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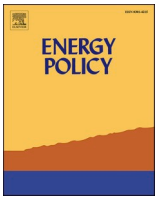

The geopolitical economy of an undermined energy transition: The case of Jordan

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ABSTRACT

For resource-poor countries in the MENA, the expansion of renewables represents a unique chance to overcome established geopolitical dependencies, develop employment opportunities, and pursue a long-term strategy of domestic energy security. While, in 2018, Jordan was declared one of the top three emerging markets globally for clean energy investment, in 2019, efforts at transition had come to a temporary halt. Jordanian attempts at energy transition were motivated by concerns for energy security, rather than sustainability. Whereas energy security and transition to renewables initially seemed to coincide, technical restraints and a renewed turn to fossil fuels have undermined efforts at transition, seemingly boosting energy security on the short-term, but compromising it on the long-run. We argue that the case of Jordan illustrates how domestic and regional political and economic drivers may undermine efforts at energy transition, deepen established dependencies, and transform renewables' distributed nature into concentrated forms of power. By zooming in on key entry points for energy flows into Jordan, we explore what dynamics are (re-)energised, and which ones undermined. Finally, we suggest decentralised renewables, communal ownership models, and the empowerment of marginalised municipal authorities as means to strengthen inclusive and participatory practices and overcome fossil fuel dependencies.

1. Introduction

Scholars of energy politics agree that efforts at energy transition are inherently political. Attempts at shifting a given society's energy sources (re-)shape power dynamics and are often heavily contested (Verdeil, 2014: 128). While it is clear that efforts at transitioning to renewable energies "empower new economic and possibly political actors, [prompting] either accommodation or suppression by authoritarian regimes" (Woertz, 2021: 705), these dynamics have not yet received adequate scholarly attention (for notable exceptions focusing on the MENA region, see Günel, 2019; Allan et al., 2022; Rignall, 2016). Against this backdrop, this paper explores how and to what extent efforts at energy transition in Jordan – a country that has in 2018 still been praised as one of the main emerging markets globally for clean energy investments – have become undermined.

Renewable energies require and enable new opportunities for regional cooperation. These, and the possible reduction of foreign energy imports are widely assessed positively (El-Katiri, 2014: 24). However, advocates of energy democracy (Becker and Kunze, 2014) criticise the central role of transnational corporations in producing and managing the required infrastructure, knowledge and technology, and of international finance institutions in providing funds. This leads to new dependencies and 'greenwashes' existing authoritarian power (Zumbraegel, 2022: 119). In fact, the majority of investments in the region's renewable energy sector are funded by public-private partnerships that help "to decarbonize the existing economy rather than transform it" (Burke and Stephens, 2018: 84). While scholars see renewable energies as a potential "game changer" (Scholten, 2018: 1) for established interstate energy relations, questions of governance and energy politics often remain disconnected.

Recent work on energy politics emphasises that energy infrastructure projects - while presenting themselves as seemingly apolitical (Anand

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et al., 2018: 3) - reproduce political and economic power (Bridge et al., 2018). States cannot simultaneously achieve energy security, sustainability and sovereignty over their energy sector (Thaler and Hofmann, 2022). The concept of energy security is highly contingent upon human interpretation and can - in different degrees and depending on the considered time horizon - both be made to coincide with or run counter to sustainability concerns and the expansion of renewable energies. While a renewed turn to fossil fuels may boost energy security in the short- and/or mid-term, associated contractual obligations and investments in energy infrastructures prefigure future political and economic opportunities and set the framework within which certain forms of energy politics are imagined, realised or prevented (Jenss and Schuetze, 2023). It is crucial then to investigate contemporary power structures and forms of decision-making in more depth, as they shape not only the extent to which sustainable futures can be realised, but also the extent to which sustainability concerns and notions of energy security can be reconciled and may even depend on one another.

Different energy sources and associated infrastructures entail different disruptive potentials (Mitchell, 2011: 236) that can be used to challenge or reinforce "energised practices" (Rignall, 2016: 542) that enable distributed energy politics, characterised as democratic, or concentrated energy politics, characterised as more authoritarian (Burke and Stephens, 2018: 82). The recent turn in scholarship on authoritarian power to focus on authoritarian practices rather than regimes is helpful to better unpack their manifestation within energy transition practices (Glasius, 2023; Jenss and Schuetze, 2021; Bruff and Tansel, 2019; Gurol et al., 2023). Transitions to renewable energies are typically linked with hopes for greater energy democracy (Daggett, 2021) and energy security (El-Katiri, 2014). Finally, the energy-related decisions that different political and economic elites take during the current period of transition are deeply geopolitical in nature (Scholten et al., 2020). They prefigure the extent to which sustainability concerns and notions of energy security can be reconciled, and have the potential to reshape alliances at the national, regional, and international level.

