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The Impact of Renewable Energy Targets on Natural Gas Export Policy: Lessons from the Israeli Case

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Abstract: Evidence indicates that various countries around the world set renewable energy targets in an effort to promote clean and sustainable energy sources at the expense of polluting, fossil fuel-based energy systems. While scholars have discussed extensively how these targets affect the promotion of renewable energy sources, their effect on fossil fuel policy at the national level has been neglected. The current study addresses this research lacuna, examining the impact of renewable energy targets on decision making vis à vis fossil fuels, given that these energy sources are considered substitutes. This is achieved by focusing on intra-governmental discussions in Israel during 2020–2021 that sought to formulate the country's natural gas export policy as a function of its ambitious renewable energy targets. The study demonstrates how renewable energy targets, which are often set by politicians, can significantly influence decision making concerning fossil fuels, even when they contradict professional regulators' positions and from their perspective represent a risk to national energy security.

Keywords: renewable energy; fossil fuels; natural gas; climate change; energy security; energy policy

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1. Introduction

Large energy systems based on coal, oil, and natural gas have dominated the global energy market for decades [1] because they can provide substantial amounts of energy relatively efficiently [2]. However, such systems are harmful to the environment; they emit significant amounts of greenhouse gases and other pollutants [3]. Hence, in recent years, many countries around the world have begun to replace fossil fuel-based energy systems with renewable energy (RE) systems (e.g., solar, wind, hydroelectric, biomass, etc.), aiming to tackle climate change by using these clean and sustainable energy sources [4].

To reflect their commitment to promoting clean RE, at the expense of polluting, fossil fuel-based energy systems, many decision-makers often choose to set national RE targets [5]. Local regulators must then translate these RE targets into concrete regulation that supports the actual establishment of RE systems [6]. Indeed, numerous countries in various continents have set different targets to promote RE, including America [7], Europe [8], Asia [9], Africa [10], and Australia [11].

Beyond their influence on the actual establishment of RE systems [12–14], RE targets may also impact decision making regarding fossil fuels because these two energy sources are considered substitutes [15]. In this context, anecdotal evidence indicates that various countries may endanger the national supply of fossil fuel resources while trying to meet their RE targets, for instance, increasing exports or avoiding the development of new reservoirs [16,17]. Considering that they are finite resources, this may constitute an irreversible measure and represent a risk to countries' energy security [18,19], especially should they fail to reach initial RE targets.

However, while the energy policy literature has discussed extensively the influence of RE targets on the actual promotion of RE systems [12–14], it has neglected the influence of RE targets, which may not be reached, on national fossil fuel policy. Hence, the implications

of setting ambitious RE targets are still not completely clear in the context of fossil fuel policy. In particular, it is unclear whether and to what extent energy policies can balance the possible benefits associated with trying to meet ambitious RE targets [20] and the risks that accompany failure to meet these targets, specifically with regard to decision making vis à vis fossil fuels and ramifications for energy security [21].

This study aims to address this research lacuna, examining the impact of RE targets on decision making concerning fossil fuel resources. To do so, it focuses on intra-governmental discussions held in Israel during 2020–2021 to formulate the country's natural gas export policy as a function of its ambitious RE targets. Exploring the interactions between RE targets and national decision making regarding fossil fuels is of great importance because many countries are currently increasing their RE targets, aiming to reshape their national energy mix in an effort to contend with climate change [22]. Furthermore, exploring this issue is especially significant because decision making with regard to fossil fuels may lead to irreversible results, with energy security implications at the national level [18]. Indeed, energy policy scholars have called for further exploration of how setting highly ambitious RE targets can affect energy security issues [23].

This study is structured as follows. The next section discusses the differences between RE and fossil fuels in the framework of energy security. The third section illuminates the role of national energy policies in combining RE with fossil fuels. The fourth section introduces the methodology of the study, which is based on an analysis of the protocols of intra-governmental discussions held in Israel during 2020–2021 to formulate the country's natural gas export policy. The fifth section presents the results of the Israeli case study. The sixth section discusses these results, while illuminating the study's contribution. Finally, the last section presents the conclusions of the study, highlights its limitations, and proposes a path for future research.

2. Energy Security: Renewable Energy versus Fossil Fuels

RE systems and fossil fuel-based energy systems are often considered substitutes because in essence, both can be used to produce energy, in particular electricity [15]. One common definition of RE systems refers to them as any source of energy that is not based on fossil fuels such as coal, oil, or natural gas [24,25]. Hence, by definition, RE and fossil fuels cannot overlap. Indeed, RE systems and fossil fuel-based energy systems differ significantly, and many of these differences shape their unequal compliance with the concept of energy security.

