious commitments.*

Respondent 14 BP

A number of respondents pointed out that environmental concerns are rapidly set aside by Western European countries in cases of energy shortages, suggesting that 'green' transitioning may not be their first priority. The UK's environmental investment in the development of renewables is compromised in their eyes by the government's decision to supplement the energy mix with coal, considered to be the dirtiest form of energy. The UK has however managed to significantly reduce the share of coal in the energy mix over the last 5 years. The European Commission also openly noted as early as 2018 that the transition to renewables also has the political goal of energy independence from fossil fuel providers such as Russia (European Commission 2018). The special status given to American LNG has also been criticised as being politically motivated. Even representatives of NGOs recognise that alongside the obvious need to cut carbon emissions, the 'green' transition provides Western Europe with other benefits, such as improved governance and energy independence.

*While Western European countries talk a lot about cutting out ‘dirty’ energy sources, when there are significant interruptions in energy supply from renewable sources, they make up for the shortage by using coal-fired power generation, which is much dirtier.*

Respondent 3 Union of Oil and Gas producers of Russia

*While decarbonisation is necessarily the first priority, there is no doubt that there are for European countries other advantages attached to the green transition, such as improved democratic governance, independence and the social benefits of developing participatory energy.*

Respondent 10 Greenpeace

Russia’s energy mix is guided by national security and stability concerns. Russia has not begun its ‘green’ transition for a number of reasons stated by respondents including the desire not to become path dependent on emergent technologies that may not be able to provide energy security. The difficulties linked to a total electrification of energy, storage issues and the impact of weather dependency on the production of renewables are widely recognised as major challenges to the global energy transition. This is particularly relevant considering that, according to forecasts by the UN, the global population will increase by 2 billion people in the next 30 years and as yet the whole global population does not have access to energy. While previous energy revolutions improved wellbeing and were about moving away from climate dependence, this transition may result in higher vulnerability on factors humankind is not able to control.

*We should only shut down the fossil fuel option when we are certain to be able to provide through other means the energy society needs. Saying we should first give up on fossil fuels and then find a workable option is demagogical and dangerous.*

Respondent 5 Rosneft

*In times of rapid climate change, it makes little sense to completely transition to renewables as it would compromise our energy security. Making ourselves more reliant on the weather when it is becoming highly unpredictable amplifies the existing risk.*

Respondent 13 Tatneft

Russia has not however not decided against using renewables and is exploring the technology to ensure it can transition rapidly if it needs to. Its priority, according to a number of respondents, is to ensure that it remains independent and that it preserves its energy security. The goal is not to forcibly change the energy mix of the country but to remain ready to transition when the need arises. The adoption by the Russian government of Local Content policy measures in the sphere of renewables reflects the ambition to be independent, even in the production of renewables' infrastructure. Fossil fuel producers and exporters are tied down by the investments made to develop oil and gas sites which take decades to write off and turn around. A number of respondents note however that Russia's interest in renewables is strictly symbolic and that anything representing less than 1% of the energy mix is an experiment rather than a policy orientation.

*The share of renewables in Russia's energy production is statistically insignificant, but major companies are still technologically exploring renewables. For example, Gazprom Neft has a*

*number of small-scale projects related to solar energy, with its Omsk Refinery being built with 1 MW solar-powered electricity station.*

Respondent 6 Gazprom Neft

*Stringent requirements that infrastructure for renewables be manufactured in Russia shows that the country wants to retain energy independence even when transitioning to green energies. [...] The potential for the development of renewables is huge in Russia, but the pace is deliberately moderate as it wants to master each stage of the learning curve.*

