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Abstract

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Is green a Pan-African colour? Mapping African renewable energy policies and transitions in 34 countries



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ABSTRACT

Renewable Energy (RE) is rapidly gaining relevance as a key technology to quench growing energy demand on the African continent. Many African states have introduced RE legislation, but the design of RE policy instruments, as well as their application and efficiency vary considerably across African economies. This article presents an analysis of energy transition processes based on a comparative mapping of African renewable energy policies in 34 countries. We discuss these developments with respect to their justice dimension, following up on the recent debate on distributive, recognitional, and procedural energy justice. We not only provide evidence of African energy policies covering recognitional and distributive justice, but also identify potential trade-offs between strong market orientation and justice concerns. We embed our findings in the debates on a “just transition” and on “energy justice” that have emerged as recent outcomes of the transition management literature travelling to the Global South.

1. Introduction

Renewables have captured global energy market shares at unprecedented rates and have increasingly tilted the contemporary energy landscape towards sustainable and renewable alternatives.¹ Costs for renewable energy, particularly for wind and photovoltaic (PV), have dropped significantly, rendering them profitable and attractive vis-à-vis conventional energy markets. In Africa and the Middle East alone, investments have risen from 1.2 billion USD in 2006 to 19 billion USD in 2017 [1,2], ([3], p.19). As a result, renewable energy capacity on the African continent nearly doubled from 22,93 GW to 38,28 GW between 2007 and 2016 [4]. With forecasts estimating electricity demand to triple between 2015 and 2030, however, the continent faces a challenge unparalleled in other regions [5].

Even though most African states have initiated renewable energy policies that feed into broader energy transition strategies, literature on

Renewable Energy (RE) transitions has predominantly focused on the Global North, whereas comparative studies on energy transitions and accompanying RE policies in Africa are rare [4,5]. To bridge this gap and to amplify political science debates on African energy transitions, this article presents an energy policy analysis that assesses transition endeavours based on a comparative mapping of African renewable energy policies in 34 countries.² We discuss these initiatives with a particular focus on “energy justice”, a concept that forms part of the broader debate around just transitions [6–9]. Based on earlier debates on environmental justice and environmental racism [10,11], the current debate has intensified as an outcome of the transition management literature travelling to the Global South and focusing on the question as to how a “just transition” [8,12] and therefore also energy justice could be achieved in developing countries [7]. Against the backdrop of renewable energy transitions oftentimes prioritizing market-based (and particularly investor-oriented) solutions, such as green funds, auction

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² Countries in the sample: Algeria, Angola, Benin, Botswana, Burkina Faso, Burundi, Cameroon, Cape Verde, Côte d'Ivoire, Democratic Republic of the Congo, Egypt, Ethiopia, Gabon, Gambia, Ghana, Guinea, Kenya, Madagascar, Malawi, Mali, Mauritius, Morocco, Mozambique, Namibia, Nigeria, Rwanda, Senegal, South Africa, Tanzania, Togo, Tunisia, Uganda, Zambia and Zimbabwe.

instruments and derisking programmes, there is reason to ask whether RE policies at the energy/development nexus pay attention to questions of social and ecological justice. Therefore, the scope of a policy – i.e. if a policy aims for direct, short-term change or for far-reaching transformation – plays a significant role, as does the actor constellation, which helps to expose public or private actors as main change agents.

In this light, the article seeks to enrich the ongoing debate by assessing African RE policies' potentials for contributing to greater energy justice. Our comparative energy policy analysis relies on an aggregated database of African renewable energy policies (hereafter AFRO_ENERGYPOL [37]). Our findings display good practice examples and outline strategies for developing more just policies that foster renewable energy transitions in the Global South.

2. Energy justice in the Global South: exploring the justice dimension in energy transition policies

Energy transitions have become an almost universal phenomenon, with more and more countries in the Global South adopting RE policies. While this is a laudable development in terms of implementing SDG 7, it also raises concerns in terms of access and affordability, as well as accountability and participation. 'Energy justice' debates have recently concentrated on these aspects. They resulted in analytical frameworks that relate to prevailing justice theories whilst paying respect to social justice concerns brought up by trade unions [6–8]. Drawing on liberal justice theory, namely Sen's [13], Rawls' [14], and Fraser's [15] works, energy justice gained momentum as an analytical tool to dissect energy problems (see [6,7,8,16,17] for an implementation of justice theory). Jenkins and her co-authors [6] suggest an analytical framework that distinguishes between distributive, recognitional, and procedural justice as different pillars of any energy transition process. Distributive justice refers to questions of access to and affordability of renewable energy. Recognitional justice, in turn, reflects to what extent energy policies address the needs of groups considered especially vulnerable due to energy poverty. Lastly, procedural justice emphasizes questions of participation as well as articulation and calls for greater awareness for RE's democratising potentials within transition processes. In recent publications, Jenkins and her co-authors [7,8] further stress the need to enrich socio-technical transitions through a normative justice perspective and underline its potential for fostering socio-technical change.

The concept has sparked much theoretical and empirical reception. Several authors have started to discuss the ways in which African energy transitions should consider questions of justice. Monyei et al. [18,19] stress the need to diversify the energy justice framework by highlighting western narratives in the energy debate and differentiating between access to energy in the global North (affordability and path dependency) and global South (clean energy for domestic use). From a critical geography perspective, Boamah and Rothfuß [20] concentrate on distributional concerns. They argue that solar home systems in Ghana are used to counteract the perceived expense and unreliability of grid-based electricity, thus predominantly safeguarding the electricity-intensive lifestyles of an emerging "energy elite" (p. 3). A similar argumentation is found in Brato et al. [21], who emphasize that the energy justice concept has to be linked to postcolonial realities, i.e. the ways in which today's transition processes reaffirm colonial power structures in epistemological (power over transition knowledge) or material terms (ibid., p. 646). Sovacool et al. [3] also detect Eurocentric notions in the western-liberal set of norms which underpins most energy justice concepts. By connecting the concept to norms from Southern cosmologies, such as *ubuntu*, the authors outline strategies for pluralizing and localizing energy justice. These examples underscore the impetus to broaden debate on energy justice in the global South.

