



# Energy regime reconfiguration and just transitions in the Global South: Lessons for West Africa from Morocco's comparative experience

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## ABSTRACT

Working on the premise of the importance of comparative lesson-drawing for policy outcomes, and not ignoring the limitations of policy learning in practice as well as the crucial role of context in shaping transition outcomes, this article argues that the case of Morocco - a country at the forefront of renewable energy development in Africa - provides salient lessons for the Economic Community of West African States (ECOWAS) in its design and implementation of the West Africa Clean Energy Corridor (WACEC). Focusing on two key dimensions of energy sovereignty, viz: (1) people's ownership of the energy transition process, and (2) land use, livelihood issues, and environmental footprints, the paper discusses the implications of Morocco's Noor Ouarzazate (Noor 1) solar project and illuminates the injustices embedded in the process, including their post-colonial ramifications, in order to better grasp the challenges that West Africa must tackle for its energy transition through WACEC to be truly just.

## 1. Context and motivation/rationale

Knowledge and understanding of the dynamics of energy transitions has come largely from the Global North, especially the EU, which has been at the forefront of developing technologies and policies to source energy from renewables and mitigate climate change (European Commission, 2019), even though this transition has been progressing at uneven speeds among EU member states (Pérez, de la, Scholten, & Stege, 2019). Although not as much is known or has been done about 'clean' energy transitions in Africa as compared to the EU experience, interest in this topic is growing in both policy and academic circles (Broto, 2017; International Renewable Energy Agency, 2019). Pressure to diversify energy sources and enhance energy access to promote technological innovation, competitiveness, and economic growth in Africa, concerns over greenhouse gas emissions and utopian anticipation of a post-fossil fuel future, and growing economic uncertainty in a post-COVID era have invigorated renewable energy policy initiatives on the continent. As with the EU, progress in Africa has been uneven, policy paths have varied among different countries, and some parts of the continent have been less intensively studied than others.

As a country whose fossil fuel resources are marginal (U.S. Energy Information Administration, 2019), Morocco depends heavily on

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oil imports to meet its energy needs. High energy import bills, rising electricity demand, and funding, especially from International Financial Organizations (IFOs) such as the World Bank and the EU, have prompted the development of alternative reliable and sustainable energy sources (El Gharras & Menichetti, 2018) through such projects as the Noor Ouarzazate, described as the “world’s largest concentrated solar system” (CNN, 2019) and the Noor Midelt, described as the “world’s first advanced hybridization of concentrated solar power (CSP) and photovoltaic (PV) technologies” (Masdar, 2019). In addition to these practical feats, Morocco is also playing important political/policy roles in different sustainable energy development initiatives, such as its leadership of the United Nations-launched international coalition based on South-South Cooperation to accelerate access to sustainable energy in least-developed and developing countries (Bakkoury, 2020). Also, alongside prominent EU countries such as Germany, Spain, France and Portugal, Morocco is part of the Sustainable Electricity Trade (SET) Roadmap for cross-regional integration of energy systems that would allow the exportation of surplus renewable electricity produced in one country to a nearby country with lower production levels in order to equalize fluctuating supply and demand (European Commission, 2017). Finally, Morocco is also providing practical support towards South-South Cooperation by providing capacity-building and technical assistance programmes to help develop renewable energy projects for about 20 countries, mostly African (Bakkoury, 2020). Against the above backdrop, we believe that West Africa, a region that has faced acute energy access challenges but has also embarked on a regional coordinated ‘clean energy’ initiative, has important lessons to learn from Morocco’s example as a reference model in renewable energy development in Africa.

Working on the premise that comparative lessons and learning are important to successful and sustainable transitions (Meadowcroft, 2011), and not ignoring the role of context in the process and overall outcome, this article asks the following questions: What are the implications of Morocco’s Noor Ouarzazate Solar Complex, in particular the 160 megawatts CSP plant (often referred to as Noor I or NOORO I) for state-society relations, and what lessons can West Africa learn from Morocco’s experience in the design and implementation of West Africa Clean Energy Corridor (WACEC)? By answering these questions from the perspective of energy sovereignty and energy justice, we shall go beyond the roles of energy financing, technological innovation, and socio-technical design to discuss the political economy and socio-ecological dynamics involving the complex and contradictory interfaces between political regimes and power, and the whole gamut of energy democracy (Burke & Stephens, 2018), including participation and equality in shaping the development of the Noor Ouarzazate as an epitome of Morocco’s energy transition. The attention to energy sovereignty and its accent on energy justice is important because as scholars and activists have noted, not all transitions produce just outcomes; rather, they may also generate new forms of inequality or lock in pre-existing inequalities and vulnerabilities not just in energy systems but in the society at large (Broto, Baptista, Kirshner, Smith, & Alves, 2018: 646; Goldthau & Sovacool, 2012; Sovacool, Turnheim, Hook, Brock, & Martiskainen, 2021). As we discuss below, understanding the implications of the Moroccan energy transition through the lens of energy sovereignty will enable us to uncover the injustices embedded in the process in order to better grasp the challenges that West Africa must tackle for its energy transition to be truly just.

### 1.1. Morocco and West Africa as units of analysis

This article adopts a comparative case study between Morocco and West Africa. Aware of the necessity of maintaining consistency in units of analysis, we provide an explanation of energy integration in the Maghreb region, and justification for drawing lessons from Morocco for ECOWAS instead of the Arab Maghreb Union (AMU), Maghreb’s regional body.

Any attempt at explaining energy integration in the AMU necessitates a historical documentation of the Maghreb Electricity Committee (COMELEC). COMELEC was established in 1974 by state-led utility companies of Morocco, Tunisia, and Algeria to facilitate cooperation in electricity between these Maghreb countries. In large part, this cooperation spurred a discussion on the founding of the Union of Arab Maghreb, a regional political and economic cooperation organisation that comprises five countries: Morocco, Algeria, Tunisia, Libya, and Mauritania. In 1989 in Marrakech, Morocco, government officials from the five countries came together to sign a cooperation treaty to strengthen ties between member states and to ensure regional stability and to enhance policy coordination (Finaish & Bell, 1994).