Countries throughout the Middle East and North Africa (MENA) are pursuing ambitious targets for a transition to renewable energies (IRENA, 2020: 17). Although renewables continue to account for a low share of the region's energy mix, the beginning of the shift from oil and gas to hydro, solar and wind marks an important point of transition. Nevertheless, energy politics in the MENA is often marked by centralised and capital intensive technologies and infrastructures (Rignall, 2016: 548), intransparent systems of financing (Krupa et al., 2019), and lacking public control (Hamouchene, 2016: 8). It is characterised by forms of knowledge production that reproduce existing hierarchies in the name of sustainability (Koch, 2014: 1122), and a dependency on financial markets in the Gulf (Hanieh, 2018: 174). The political and economic elites of the MENA have a preference for megaprojects and show little interest in public goods approaches. Instead, they attempt "to re-organize distributed energy flows into aggregated and concentrated stocks of energy, investment instruments, technological research, ownership patterns, etc." (Burke and Stephens, 2018: 80) via processes of technocratisation premised on market-oriented technical fixes (Günel, 2019: 11).

Against this backdrop, we explore in this paper how, in the case of Jordan, domestic and regional political and economic drivers have undermined efforts at energy transition, deepened established dependencies, and transformed renewables' distributed nature into concentrated forms of power. In short, we analyse the political economy of an undermined energy transition. We first provide some background information about Jordan's socio-economic context, the current state of attempts at renewable energy transition in the country, its electricity grid and transnational interconnections, followed by a brief description of our methodological approach. Subsequently, we discuss how recent developments have renewed Jordan's dependence on fossil fuels, undermining attempts at energy transition and re-energising established power hierarchies. Finally, we reflect on the 2021 declaration of intent for a joint Israeli-Jordanian-Emirati water-solar energy deal and argue that ambitious plans for transitioning to a more energy secure Jordan via increased investment in renewables and diversification of imports have during the past years given way to the reinforcement of a highly centralised and fossil fuel-based energy politics that further increases pre-existing dependencies.

2. Background

2.1. Socio-economic context

As Jordan has throughout its history been in a position of relative economic, political and military weakness vis-à-vis its neighbours (Fig. 1), and is for its energy needs almost completely dependent on imports (95%), its foreign policy has been strongly influenced by said geopolitical dependence, primarily on the US. Despite strong reliance on US financial support, it opposed the US-led military intervention in Kuwait and Iraq in 1991. However, it quickly realigned its foreign policy after the war and began to support the US-sponsored Arab-Israeli peace process, in spite of strong popular reservations regarding Arab-Israeli normalisation (Schwedler, 2022: 131–134). According to Schuetze (2019), economic dependence on external powers, highly centralised decision-making processes and repression of oppositional activists constitute some of the key characteristics of Jordanian (energy) politics. Whereas concerns about energy security and energy prices feature prominently at public protests (Verdeil, 2014) - state subsidisation of electricity constitutes a key element of Jordan's so-called social contract - sustainability concerns have only recently entered public debate (Sandri et al., 2020).

For resource-poor and demographically growing countries like

Fig. 1. Map of Jordan. © peter palm, berlin.

Jordan (see Fig. 2), the expansion of solar and wind energy represents a unique chance to mitigate or overcome established geopolitical dependencies, develop employment opportunities, and pursue a long-term strategy of domestic energy security based on green growth (Eicke and Weko, 2022). However, as Jordanian attempts at energy transition were motivated by short- and mid-term concerns for energy security rather than sustainability, technical restraints and domestic and regional actors with an interest in continuing existing political and economic dependencies were able to undermine them. Such actors include Jordanian elites, transnational corporations like UAE's Masdar, and Israeli energy companies and state officials. Jordan's continued dependence on fossil fuels not only seriously compromises sustainability concerns, but also undermines long-term goals of Jordanian energy security and the possibility of a more decentralised and less hierarchical form of energy politics.

Following the 2003 Iraq War, which resulted in the end of oil imports at a low price, the Jordanian government started diversifying imports - primarily by increasing the share of natural gas (Fig. 3). After the Egyptian gas pipeline was blown up in 2011 in the context of the Egyptian uprising, Jordan was once again forced to adjust its energy policy. As the country replaced gas with much more expensive diesel and heavy fuel (Figs. 3 and 4), Jordan's National Electric Power Company (NEPCO) began to accumulate a massive debt, which rose up to approximately 5 billion Jordanian Dinar (approximately 7 billion USD) by late 2020 (Nepco, 2020; 47), equalling around 75% of the value of its capital (Jordan News, 2021), and significantly contributing to Jordan's growing national debt (see Fig. 5).

2.2. Jordan's attempts at renewable energy transition

Jordan's "Master Strategy for the Energy Sector 2007–2020" was guided by the need to ensure energy security by diversifying sources of energy imports, increasing energy efficiency, and boosting locally produced renewable resources. Tariffs and pricing mechanisms, support for investments in energy-saving techniques, and the import of electric vehicles were identified as important tools to increase energy efficiency. To support the development of renewable energy in the country, the strategy identified the need for a new law to attract private sector investment and for a specific fund to support such projects. The "Renewable Energy and Energy Efficiency Law" (RE & EE) was passed and approved in 2012, but the costs of interconnecting renewable energy projects to the national grid remained an obstacle (Sandri et al., 2020).