Still, the energy justice debate may benefit from further Southern evidence, especially if geared towards the justice dimension of RE policies and sustainable transitions. While the "energy/development nexus" ([22], p.306) is considered a terrain, where ecological and social

needs are intertwined almost naturally, reality indicates, that the rise of blended finance and green funds may in fact result in a financialization of socio-ecological transitions that downplays justice-related questions as a whole [23].

It is in this light, that the authors assess the content and scope of African renewable energy policies, in order to offer evidence on their potentials for contributing to energy justice. Comparative perspectives have mostly been missing in the energy justice debate (but see [24]), and a comparative policy analysis provides stronger evidence on the course of transitions and their awareness for the justice dimension. We do so by comparing policy frameworks and actors' coalitions in 34 African states, which we then assess in terms of procedural, distributive, and recognitional energy justice. Our empirical results shed light on the main actors and driving forces behind policy formulation and implementation, assess the transformative quality of the policies under scrutiny and, lastly, consider the justice dimension of a given policy mix.

3. Methodological considerations for mapping African energy transition policies

Environmental policy analysis examines the content, extent and impact of policies that focus on environmental concerns. It aims at identifying the most appropriate solutions for tackling environmental problems, taking account of their efficiency and legitimacy. Typically, environmental policy analysis concentrates on certain policy networks and advocacy coalitions [25,26], on the powers of political discourse [27–29], or in a more practice-oriented sense on impact assessments, which measure the outcomes of a particular policy and offer guidance to policymakers [30]. Likewise, energy policy analysis concentrates on certain stakeholder networks as well as on the content and impact of policies that regulate grid infrastructure and energy mix, promote energy transitions or incentivize the private sector. Energy policy analysis is, therefore, interested in mapping governmental activities that seek to transform a country's energy mix and materialize in promising policy mixes for sustainable transitions [31]. In the case of RE policies, this calls for a methodology that is able to map policy change with a focus on actors and advocacy coalitions in charge, the transformative potential, and the dimension of social and ecological justice. To assess the potential of the RE policies under scrutiny, we outline three dimensions that account for the actor-specific dimension, the scope of a given policy and its normative quality:

- The *actor-specific dimension* identifies the *driving forces of a policy*. This dimension refers to the implementation process and uncovers to what extent a policy addresses not only public actors, but also involves donors or other private actors. Here, we initially assumed RE policies to be either state- or market-led, since most policies highlight either public institutions or market actors as change-makers. For each policy, we coded the actors constellation in order to identify the changemakers addressed in a policy. However, our coding process resulted in a reframing, as we found a considerable amount of donor-led policies demonstrating the influence of development cooperation in shaping African transition processes. We therefore used 'state', 'market' or 'donor' as codes.
- The *transformative potential* refers to the *policy objectives and the interaction of various policy instruments* within a specific framework. This dimension is expressed through the scope and scalability of a policy and explores the extent to which a policy drives policy change. The dimension of scalability shows whether a policy is limited to local implementation or applies nationwide. With regard to scope, we asked whether a policy has incremental implications or system-changing potential, based on a heuristic suggested by IRENA, IEA and REN 21 ([32], p.15,101–103). Accordingly, we distinguish between three types of policies aiming at policy change. *Direct policies* refer to very concrete changes within a limited policy

Table 1
African renewable energy policies: Policy frameworks, stakeholder coalitions and energy justice.

