Informing a just energy transition: Case of South Africa

Abstract

Energy transition from coal to clean energy is gaining momentum throughout the world. Such a transition is complex, and carries with it significant social, economic and political consequences as it impacts worker livelihoods and the coal mining communities. To ensure that such an energy transition is sustainable, it must also be just, wherein the interests and rights of communities and workers likely to be impacted the most, are safeguarded. This paper studies the phenomena of a just transition, draws out the complexity and conflicting interests that make such a transition challenging, and points to interventions and mechanisms that can guide a just energy transition policy. This paper studies the case of South Africa in particular, as it is unique. South Africa has vast resources of renewable energy, yet it is struggling to make a sustainable and just transition from coal. Drawing on the institutional, economic, political and social barriers that South Africa continues to face, this paper aims to guide future policymaking for a just energy transition.

Politics of energy justice – a background

Energy policy decisions have justice impacts (Healy & Barry, 2017). Responding to climate change and environmental degradation concerns, global decarbonization has assumed center stage in the energy sector. Rightfully so. But the transition towards clean energy has one collateral damage – workers in coal production, distribution and related industries. The political economy of this energy transition demands investigation to deepen the understanding of distributional impacts and the politics and power dynamics at play that make this energy transition unjust and inequitable (Healy & Barry, 2017). Energy poverty – lack of equal access to affordable energy, consumes most nations – developing and developed alike, as a rapid transition towards clean energy is concurrently taking place with rising income inequality (Healy & Barry, 2017). The socio-political costs that accompany decarbonization efforts have not been systemically addressed, and in the absence of that, winning unanimous political support across stakeholders will remain unlikely. It cannot be asserted enough, that a just energy transition is as much technological

and economic as it is political wherein issues of power intersect with resource distribution and allocation (Healy & Barry, 2017). Pursuing the dual goals of energy and climate justice, concurrently, demands that we make challenging political trade-offs in both procedural and distributional aspects (Newell & Mulvaney, 2013). Finley-Brook & Holloman (2016) assert that to reduce the widening gap between green and just, the state, civic and market processes need to ensure that the costs, benefits and decision making power is equally distributed. The fossil fuel divestment movement will have profound impact on the livelihoods of those dependent on it. Energy justice will be possible only when the discussion can shift upstream to focus on the impact of supply-side policies; the human and health impacts of such policies; and hold new actors responsible for energy injustices accountable (Lazarus et al., 2015).

The current status quo is the result of the growing gap between the interests of the elites and those of the world's poorest (Newell & Mulvaney, 2013). Energy justice rests on the fact that the impact of climate change and environmental degradation is unequal for different sections of society and that all of society must have access to safe and affordable energy. Justice and equity can only be assured when the global energy system can institutionalize a fair distribution of both costs and benefits of energy services, and where decision making is representative and impartial (Sovacool, 2013). A key constrain in the energy justice movement is the highly fragmented nature of energy governance of current decarbonization policies, where multiple levels of governance and supply chains are misaligned (Jenkins et al., 2014). Across the energy lifecycle and supply chain, an identification, diagnosis and redressal of the costs, risks and vulnerabilities is essential to ensure a just energy system transition (Miller & Richter, 2014). Jenkins et al. (2014) find that a whole of system approach may be necessary to address social, environmental, economic, health and environmental externalities, concurrently. The challenge with the divestment narrative is that it puts the issue of energy transition in a vacuum where energy consumers and policy makers seek self-interest and do not address the lack of democratic processes in decision making (Sovacool et al., 2016). Healy & Barry (2017) note that disruptive technological innovation must be complemented with disruptive political action to meet energy justice.

Theoretical frameworks guiding a just energy transition

In order to respond to individual choices and incentives, Ostrom (1990) argues that institutions must evolve to effectively and efficiently influence economic and political processes. Concerned with excessive consumption and high administration costs, Ostrom (1990) insists that common-pool resources must be organized with deliberation and caution. The author finds that if issues of supply, credibility and monitoring are resolved, it is possible to have stable institutions of self-government (Ostrom, 1990). The discourse on natural resource management is mostly divided between those supporting state control of natural resources and those insisting that the private sector must take center stage, however, Ostrom (1990) observes that neither have proven to succeed in natural resource management in the long-run, sustainably. In developing a just and equitable energy transition model, using key theoretical models may be prudent, namely – the tragedy of the commons, the prisoners dilemma game and the logic of collective action (Ostrom, 1990). Each can guide the governance of the energy sector as it transitions from coal to clean energy.

