

# TOWARDS A JUST ENERGY TRANSITION FRAMEWORK IN THE MINERALS AND ENERGY SECTORS

November 2021

**Discussion Document** 



### **ACRONYMS**

AMD	Acid Mine Drainage	
ccs	Carbon Capture Storage	
CGS	Council for Geoscience	
DFFE	Department of Forestry Fisheries and Environment	
DMRE	Department of Mineral Resources and Energy	
GDP	Gross Domestic Product	
GHG	Greenhouse Gas Emissions	
GP	Gauteng Province	
GW	Gigawatt	
GUMP	Gas Utilization Master Plan	
IEA	International Energy Agency	
IEP	Integrated Energy Plan	
IPCC	Intergovernmental Panel on Climate Change	

IRP	Integrated Resource Plan		
ITUC	International Trade Union Confederation		
JET	Just Energy Transition		
JT	Just Transition		
KPI	Key Performance Indicators		
LNG	Liquified Natural Gas		
MW	Megawatt		
MP	Mpumalanga Province		
NDC	Nationally Determined Contribution		
PCC	Presidential Climate Commission		
PA	Paris Agreement (within the UNFCCC framework)		
SJRP	Sector Jobs Resilience Plans		
UNFCCC	United Nations Framework Convention on Climate Change		



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### **EXECUTIVE SUMMARY**

### **Objective**

DMRE's JET Framework objective is not to revise the current IRP2019 targets, or to produce a new plan outside the IRP2019, but rather to provide a structure to monitor the socio-economic impacts of the transition and to support the decarbonization of the mining and energy sectors in a socially acceptable manner while contributing to the economic development of the country in line with the IRP 2019 targets until 2030.

#### **DMRE's JET vision**

As the custodian of the mining and energy policy, DMRE is mandated to plan, oversee, and implement South Africa's future energy mix, while maximizing the advantages of its rich mineral endowment in an environmentally sustainable manner – this in the context of *the energy transition*.

- In this regard, the DMRE recognises the impacts that climate change is likely to impose on the economy and society, and supports the global energy transition, in line with the country's targets as expressed under the United Nations Framework Convention on Climate Change (UNFCCC) and its Paris Agreement (PA). In this regard, the DMRE recognises the debate on net zero carbon emissions by mid-century, and is fully appreciative of the proposals to limit fossil fuel usage through a well-managed transition framework.
- It also understands that climate change will affect the poorest disproportionately as they do not have adequate resources to adapt.
- Thus, a key Government priority is to ensure that the pending energy transition is also just (i.e., JET). Here, DMRE's primary role is to develop and carefully manage a planned and coordinated process for the portfolios under its direct mandate (mining and energy) and to support all stakeholders (other organs of state, labour, private sector, and civil society) to enable the

transition. The extent of 'justness' will therefore ultimately be determined by consensus amongst all the stakeholders, whilst complying with national policies and regulations, to deliver social justice, and protect the long-term interests of local economies, civil society, state-owned enterprises and the private sector. The transition must strengthen the DMRE's gender equality objectives by creating new opportunities and equal access for youth, women and people leaving with disability.

 On this basis, the objective of the DMREs Just Energy Transition (JET) is to provide a structure to monitor the socio-economic impacts of the transition and to support the decarbonization of the mining and energy sectors in a socially acceptable manner while contributing to the economic development of the country.

#### **JET objectives**

In order to achieve the said JET vision, the following objectives will have to be met:

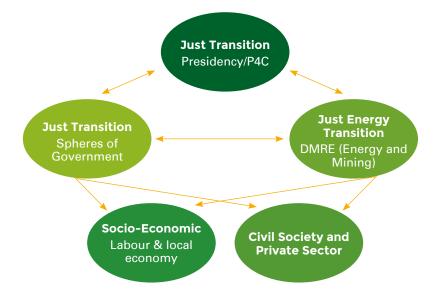
- Establishing a DMRE JET Unit which is appropriately resourced and independent, reporting directly to the DG and Minister.
- Leading the JET (mining and energy sectors) effort to monitor and evaluate
  the socio-economic impacts of the decommissioning of aging and retiring
  coal generation plants and related infrastructure, as detailed in the integrated
  Resource Plan (IRP2019) and the envisioned Integrated Resource Plan (IEP),
  while also being cognizant of broader transition effects across other fossil
  fuel and mineral value chains. This includes ensuring that the environmental
  rehabilitation and best practice social closure processes for energy and
  mineral infrastructure is carried out.
- Developing where necessary the policy instruments and legislation to ensure that the transition is well-planned, just and protects the most vulnerable members of society, especially in regions which have economic dependence on coal mining.

