JOURNAL OF SUSTAINABLE FINANCE & INVESTMENT
https://doi.org/10.1080/20430795.2021.1972678

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Just transition transaction in South Africa: an innovative way to finance accelerated phase out of coal and fund social justice

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ABSTRACT

A just transition transaction (JTT) in South Africa aims to address complex challenges of financing a transition away from coal, and social justice. Accelerated decarbonisation of electricity is essential for mitigation globally and in SA. However, the national utility Eskom, a state-owned enterprise, is in crisis with major operational, structural and financial problems, including legacy debt of €25bn. How and to what extent can a just transition transaction catalyse deep, structural change that is required in SA's electricity system and promote social justice? What can we learn from the case study of a JTT about transition finance? The architecture of the JTT includes a blended finance vehicle, combining international concessionary and domestic commercial finance. Finance enables transition if it respects certain principles, promotes ambitious decarbonisation and assures compliance. A tough problem is whether such finance is provided at activity – or entity-level. We explore options for watertight remedies to ensure compliance with ambitious climate change action, though these merit further research. The innovation proposed to fund social justice is that concessional value provides significant and predictable flow of funds into a Just Transition Fund. The JTT partially addresses Eskom's financial challenges, and thereby the strain on the country's fiscus against a background of increasing public debt. Significant mitigation on the scale of 1–1.5 Gt CO_2-eq over thirty years is achievable. The transaction may be of wider interest: Emerging economies with high coal dependence and socio-economic risk during energy transition might translate lessons from South Africa's JTT for their own contexts.

ARTICLE HISTORY
Received 13 May 2021
Accepted 23 August 2021

KEYWORDS
Just transition transaction; transition finance; social justice; South Africa; electricity; climate change mitigation; sustainable development

1. Introduction

A just transition in South Africa's electricity sector from coal to cleaner energy is critical for climate change mitigation. And to be just, the transition must leave no-one behind.

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Yet, although renewable energy technologies are now cheaper than coal, this alone is insufficient for the phase-out of coal-fired power. Political economy and institutional challenges remain. Might climate finance be utilised to ensure a transition away from fossil fuels within the timeframes required by the Paris Agreement? What innovation is required to fund social justice? How can these innovations promote sustainable development at the national and regional scale?

We explore these questions through a case study of a just transition transaction (JTT), being considered for the South African electricity sector by the state-owned enterprise, Eskom. The case study method means that we take the complex challenges seriously. We outline challenges facing Eskom. Not only is Eskom's debt the largest in the SA financial system, it is currently unable to refinance legacy debt, with implications for the sustainability of the utility and hence South Africa's power supply.

International development and climate finance, blended with commercial domestic loans, are core to the JTT. The potential of the JTT lies in its dual aim to accelerate the decarbonisation of the electricity sector by funding faster phase out of coal-fired power, and to fund social justice interventions in South Africa's coal region, Mpumalanga. Yet realising the potential of the JTT's approach requires re-conceptualising climate finance.

Financing in the JTT is provided through a blended finance vehicle, combining international concessionary and domestic commercial finance. A key challenge in funding transition activities that inherently include some fossil fuel activity is how to avoid greenwashing, and we consider activity – and entity-level approaches. Social justice is supported through significant and predictable flows via a JT Fund, which receives the accrued value of the concessional component. Sustainable development is supported at national scale by providing Eskom continued access to market finance during the transition without having to recourse to an increasingly overwhelmed fiscus. And mitigation and regional economic development contribute to making SA's energy development more sustainable.

The article proceeds as follows: Section 2 elaborates the problem statement, reviews the literature on transition finance, and specifies two research questions. Section 3 presents the JTT, its architecture and analysis of financial flows, in the context of complex challenges facing the electricity sector. The implications of the JTT are outlined in Section 4 at three scales – the electricity system, South Africa and international. Section 5 clarifies the limitations of this single paper and suggests some future research directions, before Section 6 concludes with key findings.

2. Background: problem statement, literature review and research questions

2.1. Problem statement

The just transition transaction responds to several complex challenges.

The climate crisis means that a rapid and deep transformation is required in the electricity sector globally – from fossil fuels to lower-emissions energy sources. Yet a rapid shift from historically coal-based electricity to renewable energy in South Africa would benefit some but disadvantage others. The transition would need to ensure that

neither the vulnerable in the country's coal region, Mpumalanga, nor the vulnerable in the national economy are left behind. The transition should not undermine social justice or sustainable development at either scale.

South Africa's national electricity utility, Eskom, had a debt of R488 billion (approx. € 25 bn) in 2020, (Ruyter 2020a; Stoddard 2020). This debt is on a similar scale to 'a massive social relief and economic support package of R500 billion' (Ramaphosa 2020) for recovery from COVID, or around 7% of GDP. Finance flows need to shift. Renewable energy technologies, notably wind and solar photovoltaics, are now least-cost options (Ruyter 2020b) for new grid-tied electricity generation in SA. In this regard, a 'tipping point' has been passed – technologies that used to cost more than high-GHG-emitting coal plants are now cost-competitive, and no longer require public subsidies. Green finance is significantly commercial. At the same time, there is an increasing fossil-fuel disinvestment trend among financial institutions with 222 financial institutions found globally with some form of coal exclusion policy (Reclaim Finance 2020). What is not being financed is the transition.

To be just, the transition should leave no-one behind, and instead concretely support social justice and sustainable development. Support is required to protect the livelihoods of communities and workers dependent on coal. The transaction would assist with innovative finance, to overcome the political economy and institutional challenges of ensuring that affected communities and workers benefit – and define their own futures.

The problem, therefore, becomes one of the role of finance in supporting a just transition away from a fossil fuel legacy infrastructure in a developing economy, with high levels of poverty and inequality, where a failing state owned electricity utility operates as a regulated monopoly.

This just transition transaction case study explores innovation in financing the energy technology transition (meaning the accelerated phase-out of coal) and the social transition, providing a predictable source of finance to promote social justice. SA requires transition finance to implement the transition and at the same time make provision for societal justice.

2.2. Literature review

Financing the transition to a low carbon economy is an emerging global challenge, particularly in the power sector, as techno-economic disruption continues apace and the response to climate change ramps up the global societal agenda. This challenge has, however, only very recently come into focus as an issue relating to both 'sunset' and 'sunrise' industries (Kessler et al. 2019; Semieniuk et al. 2020). The majority of climate finance literature and financial flows focus on the 'sunrise' portion, such as financing the rapid uptake of renewable energy (for example (Buchner et al. 2019)). The Rocky Mountain Institute (RMI) explicitly suggests the need to 'reinvent climate finance', focusing on larger capital stocks not only smaller flows (Kessler et al. 2019). The concept of 'transition finance' is emerging to respond to this gap, together with a growing literature. Currently, only a small portion of this literature applies specifically to the financial implications of – and mechanisms for – phase out of fossil fuel in energy systems,[1] mostly in grey literature by think tanks and NGOs. We aim to add to the formal literature on transition finance in this particular niche, presenting a case study of a just transition transaction.