While the Union failed due to poor diplomatic relations between Morocco and Algeria, member countries still maintained cooperation in energy especially with the onset of a transition to clean energy in the region, even though this partnership needs to be scaled up (Hatim, 2020). In the meantime, however, individual countries in the region have begun to exploit their renewable energy resources to produce electricity. For instance, Algeria’s target for power generation from renewable energy sources (RES) was 6% for 2015, Egypt’s target was for RES to cover 14% electricity demand by 2020, while Morocco had set the target to 20% of electricity generation from renewables by 2020 and 50% by 2030 (International Energy Agency, 2008; Komendantova, 2012). Compared to the rest of African Maghreb states therefore, Morocco has carried out more massive restructuring of its power sector, established various implementing institutions, and enacted legislations to scale up renewable energy generation (Moore, 2019). These transformations have made Morocco to become one of the countries with “the most ambitious and comprehensive renewable energy strategies in the Middle East and North Africa (MENA) region” (Alhamwi, 2015: 39), and a leader in the renewable energy in not just the North Africa region, but Africa in general (Mokhtari, 2020). Against this background, we will use Morocco as an empirical case to draw salient lessons of energy transition for ECOWAS.

We argue that even though the Morocco and West Africa’s renewable energy projects discussed in this paper are an odd pair for comparative lesson-drawing as they represent, respectively, a national and region-led renewable energy initiative, they nevertheless share some similarities that would allow for such lesson drawing. First is the fact that even though the WACEC is led by institutions of ECOWAS, its projects are ultimately situated in specific ECOWAS countries. Given the multi-actor nature of energy transition processes (Rogge, Kerna, & Howlett, 2017), these countries and their relevant stakeholders are therefore entangled in the implementation of WACEC and affected by its outcome as was with the Moroccan case. Thus, just like Morocco, there are influences by multiple external

actors such as multilateral institutions, foreign governments, and private companies etc., on the West African clean energy policy mix design and implementation processes, and some lessons can be learnt from this. A second basis for lesson drawing is related to the multi-scalar nature of energy transitions (Essletzbichler, 2011; Newell & Bulkeley, 2016; Sovacool & Dworkin, 2014). While, unlike the West African case, the Moroccan case was not coordinated at the regional level it nevertheless had interlinkages at multiple governance scales, just as the West African case, given the reality that energy transitions, especially in the Global South, are embedded in a complex global energy system or transnational governance (Newell & Bulkeley, 2016). Finally, the implementation of Morocco's renewable energy transition has been criticized for its centralized policy design and implementation that have negatively impacted people at the local level. The West Africa process being coordinated by a regional body far away from local populations therefore faces an even more daunting challenge of how to ensure energy justice for the people, and it can learn important lessons from Morocco's pitfall in order to ensure a smooth synergy between a hierarchical regionally driven policy process and decentralized clean energy applications at the national and local levels.

Using the case of Morocco, this study explores the social, political, and environmental impacts of Morocco's renewable projects, particularly the Noor Ouarzazate. To reiterate, the exploration of the implementation of this solar project is not for its own sake, as a large body of literature exists on Morocco's energy transition. Rather, the core objective of this article is to use insights from the Moroccan case to inform lesson-drawing for West Africa which is. Specifically, a qualitative examination of the megaproject allows us to investigate what lessons West Africa can learn from Morocco's experience in energy regime reconfigurations, particularly in terms of continuity and change, in the context of state-society conflict and the impact on just energy outcomes along two dimensions of energy sovereignty (Broto et al., 2018: 653–54): prioritization of socio-ecological responsible relationships and peoples' livelihoods and needs, and active participation of citizens in renewable energy decision making and innovation.<sup>1</sup>

## 1.2. Conceptual/theoretical framework

Energy sovereignty is the conceptual framework that undergirds this paper. We believe that this perspective will help us better understand the Moroccan case, including the patterns of inequality and disempowerment associated with the transition, in order to map out practical lessons for West Africa as it tries to accelerate its own transition towards clean energy.

Research on energy transition has begun to shift from sole focus on energy security as a way of mitigating energy poverty and enhancing access to focus also on energy sovereignty, a concept which is attentive to the determination of energy systems by local people "in ways that are culturally relevant and ecologically sustainable" (Laldjebaev, Sovacool, & Kassam, 2016: 98). A sovereignty perspective also draws attention to the "relevance of local understandings of energy in multi-scalar forms of planning and recognizes agency distribution at different levels" (Broto, 2017: 244). To reiterate, energy sovereignty is central to the realization of a just energy transition. This is because an energy transition which is based on the interests of the governing elites and their international and market partners, but which gives scant or limited attention to the ownership and self-determination of decision making by the people the transition is meant to serve may facilitate low carbon energy but at the risk of generating significant negative social, environmental, and political consequences. These include distributional inequity across social class, race, and geographical locations, exploitation and dispossession of agrarian or Indigenous people's lands, ecological destruction, conflicts, violence, and suppression of social resistance (Broto et al., 2018; Broto, 2017; Carley & Konisky, 2020; Finley-Brook & Holloman, 2016; Jenkins, 2016; Newell & Mulvaney, 2013; 2018; Sovacool, Hook, Martiskainen, & Baker, 2019; Sovacool et al., 2021).

In recent times however, scholars have also begun to emphasize the critical issue of power relations to the concept of energy sovereignty to enrich it and to situate it to be able to better illustrate and serve as a corrective to the wide range of potential injustices in energy transitions. Centering political economy in the debate about just energy, scholars have urged us to give attention to the key questions about:

'Who wins, who loses, how and why' as they relate to the existing distribution of energy, who lives with the side effects of its sites of extraction, production and generation, and who will bear the social costs of decarbonizing energy sources and economies (Newell & Mulvaney, 2013: 133).