- Coordinate with other departments and other social partners to ensure that minerals and energy value chains are included in potential international investment plans and programming to enable access to international funding and finance for JET in the minerals value chain.
- Managing the decarbonisation process in a manner which not only replaces
  lost work opportunities but promotes economic development, creating new
  and sustainable options, which initially prioritizes the coal regions to mitigate
  the prospect of 'ghost mining towns' but that over time expands its coverage
  to address risks in other key mining and energy sectors.
- Contributing materially towards South Africa achieving its fair share contribution to a climate compatible target that limits warming to 1.5°C, as defined in the Paris Agreement.
- Addressing universal and affordable access to modern energy services through energy pricing rules that consider poor households and through addressing household reliance on fuel burning, noting the gender and health impacts.
- Ensuring electricity supply security and reliability is maintained, through the timely procurement of and investment in new generation capacity by municipalities, private generators, and Eskom and that network investments to improve reliability and connect new capacity are undertaken.
- Assessing existing departmental programmes and funding and iteratively redirecting funding towards supporting transition in the energy and value chains for mitigation, adaptation, and just transition interventions.
- Iteratively and regularly updating the identified KPIs and roadmap to address the next steps in the energy system decarbonization process and associated social and economic consequences as they arise.

#### **DMRE's JET and the broader Just Transition**

The DMRE's development of the Just Energy Framework for coordination of
the transition within the mining and energy sectors, is within the broader Just
Transition Framework as led by The Presidential Climate Commission and
takes into consideration the pieces of work done by various stakeholders. It
also takes into consideration the stakeholder structure that has been laid so
far and seek to leverage on that existing platform as demonstrated by the
schematic representation.

Figure 1: Structural approach for the JT in South Africa



- The importance of a JT to South Africans is deemed of such a magnitude that the NPC concluded that it should not reside within a single ministry as its success requires the application of inter-governmental coordination.
- Simultaneously, the PCC has initiated an inclusive national decarbonization debate, which will be supported by a national JT framework (mid-2022),

- which although independent and an outcome of a different process, will be coordinated with the DMRE's JET framework to ensure governmental alignment.
- Government's decarbonization commitment is demonstrated by Cabinet endorsing the updated, and more ambitious, Nationally Determined Contributions (NDC) emissions targets which together with the recent Cabinet approved Sectoral Emissions Targets (SETs) Framework will successively chart the country's pathway towards net-zero carbon emissions by 2050.
- This ambition is envisaged to be achieved through the implementation of a suite of Policies and Measures that have already been approved, but also supported by others that are still under construction. The draft Climate Change Bill that was also endorsed by Cabinet, to be tabled in Parliament before year end 2021 will also further strengthen the country's response to climate change.
- The efforts by Eskom, in implementing the IRP 2019 plan which decommissions over 11 GW of coal power plants, and the establishment of a JET office, the development of a retirement plan, and the initiated JET Transaction facility will be used as part of the learning tools in the JET development process.
- In addition, there are municipal, provincial, and national processes, for example, the phase one Provincial Strategy on Just Transition (part of the Mpumalanga Climate Change Strategy process); South African Renewable Energy Masterplan; Gas Utilization Masterplan; Green Hydrogen Roadmap.

#### **Risks**

 Coal has a strong history in South Africa and has become the country's biggest mineral export commodity. Its value chain creates tens of thousands of direct, indirect, and induced jobs, especially in the province of Mpumalanga. An abrupt end to coal activities will place workers, their dependents, and local economies at risk.