The International Energy Agency defines energy security as the uninterrupted availability of energy sources at an affordable price [26]. Ang et al., by contrast, argue that there is no consensus regarding the definition of energy security; indeed, it is highly context-dependent [27]. Based on the exploration of 83 energy security definitions, however, they were able to identify several common dimensions that constitute an important part of many energy security definitions, among them the availability and reliability dimension, the price dimension, the sustainability and environmental dimension, and the social dimension. Below, the main differences between RE systems and fossil fuel-based systems are outlined, considering these four main dimensions of energy security.

The first dimension of energy security concerns energy supply aspects, focusing on availability and reliability. On the one hand, RE systems tend to be characterized by a reliance on non-finite resources and therefore, unlike fossil fuel-based energy systems, future production is usually less constrained by resource limitations [28,29]. On the other hand, the timing of some RE systems' production cannot always be controlled without costly storage facilities because the production depends on external factors such as wind speed, water flow, or solar radiation [24,28]. Fossil fuel-based energy systems, however, do not depend on external variables; provided with a sufficient supply of fossil fuels, local or imported, it is possible to continue producing energy, electricity in particular [30].

The second dimension of energy security concerns economic aspects, affordable energy prices in particular. For many years, energy production based on RE systems was consid-

ered much more expensive than fossil fuel-based energy systems [2,31]. In recent years, however, this trend has changed; in many cases, energy production based on RE systems is cheaper than fossil fuel-based systems [32–34]. Notably, not all fossil fuels systems produce energy at the same price, the same way different RE systems differ in price [35]. Despite this trend, as a general rule, when taking into account necessary storage facilities and ignoring the cost of externalities, energy production based on RE is still somewhat more expensive than fossil fuel-based energy systems [36,37].

The third dimension of energy security refers to sustainability and environmental aspects. A significant advantage of RE systems, specifically in comparison to their fossil fuel-based counterparts, is a very low-to-zero greenhouse gases emission rate, as well as minimal emission of other pollutants that harm the environment [38–40]. While fossil fuels are much more polluting than most RE systems, not all fossil fuels pollute equally [41]. At the same time, many RE systems suffer from a low-capacity factor in comparison to fossil fuel-based energy systems [42–44]. Hence, RE systems often require more space to produce the same amount of energy as fossil fuel-based systems [45,46]. This space consumption may pose various environmental hazards including endangering animals [47], harming the landscape [48], and reducing biodiversity in various regions [49].

The fourth dimension of energy security concerns social aspects. Fossil fuel-based energy systems tend to be centralized, both in spatial terms and also with regard to the players involved in their establishment and operation; usually, these are players from both the public and private sectors [50]. RE systems, in opposition, tend to be more decentralized, both spatially and in terms of the significant involvement of community players in their establishment and operation [51]. This decentralization, combined with the environmental merits of RE systems, often increases their social acceptability, specifically in comparison to fossil fuel-based energy systems [52].

The next section discusses how energy policies can balance the use of these two different systems, RE and fossil fuels, specifically in the context of energy security.

3. Energy Policy: Mixing Renewable Energy and Fossil Fuels

The International Energy Agency refers to the concept of national energy policy as the way in which countries address issues of energy development, including energy conversion, distribution, and use [53]. One of the most important roles of energy policies concerns determining the national energy mix, i.e., the different types of energy systems employed to meet the national energy demand [54]. While the considerations in determining the national energy mix are diverse and may relate to the specific characteristics of each country or region [55,56], they often share a common ground: they aim to maintain and enhance national energy security, alongside other important purposes (e.g., increasing safety, supporting affordability, minimizing the potential impact of supply-price volatility, and reducing the negative environmental impacts of energy production and use) [57–60].

Many countries address the energy mix from the starting point of fossil fuel-based energy systems [61] because these preceded RE systems (as well as nuclear energy systems) [62]. Because they are finite resources, the use of fossil fuels is mostly affected by the existence of reserves in the country itself, as well as the ability to trade with other countries [63]. Such trade capacity is affected by geopolitical aspects, as well as by global prices and possible means of delivery [64]. Thus, in a fossil fuel-based market, energy security issues first and foremost focus on the energy availability dimension, alongside the economic dimension of affordable energy prices [21].