Scholars have pointed out that insufficient attention to the political economy aspect of energy transitions in energy transitions has led to the depoliticizing of energy transitions or focus on "depoliticized indicators" (Müller, Neumann, Elsner, & Claar, 2021), with the attendant disempowerment of the poor, and or poor regions, where renewable energy projects are desperately needed. This latter point which draws attention to the geography of power and history of unequal power relationship serves to sensitize us to the possibility that global energy transition may perpetuate the domination of or further the disempowerment of weaker geographical areas and their people. For instance, drawing on postcolonial perspective, scholars have pointed out that global energy systems are infused with colonial thinking characterized by imposition of Western models of energy knowledge and policy prescriptions on countries in the Global South (Broto et al., 2018). In several ways, such imposed expert-driven, 'universal best practices' on energy transition have been discovered by scholars and activists to be divorced from the concerns and material conditions/needs of local communities or the peculiarities of the context of implementation (Cloeke et al., 2017).

<sup>1</sup> This is a modification of Broto et al. (2018) three dimensions of energy sovereignty based on lessons from the Mozambiquan case. As this paper will not discuss technological design, reference to "possibilities for self-determination in the deployment of business models and technologies" towards meeting people's livelihoods and needs is de-emphasized in the second dimension, and emphasis is given to the issue of people's livelihoods and needs generally, which is then combined with the first dimension about socio-ecological responsibility.

Our paper is therefore situated within an understanding of just energy transition that not only recognizes the salience of the diffusion of ideas about renewable energy across countries in shaping energy transfers, but also underscores the fact that such policy diffusion and transfer can undermine the autonomy and self-determination of citizens in decision making (Broto et al., 2018). In other words, just and sustainable energy transitions go far beyond the issue of energy access (even though this is a central goal), to fundamental questions about genuine and active participation of the citizens in energy decisions that affect their lives. Moreover, as Broto (2017) argues, the energy sovereignty model challenges the energy transition access perspectives that privilege national strategy over local energy interpretations. It directs attention away from exclusive state power over renewable energy design and access policies and implementation and focuses on the participation and rights of the people over these issues.

The recent focus on just and sustainable energy transitions has broadened the restrictive technical and economic focus or what Lawhon and Murphy (2012) calls “techno-economic determinism” to the issue of energy sovereignty and its attentiveness to underlying socio-ecological and livelihood needs of the people, but, more importantly, political processes of change that is emancipatory and disavow domination and exploitation (Newell & Bulkeley, 2016; Powell et al., 2016), the realization of just energy is enhanced as energy transitions become emancipatory (Broto et al., 2018) and even transformative rather than mere energy transition. Andy Stirling (2015) speaks on this much needed transformation as follows:

Transitions... are managed under orderly control, through incumbent structures according to tightly disciplined technical knowledges and innovations, towards a particular known (presumptively shared) end. This typically emphasizes integrated multidisciplinary science directed at processes of instrumental management through formal procedures in hierarchical organizations sponsored by the convening power of government. Transformations, on the other hand, involve more diverse, emergent and unruly political alignments, challenging incumbent structures, subject to incommensurable, tacit and embodied social knowledges and innovations pursuing contending (even unknown) ends. Here there is a much stronger role for subaltern interests, social movements and civil society, conditioning in ambiguous and less visible ways the broader normative and cultural climates in which more explicitly structured procedures are set. (62)

Even though Stirling (2015) added that “both real-world dynamics and salient models will typically lie somewhere in between, and the two concepts are not mutually exclusive” in the sense that “there are several ways in which each dynamic depends on (and is partly constituted by) the other,” he maintains that this distinction matters for sustainable green outcomes as they demonstrate the governance, knowledge, discourses, and practices, and the potential for democratic control and radical changes.

### 1.3. Main thesis

Our main argument is that a government-focused energy transition, which is predominantly based on the technical aspects of policy and is inattentive to the politics of energy transitions, particularly how this process creates winners and losers at different temporal and spatial levels, is bound to generate inequality and conflict. We argue further that, lessons from comparative experiences, as in this article, can animate discussions of imagined alternative pathways that are just and democratic, and that contest top-down energy transition paradigms that marginalize the people they purport to serve and destroy their environment. Given the evidence of contradictory energy transitions taking place in Morocco (Cantoni & Rignall, 2019), a study of what other countries can learn from Morocco will make important contribution to the quest for a just transition. Our analysis will be structured along the two dimensions of energy sovereignty that we previously highlighted: the prioritization of socio-ecological responsible relationships and peoples’ livelihoods and needs, and active participation of citizens in renewable energy decision making and innovation (Broto et al., 2018: 653–54).

## 2. Methodology

This article uses a mixed qualitative method, drawing on documentary research and textual analysis of policy documents, academic literature, newspapers/journal reports or news, and experts or activists’ opinions available online, in order to trace ideational processes of renewable energy policy Morocco, focusing on the Noor Ouarzazate and the socio-ecological and political impact.

Our choice of West Africa is compelling. As in Morocco, its WACEC initiative is being heavily supported ideationally, technically, and financially, transnational governments and other international actors, in addition to need support it has received from ECOWAS Heads of state and relevant domestic energy-related institutions. But perhaps more important are the potential positive environmental and economic benefits that renewable energy offers. A crucial point in economic benefits is the energy deficit, which has made the idea of transition to renewable energy very attractive. There are three main economic reasons why this transition is necessary for West Africa. First, despite the significant economic growth from 5% to 8% in the past ten years among members of the Economic Community of West African States (ECOWAS) (GIZ, 2020), the region continues to experience acute and unreliable electricity supplies, significantly imperilling its development agenda and the achievement of the Sustainable Development Goals. As much as 58% of more than 340 million people in the region lack access to electricity (GIZ, 2020), a figure lower than the continental average of 57% (Benkenstein & Chevallier, 2020: 3). The low access is in spite of the region’s high energy potential and mixture, which could guarantee adequate energy generation and transmission. An adequate power supply is now the most significant challenge facing the region. Energy is a significant part of the total infrastructure that allows rural and urban people to grow beyond subsistence activity, generate individual savings, and increase their demand for modern energy services (Akimboyo, 2010) and there is a significant expectation that the transition to renewable energy can facilitate the realization of these goals. Yet, as the Moroccan case has revealed, just energy transitions are not givens but are imbricated in politics and contested power relations between state and society (Cantoni & Rignall, 2019).