- Unless appropriate mitigation plans are in place, climate change and the inevitable decline of coal mining will deepen South Africa's three primary challenges of inequality, poverty, and unemployment, and most acutely in mono-industry coal towns.
- While technology advances and falling costs in RE, EE, energy storage and embedded generation are transforming the energy sector, resulting in large scale adoption by the private sector, this has the potential to exacerbate the stability challenges that the country's entire energy system is currently experiencing.
- Similarly, large investments in new fossil fuel plants may become stranded due to financing restrictions and international carbon taxes, creating 'ghost towns', if international climate change policy is accelerated and / or there are rapid technology advances, as mentioned with RE and more recently in nuclear, which will significantly reduce upfront capital costs and build times.

#### Opportunities for alignment and cooperation

- JET implementation can only succeed if it is supported by a well-conceived strategy which maximizes the use of all the mechanisms and technologies available to government.
- In developing and implementing a JET, stakeholder identification and regular and ongoing consultation is crucial. Mapping the landscape to identify role players and affected parties to understand their fears and concerns is thus a core foundational priority of the JET Framework.
- Financing requirements for the JET include for i) mitigation programmes ii) adaptation, and iii) interventions to manage the socio-economic consequences of transition. Alongside investments in decarbonizing the energy sector, there is a strong need for scaling up social inclusion programming for a JET.
- The newly announced Just Energy Transition Partnership (JETP), if well managed and terms clearly understood raises the potential for significant

- financial flows to support a JET, power system decarbonization and economic diversification opportunities.
- DMRE will assess and consider the potential support requirements in the
  minerals and energy value chain for new energy supply projects, worker
  transition, mine closure and rehabilitation, whether such funding can be used
  to support energy access or to protect poor households from price rises.
- South Africa is a resource rich country with an estimated US\$2.5 to US\$3
  trillion non-energy mineral resource base. Thus, the decarbonisation of coal
  mining should be done in a manner that contributes new sectors which will
  present new and sizable opportunities for the coal region and the country.
  Innovations are now prizing new technologies and new minerals which will
  ensure that South Africa can maintain and grow its mining sector.

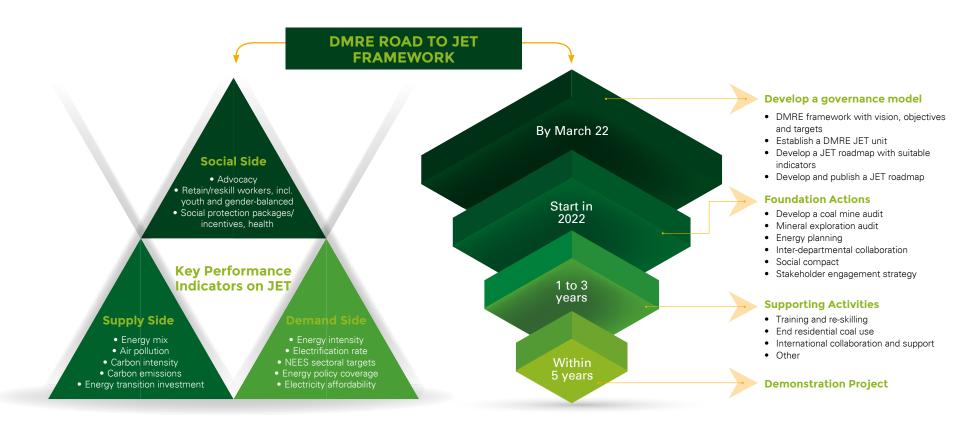
#### Proposed pillars and elements of the framework

- The proposed JET Framework is built under three pillars: planning, implementation and monitoring and evaluation (M&E); each pillar has key elements with specific activities whose implementation will be measured by key performance indicators (KPIs).
- Planning: Enabling a people centric and collaborative transition founded on the principles of inclusivity, openness, and transparency to ensure that noone is left behind.
- Implementation: Harnessing the socio-economic value of mitigation, adaptation, and social inclusion programmes while mitigating/managing the adverse impact the transition may have on the coal value chain.
- Monitoring and Evaluation: The JET framework KPI will consist of three layers: underpinning the approach are energy supply-side indicators; the second layer then focuses on the demand side indicators; and the third, and final layer, seeks to manage local socio-economic factors which, if left unattended, will result in a one-sided and unjust transition.