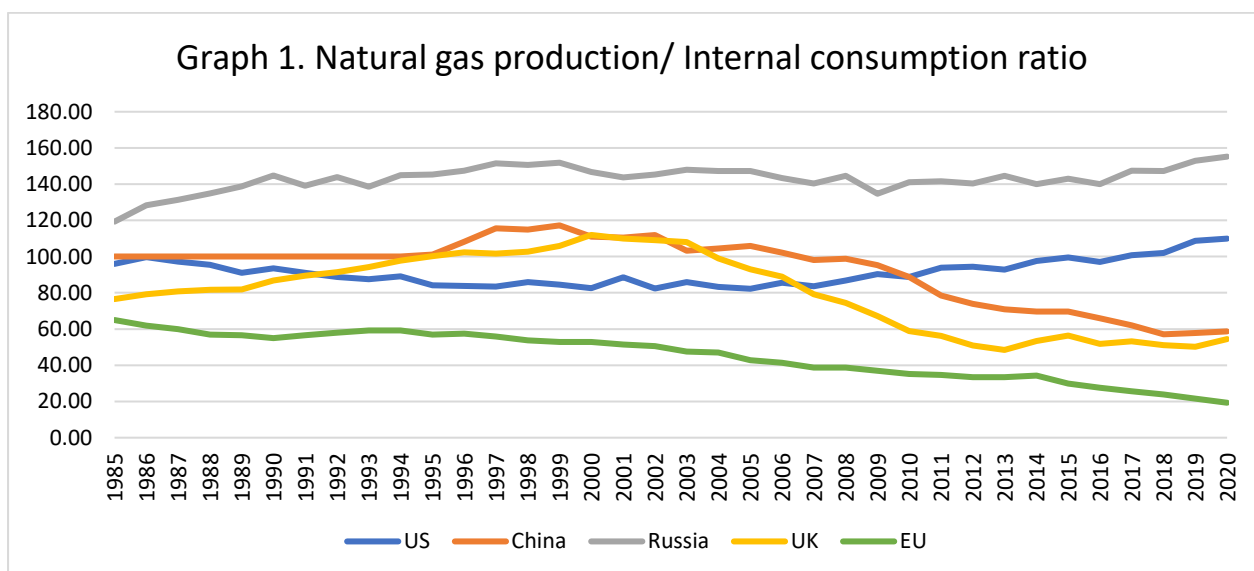
Respondent 8 Unigreen Energy

*Russia's development of renewables is marginal and it's more about giving business a cloak of legitimacy in relations with foreign partners than about environmental concern.*