The tragedy of the commons, as Hardin (1968) explains, is a metaphor to suggest that when many individuals use a common scarce resource, environmental degradation is bound to take place. This is particularly critical at a time when the population world over is growing at a faster rate, than the environment can be conserved and restored, which Hardin (1968) refers to as the issue of overpopulation. Scholars find that Hardin's tragedy of the commons model has the structure of a prisoner's dilemma, that refers to a paradox – "individually rational strategies lead to collectively irrational outcomes" (Ostrom, 1990, p.5). The prisoner's dilemma explains that individual choice while rational in intent and aligned with individual expectations, when collectively exercised might not deliver outcomes aligned with collective goals, presenting a distinction between individual benefit and collective welfare. This further leads to the logic of collective action that explicitly states that incentivizing individuals to act in pursuit of joint welfare is far more challenging than to get them to act in individual interest (Olson, 1965). He found that "rational, self-interested individuals will not act to achieve their common or group interests" (Olson, 1965, p.2).

The three models - the tragedy of the commons, the prisoner's dilemma and the logic of collective action are all impacted by the free-rider phenomena which states that individuals benefiting from communal resources, are less likely to contribute to the effort and more likely to

free-ride (Ostrom, 1990). These theories speak to fundamental challenges facing policy governance and implementation today. The subject of energy governance in particular can draw on these models to ensure supply-oriented efforts meet demand-forward needs; incentivize collective welfare; and reduce the propensity to free-ride.

Need for a Leviathan?

Ophuls (1973) notes that for environmental concerns in particular, cooperation may not be adequate, and a coercive force, in the form of a government may be necessary to introduce and sustain change. Hardin (1978) echoes Ophuls and insists that an external Leviathan will prevent a tragedy of the commons and argues for control by the central government in natural resource management (Ostrom, 1990). In most energy systems, the central government works with the state utility to provide electricity to the public. However, this can also prove to be a barrier for large scale transition in the energy sector.

Another school of thought insists that to avoid the tragedy of the commons, privatization may be the most optimal way to manage natural resources owned in common (Smith, 1981; Ostrom 1990). This applies well to the energy system, where the case of unbundling services provided by the State utility provider are being considered by involving private players and privatization is seen as potentially aiding the transition towards clean energy whilst ensuring the labor force is not rendered unemployed.

Forms of justice

Pai et al. (2020) note that any energy transition model must take into consideration the massive employment impact that large scale technological and infrastructural change can bring and focus on transition strategies that mitigate the significant and disproportional affect this can have on workers' livelihoods. Winning the support of the workers and the local community is critical for any just transition strategy to be politically feasible (Pai et al., 2020). McCauley & Heffron (2018) identify a triumvirate strategy that suggests distributional, procedural and restorative justice be pursued simultaneously and urge a more intersectional and interdisciplinary approach in formulating just transition policies. Pai et al. (2020) build on the three justice types,

identifying a fourth - recognition justice. All justice forms focus on one key aspect: equity. Distributional justice aims at equitable distribution of costs and benefits; procedural justice focuses on the right to a fair participation in decision making processes; restorative justice seeks to support those harmed or at harm as a result of the transition; recognition justice recognizes individuals and communities who will be impacted by energy transition policies (McCauley & Heffron, 2018; Pai et al., 2020). These varied justice forms are interdisciplinary and intersectional, and fundamental to informing just energy transition strategies that are inclusive and representative.

South Africa – in pursuit of a just energy transition

To pursue a deeper understanding of the social and political aspects of transforming to clean energy and to strengthen policy outcomes in support of energy justice, this paper studies the case of South Africa. South Africa is unique, in that, it owns vast renewable sources – solar power in particular and has signaled a serious intent and commitment to transition towards clean energy but the 2020 BP Statistical review of World Energy reveals that renewable sources account for only 2% of the total energy mix of South Africa (Todd & McCauley, 2021). This is less than half of the world average that currently sits at 11% (BP, 2020). The limited use of renewables in South Africa, despite its abundance, makes it an impelling case to study.

Swilling et al. (2015) explain that to commit to just transition is to commit to both human well-being and sustainability – where indicators of income, education and health are as important indicators as decarbonization, resource efficiency and ecosystem restoration. It is therefore critical to build a deeper understanding of the socio-political drivers of the energy transition model. This paper leans into South Africa as the relationship between development processes and sustainability transitions may be particularly complex, and may have key lessons to offer to the Global South (Swilling et al., 2015). The authors explain that a just transition is enabled through a structural transformation that aids the achievement of dual goals – developmental welfarism and sustainable transition (Swilling et al., 2015). A structural transition is only possible when a political regime is committed to building accountable institutions, and in the case of South Africa, the current institutions do not have adequate capacities to manage a large scale change transformation (Swilling et al., 2015). To improve the transition to clean energy, the alternative – renewables must become easier to adopt, and while the technological advancements have made renewable energy

more cost effective, the market barriers which may be political, institutional, commercial, regulatory, socio cultural and environmental, still remain unresolved (Todd & McCauley, 2021).

