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# The end of coal? Planning a “just transition” in South Africa

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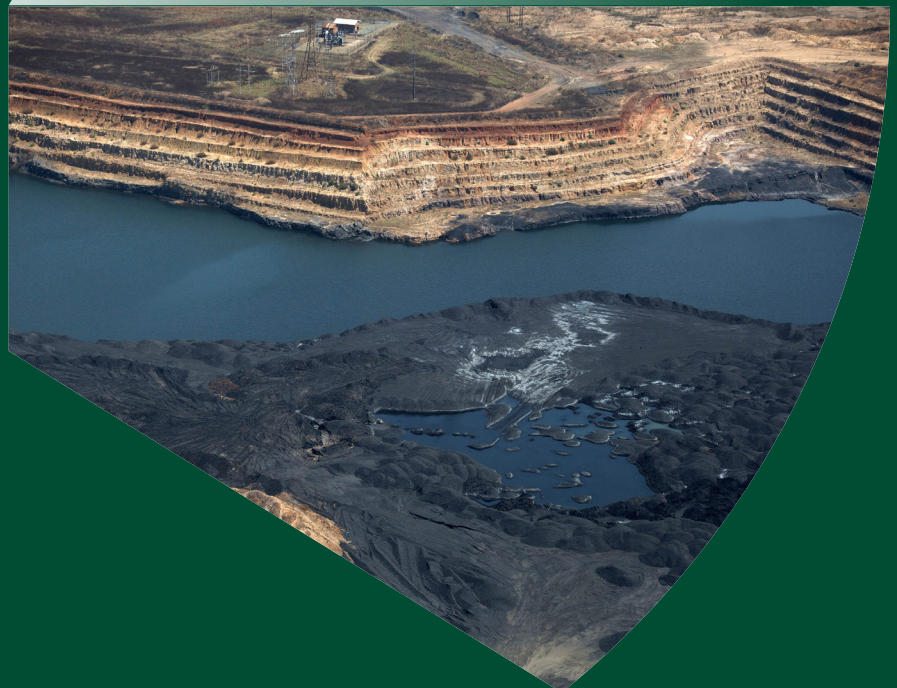
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## Introduction

In early 2017, Eskom — South Africa’s state-owned electricity utility — announced the imminent closure of five of its coal-fired power stations.<sup>1</sup> The announcement sparked a strong reaction from trade unions (COSATU 2017b; Seeth 2017) and a public debate about how changes in South Africa’s energy system will affect workers and communities. This was a departure from previous political debates about transforming South Africa’s energy system; in the past, the conversation has focused on technical and economic issues directly related to the energy system, but has given little attention to the wider, especially upstream, socio-economic effects that the inevitable shift away from coal implies.

The local social and economic effects are nevertheless likely to be significant, particularly in coal mining regions. The impacts of closures will be highly concentrated; the majority of Eskom’s coal plants — and the mines that supply them — are located within a 100km radius, to the east of Johannesburg in the Mpumalanga province. Likely effects include job losses in power stations, coal mines and the coal transport sector; declining revenues for municipal governments; and secondary economic effects on local economies. Managing these risks is essential for gaining social acceptance and reducing resistance towards these transformations, and for making sure that poverty and inequality — already significant in mining areas (Ledger 2016) — are not deepened by an unplanned transition.

In this report, we explore some of the main challenges associated with the likelihood that South Africa’s coal production might decline significantly, potentially over the next five to ten years. We highlight some of the key issues that need to be thought through and discussed as part of ensuring a “just transition” to this future. This challenge is not unique to South Africa. Energy systems worldwide are changing, in some cases very rapidly, as the economics of alternatives to fossil fuels improve.

We explore some of the main challenges associated with the likelihood that South Africa’s coal production might decline significantly, potentially over the next five to ten years.

This report is based on insights from a workshop held in Tshwane in September 2018, titled “The end of coal? The risks and opportunities facing South Africa’s energy economy”,<sup>2</sup> as well as on interviews conducted between 10 and 19 September 2018 in Gauteng and Mpumalanga with public officials, business associations, civil society organizations and researchers.<sup>3</sup> Participants to the workshop included public officials from national government — such as the departments of Energy, Trade and Industry, Economic Development, and Environmental Affairs — as well as state-owned enterprises Eskom and Transnet, trade union representatives, researchers, business representatives and civil society organizations.

Workshop participants brought up and discussed the main economic and political impacts of a coal decline, as well as potential economic development alternatives, knowledge gaps and the institutional arrangements required to implement a just transition. In interviews, local stakeholders shared the same concerns, but they also raised significant worries about environmental impacts and how they will be handled as the coal industry declines.

This report is structured along the themes raised by the workshop participants and the stakeholders we interviewed, and is supplemented with desktop research. After describing the evolving role of coal in South Africa — and the likely impacts of a coal phase-out — we outline the key elements of a coal transition, including available policy mechanisms and the role of subnational governments.

## Coal in South Africa

South Africa today relies on coal to generate 92% of its electricity and to produce roughly 20% of its liquid fuels (Department of Energy 2015). As a result, the public utility Eskom and chemical firm Sasol together account for more than 50% of South Africa’s greenhouse gas emissions and 85% of the coal used in the local market by volume. Coal is also one of South Africa’s largest exports by value (accounting for ZAR 61 billion,

<sup>1</sup> The stations were in Hendrina, Kriel, Komati, Grootvlei and Camden. Most were reaching the end of their technical lives, and the closures were not related to an explicit policy decision to phase out coal-fired power in South Africa.

<sup>2</sup> The workshop was hosted by the Energy Research Centre, Trade and Industrial Policy Strategies, and the Stockholm Environment Institute in Pretoria on 17 March 2018.

<sup>3</sup> Interviews were conducted with three representatives of environmental non-governmental organizations, three representatives of the business sector, two researchers, one union representative, one public official from the Mpumalanga provincial government, and two officials from the local government.

or about US\$4.6 billion, in 2017<sup>4</sup>) (Minerals Council 2018). The coal mining sector employs around 82,000 workers (Minerals Council 2018), and Eskom employs nearly 50,000 in its fleet of primarily coal-fired power stations (Eskom 2018). The sector has been woven into the country’s political economy for decades, through the creation of jobs; the accumulation of wealth in foreign companies and, more recently, in local corporations; linkages to politically powerful trade unions; corruption scandals; and the enabling of an electricity supply sector based on cheap fuel inputs (Fine and Rustonjee 1996; Baker et al. 2014).