Country	Policy framework & scope Direct policies/ integrated policies/ enabling policies	Driving forces State/donor/private actors as stakeholder networks	Socio-ecological justice Distributive/ recognition/procedural dimension
Algeria	Highly diversified policy framework with several enabling policies (REFIT, RE fund, RE power generation)	Ministry of Energy and Mines, transnational investors → state-driven; market-oriented	No specific attention for energy justice concerns
Angola	Mostly direct policies (individual energy access, solar cookstoves); often still in the planning stage	Ministry of Energy and Water, Rural Electrification Agency → state-driven	Some attention for distributive concerns (access to energy, rural electrification), but no systemic mainstreaming
Benin	Mostly direct policies (individual energy access), some enabling policies, but so far still in the planning stage	Ministry of Energy and Mines, European donors, Supra-national actors (ECREE and ECOWAS) → donor-driven	Some attention for distributive concerns (access to energy, rural electrification), but no systemic mainstreaming
Botswana	Mostly direct policies (individual access, rural electrification), some integrative policies (technology transfer, off-grid fund)	Ministry of Minerals, Energy and Water Affairs, Japanese donors, USAid → state-driven	Some attention for distributive concerns (access to energy, rural electrification), but no systemic mainstreaming
Burkina Faso	Few direct policies (fiscal incentives); ambitious integrative and enabling strategies (FiT, auctions green investment) but still in the planning stage	Ministry of Mines and Energy, UNDP, Global Env. Facility, World Bank, EU donors → donor-driven	No specific attention for energy justice concerns yet
Burundi	Few direct (fiscal incentive) and enabling policies (2 auctions), aiming at market-based solutions	Ministry of Energy → market-oriented	No specific attention for energy justice concerns yet
Cameroon	Highly diversified policy framework featuring direct (incentives) and integrative (liberalisation and unbundling) policies; lack of enabling policies	Ministry of Energy → state-driven, market-oriented	No specific attention for energy justice concerns yet
Cape Verde	Very intricate policy framework featuring direct (fiscal + investment) policies as well as integrative + enabling (cleaner production, research)	Ministry of Tourism, Industry and Energy, IMF, UNDP, ECREE, European donors, transnational companies → donor-driven / market-oriented	Some attention for recognitional energy justice (clean cooking), but general focus on transnational investors raises concerns regarding procedural energy justice
Côte d'Ivoire	One direct policy (tax reduction), but no RE policy framework in place	Energy Ministry, UNDP → no clear RE strategy yet	No specific attention for energy justice concerns yet
Democratic Republic of the Congo	One integrative/enabling policy on liberalisation of the energy sector, but no RE policy framework in place	Ministry of Hydraulic Resources and Energy → no clear RE strategy yet	No specific attention for energy justice concerns yet
Egypt	Very intricate policy framework featuring direct (net-metering + auto generation, tax reduction) integrative (FiT, auctions) + enabling policies	Ministry of Electricity & Energy, government agencies, EU donors → state-driven / market-oriented	Attention for distributional energy justice (access to RE, small-scale generation)
Ethiopia	Very intricate policy framework featuring direct (incentives, tax reduction), integrative (auction, funds) and enabling (green jobs, carbon neutrality, RE targets) policies	Ministry of Water, Irrigation and Energy, Ethiopian Investment Agency, World Bank, African Development Bank → state-driven	Attention for recognitional and distributional energy justice (access to RE, off-grid electrification, small-scale generation, green jobs)
Gabon	Ambitious INDC targets, but no RE policy framework in place	Energy Ministry, UNDP → no RE strategy	No specific attention for energy justice concerns yet
Gambia	Few direct policies; integrative and enabling policies (RE fund, FiT, off-grid support) are promising, but still in the planning stage	Gambian government, Public Utilities Regulatory Authority → state-driven	Some attention for recognitional energy justice (clean cooking, RE engineering curricula)
Ghana	Highly detailed policy framework featuring direct (incentives, tax reduction, school & hospital solar scheme) and integrative (auction, FiT, funds) policies; lack of enabling policies; adoption/implementation gap	Ministry of Energy, World Bank, African Development bank → state-driven, market-oriented	Some attention for recognitional energy justice (school & hospital solar scheme)
Kenya	Very intricate policy framework featuring direct (incentives, tax reduction, rural electrification) and integrative (FiT, auctions, funds), but no outspoken enabling policies	Ministry of Energy → state-driven; market- and consumer-oriented	Some attention for distributive energy justice (access and rural electrification)
Madagascar	Few direct (tax exemptions, rural electrification) and integrative policies (auctions), but no comprehensive framework	Ministry of Energy & Hydrocarbons, World Bank → state- and donor driven	Some attention for distributive and recognitional energy justice (access and rural electrification, combatting energy poverty)
Malawi	Several direct (rural electrification, clean cooking) and integrative policies (testing centre for RE + training programmes)	Ministry of Energy & Water; World Bank → state-driven; consumer-oriented	Much attention for recognitional and distributive energy justice (access and rural electrification, clean cooking, RE training courses)
Mali	Several direct (tax incentives, energy saving, energy subsidy, women's empowerment in RE) and few integrative (solar tender) policies, whereas enabling policies are still in the planning stage	Ministry of Mines, Energy and Water, National Solar and Renewable Energy centre, Donors (India, African Development Bank, IFC) and supranational actors (ECOWAS) → state-driven	Much attention for recognitional energy justice and distributive energy justice (RE subsidies, women's empowerment through RE, clean cooking, energy saving measures)
Mauritius	Comprehensive policy framework featuring several direct (energy cooperatives + clean cooking, consumer incentives, women's empowerment), integrative (FiT, RE efficient buildings) and enabling (RE fund, zero-carbon tourism) policies	Ministry of Energy & Public Utilities donors (Denmark, France, World Bank, UNDP) → state-driven; market- and consumer-oriented	Much attention for recognitional (women's empowerment through RE, clean cooking energy subsidy) and distributive energy justice (solar cooperatives)
Morocco	Few direct (private sector incentives), but several successful integrative (solar tender) and enabling (Moroccan Solar Plan; Wind energy programme, research and development) policies	Ministry of Energy, Mining, Water and Environment, Moroccan Agency for Solar Energy → state-driven, market-oriented	No visible attention for energy justice
Mozambique			

(continued on next page)

Table 1 (continued)