A second National Strategy for the Energy Sector was adopted for the 2015–25 period, followed by another one for the 2020–30 period. The principles of the two strategies remained similar to the previous ones: ensure energy security by diversifying sources of imports, investing in renewable energy, increasing local energy production, improving energy efficiency, and exploring alternative energy options. The 2020–2030 strategy, which states Jordan's objective to become a regional energy hub, aims at 53% of electricity to be produced via natural gas, 31% via renewable energies, 15% via oil shales, and only 1% via oil. What emerges is that the envisaged role of renewable energy for power generation increased from 15% in the 2015–2025 strategy to 31% in the 2020–2030 strategy. And indeed, until 2019, the Jordanian government actively pushed for the development of renewable energy sources in the country, "making Jordan a regional front-runner in renewable energy" (IRENA, 2021: 2). However, in light of an achieved growth of the share of electricity from renewables from less than 1% in 2014 to 20% in 2020 (Enerdata, 2021), a formulated policy target of 31% by 2030, appears not particularly ambitious. In this context, and in light of plummeting public investments in renewables (Fig. 6), the question is then not so much whether Jordan will be able to achieve its formulated target, but rather why and how Jordanian attempts at energy transition were undermined and did not result in the formulation of more ambitious policy objectives.

Jordan's potential for renewable energies is very promising; technology costs have been decreasing and solar and wind energy are widely available, with potential also for the production of bioenergy and geothermal energy. As noted by IRENA (2021: 2), "the results of the latest (third) round of direct proposal submissions in 2018 yielded bids as low as USD 0.03 (US dollars)/kWh (kilowatt-hour) [while] the average cost of electricity purchased by National Electric Power Company (NEPCO) in 2018 was (USD 0.114/kWh)." However, as Sandri et al. (2020: 15) remind us, "getting the maximum benefit out of renewable energy is more a question of political will, coordinated action, and investment, rather than a mere issue of resources and conditions." Sandri et al. (2020) have in this regard identified inadequate infrastructures, lack of funds and financing schemes, and the small size of the Jordanian market as the key challenges and main factors discouraging investments.

The Jordanian government has been striving to support the development of renewable energies by promoting regional collaboration, focusing on incentivising investors, launching public-private partnerships (PPPs), and granting exemptions on income tax and property tax. In order to encourage the involvement of private investors, the Jordanian government has committed to buying the electricity generated at a negotiated price (Komendantova et al., 2020). As noted by Abu-Rumman et al. (2020), Jordan is home to over 300 registered installation companies, of which about 20 companies are active in the Jordanian market. However, while the Jordanian government has promoted the development of renewable energies up until 2019, this seems to have been halted with "the indefinite suspension of new projects over 1 MW (MW) since January 2019" (IRENA, 2021: 2).

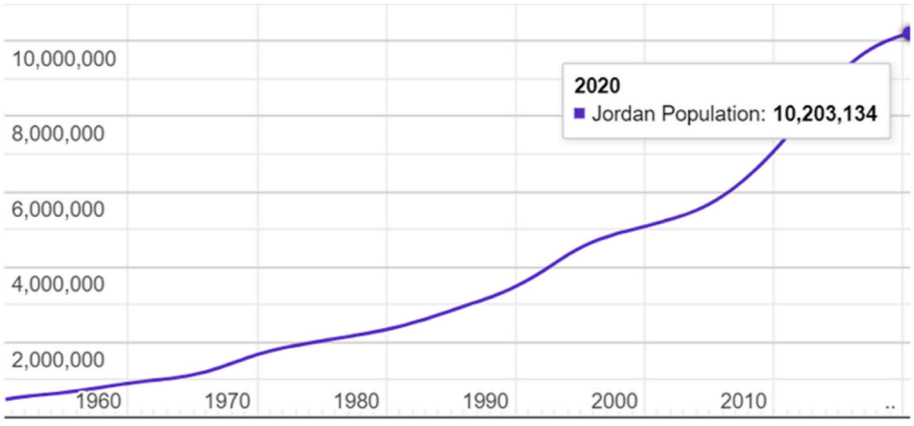

Fig. 2. Jordan – population (1950–2020) (Worldometers, 2023).

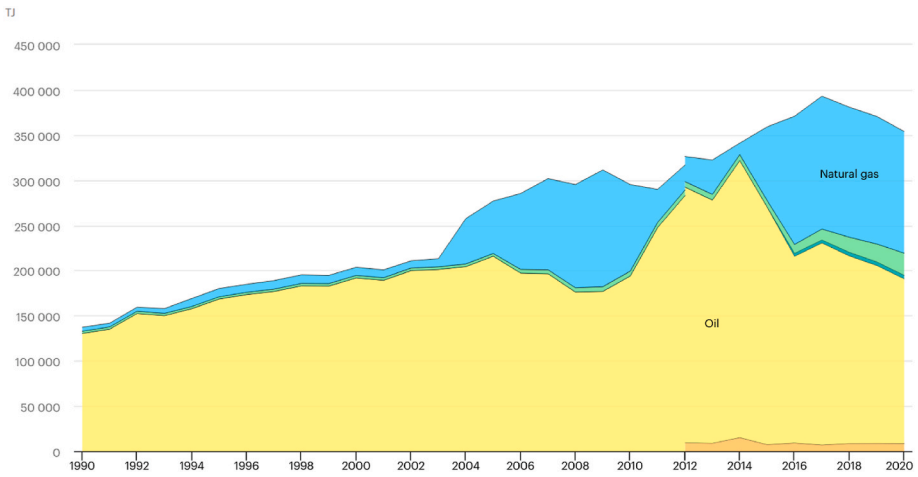

Fig. 3. Total energy supply by source, Jordan 1990–2020 (IEA, 2023a).