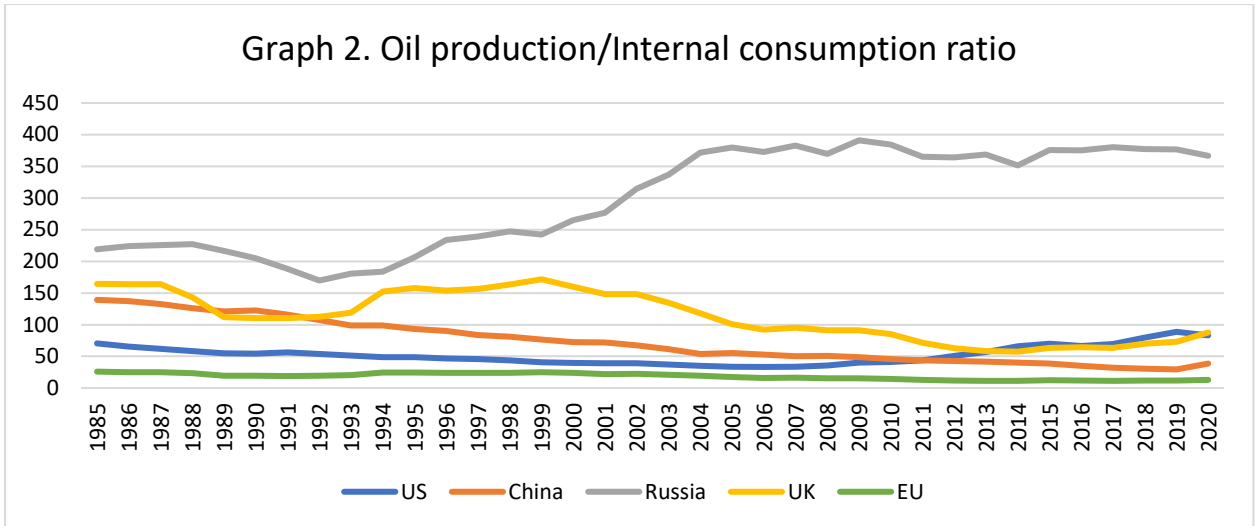
Respondent 9 WWF

The triangulation of these findings, which confirm the political motivations behind the green transition, with a quantitative analysis of energy mixes in a number of European countries confirms that the transition to renewables is led by countries that have a high internal demand for energy and are dependent on energy imports from abroad. Graphs 1 and 2 show the natural gas production on internal consumption ratio and the oil production on internal consumption ratio of Russia, the EU and the UK, with the US and China providing a comparative dimension. Graph 3 presents renewable power consumption reflecting the degree of development of renewables in each country/regional organization. Together, they confirm the hypothesis that a high dependence on imported fossil fuels positively correlates with aspirations to develop renewable forms of energy.

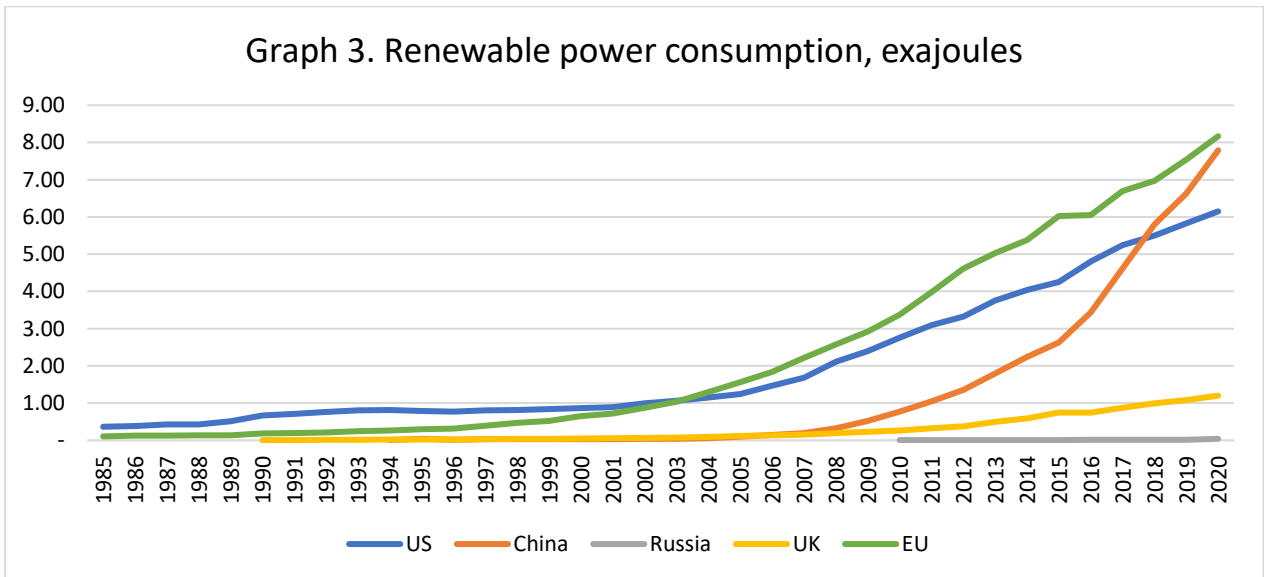
The comparative analysis of fossil fuel production and consumption on the one side and the development of renewables on the other reveals that the more dependent a country is on the import of fossil fuels from abroad, the more likely it is to have started developing renewables. The EU's investment in renewables is motivated by a strong energy demand on its internal market and a high-level dependence on importing fossil fuels. Russia's consumption on production ratio of natural gas and oil explains the lack of political motivation to change the country's energy mix. The main takeaway is that countries do not have an equal level of commitment to developing renewables and that those countries that have started their 'green' transition are mostly those which are energy dependent. This shows that the energy transition is most likely also motivated by political factors, such as the desire to be less dependent on the import on foreign fossil fuels. In order for countries that have sufficient fossil fuels to develop renewables, they need a commercial motivation to supplement the environmental one, for example the ambition of being competitive in developing and applying new technologies.