The article is structured as follows: the next section provides a brief background of Morocco's energy transition. This is followed by a discussion of West Africa's efforts to transition to clean energy, a reflection on how West Africa can nudge its own experimentation towards just and sustainable energy futures, and then a concluding statement.

### 2.1. Morocco's energy strategy: a success story of just transition?

Morocco's 2009 National Energy Strategy for transforming its energy sector aims to ensure the security of supply with the diversification of energy sources away from fossil fuels, energy access for all social strata at competitive prices, the integration and promotion of renewable energy sources, and regional integration with both African and European partners (Kousksou et al., 2015). This strategy plans to draw on renewable energy sources to meet 42% of Morocco's installed energy capacity by 2020, an ambition later reviewed in 2015 with a further planned increase in the renewables capacity to reach 52% of the total by 2030 (20% solar, 20% wind, 12% hydro) (International Energy Agency, 2019b, 2019c). This strategy established Morocco as a country with "a proactive policy, supported by a vision at the highest level of government for a national strategy for sustainable development that affects all sectors" (Middle East Policy Council, n.d.). As such, Morocco has demonstrated a "huge potential in terms of green economy and know-how that can serve the country, the African continent and partner countries" (ibid.).

To deliver on this strategy, Morocco has achieved several legal reforms and frameworks spearheaded by various institutions, which include the Office Nationale de l'Electricité et de l'Eau Potable (The National Agency for Electricity and Water, or ONEE), the public utility company in charge of the production and distribution of electricity in the country. In 2016, a law was enacted for the creation of the Authority for the Regulation of the Electricity Sector (or ANRE) to regulate electricity sector market competition/network access and fix tariffs. In addition, the Moroccan Agency for Sustainable Energy (MASEN) coordinates the development and deployment of renewable energy at the economic, technical, and financial levels. Though it was initially meant only to coordinate solar energy, its activities were extended in 2016 to include the promotion of all renewable energy projects, through a combination of mechanisms of local development, capacity building, operational research, industrial integration, development, and demonstration of renewable energy in Morocco, Africa and beyond (International Energy Agency, 2019a). Other institutions that govern the energy sector in Morocco are the National Agency for Energy Efficiency, the Institute for Research into Solar and Renewable Energies, the National Office of Hydrocarbons and Mines, and the Moroccan Limited Company of the Refining Industry.

With these programs in place, Morocco aims to achieve sustainable energy development in line with the United Nations' Sustainable Development Goals (SDGs). One notable success story in this regard is the improvement in access to electricity for all Moroccans. Rural electrification has accelerated exponentially from 18% in 1995 to 100% in 2017 (Usman and Amegroud, 2019).

Morocco's National Energy Strategy is one of the main hallmarks of the King's reign, with His Majesty striving to secure the country's position as an important energy player and broker at the national, continental, and regional levels (EU). However, some critics argue that the Moroccan Solar Plan is a megaproject that further entrenches the country in an increasingly unjust flow of financialized capital that marginalizes the Moroccan people while benefiting the palace (Aoui, Amrani, & Rignall, 2020). In other words, Morocco's success in renewable energy development has been criticized for trumping energy sovereignty. Even as Morocco is set to respond to the international aspirations espoused by the Paris Climate Change Agreement, local realities of Moroccans impacted by these global aspirations and international commitments might prove otherwise.

### 2.2. Energy transitions in West Africa: A long path towards sustainability?

The West African region is used here to refer to the 15 ECOWAS Member states. Its economies are already hard hit by the effects of climate change, and these impacts are bound to exacerbate in the coming decades. Despite some progress made in some of these countries such as Cape Verde (Cabo Verde) and Ghana to improve energy access through renewable energy, the region faces energy crisis and has been described as one of the regions with the lowest electricity access in the world (Reiss, 2015). Although policymakers and scholars are crafting urgent national and regional policies and adaptation measures to mitigate emissions while at the same time achieving the sustainable development goals, successes have not only been uneven across countries, but policy measures are often conflicting. Take Nigeria, the region's major oil player, for instance. While the country has pledged to reduce emissions by 20% below the 'business as usual' concentrations by 2030, and committed at COP 26 in Glasgow, Scotland to a Net-zero regime within the 2060-time frame, (Lo, 2021a), the country's overall economic development and even climate change budget will be largely based on revenues from crude oil (Okoh, 2021), thereby raising questions whether the country can actually wean itself from its historic reliance on fossil fuel as major source of energy. This is because even though efforts at economic diversification have been on the rise, "political inertia resulting from oil stakeholders' hold on power [have] railroaded the energy transition toward maintaining the status quo" (Okoh, 2021: 10). In addition, while some African countries (including those in West Africa) continue to work towards addressing their energy crisis and contributing to the objectives of the Paris Agreement by increasing their share of grid-connected renewable energies, the recent pledge by some international financial organizations and largely Western countries to end public financing of gas which many emerging countries view as a transition fuel along the path towards net zero will further complicate energy transitions in most of these countries (Lo, 2021b).

Concerns over sustainable energy transitions in West Africa are heightened by the high level of energy poverty and resource dependence (Bazilian et al., 2013), which has hindered socioeconomic development, poverty reduction, and enhancement of the quality of life of millions of people (Cormier, 2020). In 2017, the total installed electricity capacity in the region (excluding Nigeria) was only 18 gigawatts, with an average yearly consumption per capita of 188 kilowatts per hour, compared to 1500 and 2000 kilowatts per hour in the North and the South African regions, respectively (World Bank, 2018). According to ECOWAS Centre for Renewable

Energy and Energy Efficiency (ECREEE), while the region has a population of over 300 million inhabitants and a growing economy leading to increasingly rapid energy demand, “the current installed capacity in the region covers less than 40% of the demand and only 42% of the population has access to electricity, while network reliability issues restrain the industrial development of the region and affect productive activities” (Ben Jemaa, Dekelver, & Teyssieux, 2019: 5). The region also has one of the highest tariffs globally, despite operational inefficiencies, with an average of 44 hours of outages per month (Cormier, 2020). At the same time, the region’s current cooking energy needs are primarily met through “solid fuels (predominantly wood and charcoal), with national figures ranging from 98% in Guinea-Bissau, Liberia, Mali and Sierra Leone, to less than 30% in Cabo Verde” (Reiss, 2015). However, with increasing population and urbanization, the use of biomass has taken a significant toll on forest and woodland environments and has negatively impacted the health and quality of life of rural/urban people, particularly women and girls (IEA, 2020; Wathi, 2020).