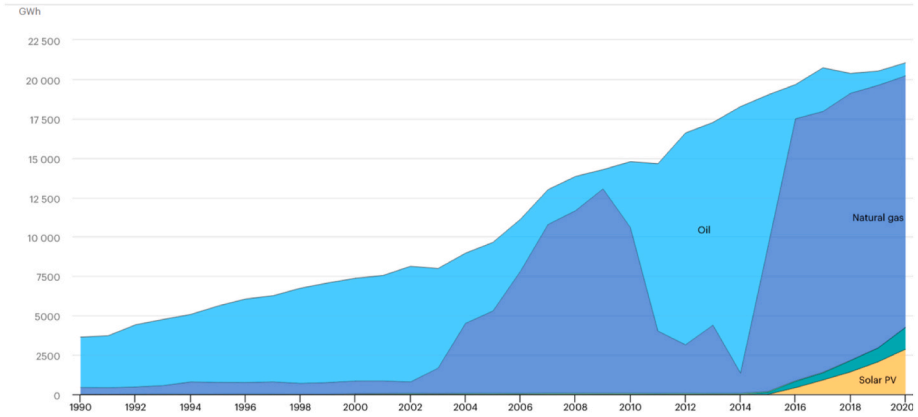

Fig. 4. Electricity generation by source, Jordan 1990–2020 (IEA, 2023b).

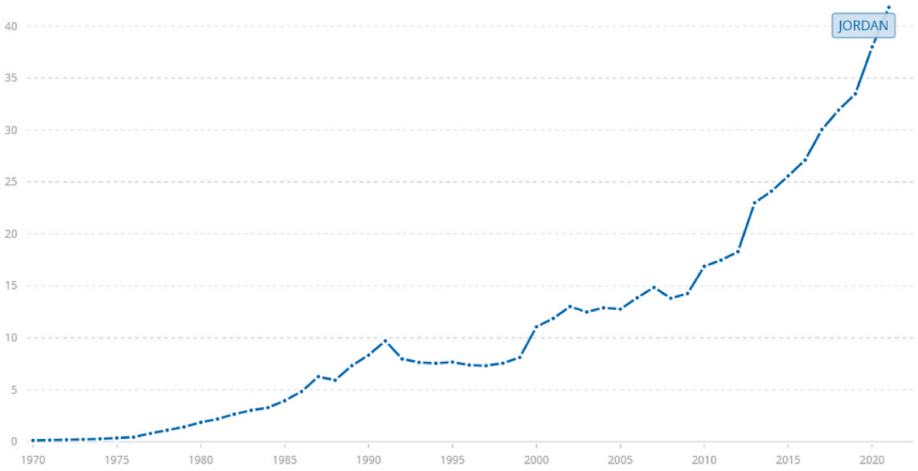

Fig. 5. Jordan's external debt stocks, total (debt outstanding disbursed, current US$) (World Bank, 2023).

2.3. NEPCO, Jordan's electricity grid and regional interconnections

For its electrical power production, Jordan relies on a combination of private and state-owned power plants. The country's transmission grid is owned, operated and managed by the National Electric Power Company (NEPCO), which operates as a public shareholding company, and is responsible for purchasing, transmitting, controlling and selling electric power by linking generation plants to consumers via the national transmission grid. NEPCO is wholly owned by the Ministry of Finance. Electricity distribution is managed by three publicly owned shareholding companies that have regional monopolies in Jordan's North (Irbid District Electricity Company, IDECO), Centre (Jordanian Electric Power Company, JEPCO) and South (Electricity Distribution Company, EDCO).

In 2020, all generating plants connected to Jordan's transmission

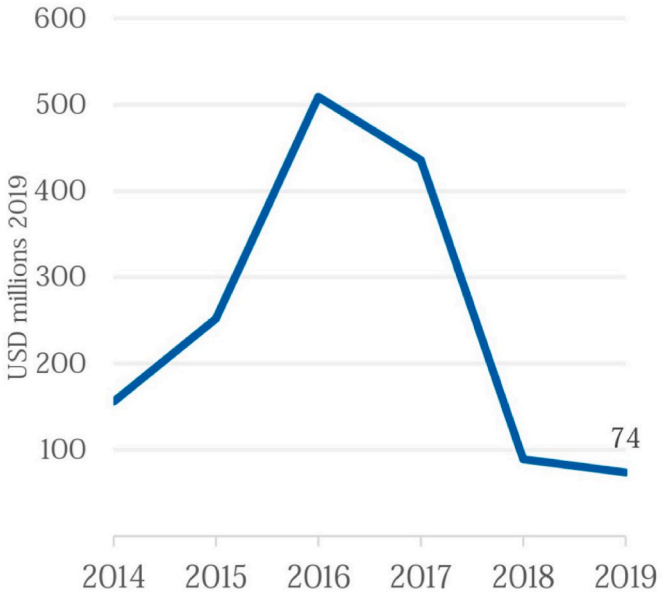

Fig. 6. Public flows to renewables in Jordan, 2014–2019 (IRENA, 2022).