How does the existing literature define transition finance? A number of authors have engaged with a definition of transition finance. Piemonte *et al.*'s definition is contextualised by the world of development finance flows: 'Transition is the journey towards sustainable development, and transition finance is the financing of that journey' (2019, 8). Caldecott's articulation is broader in scope, as 'the provision and use of financial products and services to support counterparties, such as companies, sovereigns, and individuals, realise alignment with environmental and social sustainability' (2020, 3). Other scholars retain the breadth of counterparties in their definition, whilst specifying the (social and environmental) sustainability requirement: 'Transition finance is capital provided to economic agents to achieve a minimum rate of carbon emissions reduction' (Donovan, Fomicov, and Ostrovnaya 2020, 6). CBI (2020) similarly focus solely on climate change. In South Africa, the National Treasury define climate finance in close relation to the concept of a transition, as resources 'intended to cover the costs of transitioning to a low carbon global economy' (National Treasury 2020a, 17) and highlight the need to generate new approaches dedicated to solving the problem of transition risk. We argue that a JTT is one such approach.

To specify what counts as 'transition finance', it needs to be measured. A number of studies explore the challenge of measurement, be it for purposes of allocating concessional capital (such as development or climate finance), or meeting standards to enable commercial capital investment (Millar et al. 2018; CBI 2020). Millar et al and the CBI propose sets of principles to which transition finance must adhere; with Millar et al's proposals subsequently adopted as the Oxford Martin Principles (2018). Donovan et al propose their 'minimum rate of emission reduction', but expressly leave the quantification of decarbonisation to be agreed between financier and entity (Donovan, Fomicov, and Ostrovnaya 2020). Finance enables transition if it respects certain principles, promotes ambitious decarbonisation and puts in place remedies for greenwashing. We explore this further in the case of the just transition transaction, in section 4.

An important distinction that emerges from the transition finance literature relates to options in the mode of transition finance, usefully articulated by CBI (2020) as entity-level versus activity-level.

Activity-level transition finance specifies how the proceeds of the financing are to be used. Eligibility can be simply discerned through a list of transitional activities. Such activities might be defined as the activities of Eskom's Just Energy Transition Office, established in 2020 to prioritise activities to ensure a focused drive in the organisation around a just transition (Rambharos 2020). This can be understood as institutional reorganisation, within which it would be possible to identify activities related to phase out of coal-fired power, such as decommissioning, grid extension and power plant repurposing. Remedies would be written into contractual obligations, and applied if funds were not used for the specified activities.

This approach is supported by one of the CBI principles: 'Credible transition goals and pathways are established by the climate science community and are not entity specific' and reduces the risk of greenwashing (CBI 2020). The principle can also be applied to entity-level finance, as long as transition pathways are not determined by individual institutions on a case-by-case basis. There is a risk that activities that are not listed, but turn out to be essential to the transition, are ineligible for finance. Thus, the activity-level

approach is aligned with traditional funding modalities of climate finance through Development Finance Institutions (DFIs), and is well known to the climate finance community. It is therefore relatively simple, but arguably has less impact on broader systems, beyond the activity.

Transition finance at an entity level is a recent proposition in research on sustainable financing (Mann et al. 2020; Caldecott 2020; Donovan, Fomicov, and Ostrovnaya 2020; Semieniuk et al. 2020; Kessler et al. 2019). A core argument is to take a broader view of all invested capital in an entity, focusing on larger stocks. The underlying assumption is that the entity allocates finance efficiently, while in practice, there are questions about the efficiency of spending in Eskom. Demonstrating entity-level transition finance eligibility is a new endeavour, likely more complex than an activity-level model, and it might include demonstrating that transition principles are observed or meeting defined requirements such as minimum mitigation targets. Compliance would be ascertained in terms of the entity's transition pathway, with Donovan, Fomicov, and Ostrovnaya (2020) including non-compliance penalties of adjustment to risk premiums and capital allocation. Avoiding 'greenwash' is critical (CBI 2020), but defining clear and watertight conditions of compliance is challenging in practice. How can entity level finance avoid investment supporting the prolonged operation of legacy coal assets?

Should some entities or sectors be considered *a priori* ineligible for transition finance? The argument of Semieniuk and co-authors rests strongly on the importance of 'sunset' industries being included, while other studies are less clear. Whilst CBI (2020) suggests that transition finance should be applicable to high emissions sectors, they draw a distinction between activities still needed in the future and those that are 'stranded', citing coal as an example of the latter, and therefore suggesting a priori ineligibility. Donovan, Fomicov, and Ostrovnaya (2020) identify 'red or brown' activities, with the implication that coal-fired power would be ineligible given economically competitive alternative technologies. However, it may take time for such alternatives to be implemented. It takes time to move from a coal-fired system to a renewable one, which is core to a just transition in South Africa. Donovan et al include decommissioning of coal-fired power as an eligible activity. Kanak (2020) elaborates on activity-level mechanisms to address exactly this issue of stranded coal-fired power assets in the context of South-East Asia.

Existing literature on transition finance engages to a limited extent with the issues of sustainable development and social justice. A recent review found mainly literature from the global North (Carley, and Konisky 2020). Whilst Caldecott argues that transition finance must encompass both social and environmental objectives broadly, most of the literature specific to fossil fuel transition finance focuses on the need to support localised workers and communities. Whilst the RMI addresses the impact on electricity consumers generally (Bodnar et al. 2020), the poverty and inequality implications of transition costs in a developing country context, and the lack of state resources to act as a buffer is not well explored. The RMI does identify the need for international development finance to assist. (Bodnar et al. 2020), and Kanak's (2020) specific proposals are embedded in this reality, including the use of international climate finance. The potential of transition finance to influence development paths themselves is seldom addressed, with some authors starting to explore this domain (see Hall et al. 2018; Naidoo 2019).