However, a series of changes in the domestic and global energy landscape are reshaping the role of coal in South Africa. It makes sense to begin a dialogue about what South Africa will do after coal, and how to best manage a transition, in order to minimize social and economic disruptions and identify new opportunities.

First, the electricity system is already undergoing structural change. Several coal plants are reaching the end of their operating lives and becoming too costly to maintain and run (Steyn et al. 2016). As they close, these are likely to be replaced by renewables, which are increasingly cost-competitive against even existing coal plants (Wright et al. 2017). Finance for long-lived, carbon-intensive infrastructure also is becoming more difficult to find. At the same time, coal resources are running out at existing mines, while new mining basins face significant commercial and infrastructural challenges related to water supply and rail connections (SACRM 2013).

Second, if the global demand for coal declines, as expected, it could very quickly cut into South Africa’s exports. European demand for South African coal has already declined dramatically, as the European Union quickly decarbonises its energy systems (Burton et al. 2018; IEA 2017). Today, most exported coal goes to the Pacific market, primarily India, where future demand is highly uncertain. While India’s coal use is expected to increase in the coming years (before peaking), the Indian government and its state-owned mining company, Coal India Limited, plan to dramatically ramp up domestic coal production. Even if only part of this production expansion is achieved, it could easily displace most, if not all, coal imports from South Africa (IEA, 2017). While uncertain, a future in which coal exports to India disappear in a relatively short time frame is entirely feasible and would have major implications on South African coal-producing regions.

Changes in the South African energy system and international coal markets are interlinked. Many of South Africa’s mines are commercially viable because they can sell a portion of their product to the international markets at higher prices (Burton and Winkler 2014, SACRM 2011). If export demand reduces or disappears, some mines would no longer be profitable regardless of local demand from South Africa’s energy system (Huxham et al. forthcoming).

## Navigating change: preparing for life after coal

Coal mining is an important contributor to the value of goods and services produced in the Mpumalanga province, accounting for 19% of gross value added (GVA) in 2015 (Thurlow 2018). This regional figure is far more significant than the 2.3% that coal mining contributed to national GDP in 2012 (van Seventer et al. 2016). However, even within the province, coal-related activities are highly concentrated in certain areas. In 2013, 72% of mining GVA and 58% of utilities GVA in Mpumalanga came from a single district municipality (Nkangala).<sup>5</sup> A further 23.7% of mining GVA and 24% of utilities GVA came from the Gert Sibande District Municipality (Mpumalanga Provincial Treasury 2015). Coal mining accounts for about 5% of Mpumalanga’s formal workforce, with workers each typically supporting around three dependents (Mpumalanga Provincial Treasury 2015).

As coal production declines, jobs and regional economic development will need attention. Significant changes in the mining and power sectors are also likely to have implications for South Africa’s political landscape. Environmental impacts, already in need of close attention, will also require assessment and consideration. Given these many dimensions, among others, the coal transition should not only be an isolated matter of concern for the departments of Mineral Resources and Environmental Affairs, but rather a common challenge that is addressed across different levels of government and various ministries.

<sup>4</sup> The average exchange rate in 2017 was 13.3209 ZAR/USD (Nedbank 2018).

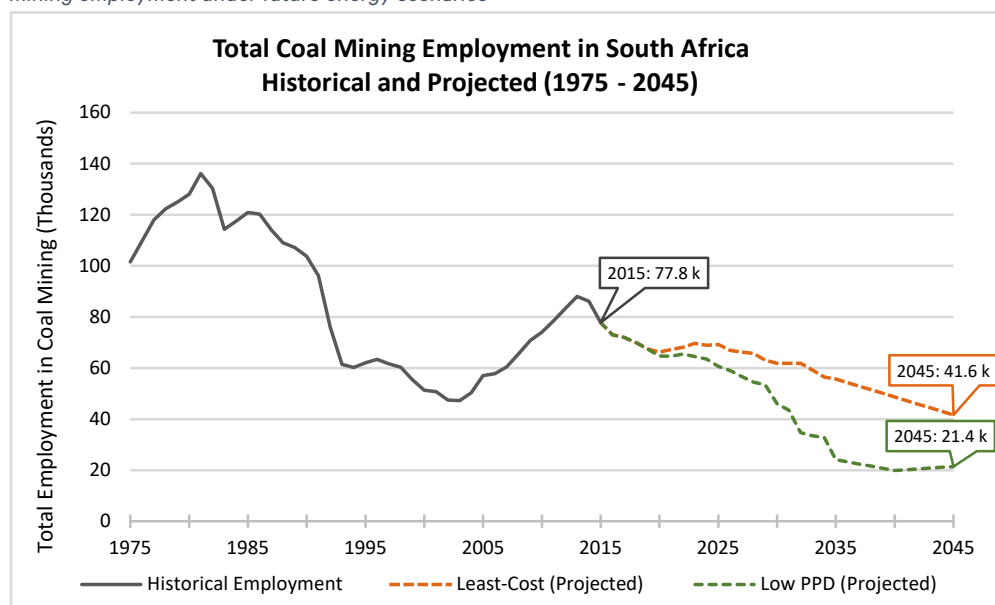
<sup>5</sup> In South Africa there are two layers of municipality: district municipalities and local municipalities.

## Employment

After peaking in the early 1980s, employment in South Africa's coal mines mostly trended downwards as the sector became more capital-intensive. Automation and digitalization are expected to further shrink the workforce over the coming decades, mirroring global trends (Burton et al. 2018; Cosbey et al. 2016).

Figure 1 shows historical (1970-2015) and projected (2016-2045) coal mining employment in South Africa. Even without the implementation of policies to reduce greenhouse gas emissions, employment will decline as power plants and mines reach the ends of their lives, unless large subsidies are provided to the sector to develop new coal-fired power plants and extend the lives of old ones. Under a pathway consistent with South Africa's long-term climate policy and commitment to limiting climate change to "well below" 2°C (the "Low-PPD" scenario), this decline is accelerated.