The rise of clean RE [4] has increased the flexibility of national energy policies in determining diversified energy mixes, thus enabling them to enhance energy security in additional dimensions [65]. RE systems can better address the environmental [38–40] and social [52] dimensions of energy security and, recently, with the significant decrease in RE prices, also the economic dimension [32–34]. Moreover, countries that enjoy advantageous natural conditions, such as solar radiation, wind, or water flow, but lack fossil fuels can improve their energy availability using RE [66], despite the timing limitations of these

energy sources mentioned above. However, unlike fossil fuels, which are relatively easy to trade, RE systems usually only enable the trading of the electricity produced [67].

In practice, to strengthen their energy security in different dimensions [68], most countries choose different energy mixes that involve a combination of fossil fuel-based energy systems alongside RE systems [4]. By diversifying their energy sources, countries take advantage of the energy security-related benefits of combining such systems [69]; for example, they may enjoy the significant energy availability and controllable production timing of fossil fuel-based energy systems [61] while also reaping the environmental benefits of RE, strengthening energy security in this dimension [65].

The promotion of RE systems, alongside or as an alternative to fossil fuel-based energy systems, tends to rely on national RE targets set by decision makers [5]. In many cases, these targets refer to the share of electricity generation that uses RE systems. Different countries also set 'interim' RE targets, which are aimed to be checked and adjusted along the way in order to achieve the long-term targets. However, national RE targets are often declarative, and thus they are not always binding for the practical promotion of RE [70]. Even when RE targets are legally binding, in many cases they are too ambitious, making their full realization impossible [71–73]. This stems from the fact that similar to other energy-related directives, RE targets are frequently influenced by political considerations, as the decision makers who set them are usually elected politicians [74]. Hence, local regulators, whose role is to execute such RE targets, often find it difficult to do so [6,75–77].

The energy policy literature has examined at length how ambitious RE targets can influence the actual promotion of RE; in some cases, ambitious targets significantly incentivize all parties involved, regulators in particular, to promote RE as much as possible, even if the targets are unreachable [78,79]. In other cases, however, ambitious RE targets discourage local regulators, based on the understanding that they cannot achieve the desired targets [80,81]. Nevertheless, researchers have overlooked the influence of ambitious RE targets on decision making vis à vis fossil fuels, specifically in the context of national energy mixes. Accordingly, the next section presents the methodology of this study, which explores the influence of RE targets on decision-making concerning fossil fuels.

4. Methodology

To examine the influence of RE targets on decision-making regarding fossil fuels, this study focuses on the Israeli case. This constitutes an excellent example of a country that mostly relies on fossil fuels to meet its energy demand, on the one hand, and, on the other, has set highly ambitious RE targets, the actual achievement of which is doubtful.

In recent years, significant natural gas reserves were found in Israel's territorial waters [82]: The Tamar Reservoir (with a total estimated capacity of 350 BCM) began producing gas in 2013; the Leviathan Reservoir (600 BCM) began producing gas in 2019; and the Karish and Tanin Reservoirs (100 BCM together) began producing gas in 2022. These natural gas reservoirs together have an annual supply capacity of about 40 BCM. At the same time, as of 2021, the annual domestic demand for natural gas in in Israel stands at about 12 BCM and is expected to rise gradually to about 27 BCM by 2045.

At the same time, Israel has also made significant efforts in these years to increase its RE use. These efforts relied, first and foremost, on RE targets set by local politicians, who try to emphasize their commitment to promoting clean energy sources [83]. In 2009, the Israeli government, led by the former prime minister, Ehud Olmert, announced a target of 10% electricity production based on RE by 2020 as part of an official government ruling [84]. However, in practice, 11 years later, only 6.3% of electricity production was based on RE [85].

Despite not meeting its previous targets, the Israeli government announced new RE targets in 2020 as part of another official government decision, promising that 20% of electricity production would be based on RE by 2025, and 30% by 2030 (the Israeli Government, 2020). Moreover, as part of the 2021 climate summit organized by the US president, former Israeli Prime Minister Benjamin Netanyahu promised that Israel will

reach a target of 100% RE by 2050 [85]. Local energy professionals have criticized Israeli RE targets over the years, highlighting that they are not supported by scientific work, but rather constitute declarative announcements for political reasons, making them too ambitious to achieve [86]. Indeed, in practice, as of 2022, energy consumption in Israel was based on local natural gas (75%), imported coal and oil (15%), and lastly RE (10%), of which 86% is solar PV, 11% is thermo-solar, 2% is biogas and biomass, and 1% is wind energy [83].