To fill a gap in the literature on funding for social justice, we propose that there is innovation in the just transition transaction, through a design that generates significant and predictable funding flows. In South Africa, social justice together with sustainable development are inseparable from the country's consideration of a climate transition (Republic of South Africa 2015, 2020). A South African just transition conceptualisation reveals a broad economic and social framing, prioritising the need to address societal issues of poverty and inequality (Swilling and Annecke 2012; Winkler 2018; Strambo, Burton, and Atteridge 2019; Montmasson-Clair 2019) While most public debate remains on inequalities exacerbated by moving away from coal (Cock 2019), a just transition is also represented as an opportunity to move to a more equitable development path (Scholtz et al. 2019; Swilling 2020). The transition away from coal, if subject to indiscriminate disinvestment by the financing community, may have very negative implications for the country's economic growth prospects, if transmitted through scarce and expensive electricity. However, the literature also suggests responsible disinvestment can address financial risks caused by climate change and reduce carbon exposure of investment portfolios (Hunt and Weber 2019).

Transition finance for state-owned utilities in the energy transition is also under-researched. Caldecott (2020) notes that state owned enterprises (SOEs) are neglected by the broader sustainable finance literature, but focuses his own definition on firms and companies. Bodnar and colleagues (Bodnar et al. 2020) propose refinancing coal utilities, together with simultaneous clean energy investment and support for coal communities as a way of overcoming uncompetitive institutional structures. Semieniuk et al. (2020) argue that the risks posed by an unmanaged transition of a monopolistic and state owned entity may heighten the risks of system-wide financial and economic crisis. The imposition to tight conditions by international financiers may also raise concerns over sovereignty, particularly when applied to state-owned enterprises.

The JTT case study builds on this nascent transition finance literature and extends it in a number of areas. We present a case study focused on an under-represented instance of a state owned enterprise, the national utility Eskom, which as a sunset industry needs to transition away from coal, in the context of a developing country, South Africa. This focus in turn highlights the role of transition finance in supporting the emergence of a political, regulatory and institutional environment capable of aligning an electricity sector with international and domestic climate and social justice policy objectives (Tyler and Hochstetler 2021). The use of a blended finance vehicle to attract both commercial and concessional climate finance enables the transaction to achieve the scale required to address these challenges in a complex context. Social justice imperatives are integrated in the core financing structure, inextricably linking support for decarbonisation to the issue of justice. We argue that this is innovative conceptually and is salient to the domestic political economy.

In addition, given the novelty and complexity of the mechanism proposed in the case, it connects to a complex set of literatures beyond that of transition finance, but already evident in the review of several literatures above. Given the emergent field of transition finance and the innovation of the mechanism being proposed, the use of any one theory would be premature (Semieniuk et al. 2020). Rather we draw on a variety of theoretical frameworks and concepts from this multi-disciplinary set.

2.3. Research question, methods and design

The paper explores two questions:

- How and to what extent can a just transition transaction catalyse the deep, structural change that is required in SA's electricity system and promote social justice?
- What can we learn from the case study of a JTT about transition finance?

To explore these questions, we use a case study methodology. Having located our work in the literature (section b. above), this paper provides an in-depth examination of the JTT under consideration in South Africa. The case study reflects on the JTT as a concept developed by Meridian Economics (2020b), given that this is the information that is currently in the public domain. We build on and further develop thinking presented in an earlier, longer research paper (Winkler, Keen, and Marquard 2020a). We present the JTT as a case of transition finance in a developing country context, where sustainable development and social justice frame climate mitigation objectives, and as an instrument that can provide significant, predictable funding to affected communities and workers.

We adopt an inter-disciplinary approach to social science research (Sovacool, Axsen, and Sorrell 2018), using mixed methods, drawing on both quantitative and qualitative information. Our methods include content analysis of public documents (referenced in each instance), supplemented by three discussions with focus groups (all virtual due to COVID-19), and having conducted interviews to fill gaps in information. We refer to results of existing quantitative modelling and other quantitative analysis, but do not undertake any modelling for this paper. The JTT has not been implemented as yet, so we are examining a proposal *ex ante*. To the best of our knowledge, this is the only example of its type (involving a state-owned enterprise in a developing country), and so we give brief consideration to what might be learned for other countries, in section 4.3. below.

The case study does not claim to provide any definitive answers, but aims at better understanding of the JTT as a transition finance mechanism for decarbonisation through accelerated phase out of coal and social justice.

3. A just transition transaction in the context of complex challenges facing the electricity sector

A just transition transaction accelerates the decarbonisation of the electricity sector by funding faster phase out of coal-fired power, and supporting social justice by providing an annual financing stream to a Just Transition Fund (JTF). Long term debt finance is made available to Eskom, conditional on the faster phase out of coal-fired power, which can be assessed against a pre-agreed trajectory, with remedies for non-compliance. Financing is provided through a blended finance vehicle, combining international concessionary and domestic commercial finance in order to leverage the concessional rates. Predictable funding for social justice is provided by an annual financing stream to the JTF, which receives the accrued value of the concessional component, with spending initially focused on Mpumalanga province but with national perspectives.

The JTT is a complex arrangement seeking to address some – but not all – of the complex challenges facing South Africa's electricity sector. These challenges are illustrated in Figure 1. Central to the illustration is Eskom, a monopolistic SOE with significant operational problems, structural issues and financial constraints (described more fully in (Winkler, Keen, and Marquard 2020a)).

Actors in the electricity sector need to respond to both the pressing developmental issues in South Africa – often referred to as the 'triple challenge' of unemployment, poverty and inequality – and the urgency of climate action. As a vertically integrated utility, Eskom is at the core of an outdated electricity sector structure. The domestic financial pressures on Eskom are exacerbated in a context of global coal disinvestment, and the disruptive change in the international power sector, where renewable energy costs have plummeted in the past decade. The utility faces increasing competition to its dominance of the sector, especially from wind and solar PV.

Eskom's debt portfolio has ballooned over the past decade due to a mix of factors including the building of two of the world's largest coal power plants, Medupi and Kusile from 2009, non-cost reflective tariffs, and mismanagement and corruption within the utility. Total debt currently sits at R488 billion. Despite regular refinancing of its debt portfolio as borrowings mature, Eskom's cashflows are increasingly insufficient to service all this debt, resulting in the utility being caught in a debt trap. Approximately half of this debt can be considered stranded and unserviceable, and is referred to in this paper as 'legacy debt'. As an SOE, Eskom's debt burden poses a risk to the entire country's finances (Mboweni 2019). The direct risk arises because sovereign guarantees on part of Eskom's legacy debt strain the fiscal framework, and contribute to the