Figure 1: Historical (1970-2015) (Quantec, 2015) and projected (2016-2045) (Burton et al. 2018) coal mining employment under future energy scenarios



South Africa has an extremely high unemployment rate. In the first quarter of 2018, unemployment stood at 26.7% using the narrow definition and at 36.7% using the broad definition (Stats SA 2018).<sup>6</sup> Jobs, and job losses, are therefore particularly sensitive both politically and socially. Facing potentially rapid declines in employment in the coal sector, trade unions have called for a "just transition" for coal workers and coal communities, emphasizing the need to create alternative decent employment opportunities in affected regions (Cosatu 2017a; Cloetes 2018). A clear and credible plan regarding jobs is essential to ensure unions, coal workers and communities are part of the transition and not simply left behind.

For many coal mine workers, early retirement will not be an option since their median age is under 40 (Makgetla 2018) and many coal mine closures will take place before the mid-2030s, if not much earlier. This is due both to mines reaching the end of their lives and because retiring power plants will result in a lower demand for coal. This means we need to understand the prospects for labour mobility. Mobility is influenced by factors such as age, information about alternative job options, education, technical skills, and the cost of moving; it also depends on the impacts of movement on families and social networks (Makgetla 2018; Atkinson 2014). Beyond the level of formal education, specific technical skills can determine transferability. The dynamics will therefore differ between coal mine and power plant workers. A lack of data and analysis — on age and technical skills in mining, on the employment impacts of declining coal production, and on the employment opportunities in new sectors (including where these are located relative to the current mining workforce) — is currently an obstacle

<sup>6</sup> The narrow definition includes only unemployed people who are actively seeking work, while the expanded definition also includes discouraged work seekers (those who are no longer actively seeking employment).

to developing strategies that could support labour redeployment and retraining and, more broadly, regional economic development.

According to the national skills scale, coal workers are considered relatively skilled, with 70% of miners having at least a grade 12 qualification (which means they have finished high school or hold a post-secondary school qualification) (Stats SA 2016). In practice however, grade 12 still offers limited job opportunities.

## Regional economic development

The main sectors contributing to Mpumalanga’s gross value added (GVA) are mining, manufacturing (mostly heavy industry), construction, and agriculture (TIPS 2016). Coal mining is mainly concentrated in the local municipalities of Emalahleni, Steve Tshwete, and Govan Mbeki.

Coal mining has also created employment and revenues in the transport sector. Trucking and rail transport of coal has increased over the past 10 years, both for export and for delivery to Eskom’s power plants (Hartley et al. 2018). Other economic sectors that benefit from linkages with coal mining are machinery (about 13% of the industry’s purchases) and financial and business services (about 12%). Some local economies are highly dependent on mining; for example, approximately 38% of GVA in the Emalahleni municipality comes from mining (Ledger 2016). This means the impacts on suppliers and on other industries — such as retail and services that depend on the earnings of workers in coal and related industries — could be large, though the magnitude of these effects is not well understood. Mining companies in South Africa also sometimes fund services that are normally provided by local governments, such as housing, water and sanitation (Marais et al. 2018; Ledger 2016). Hence, any decline in production could lead to significant social and economic upheaval if such impacts are not understood and managed carefully.

Economic diversification is essential to offsetting the declining coal sector. The nearby Free State gold fields learned this lesson in the 1980s, when a wave of production declines resulted in the collapse of the regional economy. The region suffered enormous job losses because it was heavily concentrated in the gold sector and had not developed a diversified local economy. Even today, these areas have not recovered (Marais 2013). Diversification and re-purposing of economies can take a long time, so the sooner plans are designed and implemented, the better the chances that Mpumalanga can avoid a similar fate.

During the workshop, participants suggested various alternative sectors that could be nurtured in Mpumalanga, such as renewable energy and smart grids; IT/telecom in transport; agriculture and agro-processing; and manufacturing.<sup>7</sup>

Coal mining areas in Mpumalanga have a good electricity transmission system and are close to a major load centre in Gauteng province. Repurposing the region’s development to be a hub for generating renewable energy is therefore one viable option for regional economic development that could smooth impacts on coal plant workers. It could also provide wider growth opportunities for the Mpumalanga economy, if coupled with the local manufacturing of renewable energy technologies and the associated value chains. New economic opportunities may not only be in the energy industry. Rather, a strategy based on multiple and diversified economic activities is more likely to succeed in cushioning the impact of the coal decline and in fostering a just transition towards new economic activities (Campbell and Coenen 2017).

Agriculture and agro-processing also may have potential going forward, but face challenges. Mpumalanga accounts for 46% of South Africa’s high potential arable land, but additional coal mining will reduce the available land that can be devoted to agriculture (BFAP 2012). Furthermore, environmental damage in the vicinity of mines will most likely make these lands unsuitable for any agricultural activities, and even rehabilitated mining land shows reduced yields (AngloAmerican 2016; Slater 2017). Another issue is that

<sup>7</sup> The Mpumalanga Economic Growth and Development Path (Mpumalanga Department of Economic Development and Tourism 2011) identifies the following as key sectors in its provincial strategy: infrastructure development, climate change and green economy, agriculture and agro-process, rural development, minerals and beneficiation, manufacturing, knowledge-based economies, tourism and business services, social economy, public sector, and the regional economy.

wages in the agriculture sector are far lower than those in the mining and power generation sectors. Finding credible alternatives to coal jobs requires careful consideration of wage dynamics.

## Political impacts

In South Africa, the debate about energy transitions has already been highly politicized. For instance, in March 2017, thousands of coal truck drivers blocked access to the city of Tshwane to express concern about potential job losses due to closing coal plants. They blamed the closures on the growth in renewable energy plants (though this is not why Eskom is closing old coal plants).

There could be significant political consequences of a coal decline, especially one that is unmanaged. In an already tense socio-economic context, some fear that failing to provide opportunities for affected employees and communities — by failing to adopt a transition policy or by adopting one that disproportionately favours incumbent interests — could lead to further exclusion and even violence.

Yet, at the same time, a coal transition policy could provide opportunities to people who have been excluded from the economy so far, and give a voice to those who are usually absent from political debates in general and on the energy transition in particular. Workers, communities, and even unions, have little space to voice their concerns and opinions about what happens in the energy sector and the economy as a whole (despite formal forums for doing so).

Another important political aspect is the challenge that a declining coal workforce represents to the trade unions. A dramatic fall in coal production poses an existential threat to some parts of the trade union movement; when this happened in the United Kingdom in the 1980s and 1990s, union numbers were decimated. Unionization for a decentralized energy system is likely to look fundamentally different than it does in the current energy system, where workers organize at a few large power stations and mines. A declining relevance of unions also has broader effects on the political sphere; historically, organized labour has been a space for the training and personal development of many of South Africa's political class (Beresford 2012).