To explore the Israeli case, this study specifically focuses on intra-governmental discussions held during 2020–2021 within the framework of the "Adiri Committee," named after its chairman, the former CEO of the Israeli Ministry of Energy, Udi Adiri. This committee was preceded by two previous committees which sought to formulate Israel's natural gas policy in light of the significant discoveries of this resource. The committee's full name was "The Professional Committee for Formulating Governmental Policy concerning Natural Gas", and thus its official goal was to formulate the government's policy concerning natural gas, specifically in light of Israel's RE targets. In particular, the committee aimed to reach policy recommendations concerning the exportation of natural gas to Israel's exclusive economic zone, which the government would later approve [82]. In the Israeli case, regulators are often involved in shaping energy-related policy recommendations. However, such policy recommendations have to be approved by decision makers (often the government itself or specific ministers) in order to be executed. Natural gas in Israel is owned by private companies that locate and produce it. However, they can export this privately owned natural gas only after obtaining an official government license which is granted based on the government's energy policy.

To examine the discussions that took place within the "Adiri Committee," this study relies on the classified protocols of the committee as well as the presentations given to it. The study itself is based on a qualitative case study approach [87], which aims to provide an understanding of the constructed social reality as part of the process of formulating Israel's energy policy, as reflected in the committee's discussions [88]. Based on this approach, the study investigates how the committee formulated Israel's energy policy, focusing on natural gas exports, and considers the significant disagreements that arose between its members. This is achieved by presenting the diverse positions of the committee members, dividing them into four groups of regulators (non-elected officials) with different agendas: regulators with an energy-oriented agenda (led by the Ministry of Energy and the Electricity Authority); regulators with an environmental-oriented agenda (led by the Ministry of Environmental Protection); regulators with an economic-oriented agenda (led by the Ministry of Finance); and, finally, regulators with a security-oriented agenda (led by the National Security Council). Based on the presentation of these diverse agendas, the course of events that eventually led the committee to publish its official energy policy is illuminated [89].

5. The Adiri Committee

The Adiri Committee's discussions can be divided into three main over-arching categories: Israeli RE targets and the possibility of meeting these targets; long-term trends concerning natural gas; and policy recommendations regarding Israel's natural gas policy, specifically with regard to exportation. The following presents these three categories of discussion.

5.1. Israel's Renewable Energy Targets

To reach decisions concerning Israel's natural gas policy, within the broad framework of the country's energy mix, the members of the Adiri Committee first discussed several fundamental issues. One fundamental issue on which there was general consensus was the estimated growth rate of Israel's energy demand, and electricity demand in particular. This estimation (more than 2% growth per year) was mainly based on the expected increase in population size, one of the highest among OECD countries [90]. However, another fundamental issue prompted significant disagreement among committee members: the

estimated diffusion rate of RE in Israel. As was described in the opening presentation of the committee, "Because energy production based on RE is considered a substitute for energy production based on fossil fuels, this issue is of great importance in the committee's process of formulating Israel's natural gas policy" [90].

At the beginning of the discussion regarding RE diffusion in Israel, the official government RE targets were presented by the committee organizers from the Ministry of Energy [90]. The representative of the Electricity Authority, which is responsible for formulating concrete regulations for the promotion of RE, spoke first, arguing that although the RE targets set by the government constitute the framework for promoting RE, in practice they are highly ambitious. According to the representative, the Electricity Authority would do everything in its power to reach the target of 20% electricity generation from RE by 2025 and 30% by 2030; however, he sought to emphasize that it is unclear whether this will indeed be possible. In this context, he mentioned that Israel had failed to meet the RE targets set by the government in the past. He therefore suggested that the committee rely on professional research conducted by the Electricity Authority, which predicts a more modest diffusion of RE: 15% electricity generation from RE by 2025 and 20% by 2030 [91].

The representative of the Ministry of Environmental Protection addressed the claims of the Electricity Authority's representative and presented an opposing position. According to this representative, the RE targets set by the government should constitute only the baseline, while in practice the committee should envision a much more significant diffusion. She gave several reasons for this. First, the representative argued that the statement made by former Prime Minister Benjamin Netanyahu regarding 100% electricity generation based on RE by 2050 should be considered the official RE target. Second, global trends indicate a much higher penetration rate of RE, and therefore Israel must not lag behind other countries in this regard. Finally, the representative claimed that the "committee's vision would create the reality," arguing that if the committee chose to implement a higher RE target, this would eventually shape real-life events [91].