#### Building blocks of activities to operationalize it

- To support and guide the DMRE's JET pathway a bottom-up approach
  has been developed: firstly, a governance model is developed to facilitate
  the transition; secondly, the DMRE JET activities may commence with
  foundational actions which are based on collected data to develop a
  stakeholder and local economic regeneration strategy; thirdly, broader and
  inclusive longer-term actions can be considered to embed the transition;
  finally, demonstration projects provide an opportunity to demonstrate the
- DMRE's will and ability to implement the roadmap.
- To implement this approach, DMRE will establish a dedicated JET unit that reports directly to the Director General and Minister. The Unit will be tasked to oversee and coordinate all JET activities and programmes as well as ensuring that JT complements traditional energy planning.

Figure 2: DMRE road to JET Framework



- In line with the above schematic representation:
  - Key aspects that the JET unit needs to cover include: (i) define the JET and set decarbonization targets; (ii) formulate simple and straightforward benchmarks to monitor progress; (iii) develop an online and dedicated portal to disseminate information to stakeholders, which also supports transparency and accountability in the use of public resources; (iv) create a stakeholder engagement forum; and (v) conceptualize and develop a JET fund.
  - In parallel, several priority activities have been identified: (i) coal mining and minerals exploration assessments; (ii) a universal energy access strategy; (iii) coal worker skills audit; (iv) identifying new priority industries and maximizing the socio-economic benefit from them; (v) developing an internal coordination mechanisms within DMRE to ensure that the energy transition occurs at the speed and level required to meet DMRE defined objectives, which align with the national targets set by the PCC Framework, NDP and NDC; (vi) developing cooperation agreements with other departments to monitor environmental and socio-economic performance and inform and redirect young South Africans towards new burgeoning energy transition opportunities.





The Department of Mineral Resources and Energy (DMRE) is the custodian of mining and energy sector policy, and as such it is mandated to plan, oversee, and implement South Africa's future energy mix. The DMRE recognises the impacts that climate change is likely to impose on the economy and society and supports the global energy transition in line with the country's targets as expressed under the United Nations Framework Convention on Climate Change (UNFCCC) and its Paris Agreement (PA). In this regard, the DMRE recognises the debate on net zero carbon emissions by mid-century and is fully appreciative of the proposals to limit fossil fuel usage *through a well-managed transition framework*.

To this effect, and guided by its five-year strategic plan, the Annual Performance Plan (APP), and the Integrated Resource Plan (IRP2019), the DMRE is developing a Just Energy Transition (JET) Framework whose main purpose is to support the decarbonization of the minerals and energy sectors (in line with the current IRP2019 targets until 2030) in a socially acceptable manner while contributing to the economic development of the country.

To achieve this overarching purpose, and for the DMRE to contribute meaningfully to the broader national Just Transition (JT) effort will require that it meets several discrete objectives, namely:

- a. Establishing a DMRE JET Unit which is appropriately resourced, reporting directly to the DG and Minister.
- b. Leading the JET (energy and mining sector) effort to monitor and evaluate the socio-economic impacts of the decommissioning of aging and retiring coal generation plants and related infrastructure, as detailed in the integrated Energy Plan (IEP) and Integrated Resource Plan (IRP), while also being cognisant of broader transition effects across other fossil fuel and mineral value chains. This includes ensuring that the environmental rehabilitation and best practice social closure processes for energy and mineral infrastructure is carried out.
- c. Developing where necessary the policy instruments and legislation to ensure that the transition is well-planned, just and protects the most vulnerable members of society, especially in regions which have economic dependence on coal mining.
- d. Coordinate with other departments and other social partners to ensure that energy and minerals value chains are included in potential international investment plans and programming to enable access to international funding and finance for JET in the minerals value chain.
- e. Managing the decarbonisation process in a manner which not only replaces lost work opportunities but promotes economic development, creating new



and sustainable options, which initially prioritises the coal regions to mitigate the prospect of 'ghost mining towns' but that over time expands its coverage to address risks in other key energy and mining sectors.