Pegels (2010) find that a key barrier in South Africa is the lack of a conducive system to encourage energy innovation, referring to the control the monopolistic state utility, ESKOM exerts on energy research and development. Given its high dependence on coal for power production, it may not be in ESKOM's interest to promote a favorable environment for renewable energy (Pegels, 2010). Elaborating on structural issues, Msimanga & Sebitosi (2014) point out that a lack of subsidies for competing fuels; high initial capital costs; inadequate legal frameworks and insufficient credit may be some of the many reasons that may be constraining the transition towards renewables in South Africa. According to the International Panel on Climate Change (2011), a four fold taxonomy of barriers can be observed constraining the acceptability of renewable energy at scale – economic, infrastructural, socio-economic and institutional/policy barriers. A subsequent report by the panel reveals policy and knowledge gaps and finds that there are capacity deficits at the financial, institutional and innovation levels that are hindering the implementation of renewable energy mechanisms at scale (IPCC, 2018).

South Africa has historically been highly dependent on coal with nearly 90 percent of its electricity being sourced through coal (Todd & McCauley, 2021). According to the South Africa National Development Plan (2017), about 15 percent of South Africa's greenhouse gas emissions can be attributed to the mining sector, that uses 48 percent of the nation's electricity. The deeply symbiotic relationship between the technological and political aspects of the energy sector has been acknowledged by scholars and articulated as the Minerals Energy Complex of South Africa, and Lawrence (2020) finds this to be a key factor influencing South Africa's energy transition (Todd & McCauley, 2021). Lack of adequate supply and a energy mix that is not diversified, have been identified by the World Energy Council (2014) as South Africa's main challenge. While the falling prices of renewables may encourage greater adoption and usage, Swilling et al. (2015) note that the government may need to play a key role in reducing structural challenges. In 2018, South Africa went through a change in government that put into motion Round 4 of the government's renewable energy programme called REIPPP scheme and the Integrated Resource Plan – the governments draft publication to this effect. This came after South Africa's Council for Scientific and Industrial Research confirmed that the country's electricity system had the institutional capacity to incorporate large quantities of variable renewables (CSIR, 2016).

While these developments signal a positive move towards renewables, ESKOM, the state electricity utility faces several structural issues – it is responsible for both power generation and grid transmission and efforts to unbundle its services remain unsuccessful (Mzolo, 2018). Furthermore, the state utility is under tremendous financial stress as several municipalities continue to default on their payments and illegal connections continue to rise — amounting to nearly 8 billion rand per year (Baker & Sovacool, 2017; Todd & McCauley, 2021). ESKOM also faces strong opposition from the National Union of Mineworkers, who have in the past resisted the Round 4 of the REIPPP from being signed (Todd & McCauley, 2021). South Africa's latest carbon neutrality targets and its Nationally Determined Contribution to the Paris Agreement, has been classified by the Climate Action Tracker (2020) as highly insufficient (Njini, 2020).

Todd & McCauley (2021) investigate the barriers – legal, physical, political, commercial or attitudinal that may be impeding or delaying the transition to clean energy, and point out that many of these barriers may be acting in concert and reinforcing each other's impact. They find that barrier types can be categorized under eight types – (i)government national; (ii) institutional; (iii) socio cultural; (iv) governmental-municipal; (v) labor; (vi) industry; (vii) financial and (viii) technological (Todd & McCauley, 2021, p.4). Of all the categories, the financial and technological barriers were considered to be least significant, while the socio-economic factors were found to be most significant (Todd & McCauley, 2021). The principal barriers among all, could be attributed to ESKOM's difficulties, followed by issues related to the national and municipal governments, compounded by the industry and labor resistance towards the transition (Todd & McCauley, 2021).

State utility provider ESKOM – South Africa's greatest threat?