Country	Policy framework & scope Direct policies/ integrated policies/ enabling policies	Driving forces State/donor/private actors as stakeholder networks	Socio-ecological justice Distributive/ recognitional/procedural dimension
Namibia	Some direct (rural electrification, mini grids) policies, but few integrative (grid expansion) and no enabling policies	Ministry of Energy, donors (World Bank, Global Environmental Facility, Nordic and African Development Funds) → state- and donor-driven	Some attention for distributive energy justice (rural electrification, mini grids)
Nigeria	Several direct (electrification funding, incentives for IPPs, tariff subsidies, local RE entrepreneurship) and integrative (RE fund, FiT) policies; enabling policies still in the planning stage	Ministry of Mines and Energy, donors (Global Environment Facility, UNDP) and supra-national actors (SADC) → state- and donor driven; market- and consumer-oriented	Much attention for recognitional (tariff subsidies) and distributive (rural electrification, local RE entrepreneurship) energy justice
Rwanda	Some direct (biofuel blending, IPP incentives, rural electrification) and integrative (FiT) policies; enabling policies still in the planning stage	Nigerian Electricity Regulation Commission, supranational actors (ECOWAS and ECREEE), donors (SE4All, Germany, UNDP) → state-driven	Some attention for distributive energy justice (rural electrification)
Senegal	Comprehensive policy framework combining direct (local lending, tariff subsidies, consumer integration, rural electrification, off-grid initiative) policies with integrative and enabling (FiT, auctions, RE fund, intra-regional RE cooperation)	Ministry of Infrastructure, regulation agencies, national banks and funds; donors (USA, Japan, Germany, France, Netherlands, World Bank) → state- and donor-driven; market- and consumer-oriented	Much attention for recognitional (local lending, tariff subsidies) and distributive (rural electrification, off-grid initiative) energy justice
South Africa	Few direct (tax exemptions) policies; integrative and enabling policies (solar tender) still in the planning stage	Ministry of Energy and Mines; donors (Germany, France, World Bank)	No visible attention for energy justice
Tanzania	Comprehensive policy framework combining direct (solar heater, basic energy support, tax incentives), integrative and enabling (FiT, auctions) policies	Department of Energy, IPP Office → state-driven; market- and consumer-oriented	Much attention for recognitional (solar heating, basic energy support, socio-economic projects) energy justice; some attention for procedural energy justice (participation in the RE auctions)
Togo	Comprehensive policy framework combining direct policies (rural electrification, tax incentives) with integrative policies (RE fund); but enabling policies still in the planning stage	Ministry of Energy and Minerals, Donors (World Bank, UK, France, Norway), supra-national actors (EAC) → state-driven; market- and consumer-oriented	Some attention for distributive energy justice (rural electrification)
Tunisia	Few direct policies (solar lamps); integrative and enabling policies still in the planning stage	Direction Générale de l'Energie, donors (EU, Spain, Austria, UNDP), supranational actors (ECOWAS) → donor-driven	No visible attention for energy justice
Uganda	Several direct policies (solar heater, tax incentives), and some integrative and enabling policies (IPP integration, RE fund)	Ministry of Industry, Energy and Small and Medium Enterprises, donors (Italy, UNEP) → state-driven	Some attention for distributive energy justice (access to solar heaters)
Zambia	Comprehensive policy framework combining direct policies (biofuels blending, investment promotions) with integrative policies (FiT, auctions); whereas enabling policies are still in the planning stage	Ministry of Energy and Mineral Development, donors (Germany, World Bank, UNDP) → state- and donor-driven; market- and consumer-oriented	Some attention for recognitional energy justice (RE accessibility targets specifically aiming at women and poor people) and distributive energy justice (rural electrification)
Zimbabwe	Few direct policies (Scaling Solar Programme), failed feed-in tariff and few integrative policies (auctions under the GETFIT scheme; Beyond the Grid Fund)	Ministry of Energy and Water Development, donors (Germany, Norway, USA, World Bank) → state- and donor-driven; market-oriented	Some attention for distributional energy justice (Beyond the Grid Fund)
	Some direct policies (tax incentives, investment promotion) and some integrative and enabling policies (FiT, Rural Electrification Fund, Carbon Tax), yet no effective implementation so far	Ministry of Energy → state-driven, market- and consumer-oriented	No visible attention for energy justice

environment, for instance material economic incentives such as feed-in tariffs, auction instruments, subsidies, tax reductions, or programmes that target certain groups. Clean cooking initiatives are such an example. In contrast, *integrative policies* foster the integration of renewables into the broader energy system, its political economy and the production chains, for instance through grid infrastructures, heating and cooling regulations or innovations for the transport and logistics sector. *Enabling policies* carry the most far-reaching consequences because they strive for a transformative change, for instance through awareness and energy access programmes, or green industrial policies ([32], p.15). While we used these three categories as codes, we acknowledge that overall only a combination of direct, enabling and integrative policies, which is cognizant of the respective country contexts, can result in a successful renewable energy transformation ([32], p.15).

- Finally, the *normative quality* examines to what extent a policy constellation reflects the objectives of *energy justice*, namely *procedural, distributive, and recognitional energy justice*, being the three

main pillars of the energy justice framework [6]. Therein, we reflected whether an otherwise promising policy framework also corresponds to procedural justice – that is, democratic and legitimate policy processes with a plural spectrum of actors involved. In terms of distributive justice, we asked whether a given policy framework may contribute to a more just distribution of energy access. Lastly, on recognitional energy justice, we assessed whether a policy framework paid attention to particularly vulnerable groups in terms of their energy needs (for instance people with disabilities or chronic diseases, mothers or children). This also resonates with the aims of the 7th SDG (access to affordable and clean energy).

Our sample comprises all African countries that had put in place RE legislation over the past two decades, resulting in a sample of 34 states. Policy data was retrieved from several publicly accessible databases on renewable energy, including the IEA/IRENA Joint Policies and Measures database [33], Global-Climatescope [34], and the Regulatory Indicators for Sustainable Energy RISE [35]. Furthermore, annual

reports such as the REN 21 Global Status Reports [36], the World Energy Outlooks, or IRENA's various Renewables Readiness Assessments provided additional information. Thirdly, as the RISE indicators and the IEA/IRENA database proved to be incomplete for some cases, we retrieved individual RE legislation. Altogether, these data sources formed the basis for an energy policy database [37].