## Environment

The closure of mining regions has left a legacy of long-term environmental impacts — and often financial burdens associated with the costs of remediating former mining sites — both internationally (Caldecott et al. 2017) and in South Africa (Marais and Nel 2016; Andrews-Speed et al. 2005; McGuire 2003; Marais et al. 2018).

The environmental legacy of coal mining is of extreme concern within Mpumalanga. Various interviewees (from a local environmental NGO, a local business association and the provincial government) highlighted significant tensions regarding the environmental management practices of the coal mining sector, especially in relation to water and air pollution. Some worry that small mining companies, in particular, are less likely to meet their legal obligations. Environmental and health impacts of coal mining in South Africa are indeed well-documented (Pone et al. 2007; McCarthy and Humphries 2013; BFAP 2012; Ochieng et al. 2010; Shongwe 2018).

As mines start closing, these impacts will persist and require long-term management. In South Africa, mining companies are required to set aside financial resources for environmental rehabilitation. However, there are concerns about the risk of mining companies closing down without fulfilling these obligations. These provisions were described as lacking transparency and accountability; information about what funds have been set aside is inconsistent, unclear, sometimes unreliable, and not comparable between companies, thus preventing shareholders or citizens from holding either companies or regulators accountable (CER 2018). Moreover, the requirements are quite new, and South Africa is still dealing with thousands of abandoned mines, including coal mines (Mhlongo and Amponsah-Dacosta 2016).

A key issue is that the current institutional arrangements around the environmental and social governance of mining do not appear to be appropriate to effectively manage the coal transition. The Department of Mineral Resources (DMR) handles both environmental oversight and licensing, resulting



in a direct conflict of interest between the regulation and promotion of mining. More broadly, the high degree of centralization of South Africa’s mining governance system leaves regional actors, including subnational authorities, with very few opportunities to participate in mining decisions. There is mounting evidence that environmental law is not being enforced and that mining interests overpower other sectors (SAHRC 2018; CER 2018), with the issuance of mining licenses inside protected areas (CER 2017). Communities are often excluded from decisions about whether mining can proceed on their land and from processes defining how any benefits from mining should be collected and used locally. This is visible through communities’ legal challenges to prevent unwanted mining on their land (High Court of South Africa 2009; Constitutional Court of South Africa 2018).

Addressing mining’s environmental impacts and properly rehabilitating lands should be priorities, not only to address the immediate local health and environmental impacts but also to enhance prospects for future economic development and sustainable livelihoods. Rehabilitation also has the potential to contribute to job creation in Mpumalanga. Transition strategies need to consider how long-term environmental impacts from coal mining — as well as climate change impacts — could constrain future economic activities, especially in the agriculture sector (SAHRC 2018), and thus affect alternative employment and livelihoods.

## Informing and governing the coal transition

Navigating the socio-economic and environmental changes as coal mining declines is daunting. Key questions are *who* should take responsibility for *what*, and *what mechanisms* are available for addressing different issues. The potential losers of unplanned, unjust transitions are clear, in principle. However, in practice, it remains to be determined which societal actors should take responsibility for which measures — as well as through which mechanisms those measures should be implemented. While some existing policy processes and mechanisms might be useful in preparing for the coal transition, their effectiveness in addressing the needs and challenges of coal mining regions is already limited and will need to be improved. Further research and social dialogues appear to be important steps.

### Institutions for a just transition

There are already existing policy mechanisms in South Africa that could be used to mitigate the negative impacts of a coal transition on workers and communities. Recognizing and tackling their limitations is an important step to using them effectively in planning for coal closures.

The National Planning Commission, for instance, has already initiated a Stakeholder Dialogue on Pathways for a Just Transition, which explores pathways to address environmental sustainability and ensure an equitable transition to a low-carbon economy. It seeks to build a shared vision and agenda between four social partners: government, labour, civil society and business. While this process is essential to support low-carbon transitions in South Africa, it is unlikely to be sufficiently granular to manage a coal transition on its own. Another possible limitation is that the NPC has relatively little implementation capacity, and it is not yet clear how the social dialogue will inform the implementation of a broad socio-economic development pathway. The process highlights the complex problem of government coordination within and between departments with competing agendas and capacities to act.

The NPC’s Just Transition Dialogue nonetheless represents a key effort to start thinking about coal transitions. The variety of actors involved in the process also indicates that a low-carbon transition is a topic that is relevant for all sectors of society — something that is also valid for coal transitions more specifically. Despite its broad scope and a limited constituency, the Dialogue can provide some useful direction and a space to discuss the multiple challenges associated with coal decline. Workshop participants noted that if a future Dialogue focused specifically on managing coal transitions in Mpumalanga (and eventually, Lephalale), it could contribute to moving forward with planning strategies for economic diversification and infrastructure repurposing; worker training and education programs; environmental rehabilitation; municipal financial health; and continued public services delivery, among others.

The government is also promoting a just transition to a low-carbon economy through the National Employment Vulnerability Assessment (NEVA) and Sector Job Resilience Plans (SJRPs). As stipulated in the National Climate Change Response White Paper (Department of Environmental Affairs 2011), the NEVA will “assess the impact on jobs of climate change and climate change responses by sector and location to understand what job-related interventions may be required and where they may be required”, while the SJRPs will be developed by Ministries to explore sectoral job creation opportunities.

Workshop participants also mentioned that the Social and Labour Plans (SLPs) are likely to play an important role in coal transition planning. An SLP, which is a licensing requirement for mining operations, is a document that describes how the mining company plans to share some of the benefits from mining operations with local communities. The SLPs were introduced in 2002, as a way to tackle social conflicts associated with mining in South Africa, and to support local integrated development (Marais 2013). They thus include measures for strengthening the long-term resilience of mining-affected communities.

Despite the theoretical benefits of the SLP system, however, research has shown that it suffers from systemic deficiencies that prevent it from reaching its goals (CALs 2016). Problems include the misalignment of planning frameworks of different state agencies, the lack of formalized relationships between the Department of Mineral Resources and other ministries, and a lack of effective enforcement. Improving the effectiveness of the SLP system could thus be one of the first steps in setting up operational and functioning mechanisms to plan and implement transition strategies. The Centre for Applied Legal Studies at Wits University has suggested measures to do so, such as improving access to information and introducing specified requirements for community participation (CALs 2018).