network provided a total capacity of 1.4 GW renewable (900 MW solar and 518 MW wind) and 4 GW conventional energy (Nepco, 2020: 12, 24). For conventional electricity production, NEPCO relied up until 2010 primarily on natural gas. The structure of Jordan's electricity pricing arrangement ensures that all financial risks are effectively borne by public NEPCO, which purchases the required fuel and sells it to private power producers (CEGCO, SEPCO, East Amman Power Company and Qatrana Power Company) based on bilateral contracts that insulate the latter from the risks associated with unexpected fuel price changes. Likewise, a tariff system that "guarantees a positive return to distribution companies" (Hashemite Kingdom of Jordan, 2011: 4) insulates the latter from the risks associated with sudden price increases on the global market. While private power production and private power distribution are guaranteed to be financially profitable, public NEPCO bears all financial risks associated with potential price increases of the fuel it imports.

Just as Jordan's electricity grid operates in a way that distributes risks publicly, while privatising profits, the recent gradual shift to renewables has been managed in a way that has only further accentuated public vulnerabilities and private opportunities - primarily for those companies that have the means to disconnect from the grid and rely on independent electricity production via renewables. As electricity tariffs have increased over the past years due to high fuel prices, several large-scale energy consumers have exited the grid and switched to self-owned renewable energy solutions. This led to a reduction of public demand and electricity tariff revenues, further exacerbating NEPCO's financial imbalance and leaving small-scale energy consumers exposed to rising electricity prices (Ministry of Energy and Mineral Resources, 2020: 15).

As Jordan's share of renewable energy expanded, the question of transnational electricity grid integration has become more and more important. The variability and intermittency of wind and solar energy requires new interconnections and/or storage capacities, as times of high solar radiation/wind speeds and high electricity consumption do not necessarily align; a problem further compounded in relatively small grids that offer only little opportunity to mitigate intermittence. The state-boundedness of most electricity grids constitutes a major challenge for the further expansion of renewables. Jordan's existing grid is still first and foremost the result of such individual state strategies and security of supply priorities (Poudineh and Rubino, 2017: 96) and hence – in the absence of new transnational connections – not yet adequately prepared for the large-scale integration of renewables.

While Jordan's electricity grid is interconnected with the Palestinian (Jericho area) (20 MW), Egyptian (550 MW) and Syrian grids (300–800 MW), the capacity of existing interconnections is rather limited, with the latter entirely ceasing operations in 2011 and eventually being destroyed during the war. While Jordan imports almost all of the energy needed to produce electricity, it also imports and exports small amounts of electricity via existing transnational grid interconnections. Thus far, electricity imports (2% of NEPCO's electrical energy purchases in 2020 were imported from Egypt) and exports (1% of NEPCO's electrical energy sales in 2020 were exported (primarily to Palestine)) play practically no major role (Nepco, 2020: 33–34). However, with a publicly stated objective of turning Jordan into "a regional center for energy exchange" (Ministry of Energy and Mineral Resources, 2020: 19), Jordan is pursuing various transnational interconnection projects. Together with similar projects by other countries in the region, these may reinvigorate already existing interconnection agreements such as the eight country block project (EIJLLPST, consisting of Egypt, Iraq, Jordan, Lebanon, Libya, Palestine, Syria and Turkey), which have thus far not yet yielded any significant level of interconnection. Ongoing projects include plans for a 164 km interconnector with the Saudi grid – a project that is also part of Saudi Vision (2030), the relaunch of the interconnection with Syria, in order to thereby also export electricity to Lebanon, the doubling of the capacity of the existing submarine interconnection with Egypt by 2025, and negotiations on contracts to supply Jordanian electricity to Iraq from 2022 on.

However, it remains highly questionable whether Jordan will indeed be able to establish itself as the desired 'regional centre for energy exchange' and whether foreign investments in a few select megaprojects will trigger any meaningful knock-on effects in terms of employment opportunities and lower electricity prices. Despite ongoing efforts at greater regional electricity grid integration, the further exploitation of renewables still confronts a number of barriers. Jordan is thus by no means the only country in the region that plans to transform itself into a regional energy hub and to use its renewable energy capacities for electricity exports, with Saudi-Arabia (Gnana, 2020) and Egypt (Abu Zaid, 2021) pursuing very similar plans, including the use of the Jordanian grid for electricity exports to Iraq.