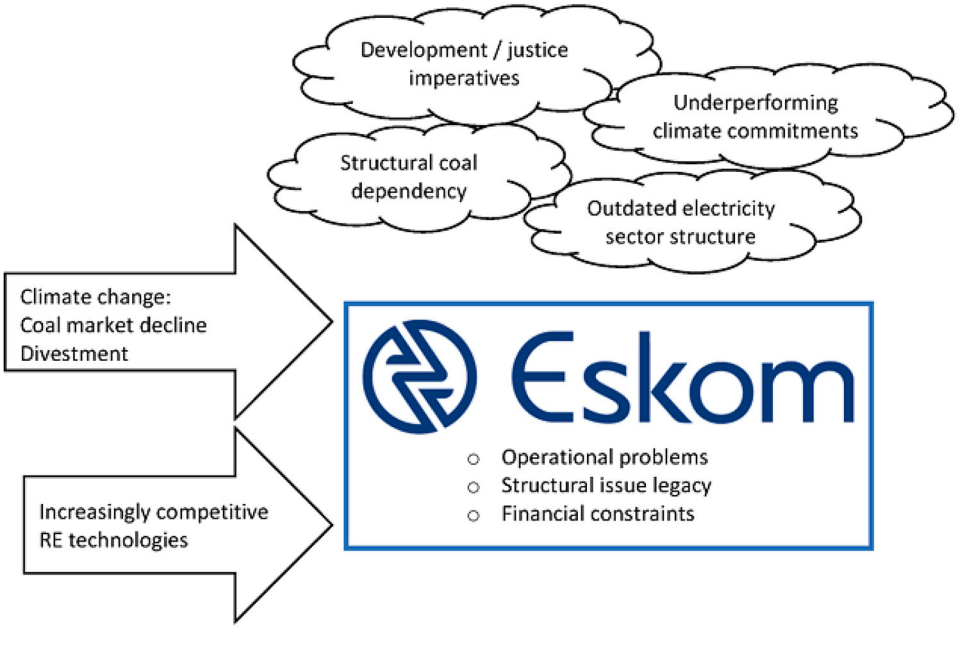

Figure 1. Complex problems in South Africa's electricity sector. Source: Policy brief (Winkler, Keen, and Marquard 2020b).

country's investment rating being downgraded. Total approved guarantees increased to R581 billion in 2021, with sovereign guarantees to Eskom constituting 77% (National Treasury 2021). Indirect, Eskom's multiple complex challenges mean that it has lost the ability to provide constant electricity supply and generate revenues to cover its costs, leading it to request and repeatedly receive bail-outs (see below).

In the context of public debate on Eskom debt and the sector's need for new investment, it is useful to distinguish conceptually two parts of the debt in relation to the proposed transaction. The JTT

(1) funds decarbonisation by accelerating the phase-out of coal; but
(2) does *not* pay off legacy debt of existing coal plants.

The JTT thus does not resolve the full extent of Eskom's financial challenges. Nor is the envisaged scale of the transaction at the scale of all of Eskom's debt. The legacy debt is a result of a combination of poor and corrupt decisions over the past decade; it cannot be serviced from cashflows and it is even using up bailout funds. It is assumed that a domestic solution is found to this debt as a condition precedent to a JTT. This is a distinct matter from the JTT funding legacy debt, as this would mean climate finance for existing coal assets. Hence the importance of conceptually distinguishing the parts of investment in Eskom.

Figure 2 illustrates several aspects of the JTT. The overall architecture is within the yellow oval, including a blended finance vehicle and JT Fund. Financial flows are shown (arrows), with concessionary loans from DFIs and commercial loans from domestic banks which are structured in tranches in the blended finance vehicle before being on-lent to Eskom. The leverage embedded in the JTT is created by the use of tranches, whereby the subordinated concessionary tranches take on greater risk than the senior commercial tranches, thus enhancing the efficiency of the structure. The rate at which the finance is lent to Eskom is higher than the total return required for investors, enabling value to accrue in the vehicle over time. Some or all of this value flows into the JT Fund on an annual basis, providing a significant and predictable source of funding to ensure social justice for affected communities and workers. Because Eskom is an SOE, and because climate finance is foundational to the JTT, Government is necessarily a counterparty to the transaction. Government is most likely represented by National Treasury, and will be represented in the governance of the blended finance vehicle.

An enabling environment for the JTT is critical, and Figure 2 shows contextual elements outside of the JTT oval which will be required to enable the JTT as envisaged here. Supportive policy and institutional arrangements are key to the implementation of the JTT. As an SOE, Eskom's activities are largely governed by Government policy. Therefore, to enable the definition of an ambitious mitigation commitment for Eskom, the SA government would need to commit to an appropriately ambitious mitigation policy for the electricity sector as a whole. Parliament is considering a Climate Change Bill including a salient element, Sectoral Emissions Targets. We propose that the electricity Sectoral Emissions Target (SET) would need to reflect a faster decommissioning of coal than the current Integrated Resource Plan (IRP), IRP2019.

SA's official electricity plan, the IRP, determines Eskom's activities. The IRP2019 includes decommissioning of coal plants assuming they reach the end of a 50-year life

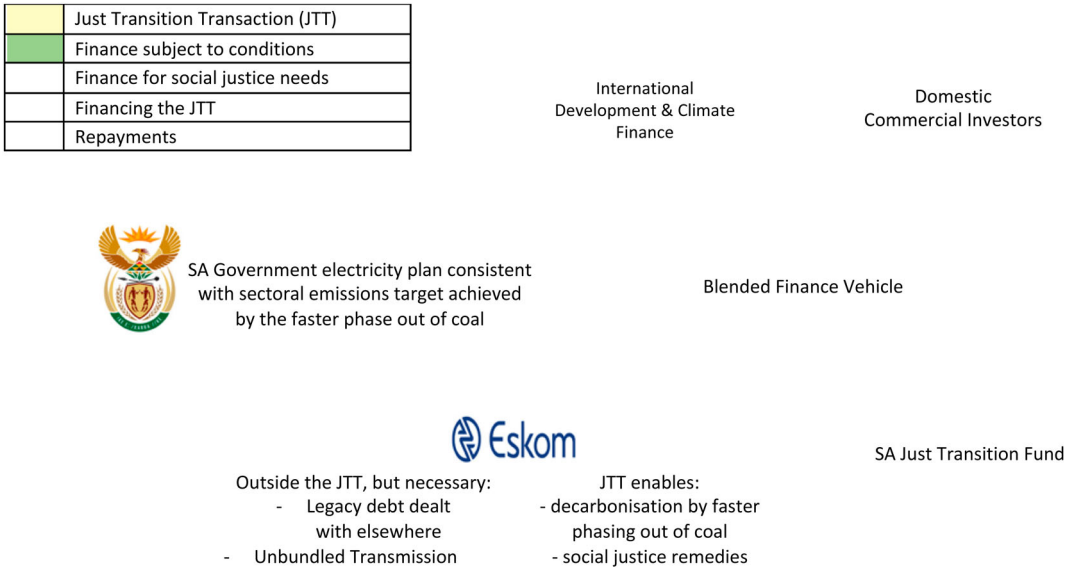

Figure 2. The just transition transaction: architecture, financial flows, actors and contextual conditions. Source: Authors.