Discussions about South Africa moving away from coal have so far remained technical and have tended to focus on the macro level. However, some workshop participants highlighted that when managing a transition, the main concerns at the national level will differ from those at the local level. Bridging these two perspectives is essential for navigating coal transitions, and workshop participants emphasized the role of municipalities and local actors in defining and implementing just transitions. This, however, must take place in a context where local authorities already struggle to mitigate the impacts of coal mining.

Indeed, past cases of mining transitions have shown that coordination between governments at different scales — and the involvement of local communities, mining companies and trade unions — is essential (Caldecott et al. 2017). In South Africa, there are obstacles to coordination. Interviewees from local and provincial governments and from the business sector emphasized that local authorities are unaware of the upcoming challenges associated with moving away from coal and are ill-prepared to face them. Local governments may struggle most to find the right capacities, including financial resources, that will be needed, particularly since mining municipalities often already struggle with providing infrastructure and services and managing urban development (Marais et al. 2018). State fragmentation, lack of transparency, and central authorities’ disregard towards subnational government priorities were also mentioned by interviewees as barriers to transition policy design and implementation.

While the State — across its different sectors and levels — plays a crucial role in navigating transitions, other societal actors have a role to play too. Coal-related companies, for instance, can contribute to the process with their expertise on market development and long-term planning, and with more detailed data on labour and skills. In addition, Eskom can redeploy workers internally, as can coal mining companies. However, the scale of the challenge requires cross-firm and cross-sectoral coordination between Eskom, industrial policy schemes,<sup>8</sup> and other firms in coal regions, including renewable energy developers and manufacturers.

An essential step in moving away from coal is ensuring all stakeholders have a common understanding of the challenges ahead. This implies both trying to reduce uncertainty by addressing knowledge gaps, and making this knowledge accessible to all concerned parties.

<sup>8</sup> State-led broad and comprehensive programs to support industrial development, which may include measures such as modifications to the regulatory and legal frameworks, lowering barriers to entry for businesses, research and development support, investments in infrastructure, subsidies, fiscal incentives, and financial incentives to specific sectors or for the whole business climate.

Going forward, there is indeed still much research to be done. Workshop participants mentioned the need to better understand future export prospects and risks, as well as the opportunities of various global coal demand scenarios. Another key gap brought up during the workshop was the lack of a detailed assessment of how coal power plant decommissioning and global market changes could affect economic outputs and employment along the value chain. A very detailed picture of workers' skills is also necessary to plan for alternative economic activities.

Workshop participants also brought up important unknowns, including the timing of changing coal production and use across scales, the pace of policy implementation, and the speed with which benefits from these will be noticed. Uncertainty often acts as a deterrent for action and contributes to delaying transitions. The complexity of processes at play here implies that ultimately, certainty will increase as policy decisions are made in spite of uncertainty. There are always risks, but as mentioned during the workshop, the risks of not doing anything could be much worse.

A third and last point is about the complexity of discussions around coal transitions. Part of the debate has been very technical, digging into energy models and the economic and technological assumptions behind these, or looking at macroeconomic implications of different energy scenarios. But, at the same time, the task can appear overwhelming, because of the extent of likely impacts and the difficulty of creating an integrated plan to address them. A key challenge is to reduce this complexity to make the debate accessible to the wider public, especially coal-dependent employees and communities.

## Inspiration from other countries

As more countries transition away from coal, there are a growing number of practical interventions being explored, including those described above. Sartor (2018) has summarized the literature and experiences of different countries, and identified several options that have been implemented: funding early retirement for older workers; redeploying workers across assets, such as mines and plants; retraining or redeploying workers within the sector or firm; coordinating across firms to redeploy workers with particular skills; and retraining or reskilling workers for existing or future industries in the region. Economic diversification strategies to build resilience include exploring and investing in existing sectors with related skills, building competitive advantage in new sectors, and infrastructure investment. However, many of these lessons have come from developed countries, and implementation will be even more challenging in a developing country such as South Africa.

In other parts of the world, there are examples of innovative governance arrangements that help coordinate coal (or other mining) transitions. An example is the Latrobe Valley Authority (LVA) in Australia, a partnership between the community, industry and government that helps workers access training and employment services, facilitates new business development, and invests in infrastructure improvements, among other interventions (Wiseman et al. 2017). Principles that have been important to the LVA include embedding planning locally, inclusion of different local stakeholders, and coordination with government and other stakeholders at different levels. The LVA also applied a narrow and broad approach to the transition, initially supporting a workforce transfer scheme and small business development, and then expanding to include regional redevelopment planning. The Australian Council of Trade Unions (ACTU) (ACTU 2016) and the Construction, Forestry, Maritime, Mining and Energy Union (CFMEU) have called for the creation of an Energy Transition Authority to ensure that Australian coal workers and communities are not left behind in the energy transition. CFMEU has analysed various sectors and transitions, and is calling for a framework that “combines cohesive and well-funded top-down leadership, coordination and funding with bottom-up engaged participation, knowledge and creativity” (Sheldon et al. 2018).

In Spain, closures of coal mines have been accompanied by funded transition strategies for workers of varying ages, alongside environmental rehabilitation plans that prioritize employment for former miners. Infrastructure development funding will be provided alongside the development of action plans for mining communities on renewable energy and energy efficiency and new industries (IndustriALL Global Union 2018).

## Conclusion

The workshop and interviews highlighted that a broad variety of impacts are already being felt in coal mining communities. The impacts are wide and varied, and the fears about the risks facing workers and the local economy may create barriers to South Africa's energy transition. One of the most challenging issues to address is how to protect workers who may be losing their jobs. Politically, risks to livelihoods may become a political barrier, exacerbated by institutional dynamics and likely resistance from unions, who see an energy transition as a threat to their own existence.

Workshop participants — many of whom were from nationally focused agencies and groups — did not focus as much as interviewees on the local impacts already facing coal areas, highlighting the differences in concerns between local and national stakeholders. This difference is especially visible regarding the environmental legacy of coal, which did not feature strongly in the workshop discussions, but did appear as a key concern for local government, civil society and business representatives in Mpumalanga. It is crucial to rethink the current environmental and mining governance landscape, which has been shown to be inadequate for addressing the social and environmental impacts of mining activities.