3. Methodology and research puzzle

This article relies on qualitative methods of data collection and analysis. In order to answer the guiding question of how and to what extent efforts at energy transition in Jordan have become undermined, we conducted desk-based research, analysis of secondary literature and semi-structured qualitative background interviews with seven Jordanian renewable energy consultants, scholars of Jordanian energy politics and technical experts. Interviews were conducted via zoom in late 2020 and in person in Amman in late 2022. Data collection relied on desk-based research of written documentation on Jordanian energy policies and strategies - both in English and Arabic - and on desk-based review of academic literature. In terms of research design, this study adopts a problem-driven interpretive single case study approach. The rationale behind the choice of Jordan as case study is due to the following reasons:

Whereas Jordan has historically been highly dependent on energy imports, it has - in the years up until 2019 - witnessed an impressive growth of the share of electricity production from domestic renewables from 0.35% in 2014 to 20% in 2020 (Enerdata, 2021). In the MENA region, only Yemen and Morocco are currently ranked higher than Jordan. In 2018, Jordan, which boasts a number of renewable energy companies, was named one of the top three emerging markets globally for clean energy investment (Bloomberg, 2018). However, this promising transition away from a dependence on fossil fuel imports came to a drastic halt, when the Jordanian government, in 2019, suspended new licences for renewable energy projects of more than 1 MW until the capacity of the Jordanian electricity grid had been assessed (Bellini, 2019). Beyond such technical challenges, efforts at expanding

renewables had also become obstructed by attempts at both diversifying and significantly expanding Jordan's receipt of fossil energy sources from abroad.

While we are aware of the limitations for broader generalisation when pursuing single case study approaches, the above indicated prominence of the case of Jordan still lends our exploration to some generalisation also beyond the specific case of Jordan. Our reliance on a qualitative interpretive approach is a deliberate attempt at addressing the predominance of quantitative methods in energy research and the shortage of context-specific case study approaches that explore socio-political transformation processes beyond North America and Europe, rely on "human-centered research methods" (Sovacool, 2014: 2 and 7–8) and discuss the power of human agency in shaping political outcomes (Woertz, 2021: 705). This paper's key contribution lies in unpacking the geopolitical actors and dynamics undermining energy transition in Jordan, and in showing how a prioritisation of short-term concerns about energy security not only compromises sustainability concerns, but also undermines long-term goals of energy security, and the possibility of a more decentralised and less hierarchical energy politics. It contributes to literature on Middle Eastern politics, energy politics and sustainability. The focus of the paper is purely on attempts at energy transition in the power sector. It does not discuss the potential role of renewable energies in mobility and consumption.

4. Results and discussion: renewing Jordan's dependence on fossil fuels

Given the limited availability of natural resources in Jordan, the country has historically relied on energy imports, with countries of origin for the latter closely following regional alliances and geopolitical relations. In fact, in the 1980s most crude oil was imported from Saudi Arabia, and since 1984 the ties between Jordan and Iraq were strengthened through the signing of a counter-purchase agreement for the import of fuel and crude oil at very low costs. Following the 1990 Gulf War and the embargo on Iraq, the economic integration between Jordan and Iraq increased to unprecedented levels: in the 1990s, about 4000 trucks were transferring oil from Iraq to Jordan (Al Hawamdeh, quoted in Alshwawra and Almuhtady, 2020: 48), and Jordan was transferring goods back to Iraq in exchange. Nevertheless, after the end of Saddam Hussein's regime in 2003, bereft of its only supplier of crude oil and petroleum products, Jordan had to revert to market prices for oil imports from Saudi Arabia and Kuwait, and to seek gas imports from Egypt (Al-Ghandoor, 2012). However, the need for diversification also became apparent in this context. Since 2003, about 80% of Jordan's natural gas has been imported from Egypt, using the Arab Natural Gas Pipeline in the Sinai Peninsula (Baconi, 2015). In light of numerous attacks on the pipeline since the Arab uprisings in 2011 (Agence France-Presse, 2015), the flow of gas was however disrupted, forcing Jordan to replace gas with more expensive diesel and heavy fuel.

Since 2016, Jordan has primarily been dependent on liquefied natural gas (LNG) imports by ship for its production of conventional energy (Nepco, 2020: 28). Between 2015 and 2018 the flow of the Egyptian-Jordanian gas pipeline was even reversed, fed by such LNG imports. By 2020, NEPCO has however started to again import natural gas also from Egypt, in addition to Israel, and imports via ship through the port of Aqaba's LNG terminal, which is operational since 2015 (Nepco, 2020: 18). Besides inadequate regional grid integration, this renewed turn to hydrocarbons constitutes a key barrier for the further expansion of renewable energies in Jordan. In fact, NEPCO's 15-year commitment to buy Israeli gas worth 10 billion USD from NBL Jordan Marketing Limited, which is owned by Texas-based Noble Energy and Israeli companies Delek Drilling, Avner Oil Exploration and Ratio Oil Exploration, means that said gas also needs to be consumed, thereby discouraging Jordanian attempts at renewable energy expansion. NEPCO had signed a first letter of intent in 2014, followed by official conclusion of the agreement in 2016, and the start of Israeli gas exports in early 2020.