For assessing African energy policies, we summarized each country's policies in terms of goals and content, combined with country specific context information, e.g. on the targeted energy sector, installed capacity, energy access, and executing actors. Afterwards, we used deductive coding according to the actor-specific dimension and the transformative potential. To ensure inter-coder reliability during the coding process, each country coding was reviewed by another team member. We classified the policy frameworks in relation to their direct, integrative, or enabling content, and identified the actors' coalitions that inform policy change. Lastly, we discussed these findings in terms of their impact on procedural, distributive or recognitional justice. With respect to the categorization process, it is important to note that we regard the classification of direct, integrative, or enabling frameworks as ideal types which cannot be found in its purest form. In order to arrive at the distinctive classification, it is rather the policy mix as well as the share of modern RE sources in the energy mix, which indicates a country's long-term goals for 'going green'. This emphasizes the processual aspect of any transition and points not only to its dynamics, but also to the existing path dependencies that might hinder a fully-fledged transition.

4. Results: processes, actors, and energy justice concerns in African energy transition policies

Even though our findings affirm that renewable energy policies are generally on the rise, dynamics, directions, actor constellations, and maturity of energy transition processes vary considerably. The overall trend indicates RE transitions in Africa to gear towards increasingly comprehensive and complex policy mixes that include direct, enabling and integrative policies ([32], p.15). While many countries still lack comprehensive frameworks, relying instead on a few direct policies, we could also identify several countries with comprehensive policy mixes. These comprehensive mixes, oftentimes, rely on market-led policies such as auction mechanisms. Regarding the justice dimension, our findings suggest that several policy frameworks address questions of distributive and recognitional justice. But especially when embarking on market-based solutions for renewable energy transitions, these endeavours tend to forego addressing the justice dimension in a systematic manner. We, thus, suggest that both donors and governments should mainstream justice perspectives as part of a successful SDG7 implementation. Table 1 provides an account of each country's policy framework (refer to AFRO_ENERGYPOL for more detailed information on single policies).

The following sections will present our empirical findings in closer detail, first (4.1) referring to the transformational impetus of RE policy frameworks, and then (4.2) touching upon the respective driving forces. Lastly (4.3), we critically discuss these developments in terms of their contribution to energy justice. For each dimension we present country cases derived from our AFRO_ENERGYPOL database.

4.1. Where are we going? Scope and direction of African energy transition policies

In a majority of cases, state institutions act as initial change agents that formulate plans of action and set targets for the respective energy mixes. Several African states started with the implementation of direct RE policies during the late 1990s and early 2000s, for instance regarding duty exemptions on renewable energy parts (e.g. Ghana 1994, Senegal 1998, Ethiopia 2002, Kenya 2009; see [37]) and rural electrification through renewables (e.g. Malawi 1980, Mali 1996, Uganda

2002). Several states still rely solely on direct policies, for instance Botswana, Gambia, and Togo [37].

While *direct policies* initiate energy transitions, some states tend to consolidate these processes by implementing comprehensive policy frameworks. Examples for *integrative policy frameworks* that combine direct policies with more systemic ones, such as feed-in tariffs or biofuel blending mandates, can be found in Algeria or Uganda [37]. Several states, namely South Africa, Rwanda, Kenya, Mauritius, Ethiopia and Egypt stood out by introducing *enabling policies* that aim at a systemic transition towards modern clean energy sources. These policies form part of larger policy frameworks that regard the cross-cutting qualities of renewable energy and address economic, socio-ecological and even educational dimensions of a transition towards renewables.

One example of an enabling policy framework is Rwanda's National Energy Strategy [38], a tailor-made RE transition framework. It combines several integrative and enabling policies, which consider the cross-cutting nature of renewables and aim at changing consumers' behaviour. The strategy promotes the diversification of energy sources such as geothermal energy and includes schemes for reducing energy consumption, energy audits for industries, and not least grid extension. This shall be achieved through a variety of small-scale and large-scale instruments, such as microfinance options, clean cooking programmes, and biofuel blending in the transport sector. The strategy also includes long-term strategies such as support for research and development on renewables and recognizes RE's cross-pollinating capacities in setting up capacity-building programmes for more female expertise in RE technology.

Overall, we observed a tendency to introduce policies that are designed to attract foreign direct investments, most prominent among them feed-in tariffs,³ derisking and auction instruments.⁴ Auction instruments include a tendering process with competitive bidding and a scoring based on least-cost pricing. Additional scoring criteria such as local content requirements, employment of local personnel, and local shareholding may apply. Auction instruments are often favoured over feed-in tariffs as they are expected to attract investment that forces down prices for electricity generation. Auction instruments also remain in a flexible competitive pricing system instead of fixed tariff bands that might distort the market. Our sample indicates a strategic shift towards a policy mix that privileges a market-oriented transition regime. The extent to which aspects of social inclusion such as LCRs or the employment of local personnel are included in auction instruments also determines their *integrative capacity* ([32], p.15). Derisking instruments foster investment by shifting risks that may adversely affect investors' behaviour [39–41]. As the most prominent example, the Global Energy Transfer Feed-in Tariff (GETFiT) – designed by Germany's Kreditanstalt für Wiederaufbau (KfW) – mitigates investment risks in RE sectors. Currently operating in Uganda and Zambia, GetFit also aims at energy markets in Ghana, Namibia, Malawi and Mozambique. These countries share several common features due to which GETFiT considered them 'target countries' for green investment: They have large untapped potentials for renewable energy generation, growing energy demands and share a lack of international investors' interest. Indeed, many have shied away from investing due to perceived political, counterparty and economic risks [40,42,43]. In case an investment experiences economic, political or structural risks and the state is unwilling to release the debt, multilateral banks guarantee a safety net and act as lenders of

³ African countries with a feed-in tariff include Algeria, Egypt, Ghana, Kenya, Mauritius, Namibia, Nigeria, Rwanda, Senegal, South Africa, Tanzania, Uganda, Zambia, Zimbabwe. Continent ([36], p.19., p.63–67, p.200), [2,4,37].