(DoE 2019). The JTT would be predicated on this phase down being accelerated. An important institutional change, as shown in Figure 2, is the un-bundling of Eskom into separate Transmission, Generation and Distribution entities. An independent transmission system and market operator (ITSMO), which has been proposed separately (Pickering 2010), would ensure a level playing field between generation options. This should be accompanied by regulatory reform, particularly with regard to tariffs that can help return Eskom to financial sustainability, without making electricity unaffordable.

Renewable energy is outside of the JTT, not funded by it but through the Renewable Energy Independent Power Producer Procurement Programme (REI4P), municipalities, socially owned renewables or Eskom (once its balance sheet allows for it, to build renewables). Wind and solar PV now being least-cost technologies (Meridian Economics 2020a).

Building on the literature on transition finance (see section 2.2.), the JTT in its high-level conceptualisation as shown in Figure 2 can be understood as either entity-level or activity-level transition finance.

Read at activity-level, the blended finance lent on to Eskom would be subject to tight conditions written into the contractual agreements that funding is for costs of phase-out of coal-fired power plant. These costs might include those associated with establishing legal and financial structures to commit individual coal plants to accelerated phase down schedules. Such structures might include those creating a level playing field for different electricity generating options. Other examples of activity costs include plant decommissioning or repurposing power plants, and grid extension. Extending the grid would create access for renewable energy and decentralised energy generation. The arrow in Figure 2 connecting the blended finance vehicle to Eskom is subject to conditions, tied contractually to specified activities. The government's electricity sector SET would reflect the collective ambition of all the activities.

Read as an entity-level transition finance concept, the JTT financing would not be tied to specific activities, but instead would be linked to Eskom's commitment under the electricity SET, reflected in an updated IRP, and then translated into appropriate milestones and targets at an Eskom entity-level. There is therefore a 'cascade' of commitments, from sector to entity-level. Critical to the design is that the entity is subject to compliance with the targets, which have to be clear and measurable commitments. One indicator to track progress against the SET might be a grid emission factor; however, the SET itself is to be defined in absolute units. The unbundling requirement means a further complexity, as the future organisational structure of Eskom is not known up front – so the entity will change. The principle of aligning incentives with agency can provide a guide in elaborating this. One advantage of entity-level financing is that it affords Eskom flexibility in managing its unpredictable coal fleet during the transition period, even as it phases out plants. Another is the potential for entity-level transition finance to render Eskom itself 'transition compliant', and thereby able to access the financial markets again at reasonable rates, mitigating the disinvestment risk.

In the SA finance community, the expectation is that 'lenders aren't going to give cheap concessional finance without watertight conditions' (Joffe 2020). Developing effective remedies to avoid 'greenwashing' proposed in the literature (see section 2.2 above) is challenging. Studies point to a history of non-compliance in South Africa,

for example analysing Eskom as a dominant regime-incumbent which 'avoids compliance with new rules' and thereby maintain its market dominance (Ting and Byrne 2020); with other scholars arguing that providing electricity for the heavy industry 'has been Eskom's raison d'etre and a close relationship with these consumers was central to Eskom's agenda', so that political elites fail to hold it accountable (Froestad et al. 2018). Yet there has been precedent for agreements between the SA government and Eskom, following the 1984 de Villiers Commission, agreed a 'price compact' allowing Eskom to initially charge higher tariffs to address financial challenges, but agree to longer-term decline (Marquard 2006, 132). After 1994, the economic regulation of price was combined with facilitation of transformation, hence adding broader socio-economic goals (Marquard 2006). Arguably a policy window exists in the present conjuncture, however, different goals will have to be set and implemented through conditions and remedies. The contractual arrangements for the JTT, under either an activity – or entity-level approach, would include tight conditions, together with remedies in the event of non-compliance by Eskom.

The conditions would differ depending on approach. For activity-level transition finance, conditions are tied to the performance of specified activities (see above). These would be written into the set of contracts for the JTT. For entity-level finance, the condition would broadly be for the entity. Eskom would be required to adhere to milestones that ensure decarbonisation specified in the electricity SET. Given that most mitigation for SA's update of its first nationally determined contribution will be in the electricity sector (UCT 2021), an electricity SET is expected to be important in making contributions to the Paris Agreement. More generally, the literature suggests that conditions should not be set by an entity, but independently (CBI 2020).

The Government is likely to be contractually involved given the need for adequate and enabling policy.

Transition finance is capital provided to economic agents, in this instance to Eskom. Whilst a phased approach to the JTT can be envisaged, and this is more easily managed under an activity-level approach, inevitably finance is provided under a degree of trust that the conditions will be met. This is problematic in the case of Eskom in particular. But remedies can assist. Remedies for non-compliance might include forfeiting further tranches of funding, and so represent much larger financial losses (in the order of R billions) than the administrative penalties imposed for non-compliance in SA legislation (typically in the order of R millions). Another remedy might be withdrawal or reduction of the concessionary rate for less material instances of non-compliance. Such arrangements could also include incentives for overperformance, i.e. faster phase down; in other words, if decarbonisation were more stringent than the SET, there could be more preferential interest rates (up to some maximum rate agreed with donors). Again, contractual arrangements for the deal would include remedies in the event of non-compliance by Eskom.

Our definition of transition finance includes an important second component, predictable funding to ensure social justice for affected communities and workers. In the SA context, the stipulation that predictable flows are provided to the JT Fund would need to be guaranteed and governance arrangements made to include affected workers and communities. This element of the JTT architecture is a key innovation, which matters for implementation. Having a significant and predictable flow of funds is

important for political support, from the affected communities to the highest level. At the 2019 UNSG Summit, the President's statement highlighted that

> as part of ensuring a just transition we will need to put measures in place that plan for workforce reskilling and job absorption, social protection and livelihood creation, incentivising new green sectors, diversifying coal dependent regional economies, and developing labour and social plans as and when ageing coal-fired power plants are decommissioned. (Ramaphosa 2019).