An important takeaway is that the potential impacts that need to be mitigated are not only about the environment, employment and regional economic development. There could be significant political implications too. Various voices at the workshop and in Mpumalanga — notably from unions, environmental activists and local officials — warned that if the economic and environmental consequences of moving away from coal are not addressed, they could potentially trigger social destabilization.

So, what is next? A key step in transition planning is to further analyse the risks and vulnerabilities of various people in Mpumalanga, especially workers of the coal sector (including accounting for their skillsets), and local communities that depend on the coal industry. So far, research on energy transitions has prioritized the macro-level impacts of moving away from coal, but a just transition requires, above all, understanding and mitigating local impacts of coal decline. It is essential to design a plan that is context-specific, being realistic about the economic conditions that characterize South Africa. Planning coal transitions requires accounting for structural unemployment, as well as the country's lack of economic growth, deindustrialization of manufacturing, and resource constraints.

The disparity in the discussions taking place at the national and local levels also highlights the need to create further exchange across all levels of governance. There are already policy mechanisms that focus on the future and can support this type of interaction, such as climate adaptation planning, and the provincial meetings in the NPC Pathways for a Just Transitions process. But a response to the scale of the just transition challenge will require national and subnational coordination, which has thus far remained elusive.

Fortunately, South African actors across stakeholder groups explicitly understand the importance of diverse interventions to prepare for a just transition, including both narrow and holistic policies (Green 2018) that address job losses in the context of structural unemployment and low economic growth. The challenge now is to implement them.

## References

- ACTU (2016). *Sharing the Challenges and Opportunities of a Clean Energy Economy: A Just Transition for Coal-Fired Electricity Sector Workers and Communities*. Australian Council of Trade Unions. <https://www.actu.org.au/media/1032953/actu-policy-discussion-paper-a-just-transition-for-coal-fired-electricity-sector-workers-and-communities.pdf>
- Andrews-Speed, P., Ma, G., Shao, B. and Liao, C. (2005). Economic responses to the closure of small-scale coal mines in Chongqing, China. *Resources Policy*, 30(1). 39–54. DOI: 10.1016/j.resourpol.2004.12.002
- AngloAmerican (2016). Kriel makes major breakthrough in land rehabilitation. *AngloAmerican*, 19 October 2016. <https://www.angloamerican.com/about-us/our-stories/kriel-land-rehabilitation-soya>
- Atkinson, G. (2014). *An Exploration of Labour Mobility in Mining and Construction: Who Moves and Why*. National Centre for Vocational Education Research, Adelaide, Australia. [https://www.ncver.edu.au/\\_data/assets/file/0018/9117/exploration-labour-mobility-2703.pdf](https://www.ncver.edu.au/_data/assets/file/0018/9117/exploration-labour-mobility-2703.pdf)
- Baker, L., Newell, P. and Phillips, J. (2014). The political economy of energy transitions: the case of South Africa. *New Political Economy*, 19(6). 791–818. DOI: 10.1080/13563467.2013.849674
- Beresford, A. (2012). Organised labour and the politics of class formation in post-apartheid South Africa. *Review of African Political Economy*, 39(134). 569–89. DOI: 10.1080/03056244.2012.738417
- BFAP (2012). *Evaluating the Impact of Coal Mining on Agriculture in the Delmas, Ogies and Leandra Districts. A Focus on Maize Production*. Bureau for Food and Agricultural Policy. [http://www.bfap.co.za/wp-content/uploads/reports/The%20impact%20of%20coal%20mining%20on%20agriculture%20-%20a%20Pilot%20study%20focus,%20based%20on%20maize%20production%20\(2012\).pdf](http://www.bfap.co.za/wp-content/uploads/reports/The%20impact%20of%20coal%20mining%20on%20agriculture%20-%20a%20Pilot%20study%20focus,%20based%20on%20maize%20production%20(2012).pdf)
- Burton, J., Caetano, T. and McCall, B. (2018). *Coal Transitions in South Africa. Understanding the Implications of a 2oC-Compatible Coal Phase-out Plan for South Africa*. ERC, IDDRI, Climate Strategies. [https://www.iddri.org/sites/default/files/PDF/Publications/Catalogue%20iddri/Rapport/20180609\\_ReportCoal\\_SouthAfrica.pdf](https://www.iddri.org/sites/default/files/PDF/Publications/Catalogue%20iddri/Rapport/20180609_ReportCoal_SouthAfrica.pdf)
- Burton, J. and Winkler, H. (2014). *South Africa's Planned Coal Infrastructure Expansion: Drivers, Dynamics and Impacts on Greenhouse Gas Emissions*. Research Report Series. [http://www.erc.uct.ac.za/sites/default/files/image\\_tool/images/119/Papers-2014/14-Burton-Winkler-Coal\\_expansion.pdf](http://www.erc.uct.ac.za/sites/default/files/image_tool/images/119/Papers-2014/14-Burton-Winkler-Coal_expansion.pdf)
- Caldecott, B., Sartor, O. and Spencer, T. (2017). *Lessons from Previous 'Coal Transitions': High-Level Summary for Decision-Makers*. Climate Strategies and IDDRI, Paris. <https://www.iddri.org/en/publications-and-events/report/lessons-previous-coal-transitions>
- CALS (2016). *The Social and Labour Plan Series: System Design and Trends Analysis*. Centre for Applied Legal Studies, University of the Witwatersrand, Johannesburg
- CALS (2018). *The Social and Labour Plan Series Phase 3: Alternative Models for Mineral-Based Social Benefit*. Centre for Applied Legal Studies, University of the Witwatersrand, Johannesburg. <https://www.wits.ac.za/media/wits-university/faculties-and-schools/commerce-law-and-management/research-entities/cals/documents/programmes/environment/resources/SLP%20Report%203%20For%20Web%2018%20January%202018.pdf>
- Campbell, S. and Coenen, L. (2017). *Transitioning beyond Coal: Lessons from the Structural Renewal of Europe's Old Industrial Regions*. Centre for Climate Economics & Policy, Crawford School of Public Policy, The Australian National University. <https://econpapers.repec.org/paper/eencepwp/1709.htm>
- CER (2017). Challenge of another licence for proposed coal mine in Mpumalanga water source area off to court. *Centre for Environmental Rights*, 30 November 2017. <https://cer.org.za/news/challenge-of-another-licence-for-proposed-coal-mine-in-mpumalanga-water-source-area-off-to-court>
- CER (2018). *Full Disclosure — The Truth about Mining Rehabilitation in South Africa*. Centre for Environmental Rights. <https://fulldisclosure.cer.org.za/>
- Cloete, K. (2018). Op-Ed: Numsa supports a transition from dirty energy to clean renewable energy. *Daily Maverick*, 15 March 2018. <https://www.dailymaverick.co.za/article/2018-03-15-op-ed-numsa-supports-a-transition-from-dirty-energy-to-clean-renewable-energy/>
- Constitutional Court of South Africa (2018). *Case Maledu v. Itereleng Bakgatla Resources (CCT 265/17)*. <http://www.saflii.org/za/cases/ZACC/2018/41.html>
- COSATU (2017a). *A Just Transition to a Low-Carbon and Climate Resilient Economy: COSATU Policy on Climate Change*. Congress of South African Trade Unions. [http://www.sagreenfund.org.za/wordpress/wp-content/uploads/2017/05/Naledi\\_A-just-transition-to-a-climate-resilient-economy.pdf](http://www.sagreenfund.org.za/wordpress/wp-content/uploads/2017/05/Naledi_A-just-transition-to-a-climate-resilient-economy.pdf)
- COSATU (2017b). The decision by Eskom Board to unilaterally close five power stations is a hostile act of provocation against workers and their unions. *Congress of South African Trade Unions*, 13 March 2017. <http://www.cosatu.org.za/show.php?ID=12514/News/numsathtreatens-to-plunge-sa-into-darkness-in-protest-over-eskomplan-20170313.cnt>
- Cosbey, A., Mann, H., Maennling, N., Toledano, P., Geipel, J. and Brauch Dietrich, M. (2016). *Mining a Mirage? Reassessing the Shared-Value Paradigm in Light of the Technological Advances in the Mining Sector*. International Institute for Sustainable Development, Columbia Centre on Sustainable Investment. <http://ccsi.columbia.edu/files/2015/07/mining-a-mirage-CCSI-IISD-EWB-2016.pdf>