⁴ So far, we find 29 countries worldwide with auction instruments with Zambia, Madagascar, Ethiopia, Rwanda, South Africa, Burkina Faso, Senegal, Kenya, Algeria, Mauritius, Cape Verde, Côte d'Ivoire, Egypt, Lesotho, Uganda, Malawi, Nigeria and Morocco on the African continent ([36], p.19, p.65–67), [4,5,37].

last resort. Besides GETFIT, several other derisking initiatives exist.⁵ Both the Regional Liquidity Support Facility, a cooperation of KfW, the African Trade Initiative (ATI) and the African Energy Guarantee Facility, a cooperation of European Investment Bank, ATI and Munich RE aim at offering insurance capacity for Africa's renewable energy projects.

This observation – the turn towards market-based instruments – feeds into a broader tendency to initiate comprehensive policy frameworks, which rely on market forces and set incentives for international investment. These policies combine a range of direct, integrative and enabling instruments and seek to create improved market conditions by unbundling monopolies, fostering market transparency and encouraging competition among independent power producers. Market-led policy frameworks, therefore, concentrate on creating an attractive environment to stimulate incoming FDI, while seeking to limit state influence or shift agency to transnational donor/state consortia, as is the case in the GETFIT constellations.

Moreover, we find some states that still rely on single-issue policies and scattered policy frameworks. While states such as Botswana, Togo, Ivory Coast, Malawi, Guinea, DRC, and Mozambique express an interest in renewables, progressive RE policies are absent due to a lack of state capacities, political agency, and donor activities that would stimulate RE policy initiation. In this regard, the Togolese case illustrates the difficulties associated with managing a transition towards renewables. Despite promising solar potential, the state seems to be lacking the capacity to build a sound policy framework that would foster an energy transition [37]. The existing policies refer to global commitments, such as the United Nations Framework Convention's on Climate Change (UNFCCC) intended nationally determined contributions to which all signatories have to adhere, albeit at times merely as political 'window-dressing'. In these cases, the transformative potentials of RE have not yet been tapped. Nonetheless, the support of regional frameworks such as ECOWAS (Economic Community of West African States), ECREEE (ECOWAS centre for Renewable Energy and Energy Efficiency), SADC (Southern African Development Community) or the Renewables Readiness Assessments by the International Renewable Energy Agency (IRENA) would seem beneficial for developing a viable transition pathway and for pioneering African political leadership.

4.2. Who shapes renewable energy transitions? Actors coalitions and donor alignment

African energy transitions are influenced by a broad network of public, private, domestic, and global actors, including international donor organisations, transnational companies, state and local governments, civil society groups and local industries. Our mapping revealed four distinct features that inform the relationship dynamics throughout RE transition processes.

First, there are states that strategically draw on donor support to pursue a renewable energy agenda, endorsed by donors and states alike. These 'donor darlings' outsource technical and administrative aspects of the transition to development organisations whilst retaining a core legislative and executive role. In this setup, crucial interests of donor agencies and government align: Both regard market-oriented transitions as the medium- to long-term objective. The cooperation between donor darlings and donors is driven by an understanding of governance that sees governmental institutions in a steering, regulating and controlling position yielding a stable policy environment. The state intervenes strategically in order to support the growth of renewable energy production. This is reflected in a long-standing interest to add renewables to the national energy mix and make use of renewables as a way to combat energy poverty and increase energy access. Donors assist

these processes with expertise and capital, thereby paving the way for market actors to set up shop. This results in a combination of state and donor activities facilitating the entrance and expansion of market forces as key change agents in their mutual quest for promoting a transition towards renewable energy. As our table points out, this often plays out in comprehensive policy frameworks aligning state and donor interests.

Uganda's energy transition is a good example for this phenomenon. The country started liberalizing its power market in 2001. By introducing a feed-in tariff (REFIT), the government arranged a cooperation involving the Ministry for Energy, Minerals and Development, the German Development Bank KfW, Deutsche Bank, the Government of Norway, the UK Government as well as the Federal Government of Germany on the GETFIT programme. Alongside this cooperation, private financing mechanisms for independent power producers were signed and a guarantee facility was put in place by the World Bank to insure against off-taker and policy risks [32,42].

Second, we also identified several cases, where factions within the state who actively pursue renewable transition endeavours find themselves confronted with powerful internal resistance. These energy sectors are characterised by the presence of energy monopolists, who cling to their path-dependent energy technologies. These monopolists resist market-oriented transition policies and hamper the state's attempts to more successfully pursue said endeavours.

South Africa is a pertinent example of this phenomenon: Against a system of accumulation that has been dominated by the minerals-energy complex and steered by South Africa's energy monopolist Eskom for decades [44,45], ([46], Ch.5), [47], the recent success of renewable energy policies has jeopardized its very mode of production. The Renewable Energy Independent Power Producer Procurement Programme (REIPPP), chief among the market-oriented policies enacted by the state, successfully forced down the costs for generating renewable energy below those of conventional sources through several competitive bidding rounds. The independent power producers that emerged in those projects, however, found themselves recurrently confronted with Eskom not willing to facilitate grid access, thus inhibiting their respective take-off and slowing down the transformation towards a more renewable energy mix [48].