Source: bp Statistical Review of World Energy, July 2021



Source: bp Statistical Review of World Energy, July 2021



Source: bp Statistical Review of World Energy, July 2021

Interviews conducted after February 2022 reveal that the hostilities in Ukraine are a rupture event that has moved in Western Europe the debate over oil and gas imports and renewables from the sphere of energy to that of security. While the common goal of energy independence from Russia firmly unites the countries of the EU; the timeframe and implementation of



solutions vary between countries, causing some tensions and resentment. Some countries will rely more heavily on imports from likeminded countries like the United States and develop renewables at an accelerated rate, others are embracing the nuclear solution (e.g. the UK, Slovakia) with less public condemnation than was previously the case. Europe's ability to subsist in the short to medium term without Russian oil and gas imports remains a controversial matter. While many EU policy-makers call for a total ban of Russian energy, Russia still received half of its total income from fossil fuels from Europe in March 2022 (Earl 2022). Russia's nascent interest in developing renewables and in environmental protection may be reversed by the growing political rift with the West and technical difficulties resulting from the new wave of sanctions.

*Poland has developed the most ambitious plan to cut out Russian imports from its energy mix. A new pipeline bringing in Norwegian gas, an increase of LNG imports, reopening coal mines, a focus on renewables, some new fracking projects but also using less oil will help the country meet its goals.*

Respondent 19, Polish Sejm Deputy

*The rhetoric and the facts are far apart at the moment. EU companies are rushing to import Russian energy while they still can, in a race against the clock to fill up their reservoirs for next winter before they are forbidden to do so.*

Respondent 28, Gazprom

*We [Germany] are at a political standstill on energy matters post-February 2022. After deciding not to prolong the work of nuclear plants, the government has little choice but to continue importing Russian gas.*

Respondent 29, German Fuels & Energy Association

*I think it would take more than what has happened so far to permanently wean the EU from Russian energy. If Russia were to use chemical, biological or nuclear weapons with severe casualties in Ukraine, then that might be the tipping point.*

Interview 21, University of Sofia

*Banning Russian energy is like cutting out a lung from the EU's economy. The financial and social costs could cripple the continent's development for decades and the people on the breadline will suffer, as always, the most.*

Interview 24, Greek Foreign Ministry

*Russia has already started to back-track on environmental measures as a result of the sanctions by allowing dirtier car exhausts and developing renewables has fallen to the bottom of the list of priorities.*

Interview 26, CEZ Group

## **5- Discussion**

The findings of this paper support the hypothesis that the 'green' energy transition is motivated by political as well as environmental considerations. We believe that the existence of political factors does not compromise the commitment to a real environmental agenda backed by a true desire to decarbonise energy production and mitigate climate change. The desire for energy independence should not be concealed but explicitly discussed, studied and debated as a valid concern. Identifying political factors could help make better sense of the strategic options and

choices made by some countries and the urgency attached to the transition. Although climate change is a genuine challenge for the survival of humankind, said environmental phenomena arguably do not unfold on a political timescale. While it is impossible to set a date of the ‘tipping point’ or point of no return to save the planet from extinction, it is equally clear that only a common global solution could make a significant difference. Therefore, prioritising country and region-level transitions over the development of a joint and global transition agenda appears as counter-intuitive at best if we are to combat climate change on a planetary scale. The European Union’s transition to renewables on its own can only have a limited impact on the global climate. If the goal, however, is energy independence, the decision to forcefully push through a ‘green’ transition in Western countries makes more sense. The political goal of energy independence through renewables may be attainable for some countries within a few decades whereas stopping global climate change would take much longer.