ESKOM, the state electricity utility occupies a key role in South Africa's national energy strategy, given that "it is the largest generator of electricity in Africa" and "the 6th largest company in Africa" (Baker et al., 2014; Jaglin & Dubresson, 2016). Coal is ESKOM's primary fuel source, with its scope of operation focused on power generation, transmission and distribution (Todd & McCauley, 2021). ESKOM occupies a monopoly position – with all efforts of unbundling having failed, and with renewable energy development delegated largely to the private sector (Todd & McCauley, 2021). Rossouw (2018) finds ESKOM in breach of corporate governance and guilty of corrupt practices – encouraging flow of the government's resources to corrupt actors. Mzolo

(2018) focuses on the issue of state capture and ESKON's steep financial liabilities crossing nearly R250 billion and identifies ESKON as South Africa's greatest threat. The International Monetary Fund echoes this by calling out ESKOM as a major risk to South Africa's growth (The South African, 2019).

Government lacking strategic direction

Furthermore, the government in South Africa has come under criticism for its lack of strategic direction, holding weak institutions and practicing corruption and bureaucracy at multiple levels (Todd & McCauley, 2021). The REIPP renewables policy in particular has been found to be formulated without adequate consultation and engagement with the local communities and while the policy has been successful in creating a private sector market, the transaction costs are prohibitive (Tait et al., 2013; Eberhard & Naude, 2016). Davies et al. (2017) call for not only improving integration with the local community but also greater coordination between REIPPP projects.

Lack of capacity and inefficiencies at municipalities

The lack of strategic direction is also observed at the municipality level – this is cause for concern given the important role municipalities play in sharing the responsibility of electricity supply with ESKOM (Todd & McCauley, 2021). This also impacts the revenue generated by municipalities that depend on residents' payments for the electricity supplied, which may account for as much as one-third of the municipality's revenue (Todd & McCauley, 2021). Madumo (2015) reinforces the observation that across the three levels of administration – metropolitan, local and district, municipalities occupy a key role in the provision of public goods and services but effective provision of services is often disrupted due to corruption, mismanagement and maladministration. The authors find that the municipalities are facing financial challenges as well as capacity and compliance challenges, constraining effective provision of services including electricity supply (Madumo, 2015). Brand (2018) alerts that out of 257 of South Africa's municipalities nearly all are facing financial challenges and this can be attributed to inadequate capacities in financial management, frequent political interferences and internal conflict within councils.

Power of labor unions

Any transition towards clean energy, cannot be made without acknowledging the key role labor unions play. The mining industry and the labor unions in South Africa, together act as a formidable force influencing its energy transition, and defining South Africa's Energy-Minerals-Complex, referenced earlier in this paper (Fine and Rustomjee, 1996; Lawrence, 2020). The labor movement in South Africa which is represented by the National Union of Mineworkers (NUM) has been exerting tremendous political influence in resisting the REIPPP projects (Todd & McCauley, 2021). This resistance does not come without reason – a recent closure of a coal power plant by ESKOM in Mpumalanga left an entire community unemployed, indicating that job loss is a real threat in this transition and one that will not be easy to address unless a systemic and structural effort is institutionalized in re-skilling and up-skilling the labor in coal mining regions (Todd & McCauley, 2021).

Discussion

Gumede (2008) hold the government and its capacity as a key determinant of a successful transition towards clean energy as the government is primarily tasked with the responsibility to allocate resources, draw a national strategy and pass legislation – so their strategic leadership is likely to guide all actors. This is an intuitive conclusion to draw given that fiscal and regulatory measures define effective policy delivery (Hirst & Brown, 1990). Todd & McCauley (2021) echo a similar observation, acknowledging that only the government has far ranging capacity to overcome the social barriers, while also pointing out the need for champions, who can hold power to make decisions and implement policies, in the face of opposition.

While the national government takes charge of the strategic leadership, the task of delivering change also lies in the hands of municipal governments, that need to plan activities with local governments and deliver local projects, and any lack of cohesion between the national and the municipal government must be addressed in South Africa (Todd & McCauley, 2021).

The greatest strength of a nation in an energy transition is its institutions, as successful implementation of the national policies set by the government depends on the capacity of institutions, which in the case of South Africa are – the National Energy Regulator of South Africa

(NERSA) and the State Electrical Utility ESKOM (Todd & McCauley, 2021). ESKOM in particular has been plagued with financial and operational mismanagement and the regulator is seen as an institution in the stronghold of politicians (Todd & McCauley, 2021).

The issues of the coal industry are not that of the coal industry alone – they are the issues of many other industries that are dependent on it – transportation, engineering services, plant maintenance services among others (Todd & McCauley, 2021). It is therefore necessary to address industrial interests in a systemic manner such that any transition is seen as a shared goal with shared interests, costs and benefits.

Organized labor occupies a central position in the transition towards clean energy with mining unions holding tremendous political power to resist all measures of a transition – seeing the move as against their economic and social interests. To avoid political conflict Sanderson (2018) recommends a careful recognition of dissent and social engineering that adequately represents the labor union interests.