- Department of Energy (2015). *Strategic Plan 2015-2020*. Department of Energy, Johannesburg. <http://www.energy.gov.za/files/aboutus/DoE-Strategic-Plan-2015-2020.pdf>
- Department of Environmental Affairs (2011). *National Climate Change Response White Paper*. <https://www.sanbi.org/documents/national-climate-change-response-white-paper/>
- Eskom (2018). *Integrated Report*. Eskom, Johannesburg. <http://www.eskom.co.za/IR2018/Documents/Eskom2018IntegratedReport.pdf>
- Fine, B. and Rustonjee, Z. (1996). *The Political Economy of South Africa: From Minerals-Energy Complex to Industrialization*. Westview Press, Boulder, CO
- Green, F. (2018). *Transition Policy for Climate Change Mitigation: Who, What, Why and How?* Centre for Climate Economics & Policy, Crawford School of Public Policy, Australian National University, Canberra, Australia. <https://coaltransitions.files.wordpress.com/2018/05/transition-policy-for-climate-change-mitigation-2.pdf>
- Hartley, F., Burton, J., Cunliffe, G., Caetano, T., Ntombifuthi, N., Fourie, R. and Chiloane, L. (2018). *Co-Benefits Assessment of the Future Development of Employment in the Power Sector and Skills Needed in South Africa in Collaboration with the CSIR for the Institute for Advanced Sustainability Studies*. Energy Research Centre, University of Cape Town, Cape Town
- High Court of South Africa (2009). *Baleni v Minister of Mineral Resources (434/2009)*. <http://www.saflii.org/za/cases/ZAECMHC/2012/19.pdf>
- Huxham, M., Anwar, M. and Nelson, D. (forthcoming). *Understanding the Impact of a Low Carbon Transition on South Africa*. Climate Policy Initiative
- IEA (2017). *Coal 2017. Analysis and Forecasts to 2022*. Market Report Series. Organisation for Economic Co-operation and Development, and International Energy Agency, Paris
- IndustriALL Global Union (2018). Spanish coal unions win landmark Just Transition deal. *IndustriALL Global Union*, 1 November 2018. <http://www.industriall-union.org/spanish-coal-unions-win-landmark-just-transition-deal>
- Ledger, T. (2016). *The Mining Sector Local Profiles and Impact*. Trade & Industrial Policy Strategies. <http://www.tips.org.za/research-archive/annual-forum-papers/2016/item/3152-the-mining-sector-local-profiles-and-impact>
- Makgetla, N. (2018). Industrial policies for the just transition. Presentation at The End of Coal? The Risks and Opportunities Facing South Africa's Energy Economy, Tshwane, South Africa, 17 September 2018.
- Marais, L. (2013). The impact of mine downscaling on the Free State Goldfields. *Urban Forum*, 24(4). 503–21. DOI: 10.1007/s12132-013-9191-3
- Marais, L., McKenzie, F. H., Deacon, L., Nel, E., van Rooyen, D. and Cloete, J. (2018). The changing nature of mining towns: reflections from Australia, Canada and South Africa. *Land Use Policy*, 76. 779–88. DOI: 10.1016/j.landusepol.2018.03.006
- Marais, L. and Nel, E. (2016). The dangers of growing on gold: lessons for mine downscaling from the Free State Goldfields, South Africa. *Local Economy*, 31(1–2). 282–98. DOI: 10.1177/0269094215621725
- McCarthy, T. S. and Humphries, M. S. (2013). Contamination of the water supply to the town of Carolina, Mpumalanga, January 2012. *South African Journal of Science*, 109(9–10). DOI: 10.1590/sajs.2013/20120112
- McGuire, G. (2003). Managing mine closure risks in developing communities: a case study. Presented at the Mining Risk Management Conference, Indonesia. Kelian Equatorial Mining.
- Mhlongo, S. E. and Amponsah-Dacosta, F. (2016). A review of problems and solutions of abandoned mines in South Africa. *International Journal of Mining, Reclamation and Environment*, 30(4). 279–94. DOI: 10.1080/17480930.2015.1044046
- Minerals Council (2018). *Facts and Figures*. <http://www.mineralscouncil.org.za/downloads/send/18-current/634-facts-and-figures-2017>
- Mpumalanga Department of Economic Development and Tourism (2011). *Mpumalanga Economic Growth & Development Path*. Mpumalanga Department of Economic Development and Tourism, Nelspruit. <http://www.dedtmpumalanga.gov.za/sites/default/files/documents/MEGDPv4.pdf>
- Mpumalanga Provincial Treasury (2015). *Socio-Economic Review and Outlook for Mpumalanga*. Mpumalanga Provincial Treasury, Nelspruit. [http://finance.mpu.gov.za/documents/SERO\\_report\\_of\\_Provincial\\_Treasury.pdf](http://finance.mpu.gov.za/documents/SERO_report_of_Provincial_Treasury.pdf)
- Nedbank (2018). *Annual Exchange Rates*. [https://www.nedbank.co.za/content/dam/nedbank/site-assets/AboutUs/Economics\\_Unit/Forecast\\_and\\_data/Daily\\_Rates/Annual\\_Average\\_Exchange\\_Rates.pdf](https://www.nedbank.co.za/content/dam/nedbank/site-assets/AboutUs/Economics_Unit/Forecast_and_data/Daily_Rates/Annual_Average_Exchange_Rates.pdf)
- Ochieng, G. M., Seanego, E. S. and Nkwonta, O. I. (2010). Impacts of mining on water resources in South Africa: A review. *Scientific Research and Essays*, 5(22). 3351–57.
- Pone, J. D. N., Hein, K. A. A., Stracher, G. B., Annegarn, H. J., Finkleman, R. B., Blake, D. R., McCormack, J. K. and Schroeder, P. (2007). The spontaneous combustion of coal and its by-products in the Witbank and Sasolburg coalfields of South Africa. *International Journal of Coal Geology*, 72. 124–40. DOI: 10.1016/j.coal.2007.01.001
- SACRM (2013). *The South African Coal Roadmap*. South African Coal Roadmap. <http://www.fossilfuel.co.za/initiatives/2013/SACRM-Roadmap.pdf>