Third, we detected a tendency amongst a few state governments to not vigorously claim renewable energy as their own agenda, but rather delegate policy design to 'partnering' donor agencies to develop and implement. These governments seemed willing to accept donor-led renewable energy projects in order to benefit from the additional capital linked to these green projects, without declaring ownership themselves. Thus, international donors, rather than the governments, orchestrate the transition processes by not only formulating the policy mix, but also implementing it as much as monitoring its results.

One significant example is Cape Verde, whose policy framework is essentially a product of intense donor activities. While Cape Verde's energy mix already consists of 25% renewables, it heavily relies on diesel generated electricity. Despite this, the country has announced to obtain 100% of its electricity from wind and tide energy by 2025 [49], ([50], p.11). Cape Verde's main RE policies draw on donor assistance, for example through the country's Poverty Reduction Strategy Paper, the Renewable Energy Plan and the Rural Electrification Programme, all of which rely heavily on advisory and financial support from the African Development Funds, Portuguese Aid and Luxembourg's development aid agency [51]. With support from the consulting firm Gesto Energia S.A., the Government developed a Renewable Energy Plan (2010–2020) in 2010, proposing 50% of the country's energy requirements to be produced by renewables by 2020. On behalf of the government, Gesto Energia also issued a geographical atlas of energy for Cape Verde. In the same vein, electrification projects have been implemented on several of its islands with the help of multilateral development banks, Japanese and Dutch aid agencies [52,53,37].

Fourth, a considerable number of states in our sample stick to non-renewable pathways even though they have adopted RE legislation.

⁵ So far, derisking instruments target the following countries: Benin, Burundi, Ethiopia, Ghana, Malawi, Mozambique, Uganda, Zambia [41,40].

This is either due to a political economy too deeply entrenched in non-renewable energy generation to initiate a substantial socio-ecological transformation, or due to either a lack of political capacities or donor interest in renewable reform.

In our sample, the oil economies Gabon, Nigeria, and Angola do not yet pursue renewable alternatives at a larger scale due to their extractivist development paths [37]. In these cases, state-oil sector relations are so profoundly intertwined that many features of the 'resource' curse, such as lack of public investment, corruption, loss of governmental agency, export dependency and currency distortions, effectively prevent the implementation of integrative or enabling RE legislation. In the case of Angola, for instance, this has led to an autocratic oil regime headed by the dos Santos clan until autumn 2017. With oil revenues amounting to 93% of state income, the country's policy space for developing its rural sector and for scaling up (renewable) energy access has been severely limited. Some ambitious policies, such as *Energia 2025*, a prestigious programme for integrating the three main grids and connecting a total of 3.7 million customers have not solidified so far. To depart from its fossil dependency, Angolan officials might be well-advised to consider the South African example [37].

4.3. How just are the current trends in African renewable energy transitions?

Our analyses of actor constellations and policy trends give evidence of several African states embarking on systemic energy transitions. Many of them rely on market-based policies, such as auctions or de-risking instruments that prioritize harmonized market conditions. It is in this light that we ask to what extent these overarching tendencies and the individual policy frameworks contribute to greater energy justice.

In terms of *distributive justice*, questions of access to and affordability of renewable energy are relevant. In this regard, the turn towards more comprehensive policy frameworks bears the potential to address the cross-cutting qualities of RE policies, namely their socio-ecological, developmental and educational potentials more systematically. This refers, among others, to training and capacity-building programmes, rural electrification as well as to pricing schemes and measurements to tackle energy poverty. Overall, we found many examples of policy frameworks that address this dimension, mostly through direct policies that target individual consumers, or through integrative and enabling policies that aim at systemic change, for instance thanks to rural electrification or grid integration. Distributive energy justice is therefore closely aligned with genuine development goals, such as problematizing and targeting energy poverty. The policy frameworks in Ethiopia, Namibia or Zambia showcase typical policies that consider the distributive dimension, largely in close alignment with international donors. Zambia's Beyond the Grid Fund is a rare example of a market-based policy that considers distributive justice by providing access to energy in particularly remote regions. Also, South Africa's auction instrument REI4P is worth noting due to the socio-economic commitments (such as local-content requirements) investors need to fulfil in order to be shortlisted [44,45,48].

At the same time, the tendency to favour market-based instruments may also pose risks to distributive justice. This is the case for instance when auction instruments result in a highly uneven geographical spread, as is the case in South Africa, where the poorer provinces most in need of renewables and green jobs have experienced difficulties in gaining access to renewable energy [44]. In general, financialization of energy transitions may result in a turn towards policies that secure 'bankability', whereas the justice dimension might be sidelined.

Recognitional justice seeks to reach out to those groups that are considered especially vulnerable due to energy poverty, namely women, chronically ill and disabled people, extremely poor people, refugees, as well as people in remote areas with limited energy access. In this regard, several countries have come up with legislation that

considers recognitional justice, be it through rural electrification, women's empowerment or tariff schemes that consider special needs. One example is Mauritius' "Long Term Energy Strategy 2009–2025".⁶ Therein, energy is understood as a justice-related and cross-cutting issue, as demonstrated by the integration of gender-sensitive energy policies. These include capacity-building programmes, which facilitate energy access for women through microcredit systems and grassroots partnerships. Also, payment systems consider the needs of women from vulnerable groups with irregular income flows. This is an important cornerstone, especially for overcoming tendencies of RE being framed as an elite technology for African middle-classes [20]. We also identified policies on recognitional energy justice in Mali, where the PENRAF programme (Promotion des Energies Nouvelles et Renouvelables pour l'Avancement des Femmes) was initiated in 2003 by the Malian Ministry for Energy and Water in cooperation with UNDP, aiming to empower women through savings on energy bills, solar water pumps and solar cooking in 400 villages [37].