The representative of the National Security Council asked to make his argument at this point. He prefaced his words by stating that he is not an energy expert. However, he claimed, after listening to the discussion so far, he understood that energy professionals cannot predict the exact penetration rate of RE in Israel in the coming years. Accordingly, the most important thing should be to ensure Israel's energy security, emphasizing that this goal should be achieved at any cost. Hence, he argued that the committee should formulate its policy based on all possible options: meeting and even bypassing the government's RE targets, or failing to do so. He concluded by saying that the government should prepare for both options and invest the required budgets accordingly [91].

The representative of the Ministry of Finance hurried to respond to these remarks, stating that it is impossible to ignore the cost element and the Israeli public's financial security should not be endangered. As such, it is impossible to prepare for all possible options, and the committee's policy recommendation should focus on maximizing the Israeli public's economic and energy utility without imposing a burden on the state budget [91].

As the disagreement among the committee members continued, a key figure intervened: the committee's legal counsel. According to this legal advisor, the committee was established to formulate the government's energy policy and therefore had no authority to contradict official government decisions. Hence, the legal advisor clarified that the committee must rely on the government's official RE targets in formulating an official government policy. The advisor concluded that if there are professional arguments that contradict the government's RE targets, they should have been voiced before the targets were set, and not at this stage, after the government decision had already been made [91].

In response, many committee members wondered why this legal position was not outlined at the beginning of the discussion; they all expressed their dissatisfaction with the fact that their professional positions regarding the possible RE diffusion rate, considering government RE targets, could not influence the committee's agenda. However, having failed to reach an agreement based on professional considerations, and due to legal limita-

tions, the committee members all agreed to accept the government's RE targets and future compliance with them as a starting point for the rest of the discussion concerning Israel's natural gas policy. It was therefore agreed that the committee would rely on a target of 30% electricity generation based on RE by 2030, without explicit reference to future trends after this date given the disagreements among the committee members [91].

5.2. Natural Gas Trends

Following the discussion regarding Israel's RE targets, committee members began to deliberate the future trends of the natural gas market both globally and specifically in Israel. The representative of the Ministry of Energy opened the meeting by saying that to some extent the discussion about natural gas trends is a mirror image of that concerning RE, given that they are close substitutes. However, he emphasized that while the discussion about RE focused on the period until 2030, due to the government's RE targets, the discussion concerning natural gas should address longer-term trends, i.e., until 2045 [92].

The first to present her position was the representative of the Ministry of Finance, providing an independent forecast concerning global natural gas demand. According to this forecast, due to decarbonization trends, by the year 2045 the global demand for natural gas will decrease dramatically, causing its value to plunge. The representative mentioned that this forecast refers to a period of 15 years after the last official RE targets approved by the government (i.e., 30% by 2030). She argued that considering Israel's significant natural gas reserves, the country should export this resource before the global price decrease to maximize its profit. With regard to the local natural gas market, the representative added that detection of further natural gas reservoirs in Israeli territory is highly likely, reducing any possible risk to the country's energy security. The representative further estimated that in coming years, Israel will gradually abandon the use of coal and oil, so any demand not met by RE would be met by local natural gas [93].

The representative of the Ministry of Environmental Protection agreed with this position; in her estimation, due to future decarbonization trends, the demand for natural gas is expected to decrease significantly in the near future. The representative qualified her remarks and said that in comparison to other fossil fuels, specifically coal and oil, natural gas is considered less polluting, and therefore its use is likely to be more prolonged. Moreover, she emphasized that the global trend of reduced demand for natural gas would also be reflected in the Israeli market, although "Israel is always lagging behind in such trends" [93].

At this point, the representative of the National Security Council rushed to intervene, arguing that there is insufficient support for the claim that natural gas prices are expected to fall in coming years. Hence, he clarified his opposition to increasing natural gas exports, because this would reduce Israel's natural gas reserves, thereby risking its energy security. According to the representative, although the committee members agreed to rely on the governmental RE targets, they cannot ignore the fact that many of them do not believe these targets will be achieved. He concluded by saying that with future trends not completely clear, Israel should make careful decisions concerning its natural gas; maximum natural gas reserves should be preserved for local use, while future exportation should be minimized [93].