Flows of funding designed as a percentage of larger flows are innovative and provide a predictable source. Rather than being dependent on donors (whether domestic or international) deciding to replenish or not, the concessional value flows – for as long as the larger flows continue. The last aspect points to the risk that, if Eskom defaulted and further tranches were not lent on by the blended finance vehicle, the funding to the JT Fund would also cease. However, once the JT Fund is established, it may very well attract investments from other sources, including donors, use of mine rehabilitation funds and others. This approach to transition finance hard-wires mitigation and social justice together into a virtuous feedback loop.

4. Implications for transition finance, decarbonisation and social justice

What are the implications of the JTT for the electricity system, more broadly for South Africa and internationally for flows of finance? We consider the implications at each of these scales in turn, and effects on decarbonisation, sustainable development and social justice. We also propose that the case study has implications for our understanding of the emerging concept of transition finance.

4.1. Implications for the electricity system

The JTT funds decarbonisation through an accelerated phase-out of coal-fired power, giving effect to energy policy through an energy transition. For more than twenty years, energy policy has included diversifying the energy mix as one of five major aims (DME 1998). The phase out of coal in the electricity sector directly supports the energy transition.

The JTT is designed to contribute to overcoming some of the complex challenges in the electricity sector (see Figure 2), most of which are political and institutional in nature. For example, an important transition goal is unbundling of transmission to enable a level playing field and access the economic advantages of renewables as least cost generation technologies. However, much uncertainty remains. The grid may eventually give way to more distributed electricity generation or not (Funcke and Bauknecht 2016), and much depends on the politics in the South Africa case (Baker and Phillips 2019). Importantly, the JTT must be considered in context, no single intervention or transaction on its own will solve all the electricity sector transition challenges.

The JTT contributes to the financial sustainability of the national utility Eskom, most directly through restoring access to capital markets which are increasingly reluctant to fund coal-fired power generation. While it does not directly fund legacy debt, an improved overall financial position may make Eskom more attractive to investors again.

A just transition in South Africa's electricity sector from coal to cleaner energy is critical for climate change mitigation, both in the near-term mitigation targets in the NDC (RSA 2021) and for a just transition to net zero CO_2 by 2050, as signalled in SA's Low Emissions Development Strategy (RSA 2020). The JTT contributes to mitigation directly, in that the accelerated phase out of coal-fired power stations means lower GHG emissions; and by creating the necessity to design and implement an electricity SET, it supports strengthening the policy environment to ensure that new capacity does not add to emissions.

The JTT would make a significant contribution to mitigation in SA's electricity sector. The sector contributes 38.1% of total GHG emissions excluding Forestry and Other Land Use (FOLU), 33.5% including the FOLU sector and its net sink (DEFF 2020). Reductions in this key sector are critical to overall decarbonisation, though on their own, they cannot achieve the economy-wide targets.

Key to the estimated mitigation outcome is the question of baseline. In the JTT, the phase out of coal is accelerated compared to a counter-factual. We assume that the IRP2019 (DMRE 2019) is the baseline. However, a further implication of the JTT is that future IRPs would need to align with the SET for the electricity supply industry. That SET would assume more rapid decarbonisation than the assumptions in the current IRP2019.

What might be the scale of emission reductions due to the transaction? A recent study has explored the costs of ambitious mitigation (Meridian Economics 2020a), with one assumption being that coal-fired plants are retired when it is economically efficient (according to least-cost modelling) to do so, and timing depending on the application of carbon constraints in different modelled scenarios (Meridian Economics 2020a). The scenarios suggest that the relative system costs of a power system representing 1–1.5 Gt CO2-eq reduction over the period 2020–2050 is 'achievable without significant cost impact' above power system costs in modelling (Meridian Economics 2020a).

4.2. Implications for the broader SA political economy

The JTT has broader implications for South Africa, beyond the electricity sector. In order to create sustainable livelihoods for affected communities, the development outcomes need to extend beyond the gates of a power plant.

The JT Fund can provide an innovative source of predictable and significant funding – and depending on design, based on principles supporting social justice. We take a step or two back to explain this argument. The funds flowing from the blended finance vehicle into the JT Fund should be considered public funds. While the source of these funds is a blend of concessional public and commercial private loans, the concessional value that is passed on is for a public good. If this proposition is accepted, then the principles and criteria for public finance apply. Schalatek and Bird (2016) propose such principles, of which two are salient to the JTT. Funds should be predictable: 'a sustained flow of climate finance is needed through multi-year, medium-term funding cycles (3–5 years) to allow for adequate investment program planning in developing countries'. Arguably development of a district or region needs longer time-frames, but the principle of having secure knowledge of funding is critical.

The affected workers and communities should have direct access to the funds. '(Directly) accessible for the most vulnerable – access to, and the benefits of climate finance, should be distributed equitably' (Schalatek and Bird 2016). If the principles of predictability and direct access are built into the design of the JTT and its fund, the prospects of supporting social justice are improved. The JT Fund could provide predictable sources of support to regional economic development in Mpumalanga, or affected districts. In this way, the socio-economic impacts on affected communities would be turned from negative to positive.

The JTT has financial implications beyond the debt in the electricity utility. Relieving some of the debt on Eskom moderates a key risk to the national fiscal framework. National Treasury is already stretched in terms of sovereign debt guarantees, R 350 billion of which are to Eskom (Winkler, Keen, and Marquard 2020a). In addition, Eskom has approached Treasury for bailouts, most recently a total of R230 billion over ten years (Mboweni 2019). Providing Eskom with access to capital markets and returning it to financial sustainability would reduce these pressures.

The JTT addresses some of Eskom's financial challenges, and thereby the strain on the country's fiscus, at a time when public debt is increasing. As part of the response to the COVID pandemic, the government has taken on new debt of $ 7.3 billion, of which $5.5 bn has been disbursed – $1bn from the New Development Bank, $4.3 bn from the International Monetary Fund and $5 bn from the African Development Bank (National Treasury 2020b). In a supplementary review of the budget due to COVID, the Finance Minister identified that 'debt is our weakness', going on to say that 21% of tax revenue is spent paying interest on past debts (Mboweni 2020). Interest on debt became the fourth-largest national expenditure category, similar in size to public health (National Treasury 2020b).

By contributing to Eskom's financial sustainability and as a consequence to its ability to provide reliable electricity supply, the transaction may contribute to more certainty for investors. Supported by the JTT, the electricity sector might again provide sufficient, reasonably priced and clean electricity to support socio-economic development, create jobs and reduce inequality. Other enablers will be needed to achieve such a transformational shift in SA's electricity development path, but the JTT can be a catalytic component.