The study also reveals that the costs of funding the transition to renewables are high as the conditions for an ‘organic’ energy transition have not yet been met. Renewables are not so far as energy intensive as other forms of energy nor as reliable (although hydroelectric and geothermal energy present the potential to become so over time). Consequently, this transition cannot be a natural process. State involvement is necessary not only to launch the transition but also to regulate and subsidise it, to transform infrastructure, to sensitize the population, to punish wrongdoers in order for the set goals to be met within the shortest possible timeframe. The current ‘green’ transition is one of the largest state interventions ever seen in the free market economy. By trying to introduce into the economic system one of the biggest externalities of all times, the risks of double market failure cannot be neglected and should be the object of further study.

The accelerated approach to the energy transition envisaged by EU countries in connection with the hostilities in Ukraine carries the risk that efficiency concerns may trump justice principles and lead to contestation. The literature points out the humanitarian but also energy policy failure risks associated with such an approach (Alford-Jones 2022). The definite impact of the 2022 conflict on Europe's and Russia's energy policies remains unclear. European countries have declared their intention to stop oil and gas imports from Russia, with the exception of Hungary, by the end of 2022. Whether this ban will overall help accelerate the green transition remains controversial: although Germany has decided against compensating with nuclear energy, France and Finland are considering expanding their nuclear energy capacity in light of the crisis and the UK and Poland are reopening coal mines. Poland's refusal in April 2022 to pay for gas in roubles and the halt of imports from Russia have nevertheless led to a hike in Poland's imports of Russian gas from Germany (flowing in reverse via the Yamal-Europe pipeline), showing that Europe's energy dependence on Russia is extremely difficult to overcome (Reuters 2022). Policy priorities have moved from developing green energy to punishing Russia and the economic slowdown the ban may entail in Europe could make the transition to renewables more difficult financially and socially. On the Russian side, the increase in military spending and the blanket rejection of Western priorities may result in all projects related to renewables being put on hold.

The findings also expose the limitations of the concept of 'just transition', by revealing the high costs associated with the replacement of fossil fuels by renewables and the possible poverty that may ensue. This correlates with the findings of existing studies on the development of renewables which show that ethnic minority and low-income households are less likely to be equipped with solar panels and remain dependent on more expensive energy that they buy off the grid, leading to an increase in relative poverty (Keady et al. 2021). The taxpayer has to

finance the energy transition and energy poverty in the developed world may increase as a whole. Additionally, the rise in energy prices could also widen the gender gap, with the need to reduce the use of personal cars or household appliances disproportionately affecting women who still undertake the bulk of childcare in the Western world. The low energy intensity and unreliable nature of renewables may also compromise the growth of developing countries by disrupting the functioning of manufacturing facilities and information flows. The development of renewables could lead to a new type of resource curse with symptoms similar to those associated with fossil fuels such as environmental damage, suboptimal governance, dependence on foreign technology and threats to economic diversity. While renewables are defined in terms of flows rather than stocks, certain aspects of the curse have already been identified in the literature exploring the effects of the development of hydroelectricity (e.g. Hancock & Sovacool 2018).

The findings provide a new insight into energy independence, suggesting that it is a spectrum that goes from being able to produce one's own energy to the capacity to create the infrastructure for energy production, all the way to having the mineral commodities necessary for photovoltaic cell, wind turbine and battery production (such as lithium, arsenic, indium, aluminium, rare-earth minerals, cobalt, graphite etc.). Countries with fossil fuels that are currently independent over the whole spectrum want to preserve this strategic advantage even when transitioning to renewables, which explains the strict localisation policies developed by Russia for solar and wind infrastructure production.