The last to address the issue was the representative of the Ministry of Energy, who argued that there is no doubt regarding the long-term trend pointing to reductions in fossil fuel use, and natural gas in particular. He then presented a research paper written by the Ministry of Energy, stating that in 20–25 years' time, the global demand for natural gas will decrease significantly, leading to much lower prices. However, he argued that experts around the globe continue to debate the reduction rate. The paper also claimed that this trend would influence Israel in the long term; the demand for natural gas will decrease, and it will be replaced by RE, with Israel reaching a level of 43% energy generation using RE by 2045 and the remainder of the demand met based on natural gas. The representative further emphasized that it would be irresponsible to rely on the possibility of finding

additional natural gas reserves in Israeli territory, even though he could not rule out this possibility [93].

Thus, although each ministry's forecast was motivated by a different agenda, in fact, there was a relatively broad consensus: due to decarbonization trends, the global demand for natural gas is expected to begin to decline in 20 years' time, and this will influence the Israeli market. The only opponent to this position was the representative of the National Security Council. The other representatives, however, argued that his position was mainly based on his agenda, which is to ensure energy security at all costs, without any data to support his arguments. Hence, most members accepted that the official position of the committee should state that in 25 years, by 2045, the global demand for natural gas will decrease significantly, also influencing the Israeli market. Thus, natural gas that will not be locally consumed or exported in the next 25 years will most likely not be sold at all, or will be sold at much lower prices. With regard to new natural gas discoveries in Israel, all members, including the representative of the National Security Council, agreed that even though this is a possibility, the committee cannot rely on it in making its policy recommendation [93].

5.3. Policy Recommendations

Based on the previous discussions, the members of the Adiri committee gathered once again to formulate their policy recommendation concerning the export of natural gas. The representative of the Ministry of Energy presented the committee's agreements thus far, stating that the two issues previously discussed, concerning RE targets and natural gas trends, constitute two sides of the same coin; because they are substitutes, in most cases, an increase in the use of RE is expected to lead to a decrease in the use of natural gas, and vice versa [94]. The representative asked all members of the committee to present their main recommendation regarding gas exports, following which they would try to reach an agreed policy recommendation [95].

The first to present his position was the representative of the National Security Council, who stressed that, based on the discussions so far, he was not convinced a clear forecast exists regarding Israel's future energy mix, specifically concerning RE and natural gas. Hence, he emphasized that, in his opinion, Israel's energy security should not be jeopardized by relying on the future penetration of RE, and any additional gas exports from Israel should be prohibited, apart from exceptional cases. Rather, all gas reserves should be reserved for local use for the longest period possible [95].

The representative of the Ministry of Environmental Protection presented the opposite position. She said that considering former Prime Minister Benjamin Netanyahu's statement regarding a complete transition to RE by 2050, the country can export a significant amount of natural gas, relying on this statement as the official guideline. She added that exporting most of Israel's natural gas reserves may help the country adopt RE at an accelerated pace. She claimed that the detection of Israel's significant natural gas reserves is to blame for the low penetration of RE; these reserves constitute a cheap and available alternative, but emit significantly more pollutants. She concluded by emphasizing that increased natural gas exports will leave Israel with no alternative but to increase its RE use in a manner that will strengthen its energy security, in terms of energy availability and energy prices, and vis à vis environmental and social aspects [95].

The representative of the Ministry of Energy was next to comment. He claimed that the representatives of the National Security Council and the Ministry of Environmental Protection both ignored the committee's previous agreements, presenting opposing yet extreme positions. Thus, the representative of the Ministry of Energy said that the recommendations concerning natural gas exports should rely on the agreements of the committee so far: until 2030, natural gas should be exported based on the assumption that Israel will reach a target of 30% RE; after 2030, exports should rely on the predication that Israel will reach a target of 43% RE use by 2045, while the remainder of the energy demand will be supplied based on natural gas [95].

The last to speak was the representative of the Ministry of Finance, who suggested dividing the recommended policy into two periods. According to the representative, this will enable Israel to take advantage of the economic gains facilitated by exporting natural gas in the long term while enhancing Israel's energy security and avoiding irreversible measures in the short term. Similarly to the suggestion proposed by the Ministry of Energy, in the short term, until 2030, natural gas exports should rely on the government's RE targets (30%), ensuring that natural gas can satisfy the rest of the local demand (70%). However, in the long term, until 2045, the amount of natural gas preserved for local use will be more limited than the amount suggested by the Ministry of Energy, preserving half of the amount of natural gas needed according to current estimations, while allowing exportation of the remainder. The Ministry of Finance argued that exporting more natural gas in this period will enable Israel to take advantage of the economic benefits of its natural gas reserves in a manner that reflects expected decarbonization trends [95].