Although the energy mix for the region has been consistent for a long time, the extensive fossil fuel reserves, recent natural gas discoveries in Ghana, Mauritania, and Senegal, and the relative success of gas and oil-fired power plants vis-à-vis renewable energy projects suggest that fossil fuels may continue to dominate West Africa’s energy mix (Galina & Trotter, 2021). Nevertheless, the slight gains from these plants have abysmally failed to drive socio-economic transformation, as economic activities “from micro-enterprises to agriculture to industry – are held back by the lack of a reliable, affordable energy supply” (KfW Development Bank, GIZ & IRENA, 2020, p. 17). This shows that unless these obstacles are scaled, the challenges of rising electricity demand will become insurmountable even with new fossil fuel discoveries, as the region’s population could reach 796,488,407 million by 2050 (United Nations World Population Prospects, 2019), with dire repercussions for health and the environment Fig. 1.

The West African region has considerable renewable energy potentials to meet the shortfall in power demand and meet universal access to electricity while sustaining the region’s transition to a low-carbon growth path (IRENA, n.d.) that remains untapped and unevenly distributed. For example, only 16% of hydropower’s potential of an estimated 23,000 megawatts is being exploited (Reiss, 2015). Similar underutilized potentials abound with solar and wind sources (Bello & Ojoyi, 2017). Providing a sufficient power supply is now the most significant hurdle facing African countries in general and West Africa in particular. Energy is a significant component of the total infrastructure that allows rural and urban poor to advance beyond subsistence activity, create individual savings, and expand their demand for modern energy services (Akimboyo, 2010). Also, the wind and solar components of renewable energy also have the potential for decentralized power generation and consumption, that fossils could not provide. Renewable energy sources are also necessary for attaining the United Nation’s Sustainable Development Goal (SDG) 7, specifically because they ensure universal access to affordable, stable, and modern energy services, substantially increase the fraction of renewable energy in the global energy mix and double the global rate of change in energy efficiency.

In addition to enhancing livelihoods directly, access to modern energy sources is commonly seen as a prerequisite for achieving all the other SDGs (KfW Development Bank, GIZ, & IRENA, 2020: 17). However, West Africa continues to face four significant energy challenges: security of energy supply and/or demand; economic efficiency of the energy sector; social equity, particularly access to affordable modern energy; and reduced emissions of pollutants from energy production and use.

Policymakers, donors, and energy firms have identified renewable energy as a strategic industry for promoting green economic development (Gallagher, 2013) and argue that modern, efficient power systems are crucial to avoid a potential lock-in to fossil energy. First, unlike conventional energy sources, renewable energy sources such as biomass, wind, hydropower, geothermal, and solar radiation do not produce carbon and are generally low polluters, making them attractive. Second, fossil fuels are becoming far less more appealing, as key performance measures such as energy returns on energy invested (EROI) demonstrate. In the 1930s, one barrel of oil could produce 199 barrels with an EROI ratio of 100:1. In 2020, this ratio was down to between 6:1 and 3:1 (Brockway, Owen,



Fig. 1. Map showing the 15 member ECOWAS States.

Brand-Correa, & Hardt, 2019). Third, there is also a growing realization that renewables could bring about expanded access to clean energy, reduce reliance on biomass, enhance greater energy affordability and reliability, place the region on the path towards a low-carbon transition (Bello & Ojoyi, 2017), and mitigate the effects of climate change.

Declining costs and increasing competitiveness of renewables offer the potential for a quick transition to renewable energy. For instance, the average market price of lithium-ion battery packs has reduced by 89% since 2010, to \$137 per kilowatt per hour in 2020 (BloombergNEF, 2020). Apart from cost, the abundance of renewable energy sources and the existential crisis facing the fossil fuel industry pushed ECOWAS member states to formally inaugurate the ECOWAS Centre for Renewable Energy and Energy Efficiency (ECREEE) in 2010. The overarching goal of ECREEE is to “contribute to the sustainable economic, social and environmental development of West Africa by improving access to modern, reliable and affordable energy services, energy security and reduction of negative environmental externalities of the system” (ECREEE, 2013). In achieving this goal, ECREEE works to provide an environment conducive to the adoption of renewable energy sources by reducing barriers within technological, financial, legal, economic, institutional, knowledge, and capacity-building frameworks (Reiss, 2015).

In July 2013, the Authority of the Heads of State and Government of the ECOWAS adopted the ECOWAS Renewable Energy Policy (EREP), intending to increase the share of renewable energy, including big hydro projects, in the overall mix to 35% by 2020 and 48% by 2030. Similar initiatives, such as ECOWAS Energy Efficiency Policy (EEEP), aim to provide 2000 megawatts of power generation capacity through efficiency gains and double the energy efficiency rate (IRENA, n.d.). In addition, a significant initiative is to introduce instruments for financing sustainable energy, including carbon finance in 2013, and in the longer term, put in place a regional fund for the development and implementation of sustainable energy projects (Reis, 2020).

However, the assumption that achieving these goals can only occur in “a clearly defined, regionally aligned policies framed within a broader vision” (Bello & Ojoyi, 2017: 3) has led to support for creating a regional power market. This is imperative as countries in the region have different renewable energy potentials. Partnerships between IRENA, West Africa Power Pool (WAPP), and ECOWAS Regional Electricity Regulatory Authority (ERERA) have already led to the creation of the West Africa Clean Energy Corridor (WACEC) to enhance the “development and integration of utility-scale renewable power in West African power systems” (IRENA, n.d.). The institutional setup for the implementation of the respective WACEC strategies is made up of ECREEE, GIZ, WAPP, IRENA, and the ECOWAS Commission, with ECREEE’s National Focal Institutions ensuring coordinator with the countries (Ben Jemaa et al., 2019: 7). WACEC has secured high-level government support for its establishment, but this was achieved from the bottom up. The Initiative was approved by the Director of Energy of ECOWAS in April 2016, adopted by the Ministers of Energy in December 2016, endorsed by the Heads of State and Government in June 2017 and was annexed to the ECOWAS treaty (Dabla, 2019).