- SAHRC (2018). *National Hearing on the Underlying Socio-Economic Challenges of Mining-Affected Communities in South Africa*. South African Human Rights Commission. <https://www.sahrc.org.za/home/21/files/SAHRC%20Mining%20communities%20report%20FINAL.pdf>
- Seeth, A. (2017). Numsa threatens to plunge SA into darkness in protest over Eskom plan. *City Press*, 13 March 2017. <https://city-press.news24.com/News/numsa-threatens-to-plunge-sa-into-darkness-in-protest-over-eskom-plan-20170313>
- Sheldon, P., Junankar, R. and De Rosa Pontell, A. (2018). *The Ruhr or Appalachia? Deciding the Future of Australia's Coal Power Workers and Communities*. Industrial Relations Research Centre, UNSW Business School. [https://me.cfmeu.org.au/sites/me.cfmeu.org.au/files/uploads/Campaign%20Materials/RuhrorAppalachia\\_Report\\_final.pdf](https://me.cfmeu.org.au/sites/me.cfmeu.org.au/files/uploads/Campaign%20Materials/RuhrorAppalachia_Report_final.pdf)
- Shongwe, B. N. (2018). *The Impact of Coal Mining on the Environment and Community Quality of Life: A Case Study Investigation of the Impacts and Conflicts Associated with Coal Mining in the Mpumalanga Province, South Africa*. Thesis. University of Cape Town, Cape Town, South Africa. [https://open.uct.ac.za/bitstream/handle/11427/28127/thesis\\_ebe\\_2018\\_shongwe\\_bonisile\\_nolwando.pdf?sequence=1&isAllowed=y](https://open.uct.ac.za/bitstream/handle/11427/28127/thesis_ebe_2018_shongwe_bonisile_nolwando.pdf?sequence=1&isAllowed=y)
- Slater, D. (2017). Debate on land rehab for future farming comes to the fore as mine closures increase. *Mining Weekly*, 1 September 2017. <http://www.miningweekly.com/print-version/mining-and-agriculture-coexistence-requires-careful-scientific-approach-2017-09-01>
- Stats SA (2016). *Quarterly Labour Force Survey: Q2 2016. Statistical Release P0211*. Statistics South Africa, Pretoria
- Stats SA (2018). *Quarterly Labour Force Survey – QLFS Q1:2018*. Statistics South Africa. <http://www.statssa.gov.za/?p=11139>
- Steyn, G., Burton, J. and Steenkamp, M.- (2016). *Eskom's Financial Crisis and the Viability of Coal-Fired Power in South Africa: Implications for Kusile and the Older Coal-Fired Power Stations*. Meridian Economics, Cape Town, South Africa. <http://www.erc.uct.ac.za/news/eskom%E2%80%99s-financial-crisis-and-viability-coal-fired-power-south-africa-implications-kusile-and>
- Thurlow, J. (2018). Social Accounting Matrix for Mpumalanga, based on Quantec South African standardized industry database (SASID) 2015. Personal communication, 2018.
- TIPS (2016). *Provincial Review 2016: Mpumalanga*. The Real Economy Bulletin. Trade & Industrial Policy Strategies. [https://www.tips.org.za/images/The\\_REB\\_Provincial\\_Review\\_2016\\_Mpumalanga.pdf](https://www.tips.org.za/images/The_REB_Provincial_Review_2016_Mpumalanga.pdf)
- van Seventer, D., Hartley, F., Gabriel, S. and Davies, R. (2016). *A 2012 Social Accounting Matrix (SAM) For South*. Working Paper 2016/26. UNU-WIDER, Helsinki
- Wiseman, J., Campbell, S. and Green, F. (2017). *Prospects for a “Just Transition” Away from Coal-Fired Power Generation in Australia: Learning from the Closure of the Hazelwood Power Station*. CCEP Working Paper, 1708. Crawford School of Public Policy, Centre for Climate Economics and Policy, Melbourne
- Wright, J. G., Calitz, J., Bischof-Niemz, T. and Muchwana, C. (2017). *The Long-Term Viability of Coal for Power Generation in South Africa*. Council for Scientific and Industrial Research (CSIR). [https://www.researchgate.net/publication/324409134\\_The\\_long-term\\_viability\\_of\\_coal\\_for\\_power\\_generation\\_in\\_South\\_Africa](https://www.researchgate.net/publication/324409134_The_long-term_viability_of_coal_for_power_generation_in_South_Africa)

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