4.3. International implications

In terms of mitigation, the JTT directly supports decarbonisation through the phase out of coal-fired power. Indirectly, the transaction precipitates that demand for new capacity will be met by renewable energy technologies. Even though grid-connected wind and solar PV in particular are supported by green finance as distinct from transition finance, the JTT through the phase out of coal would create more demand for electricity from low-carbon sources. The implications of transition finance could be broader, still, when combined with complementary measures to support the supply chain to renewable energy. A recent study finds that the substantial mitigation associated with the JTT comes at a very low cost in terms of $/t CO2e from a global perspective (Meridian Economics 2021).

The JTT has significance for the international development and climate finance communities, in terms of its potential for transformation and scale. Securing concessional

finance, a cornerstone of the JTT requires the support of development finance institutions (DFIs) and decision-makers focused on international climate finance (ICF). As currently conceptualised, the JTT will be the largest ever climate finance transaction. Its scale is considered important to achieve the international profiling, which provide a platform to motivate for the importance of this innovation – and its potential for application elsewhere (see below). The greater appetite for risk reflected in the international concessionary tranche is important in generating that scale. Yet the significance is not derived from scale alone, but the potential of the transaction to support transformation, as illustrated above, in the contribution to addressing a deep, structural change required to an electricity system. Realising this potential requires re-conceptualising climate finance. A key innovation in transition finance is using international climate finance to accelerate decarbonisation by the phase out of coal.

What might that mean for the very definition of transition finance, and for other countries? Figure 3 illustrates transition finance – as in the case of the JTT – filling a gap.

The gap lies between disinvestment from coal and green finance, with transition finance between these two elements in Figure 3. The left-hand side shows, existing downward pressure on investment in coal, driven by disinvestment; while green finance is illustrated on the right-hand side – in other words, rising investment in more climate-friendly systems. Transition finances bridges this gap in between, shown conceptually in the Figure. The bridging of a gap can also be understood temporally, since transitions in large systems can take time (Grubler 1996). Disinvestment is a pressure on energy systems, historically dependent on coal. Green finance is rising, but is still scaling up. In the period moving from 'dirty finance' to 'clean finance' (Kessler et al. 2019), we need to finance the transition.

Source: Policy brief (Winkler, Keen, and Marquard 2020b)

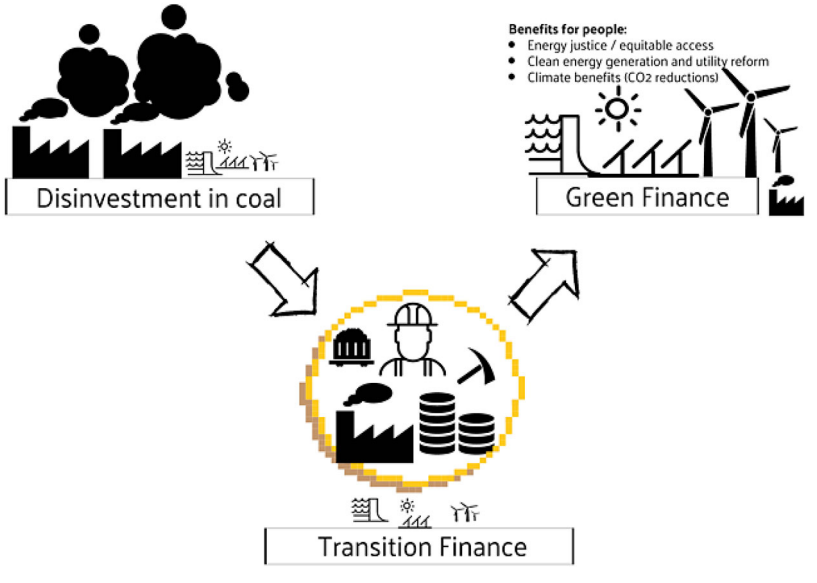

Figure 3. Transition finance filling a gap between disinvestment in fossil fuels and green finance. Source: Policy brief (Winkler, Keen, and Marquard 2020b).

Because renewable energy is commercially financeable in South Africa, the JTT does not envisage financing renewables itself. Rather, investment in the renewables fleet required to replace the coal energy displaced by the transaction, will be crowded in. Research shows that an electricity system comprised of a large renewables programme is the least cost option for South Africa going forward (Roff et al. 2020).

We argue that the case study has implications for defining transition finance. From the case study of the JTT, we would modify the definitions of transition finance to offer our own. We propose a definition that is focused on the transition in finance, social justice and socio-economic development:

> Transition finance is capital provided to economic agents on the journey to sustainable development to adhere to ambitious climate change action by transitioning away from fossil fuels or other high-emitting activities and predictable funding to ensure social justice for affected communities and workers, in different contexts.

Our definition is more ambitious than Donovan, Fomicov, and Ostrovnaya (2020) by going beyond a 'minimum of mitigation'. It is consistent with their approach, however, in seeing transition finance as going beyond 'climate finance', or what in Figure 3 is shown as green finance. We have explained the just transition as addressing complex challenges, requiring engagement with the broader context of development, which any definition of transition finance should include. We draw on Piemonte et al.'s (2019) notion of actors being on a journey to sustainable development. However, our definition is more specific on the purpose about the transition away from fossil fuels, or other high-emitting activities. We refer to economic agents. In the case of the JTT, the economic agent is a state-owned enterprise, the national utility Eskom; to make explicit SOEs as an important category of economic agent – between sovereign governments and private firms (Caldecott 2020). The most notable difference, however, is that we consider the financing of the transition for affected communities and workers integral to the definition of transition finance. This reflects a South African interpretation of just transition itself, in which social justice is emphasised. We think that this consideration will be applicable in many other contexts, and how the just transition for affected communities and workers will be funded is likely a common concern. We propose that social justice be an integral part of definitions of transition finance and include it in our own.

Some elements of the JTT are particular to South Africa. The country has a historical economy-wide path dependency on coal, for part of liquid fuels from coal (Sasol) and most of the electricity (Eskom, the national utility). A significant portion (38,1%) of national emissions are produced in the electricity sector. Eskom faces major operational and structural challenges, most salient its large and unserviceable debt. Tariffs have increased from historically low levels, but it is not politically acceptable to increase them to an extent that would deal with Eskom's deficit. The history of Apartheid led to a highly unequal and poverty burdened society, in which the majority cannot afford electricity, and energy intensive industry has relied on low tariffs in the past. The government decided in the 2000s that Eskom should not engage in renewable energy, and so independent power producers are the country's proven market for renewable energy procurement.