The WACEC seeks to identify sites for renewable power generations and expand on the WAPP projects, which currently attain a peak-load of approximately 25,000 of its 32,000 megawatts (Bello & Ojoyi, 2017). The WACEC aims to “deploy up to 10 gigawatts of solar energy into the region’s generation mix by 2030” (USAID, 2021). Its ultimate goal is to facilitate trans-border regional renewable energy trade that will benefit from resource complementarities and economies of scale (IRENA, 2019) Table 1.

According ECREEE, WACEC’s implementation plan is built on five key foundations (Ben Jemaa et al., 2019: 6):

- The identification of ecologically acceptable areas with high potential for renewable energy sources and the cost-effective installation of power plants;
- National and regional planning for integration of cost-effective renewable energy generation options into national and regional electricity generation and transmission master plans;
- Strengthening of political, regulatory and institutional frameworks conducive to the promotion of investments in renewable energies;
- Building capacity to plan, maintain, and manage electricity systems with large shares of electricity from renewable sources;
- Fostering public and political support for the initiative and raising awareness of its benefits.

**Table 1**  
WACEC Renewable Energy Corridors.

COUNTRY	HYDRO	WIND	SOLAR
Benin	✓		✓
Burkina Faso	✓	✓	✓
Gambia		✓	
Ghana	✓	✓	✓
Guinea	✓		
Ivory Coast	✓		✓
Liberia	✓		
Mali	✓	✓	✓
Mauritania		✓	✓
Niger		✓	✓
Nigeria	✓	✓	✓
Senegal		✓	✓
Sierra Leone	✓		
Togo	✓		✓

Source: Ben Jemaa et al. (2019)

### 3. Transition to Just Energy in Africa: What Lessons Can West Africa Learn from Morocco?

Within the broader context of sustainable energy transitions, scholars have focused less on the comparative lesson drawing from energy transitions in Africa. This contribution is a corrective to this research gap. We argue that as a 'leader' in renewal energy projects in Africa, Morocco can provide important lessons for West Africa. This is because while the country's renewable energy plan has been framed as engendering a win-win outcome in energy transition initiatives, critical insights have challenged this dominant framing and have described Morocco's just energy transition narrative merely as a propaganda agenda aimed at polishing its image both domestically and internationally (Bouhmouch, 2016).

We identify several challenges to the shift towards universally accessible clean energy in West Africa. For instance, in spite of the urgent need for the energy transition in Africa, there is the crucial question of how fast this transition can take place in the face of the deep legacy of overreliance on fossil fuel sources for power generation on the continent. As Tony Tiyou of Renewables in Africa (RiA) noted, fossil fuels "represent more than 70% of generated power, a reality which makes the crucial goal of rapidly improving energy access while decarbonizing the sector ... a challenge" (Tunncliffe, 2019). However, for the purpose of this article, we use the energy sovereignty perspective (Broto et al., 2018: 653–54) to highlight two key lessons in Morocco's management of its renewable energy transition related to the socio-ecological responsible relationships and peoples' livelihoods and needs, and active participation of citizens in renewable energy decision making and innovation) to which West Africa should give serious thoughts in order to leverage the green energy turn to provide universal access to electricity for its citizens in a way that is socially inclusive and environmentally sustainable. The analysis will also be reinforced with the postcolonial critique of energy transition which draws attention to the imposition of energy systems that are based on Western knowledge and oversimplified models on the global South that are divorced from the realities and histories of local communities, focus on international accountability, and do not pay genuine attention to the core issues of democratic ownership and voice of the people who will bear the consequences of energy projects (Broto et al., 2018).

#### 3.1. People's ownership of the energy transition process

The first such lesson relates to the energy transition process. Here, the key challenge is how to make the process genuinely participatory and not solely dictated and engineered by the governments or regional bodies and their international financial partners and business interests. This is one of the sticking points of the Moroccan experience, which has led critics to question which interests are being served in the country's energy reform program. Some have argued that rather than catering to local community needs and expectations, the program has gravitated towards meeting the expectations of international energy financiers and business interests with the alienation of the people masked by discourses of climate change mitigation and sporadic local development programs (Cantoni & Rignall, 2019). A closer look at land acquisition and community consultations at both the pre-construction and post-construction stages of Noor Ouarzazate unravels many social, political, economic, and environmental issues (Cantoni & Rignall, 2019). Critics point out that renewable energy development in Morocco is reflective of the colonial relationships between North Africa and the European Union. Hamza Hamouchene (2015) argues that while Desertec as a plan to power Europe from the North African desert could play a pivotal role in diversifying the energy mix, it seems as though the same colonial scheme is being rolled out, characterized by the flow of cheap raw materials from the Global South to the Global North that further entrenches the history of exploitation and economic disparities between the centre metropolis and the margins. This supports the positions of those who argue that transnational companies are given, or have exerted, preponderant control over the project in ways that undermine popular control and threaten national sovereignty. Indeed, as noted by M. Jawad, a campaigner from ATTAC/CADTM Morocco, "projects like Ouarzazate [are] a threat to national sovereignty in the clean energy sector, because crucial decisions that affect the whole population are being taken by a handful of technocrats, far from any democratic process or consultation" (Hamouchene, 2015).

Thus, the people are alienated by the focus of the energy reform design, which very often has been on technicalities such as technology transfer, industry competitiveness, cost recovery, financial risk or cost-benefit analysis, planning, private sector investment/finance, capacity building, and other factors, with half-hearted commitments to genuine popular participation in the reform process. While these concerns are no doubt important for a successful energy transition, they are not enough to guarantee that it is just and equitable.