At this stage, the legal counsel of the committee intervened, saying that as a general rule the committee should base its policy recommendation on previous agreements and discussions because they are being documented; failure to do so would make it difficult to defend such policy recommendations in court, in the case of an appeal. Thus, the counsel stated that the two positions of the National Security Council and the Ministry of Environmental Protection will be hard to justify legally, leaving the committee with two main options: those proposed by the Ministry of Finance and those by the Ministry of Energy [95].

The representative of the Ministry of Energy expressed willingness to accept the position of the Ministry of Finance on the condition that a re-examination will be conducted in 2030 to validate the recommendations, allowing fewer exports if there is insufficient natural gas for local use due to low RE penetration. The representative of the Ministry of Finance stated that she usually prefers to avoid such future changes in order to provide more certainty throughout the recommended energy policy. However, to reach a broad agreement and to promote the committee's recommendation, she agreed to this suggestion. The representative of the National Security Council said that considering the legal counsel's position, he would accept the Ministry of Finance's recommendation for natural gas exports until 2030. However, he opposed the recommendation to allow more exports during 2030–2045 on the basis that it contradicts the predictions of the Ministry of Energy. However, he clarified that as long as the committee members approve a re-examination in 2030, he would support the proposed outline [95].

The only representative who completely opposed the Ministry of Finance's recommendations was the representative of the Ministry of Environmental Protection, who insisted that any policy recommendations should be based on Israel reaching a target of 100% RE by 2050, practically allowing more exports of natural gas [95]. Accordingly, the committee's official recommendations concerning the export of natural gas were published based on the recommendation of the Ministry of Finance, dividing the policy into two periods, with a re-examination to be conducted in 2030. These recommendations were later submitted to the government for approval, in order to enable their execution. The minority position represented by the Ministry of Environmental Protection was also published, but it was not officially endorsed by the entire committee [95].

6. Discussion

This study examined the relationship between RE targets and decision making concerning fossil fuel resources, specifically in the framework of energy security, focusing on intra-governmental discussions that took place in Israel during 2020–2021 to formulate the country's natural gas export policy as a function of its ambitious RE targets. Accordingly, this study contributes to several main debates in the energy policy literature.

The first debate concerns the roles of fossil fuels and RE in the framework of energy security [23,96]. This case study illuminated that regulators perceive RE and fossil fuels as substitutes; one is used at the expense of the other. However, it has also illustrated

how these energy sources are perceived differently in the context of energy security. When referring to the concept of energy security, the regulators in the case study mainly addressed the availability dimension, and in some cases the price dimension. Apart from the representative of the Ministry of Environmental Protection, the other regulators completely ignored the environmental and social dimensions of energy security. This placed RE at a disadvantage compared to fossil fuels within the discussions, because RE systems are prominent specifically in the environmental and social dimensions of energy security. This issue indicates that while RE systems are perceived as sustainable energy sources, regulators do not always view them as enhancing energy security, despite several proven advantages in this regard. The regulators' perception here is of great importance because they ultimately shape energy policies, specifically in the context of energy security.

The second debate concerns the possible interaction between RE and fossil fuels, specifically through the energy policy prism [97–99]. The study demonstrated how Israel's ambitious RE targets eventually led the regulators to adjust the amount of natural gas preserved for local use, specifically in the short term, until 2030. In particular, the Electricity Authority, which is the regulatory body responsible for the execution of Israel's RE targets, expressed significant doubt about the country's ability to meet those targets. Hence, despite some professional disagreement, the Israeli regulators eventually relied on government RE targets, leading them to preserve minimal reserves of natural gas for local use. This illuminates how RE targets set by politicians may prevail over regulators' professional considerations, forcing them to risk national energy security by making irreversible decisions concerning fossil fuels.