For any transformation to be sustainable, the support of the public is essential. The same holds true for the energy sector. Most energy transitions remain fragmented efforts as they fail to recognize and represent the interests of rural off-grid communities and the urban poor (Lamarche, 2008; Tacoli et al., 2015). Kruger (2016) notes that a full transition is only possible when lack of education among the labor force and the inadequate re-skilling and up-skilling efforts are recognized as critical barriers in this transition and efforts are made to address them.

The issue of finance and technology, Todd & McCauley (2021) find, are seen as less prominent barriers but note that foreign investment is likely to ease financial pressures on institutions, and encourage the development of a domestic renewables industry in South Africa – it is currently dependent on expertise and minerals from abroad for renewables.

All barriers notwithstanding, South Africa's commitments signal a serious intention to transition from coal to clean energy and to do so in a just and equitable manner. But for intention to translate into implementation, South Africa must focus its efforts on coalition-building across stakeholders (Todd & McCauley, 2021). Furthermore, as the REIPPP projects have shown, foreign investment can aid not only the delivery of renewables projects but can also help in restructuring ESKOMM by reducing political pressures and resistance from unions in addition to introducing new energy systems (Todd & McCauley, 2021). Future policies must pursue three key objectives – one: be socially redistributive, and engage with disadvantaged communities in particular; two,

capacitate the local municipalities to practice net metering to encourage equity in distribution and assume a greater role in the energy transition movement; three, build a coalition that can act as an intermediary between the national and municipal governments to transfer greater autonomy and control to local governments as well as coordinate with ESKOMM to oversee local power generation (Todd & McCauley, 2021).

Conclusion and policy recommendations

South Africa's just energy transition strategy must be intersectional and interdisciplinary, span all forms of justice – distributional, procedural, restorative and recognition, and be categorized under short-term, medium-term and long-term.

Short term measures at national, provincial and local levels: Immediate, short-term measures in South Africa must focus on bottom-up, community based engagement approaches. At the local and provincial level, it starts with re-skilling and up-skilling the workforce and preparing them for alternative industries – this would entail close cooperation between the private sector and the local municipalities to ensure supply-side skilling efforts are in line with industry demands. At the national level, social protection measures will need to be outlined that can assure transitional wage support, as the workers re-skill and transition to alternative sectors. Both national and provincial efforts must maintain continuous and consistent public information across varied mediums to win the support of communities and explain shared gains. The local community can play a significant role in environmental degradation efforts and should be consulted with on all energy restoration and conservation initiatives. These efforts at the local, provincial and national levels must penetrate into remote coal mining regions in particular.

Medium term measures at national, provincial and local levels: In the medium run, national, provincial and local governments in South Africa must be focused on capacity development, improving private sector investments in alternative sectors and catapult environment restoration efforts. National governments should work towards building capacities in human and financial resources to support the transition in a sustainable and inclusive manner. This may require integrating and aligning both top-down and bottom-up approaches to improve policy and worker

transition support. Both the national and local governments will need to plan for greater economic diversification in partnership with the private sector to ensure investments in alternative industries that are environmentally prudent and economically productive. This would also entail providing local governments greater autonomy and financial assistance in implementing projects towards a just transition.

Long term measures at national, provincial and local levels: It may be important to recognize that baseline policies play a significant role in enabling and empowering just energy transition models. This necessitates that governments develop metrics to account for environmental degradation, climate change and worker re-skilling and up-skilling in all baseline policies. Such monitoring and evaluation of current policies can improve risk-mitigation measures and strengthen baseline policies. Policies focused on labor laws, employment protections, and other social protection nets will be important for economic diversification in South Africa. These efforts will also reduce resistance from labour unions and win greater political support. Stronger legislative, regulatory and planning processes will need to be institutionalized to develop a greater coordination across the national, provincial and local levels of governance in developing not only just energy transition policies, but to integrate just transition mechanisms in the national industrial policy.

Furthermore, an anticipatory approach would be necessary to create jobs in alternative sectors as the transition from coal renders thousands of workers unemployed, and to concurrently build new industries in the coal mining regions. This would call for public and private sector investments, that can further incentivize micro and small business development as well as aid infrastructure development, such that the coal mining communities become self-sustaining rather than economically deprived. It will be crucial to have a targeted approach, specific to each coal mining region's social, political, economic and cultural context. Culturally-sensitive and socially conscious energy transitions will enable South Africa to not only transition from coal to clean energy, but to do so in an inclusive, sustainable, equitable and just manner.

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