As the Moroccan example has demonstrated, the insufficient attention given to this democratic element of energy transition led to several outcomes that undermine the quest for just energy, particularly insufficient prioritization of local livelihood dynamics of renewable energy projects (Hamouchene, 2015). Indeed, in their study with local stakeholders, Wuppertal Institute for Climate, Environment, and Energy and Germanwatch (2015, 27) discovered that this procedural aspect of energy justice (Jenkins, McCauley, Heffron, Stephan, & Rehner, 2016) was a major weakness of the development of Noor 1. They noted the emphasis placed on "a formal model of compliance-based community consultation" at the expense of informal community engagement procedures" that could have led to "improved collaboration and shared decision-making among local authorities, project developers, and affected communities" (Jenkins, McCauley, Heffron, Stephan, & Rehner, 2016).

Though it may not be a definitive verdict at this point given the ongoing work on the West African renewable energy initiative, nothing suggests that the initiative has deviated from Morocco's example. For instance, a perusal of the WACEC five pillars reveals that the energy transition scenarios currently being mapped have also not given sufficient attention to this procedural aspect of energy transition which, to be really just, must not be sporadic participation but participation as a human right that is applied from the 'cradle to grave' of the energy life-cycle (Heffrona & McCauley, 2018). For instance, a WACEC capacity building and political dialogue initiative that took place in 2017 with 82 attendees was dominated by governments and intergovernmental actors and sectors considered relevant for the technological and financial advancement of the project. These include business organizations (10



members), research and educational organizations (16 members), governmental actors (33 members); intergovernmental organizations (3 members), financial Institutions (2 members), and 17 other members who largely represented energy regulators or institutions/initiatives. One attendee represented non-governmental organizations; this, surprisingly, was Agence Française de Développement (France) rather than energy-related NGOs from Africa or the West African region ([Climate Initiatives Platform, n.d.](#)). This reflects neo-colonial practices embedded in ‘global energy systems’ that prioritizes so called ‘development partners’ while giving scant attention to the lived experiences and agency of the citizens that will purportedly benefit from energy projects and who will eventually bear their negative externalities.

A just and sustainable energy transition path for West Africa, therefore, is one in which the people are not side-lined in decision-making. The people must not only be genuinely mobilized to actively learn and participate in renewables-based energy transitions, but must also take the lead, with their insights, perspectives, and acceptance undergirding every stage of the energy transition process. Policymakers and experts implementing the WACEC must resist the temptation of believing that securing high-level support at the ECOWAS Heads of State level for the initiative suffices, and that mobilizing international finance/technical assistance from development partners such as the EU, USAID, Deutsche Gesellschaft für Internationale Zusammenarbeit (GIS), and multilateral development banks such as the World Bank constitutes the public support required for sustainable implementation. They must also give serious consideration to the crucial question of democratic participation in the planning and implementation phases of the initiative. This is very important because, as scholars on the political economy of energy transition have noted, renewable energy transition significantly affects existing power relations and can lead to unequal distribution of renewable energy development in a way that disadvantages peripheral or marginal locations or regions ([Munro, 2019](#)). Indeed, as the Moroccan example has demonstrated, the “technicist discourses that dominated decision-making for the ambitious energy plan” also contributed to, and were used to mask the entrenchment and extension of, “a new form of governmentality that linked state territorialization and centralization goals” ([Cantoni & Rignall, 2019: 26](#)) and the implantation of “the central government’s political and economic control in a peripheral region” ([Cantoni & Rignall, 2019: 29](#)). Thus, decisions about renewable energy projects were exclusively made by the Moroccan government, MASEN, and ministries in conjunction with private energy companies and global finance capital, while the majority of the people were practically alienated in the process in spite of commitments in policy documents. This situation has led to the issue of agrarian land grabbing disguised by narratives about clean energy, with important negative consequences for the livelihoods of the local communities.

### 3.2. Land use, livelihood issues, and environmental footprints

WACEC seeks to build ‘utility’ scale solar power plants in Benin, Burkina Faso, Côte d’Ivoire, Ghana, Mali, Mauritania, Niger, Nigeria, Senegal, and Togo, to serve as its solar corridor. These solar plants will be integrated into the wind and hydro corridors to facilitate maximum synergy and complementarity between these resources and aid the expansion of energy access in the region ([Ben Jemaa et al., 2019](#)). However, Boris Schinke has pointed out that “no renewables project is automatically sustainable itself. It does not lead automatically to equitable and sustainable outcomes for the people” (Ortiz, 2016). The Moroccan example demonstrated this, as the land on which concentrated solar power (CSP) at Noor was built was formerly a collective tribe land that had been “practically expropriated” ([Bouhmouch, 2016](#)) in a fashion likened to “green grabbing” ([Hamouchene, 2016](#)) with compensation that the locals considered below the value of the land provided. The project also affected the community’s water source, as the solar plants require a massive amount of water for cleaning and cooling that is drawn from the local El Mansour Eddahbi dam ([Ceurstemont, 2016](#)). Such development in a “desert region already suffering from water depletion and the desertification of oases” ([Hamouchene, 2016](#)) led to serious water stress for struggling farmers who depended on the dam for agriculture ([Ceurstemont, 2016](#)). This is a classic example of the unequal distribution of the cost and benefits of renewable energy mega projects, and it is a major form of injustice and inequities in energy transition that affects marginal/vulnerable groups and locations where the energy projects are situated. Indeed, it is in this sense that rather than ensuring justice, energy transitions may end up deepening the inequality and marginalization they were meant to prevent.

The Moroccan example demonstrates that managing competing water demands for solar and human/animal consumption is also crucial for the sustainable energy transition. Indeed, as [He \(2019\)](#) have noted, “water scarcity brings tremendous challenges to achieving sustainable development of water resources, food, and energy security, as these sectors are often in competition, especially during drought.” A just energy future for West Africa must therefore give adequate attention to the complex trade-offs between and solar power system development and livelihoods in order to ensure that the meeting of clean energy targets does not exacerbate its water insecurity. This is all the more important because the West African region is heavily water-stressed: lakes and rivers provide perhaps the main source of water for human consumption and irrigation for dry season farming, and scarcity of water due to drought in some parts of the region, such as Niger, Chad, and Nigeria, has led to migration that has contributed to violent farmer-herder conflicts, even as the WACEC has been planned to include hydropower plants.