Overall, we found that recognitional energy justice is a recurring issue in many policy frameworks, indicating that renewable energy policies are closely linked to conventional development concerns. Still, several countries, which have embarked on market-based solutions, such as Morocco or Tunisia have not put in place RE legislation that considers justice concerns. This might again be an early sign of financialization downplaying development-related and societal aspects of energy transitions.

Procedural justice, in turn, points to questions of participation and articulation, as well as to an awareness for RE's democratising potentials within transition processes. According to our sample, there is almost no evidence of energy policies that actively contribute to better procedural justice. Moreover, certain actor constellations may even play out against procedural justice. If weak statehood is accompanied by a strong donor presence, such an alignment may result in highly technical 'one-stop shops' that are able to govern transitions in a highly efficient way. Such orchestration practices may simultaneously thwart the regular decision-making processes within government institutions. This limits political agency to marginal activities at the end of the 'political food chain' and results in a loss of political ownership and a shift of said governmental functions to transnational consortia.⁷ As demonstrated above, the renewable energy policy of Cape Verde provides an example for this phenomenon. The implementation of these policies and programmes is carried out by conglomerates consisting of multilateral and international stakeholders, such as aid agencies or research institutes, with domestic institutions confined to executive functions [51,52,37]. While these policies may favourably correspond with distributive justice, they circumvent procedural demands of energy justice. This may occur especially when a long history of donor activities manifests in forms of 'remote governance'.

In contrast, a rare case of attention for procedural justice is South Africa's REI4P programme, which requires public consultations before a RE project is implemented, so as to ensure that the socio-economic projects meet citizens' interests. Still, Wlokas [54] criticizes, that these consultations do not always live up to their expectations and would benefit from a stronger commitment to participative standards. We therefore argue that a 'just transition' needs to consider questions of ownership, alignment, harmonization and joint results. The norms of the Paris Declaration [55] may serve as a blueprint to be adapted for the respective RE transition context in order to allow for a democratisation of RE transitions.

⁶ <https://sustainabledevelopment.un.org/content/documents/1245mauritiusEnergy%20Strategy.pdf>

⁷ One such case is the introduction of a feed-in tariff in Zambia, which is literally based on a USAID template, without undergoing further implementation (Interviews with representatives of the Energy Regulation Board and with USAID, 11. 11. and 18.11. 2015).

5. Discussion

Overall, our mapping yields a diverse snapshot of ongoing transition processes on the African continent and expands the debate with empirical evidence. Our observation provides an account of how transition processes are proceeding and to what extent they consider diverse justice dimensions. Depending on the state's energy endowments, its capacity, its mode of production, and donor presence, stakeholder constellations have emerged that drive the respective renewable trajectories.

In several cases, we find policy frameworks, whose individual policies demonstrate a clear linkage to questions of energy justice. This is the case for RE policies in Egypt, Ethiopia, Mauritius, Namibia, Rwanda, South Africa and Uganda. In all of these countries, we find a set of direct, integrative and mostly also enabling energy policies, that address questions of recognitional and distributive energy justice. A common feature of these countries are strong stakeholder arrangements involving governments, donors, public and transnational actors, yet with a high level of domestic ownership over policy reforms. Still, even in these cases we were unable – except for South Africa's REI4P programme – to find evidence of procedural justice. We therefore see the need to address the cross-cutting and democratising qualities of renewable energy more thoroughly, for instance in donor strategies for SDG7, in scalable RE programmes, and in terms of outreach to African civil society forces that are campaigning for renewables [56].

At the other end of the justice spectrum, we could also identify several countries, whose policy frameworks are inadequately linked to questions of energy justice. Algeria and Morocco are the clearest examples. In these cases, their strong reliance on market forces may mean that the justice dimension is indeed considered negligible, due to an unshaken trust in trickle-down effects. In this regard, the introduction of de-risking programmes may similarly prioritize market-creating policies as so-called 'cornerstone policies' [39–41] leaving policies that link energy transitions and energy democracy at the wayside. While auction instruments are an asset for decreasing energy prices, careful attention must also be paid to their effects on participation, accessibility and ownership, the core conditions for energy justice. To strengthen the justice dimension and offer recommendations to advance energy justice, we therefore see the need for further research on the market-oriented energy transition processes and on financialization in Zambia, Kenya, or Ghana.

Furthermore, our sample demonstrates that many countries have put in place direct policies, that do consider recognitional or distributive justice. In these cases, integrative and enabling policies should follow suit by addressing justice concerns in a systematic way. Countries like Burkina Faso, Gambia, Mali, or Malawi have implemented promising direct policies. Here, regional actors, such as ECRREE and SADC or Development Finance Institutions should offer support for mainstreaming the justice dimension and fostering comprehensive policy frameworks that balance developmental concerns and market creation. This also holds true for those states, who still find themselves stuck on a fossilist transition pathway.

We conclude that transition studies have so far only selectively engaged with questions of justice and the political qualities of a green transition in the African context. While we were able to identify good practice and some role models for a more just transition, we observe a need to intensify intellectual engagement between transition studies, the African political economy of energy, energy justice and postcolonial perspectives in order to arrive at more inclusive transition theories.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Supplementary materials

Supplementary material associated with this article can be found, in the online version, at [doi:10.1016/j.erss.2020.101551](https://doi.org/10.1016/j.erss.2020.101551).

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