In this context, the study also shed light on how regulators' willingness to take risks regarding national energy security may differ depending on time frameworks. In the short term, until the year 2030, some regulators expressed concerns about not meeting government RE targets, which they believe may represent a risk to national energy security due to increased exportation of fossil fuels. However, in the long term, until the year 2045 (for which no RE targets exist), the regulators decided to increase this risk, allowing the exportation of more fossil fuels for the sake of financial benefit. This difference may stem from the regulators' perception of their own personal responsibility [100]. In the short term, the regulators were perhaps concerned that they would be found guilty of endangering national energy security. They therefore preferred to support less risky decisions in this matter to avoid any blame, but eventually were constrained by the government's RE targets. However, the regulators were aware that in the long term they would no longer work in their current positions. Accordingly, by that time, they are not likely to be identified with decisions that may endanger national energy security, making it easier to make higher-risk decisions concerning energy security for this period.

The third debate focuses on the process of formulating energy policy [101,102]. This case study illuminated the significant differences in the leeway available to politicians and professional regulators in shaping policies, and energy policies in particular. On the one hand, as elected officials, politicians have the privilege of outlining the framework for the energy policy, using RE targets. On the other hand, professional regulators, who actually execute the energy policy, are limited by the politicians' decisions and must align with them, despite disagreements. Thus, this case study demonstrated how professional regulators are often limited in their ability to recommend or execute energy policy; they are subject to the framework dictated by politicians, which may be based on non-professional considerations.

Regarding the work of the regulators in shaping energy policy, the case study revealed the importance of a clear and structured decision-making mechanism. The Adiri committee had no structured decision-making mechanism, so its members could not know whether the committee's decisions would be made based on a majority vote, a full consensus, or any other predefined mechanism. This lack of a decision-making mechanism led to a relatively limited dialogue between the various actors and a situation in which the different representatives found it difficult to convince each other of their opinions. Consequently, decisions were made largely based on legal restrictions such as the need to rely on gov-

ernmental decisions, and not on the basis of consensual professional positions. Thus, this study demonstrates that the lack of a clear decision-making mechanism reduces regulators' ability to make optimal professional decisions through productive dialogue, specifically in the context of energy policy.

7. Conclusions

Evidence indicates that numerous countries all over the world set different RE targets to promote the use of these clean and sustainable energy sources at the expense of polluting, fossil fuel-based energy systems. While scholars have discussed extensively the influence of such RE targets on the actual promotion of RE sources, they have neglected the influence of these targets on national fossil fuel policy. Hence, this study aimed to examine the impact of RE targets on decision making vis à vis fossil fuel resources, specifically focusing on the concept of energy security. It did so by exploring intra-governmental discussions held in Israel during 2020–2021 regarding the country's natural gas export policy as a function of its ambitious RE targets.

The study makes several important contributions with significant policy implications. First, it illuminated that RE targets can significantly affect decision making concerning fossil fuels, even when contradicting professional estimations exist; in the case study, Israel's ambitious RE targets led regulators to recommend reducing the amount of natural gas preserved for local use. Second, it revealed how regulators may perceive RE sources as less associated with national energy security in comparison to fossil fuels; in the case study, this is reflected in the regulators emphasizing the availability and cost dimensions of energy security while neglecting its social and environmental dimensions. Third, this study shed light on the significant differences in the leeway politicians and professional regulators enjoy in shaping energy policies; while politicians set RE targets, the regulators in the case study were restricted by these targets, struggling to conduct a fruitful dialogue due to the lack of a structured decision-making mechanism. When extending these conclusions to other countries, however, one must consider the unique characteristics of the Israeli case.

Hence, from a practical perspective, the study can enhance decision makers' awareness of the need to set realistic RE targets. This should be done through productive cooperation with professional regulators, considering the possible impact of such RE targets on irreversible decisions regarding fossil fuels. For professional regulators engaged in shaping energy policy, this study can improve their understanding of the importance of making decisions in their domain based on structured and pre-defined mechanisms.

This study, however, also has some drawbacks. First, it relies on a single case study, whereas findings in other countries or regions may differ. Second, it is based on a qualitative case study, and it lacks a quantitative examination. Third, the study does not include a retrospective analysis of the implications of the fossil fuel policy and whether it had a detrimental effect on national energy security. Fourth, the study does not focus on the process of setting RE targets and the discourse between politicians and professional regulators in this regard. Hence, future research, also based on quantitative methods, should explore the impact of RE targets on fossil fuel policy in other locations. Furthermore, future research should try to examine retrospectively how decision making vis à vis fossil fuels, based on RE targets, affected the energy security of different countries. Finally, scholars should explore the process of setting RE targets, particularly the interaction between politicians and regulators in this regard.

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