The Jordanian government denied requests to make the initial letter of intent public (Bustani, 2019), and until 2017 refused to provide parliament with a copy of the agreement, even if the Jordanian constitution stipulates that "agreements which involve financial commitments to the Treasury or affect the public or private rights of Jordanians shall not be valid unless approved by the National Assembly" (Constitution of the Hashemite Kingdom of Jordan, Article 33 (ii)). While parliament voted against imports of Israeli gas in 2014 and again in 2019, the Jordanian government argued that the deal was between two private corporations, with parliament playing no role in it. Despite NEPCO being fully government owned, and the Jordanian government effectively guaranteeing NEPCO's payments under the deal, Jordan's Constitutional Court confirmed the government's stance in 2019. According to the deal's cancellation terms, Jordan's public NEPCO would have to pay $1.5 billion in case of cancellation, while the American/-Israeli side would have to pay $1.2 billion. The contractual stipulation that the agreed upon amount of gas cannot be significantly reduced not only makes Jordan's energy security dependent on imports from Israel, but also puts the country into a position of carbon dependency (Nassar, 2019).

The agreement undermines the objectives of increasing sustainability and reliance on indigenous resources to enable greater self-sufficiency (Ministry of Energy and Mineral Resources, 2020: 19), and puts a major break on the further development of renewables, as also notable in the adoption of comparatively low objectives for their further expansion until 2030. As noted by different observers (see Abu Dayyeh, 2020), this is likely to hit hard Jordan's renewable energy sector. The gas deal undermines Jordanian attempts at energy transition in at least two ways. First, it puts a break on the further expansion of renewables, and, second, it represents an example of exclusionary decision-making that contradicts ideals of participatory energy democracy. Accordingly, it has faced strong opposition from the Jordanian public for making the country's energy needs dependent on Israel and for indirectly co-financing Israel's occupation of Palestine. The Jordanian Coordination Committee Against Importing Gas from Israel (2018: 7) has estimated Israeli revenues from the project (via royalty payments and taxes) to amount to 8.4 billion USD (see Bustani, 2019).

According to NEPCO (2020: 28, 33), in 2020, Jordan used natural gas totalling 3302 T.T.O.E. (thousand tons of oil equivalent) (approximately 37,227 GWh of energy) to produce 15,768 GWh of electricity (efficiency factor around 42%). Considering NEPCO's contractually obliged purchase of 45 billion cubic metres of gas from Israel during the 15 years covered by the contract, i.e. 3 billion cubic metres of gas per year (30,000 GWh of energy), a mere 7227 GWh of energy (currently used to produce 3061 GWh of electricity) could potentially be replaced by renewable energy sources, provided that all other gas imports are halted. Given that, in 2020, renewables were used to produce a total of 3042 GWh of electricity, the current share of renewables in electricity production (16%) could still be doubled, but not increased any further, provided that electricity consumption stays constant. While this is of course not the case - Jordan's demand for electricity is steadily growing (see Fig. 7) - the contractually committed to amount of gas imports from Israel is still so significant that it has not only made Jordan - for its energy needs - dependent on Israel (gas imports from Israel cover around 80% of all the gas Jordan currently requires for electricity production), but that it also strongly impedes the further development of wind and solar energy.

With natural gas primarily being used to generate electricity, with more and more Jordanian households and factories switching to renewable energy, and in light of the considerable potential for renewable energy exploitation in the country, it appears that NEPCO has committed to gas purchases that outstrip Jordan's actual demand. Finally, the contractually determined oversupply of Israeli gas, implemented against the will of Jordan's public and parliament, not only severely hampers efforts at transitioning to more sustainable energy

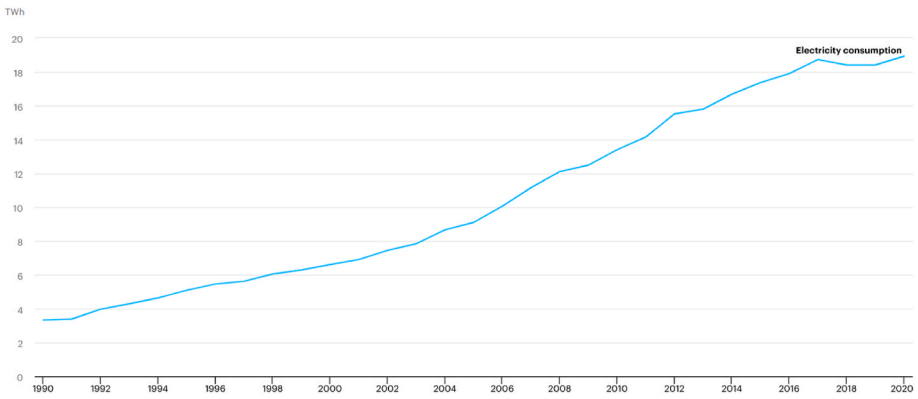

Fig. 7. Electricity consumption, Jordan 1990–2020 (IEA, 2023c).

sources, but also disappoints hopes for a transition to a more participatory and inclusive form of energy politics, prevents a more energy-independent Jordan, and – by putting a break on the exploitation of renewables – is also likely to, on the long run, impede lower electricity prices.