The innovative design of the JTT may be of interest to other countries. Some of these elements will be found in other contexts, perhaps with variations on the theme,

particularly in emerging economies. Yet more generally, development and climate finance could accelerate decarbonisation by phasing out fossil-fueled energy supply. A number of emerging economies are needing to transition away from coal (such as Vietnam, India, Indonesia), and are currently considering similar transition finance mechanisms. Whether a JTT would work in phasing out oil is unclear, given different dynamics. Oil as a commodity is extensively traded internationally, and its prices are significantly more volatile than those of coal. One might expect to see more similarities in countries with high coal dependence and socio-economic risk in an energy transition.

5. Limitations and future research directions

One limitation of this article is the focus on coal, and further research might explore the applicability of JTT to oil. Such research might also consider differences in institutional arrangements, for example, the implications of utilities (which may be SOEs) compared to refineries.

The scope of this article has been focused on two aspects of the JTT, innovation in transition finance and predictable funding through a JT Fund. As a single journal article, it cannot address all related complexities in detail. In particular, the article does not comprehensively address all elements of Eskom debt. Nor do we examine in detail the financing arrangements for the JTT, in the sense of the set of contracts and process of negotiations required to implement a transaction.

We have emphasised the importance of social justice as part of a JTT, and included in it our definition of transition finance. We suggest that further research is needed on direct access by the most vulnerable to JT funds.

Technical analysis of the baseline for emissions reductions due to the accelerated phase out of coal in South Africa would require a separate article. Our assumption is that the IRP is the baseline, politically, while a condition of the JTT is that a future electricity plan is more ambitious, aligned with an electricity sectoral emissions target. Technical assumptions of the baseline and reductions merit further research, including that more recent electricity demand forecasts are likely lower than in IRP2019, exacerbated by delays due to COVID-19 and with uncertainty around the shape and pace of recovery. The energy availability factor of electricity generation plants has declined from around 85% in the financial year 2011–67% in FY2020 (Eskom 2020). Combined with lower demand, these factors might mean that no new capacity is needed after the current shortfall is addressed.

The JTT case study refers to relevant policy in the form of the IRP and a proposed SET for the electricity sector. Technical analysis would be required for alignment with other relevant policy, including Carbon Budgets for companies (including state owned enterprises) and the Carbon Tax, both of which have been introduced with initially unambitious performance goals, while indicating increasing stringency over time.

6. Conclusion

This article has presented a case study of a just transition transaction (JTT) in South Africa. The case study has elaborated how the JTT can catalyse deep, structural change

in SA's electricity system whilst supporting sustainable development. Such change requires innovation in transition finance and to support social justice.

We have presented the JTT's architecture in Figure 2, together with its implications for financial flows, and how it creates predictable funding for a JT Fund. We have argued that the JTT contributes to resolving some, but not all, of the complex challenges in the electricity sector. What can we learn from the case study of a JTT about transition finance?

Financing a just transition is key. Transition finance fills a gap between disinvestment from coal and green finance. Filling this gap requires reconceptualizing climate finance beyond the financing of low carbon projects and programmes – concretely, the JTT funds the accelerated phase out of coal-fired power. We have focused on a state-owned enterprise, the national electricity utility Eskom. Concessional loans from development and climate finance institutions blended with domestic commercial loans are on-lent to Eskom. Using the terms of our definition, this is capital provided to Eskom as an economic agent, while ensuring that it adheres to ambitious climate change action by transitioning away from coal. The JTT includes climate finance and does not pay off the legacy debt of existing coal plants, but rather their phase out. The JTT can make a significant contribution to mitigation. We posit that predictable funding to ensure social justice for affected communities and workers is integral to defining just transition finance.

Finance can enable a just transition to a low emissions economy, if it respects certain principles, promotes ambitious decarbonisation and puts in place remedies for greenwashing. Principles such as those proposed by CBI should be applied to avoid greenwashing, ensuring that transition pathways are not determined by individual institutions on a case-by-case basis.

One of the questions not fully resolved is whether transition finance is at activity – or entity-level. A strength of an activity-level approach is its focus, simply listing activities for which proceeds may be used. This focus provides clarity and understandable means of compliance, possibly written into contractual obligations. However, it is also a weakness, with risks that some activities that turn out to be essential to the transition may not be listed. Furthermore,,, entity-level finance seeks to address these weaknesses by focusing on the fuller set of costs.

Compliance can and should be related to sector-wide decarbonisation for entity-level finance. Policy action is critical in both approaches, but particularly at entity-level. In the South African context, a sectoral emissions target for electricity would set the parameters for establishing entity-level conditions for on-lending of finance. Progress can be tracked against quantitative indicators and enforced by remedies related to the concessional rates associated with the finance or withholding of further funds.

In either approach, the JTT contributes to the financial sustainability of Eskom by providing access to capital markets. In this way, some of Eskom's financial constraints on continuing operations and for navigating the transformation of the electricity sector's infrastructure are addressed, reducing the strain on the country's fiscus, at a time that public debt is increasing. And funding for social justice that the JTT can generate has never been needed more than now.

We argue that a just transition transaction can fund social justice and contribute to mitigation.

The JTT would stipulate that some concessional value created in a blended finance vehicle is provided to the JT Fund. This provision is innovative in providing predictable

sources of funding social justice, and in how it hard-links mitigation and social justice. The JTT contributes to mitigation directly, in that accelerated decarbonisation through phase out of coal-fired power stations means lower GHG emissions, and by creating more space for renewable energy. Significant mitigation on the scale of at least 1-1.5 Gt over thirty years is achievable. Predictable flow of funds via the JT Fund to fund the protection of livelihoods of affected communities and workers is a key implication of the JTT.

While some aspects of the JTT are specific to the South African context, we posit that a transaction accelerating decarbonisation and funding social justice will be of much wider interest. Countries dependent on oil may wish to consider transactions in a more volatile commodity market. Other emerging economies with high coal dependence and socio-economic risk in an energy transition might be well advised to translate lessons from South Africa's JTT for their own contexts. The combination of contributing to mitigation and social justice is important in South Arica and may be of interest in other jurisdictions.

Note

1. A Web of Science literature research of the term 'transition finance energy' on the 28th October 2020 revealed only 120 records subsequent to 2015, of which only a handful were of relevance.

Acknowledgements

The authors are grateful for the support to the SNAPFI team at the University of Cape Town. All errors are the responsibility of the project.

Funding

Support for the research for the article was undertaken under the project 'Strengthen national climate policy implementation: Comparative empirical learning & creating linkage to climate finance – SNAPFI', supported by the International Climate Initiative (IKI) of the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU), Germany.

Conflict of interest declaration

One author, Tyler, works with Meridian Economics, who developed the just transition transaction (as a deal, rather than this academic article about the proposed deal); however, she participates in this academic article in her academic capacity, though with the knowledge of Meridian. There is no conflict of interest in this regard.

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