To be sure, WACEC seems to recognize the livelihood and environmental challenges that accompany the development of renewable energy and aims to mitigate these challenges. For instance, WACEC’s plan of action to “improve the enabling environment for the development of the identified renewable energy potential, both on- and off-grid in the ECOWAS region” ([Ben Jemaa et al., 2019: 16](#)) highlights the need to reduce the “impact on livelihoods and habitats” ([Ben Jemaa et al., 2019: 17](#)) and “anticipat[e] ... the social and environmental impacts of RE project development” such as “population displacement, loss of income and ecosystem change” ([Ben Jemaa et al., 2019: 17](#)). It, therefore, plans to carry out “environmental and social impact studies” and the “alignment of local environmental and social standards to the Equator Principles to ensure projects adhere to both local law as well as the principles imposed by international financial institutions - introduction of ‘Environmental and Social Safeguard Plans’” ([Ben Jemaa et al., 2019: 17](#)). However, even though WACEC’s awareness of these concerns is encouraging, Morocco’s example reveals that such awareness was

also not lacking in the policy documents, as the document was replete with good words about the importance of achieving social justice in the transition to renewable energy. For instance, [Wuppertal Institute for Climate, Environment and Energy and Germanwatch \(2015: 21\)](#) has pointed out MASEN's policy measures aimed at addressing the negative local-level social and socio-economic issues emerging from the development of Noor Ouarzazate, such as a Land Acquisition Plan (LAP), a Social Development Plan (SDP), and an Environmental and Social Management Plan (ESMP). The missing link here was how to ensure that these lofty plans do not exist only on paper and are truly people-oriented and focused. Morocco's case revealed how plans to prevent negative impacts on livelihood and the environment from renewable energy development may also be misguided. For instance, as [Wuppertal Institute for Climate, Environment and Energy and Germanwatch \(2015: 28\)](#) noted, Morocco's Environmental and Social Impact Assessment (ESIA) did not emerge from a participatory and community-oriented process but is geared largely towards complying with "international standard procedures," and hence "provides only limited coverage of social impacts." Collaborating this view, Muller et al. (2021:125) maintained that while Morocco developed far-reaching solar energy development policy frameworks, "these frameworks do not address questions of energy justice but reflect a strong market orientation that downplays the need for integrating social aspects into the policy portfolio."

While WACEC aims to align "local environmental and social standards to the Equator Principles to ensure projects adhere to both local law as well as the principles imposed by international financial institutions – introduction of 'Environmental and Social Safeguard Plans,'" policymakers must walk the talk to ensure that complying with "principles imposed by international financial institutions" in order to gain validation for financial support for much-needed energy transition does not take precedence over local environmental requirements and livelihood concerns.

#### 4. Conclusion

This article uses the case of the configuration of Morocco's energy regime away from reliance on fossil fuel and energy imports towards renewable energy to inform the debate about what West Africa can learn from their example as the region embarks on its own transition, especially through the WACEC Initiative. While West Africa is contextually different from Morocco or the North African region, the Moroccan case is particularly revealing, not just because both contexts share the history of overdependence on fossil fuel for energy, but also because Morocco has since established itself as a leader in the renewable energy sector in Africa. We argue that even though important strides are being taken to achieve the goals of clean energy in West Africa through the WACEC, the policymakers and bureaucrats implementing the program should learn from Morocco's example and resist the temptation of seeing the transition as merely a technological endeavour. They must also give serious attention to the social challenges that scaling up energy transitions generate in the areas of a genuine participatory approach with a mandatory community engagement component right from the design phase to the end of the project and local livelihood and environmental dimensions of the project. Prioritizing the decision-making autonomy and self-determination of the people above international accountability in renewable energy initiatives will prevent the renewable energy policies, initiatives and projects from adopting a narrow notion of justice as most transitions do that, rather than preventing injustice from taking place in the first instance, merely focuses on "adaptation, i.e., the bad 'event' having occurred already, and only then solutions are discussed as to how to reduce the damage" ([Heffron and McGauley, 2018: 75](#)).

We argue that while Morocco was able to navigate some of the social aspects of its transition over time by relying on this adaption approach, for instance through MASEN's measures to generate positive socio-economic effects in the local communities ([Wuppertal Institute for Climate, Environment and Energy & Germanwatch, 2015: 21](#)), without local resistance escalating to high-intensity conflict, West Africa may not be able to achieve this feat. For instance, despite being endorsed by ECOWAS Heads of State and being beneficial to the ECOWAS states, WACEC is driven by a regional body that is far removed from the people. Also, unlike Morocco's history of 'stable' government, many countries in the West African region are deep in the throes of multiple political conflicts and economic crises that would make the implementation of social welfare programs to enhance adaptation and resilience to the negative consequences of renewable energy development on the people a herculean task. In this context, it is increasingly important to ensure that renewable energy development genuinely addresses not just the key issue of technical choices to ensure universal energy access, but also the democratic and equity challenges of energy reform early in the planning stage and at other phases of the process in order to make the transition truly transformational. This is crucial because of the moral obligation and categorical imperative of a just shift to renewable energy. Indeed, not doing so may end up complicating existing conflict dynamics, providing a new path to future conflict in this increasingly fragile and volatile region, leading to attacks on renewables and the unravelling of much-needed progress. The accent on a democratic energy transformation is crucial for West Africa as it underscores the fact that renewable energy developments are both sociotechnical transitions and complex political processes of state-building, which, despite being framed as depoliticized processes are nevertheless deeply imbricated in power relations and struggles, with significant implications for the question of distributional equity and the fostering of an inclusive society ([Burke & Stephens, 2018](#); [Gailing & Moss, 2016](#); [Cantoni & Rignall, 2019](#)).

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