Recent developments provide further evidence for our argument. In November 2021, Israel, Jordan and the United Arab Emirates (UAE) signed a declaration of intent (2021) for a water-energy deal, which was, in US policy circles, celebrated as "good news […] a rare commodity in the Middle East" (Riedel and Sachs, 2021). If the declaration ever becomes reality, which is anything but a given in light of a history of abandoned Israeli-Jordanian joint projects, including plans for a joint airport in Eilat/Aqaba (Mizroch, 2006) and the Red Sea-Dead Sea canal project (Hussein, 2017), it would result in the UAE-funded construction of a 600 MW solar megaplant in southern Jordan, and the export of 200 million cubic metres of desalinated water from Israeli desalination plants at the Mediterranean to Jordan. While this may at first sight appear like a reinvigoration of Jordanian attempts at energy transition, all of the electricity produced at the envisaged solar plant is set to be exported to Israel, the plant itself to be constructed by UAE state-owned Masdar, and the proceeds to be split between the latter and the Jordanian state.

As such, the declaration, which was facilitated by US climate envoy John Kerry, is a perfect illustration of the ways in which Jordan and regional and international allies such as the USA, Israel and the UAE have pushed Jordan towards a form of highly concentrated energy politics to the benefit of select foreign transnational corporations. Many Jordanians perceive the project as "an attempt to push Amman into becoming dependent on Israel" (Ersan, 2021). Initially promising signs for a gradual move towards a domestically driven renewable energy transition have given way to a renewed dependence on fossil fuels and a growing political and economic dependence on Israel, which fundamentally ignores not only Jordan's parliament, but also the opinion of the Jordanian public at large (Kuttab, 2021), which had no say in the deal. While it does, on a planetary level, not matter where, but only how much electricity is produced from renewables or from fossil fuels, the envisaged Jordanian export of clean electricity to Israel, and the import of Israeli gas to Jordan locks the Jordanian economy into fossil fuels, while benefitting Israeli and UAE transnational corporations, as well as the Jordanian state (Ravid, 2021).

5. Conclusion and policy implications

In this article, we explored the relation between energy security, attempts at transitioning to renewables, and geopolitical alliances, taking Jordan as a case study. We analysed energy-related decisions that different political and economic elites in and beyond Jordan took during the current period of transition, highlighting how resulting developments are not merely technocratic, but instead deeply geopolitical in nature. They prefigure the extent to which sustainability concerns and notions of energy security can be reconciled, and have the potential to reshape alliances at the national, regional, and international level. We showed how actors from within and beyond Jordan - including transnational corporations like UAE's Masdar and Israeli energy companies, as well as state officials - contributed to halting attempts at transitioning to renewables. Jordan's continued reliance on fossil fuels has not only seriously compromised sustainability concerns, but also long-term goals of Jordanian energy security and the possibility of a more decentralised and less hierarchical form of energy politics.

Jordanian energy politics has passed a crossroads, at which hopes for a rapid transition to renewables, more domestic control over the country's energy supply and public participation in questions of energy politics are increasingly undermined. Instead, the direction of the energy sector seems to have given way to the reinforcement of fossil fuel dependencies and energy partnerships that fundamentally lack domestic support. Recent developments have compromised the political and economic opportunities associated with the emergence of a domestic renewables sector and a potential move to greater energy independence. Upon closer observation, it emerges that the Jordanian government has – since the interruption of Egyptian gas supplies in 2011 – strongly prioritised energy security over any concerns with sustainability and sovereign control over the energy sector. The involved trade-offs are considerable and range from a renewed reliance on fossil fuels and a stronger dependence on imports from Israel to the reinforcement of a highly concentrated form of energy politics. At best, the discussed undermining of Jordanian attempts at energy transition is the result of inadequate coordination of priorities and lack of planning, at worst a deliberate attempt at preventing a more inclusive and participatory form of energy politics, and a more energy-independent Jordan.

As we have shown in this paper, in Jordan, existing power relations and geopolitical dependencies are reproduced, as attempts at transitioning towards a more inclusive and participatory form of energy politics based on renewable energies and sustainability concerns have become undermined. It is crucial for policymakers to prevent problems of carbon lock-in, but also to avoid the mere technical replacement of fossil energy sources with renewables. Greater democratic control over the energy sector and further expansion of renewables must be understood as two sides of the same coin. It is only via the promotion of decentralised solar energy projects, communal ownership models, and support for marginalised municipal authorities that established authoritarian power hierarchies and fossil fuel dependencies can be challenged. Finally, the substantial capital investments that are needed for highly indebted and resource-poor countries like Jordan to successfully transition to renewables must be facilitated in ways that do not deepen already existing dependencies and/or reinforce a form of energy politics that lacks any popular support and is premised on practices of exclusion.

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Data availability

Data will be made available on request.

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