Likewise, in view of ensuring a stable supply of renewable energy, the US has developed a 'Federal Strategy to Ensure Secure and Reliable Supplies of Critical Minerals' which guarantees that those minerals for which the country is reliant on foreign sources are sourced from a number of different countries (USGS 2019). Countries which rely on the import of fossil

fuels from abroad are eager to improve their level of independence on the spectrum. The choice made by Western European countries to embrace renewables is motivated by their desire to be independent at least in their energy production, if not over the entire spectrum. The fact that the infrastructure is imported from abroad (mostly currently from China) is considered secondary, although initially countries such as Germany had the ambition to become global producers and exporters of solar panels and wind turbines. Dependence on the import of the infrastructure for renewables appears as secondary and involving less short-term risks than dependence on energy imports. Furthermore, domestic energy production is associated with job creation and economic growth. While there is a clear correlation historically between having a dominant energy source and being a global hegemon (Ediger 2019), the urgency of energy independence has recently increased as the need for uninterrupted energy supply has become more prevalent.

Our findings also correlate with the literature in saying that Russia still had before 2022 the potential to become a ‘green giant’, in spite of the hesitancy surrounding decarbonisation initiatives and the fact that it was lagging behind in the development of renewable technologies (Tynkynnen 2019, p122). The hostilities in Ukraine and Western sanctions have reduced both Russia’s motivation and its technical capacity to make the transition to green energy. Experts have found that providing appropriate regulations were in place, Russia could benefit from embracing the green transition, which would help increase energy efficiency, decentralisation and digitalization (Mitrova & Melnikov 2019). The timeline of each country’s transition will be a determining factor in defining the final outcome. Countries that start early carry the risks and costs of investing in sub-optimal technology or choosing the wrong energy mix, with the place of nuclear power still highly controversial in the energy transition. The ‘wait and see’ approach also presents risks, as being the last to transition means that international markets will

most likely be saturated with renewables technology and countries will become import dependent.

## **6- Conclusion and Policy Implications**

This paper offers an overview of the unique nature and challenges of the ongoing ‘green’ transition, presenting an analysis of how political motivations weigh in on the decision to transition to renewables. The authors show that the motivation to achieve and/or uphold energy independence informs the decisions of both categories of countries: those dependent on energy imports and fossil fuel exporters – in their respective policy agendas regarding renewables. Western European countries strive to increase their energy independence by cutting out fossil fuels from their energy mix and promoting the development of renewables, while oil and gas exporters like Russia attempt to retain their energy independence by adopting a ‘wait and watch’ approach. The hostilities in Ukraine mark an inflection point, reinforcing the impact of political considerations on energy decision-making and posing new challenges to the “green transition”. The paper provides an original analytical framework to assess energy independence and highlights some of the social and economic risks related to the green transition. It also raises the question of how an unprecedented level of state intervention may impact energy market mechanisms and offers recommendations on robust policy-making on energy mixes under conditions of uncertainty.

In line with the literature on robust decision-making (Walker et al. 2013), we suggest countries work towards a truly diverse energy mix, with renewables constituting at least half of energy consumption. Fossil fuels should however not be completely removed from the mix, as an optimised production process and the development of hydrogen could allow to reduce their carbon footprint, and their ready availability makes them a reliable back-up option in times of shortages. Developing a diverse energy portfolio may not be the most efficient solution for

each country in the short-term but it is the most robust one, allowing countries to overcome uncertainty. It requires strong political commitment: in Russia because fossil-fuel path dependency and the current rejection of the ‘green transition’ as a western idea are slowing the development of renewables and in Europe because public scrutiny guided by a strong green lobby and the complications linked to finding new fossil fuel providers are tempting governments to prematurely renounce fossil fuels. More generally, energy independence should also be recognised as a legitimate policy objective as the idea that economic interdependence is an underlying condition for peaceful international relations is increasingly being challenged.