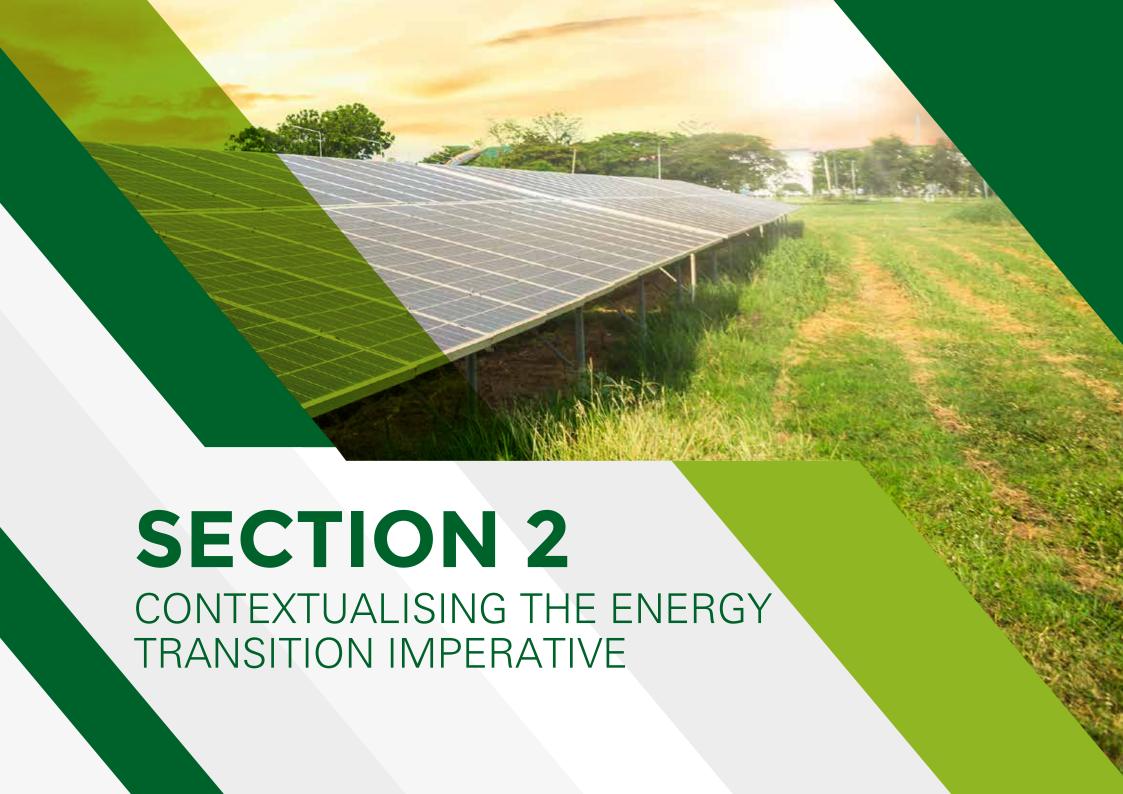
- f. Contributing materially towards South Africa achieving its fair share contribution to a climate compatible target that limits warming to 1.5°C, as defined in the Paris Agreement.
- g. Addressing universal and affordable access to modern energy services through energy pricing rules and social inclusion programmes that consider poor households and through addressing household reliance on fuel burning, noting the gender and health impacts.
- h. Ensuring electricity supply security and reliability is maintained, through the timely procurement of and investment in new generation capacity by municipalities, private generators, and Eskom and that network investments to improve reliability and connect new capacity are undertaken.
- i. Assessing existing departmental programmes and funding and iteratively redirecting funding towards supporting transition in the energy and value chains for mitigation, adaptation, and just transition interventions.
- j. Iteratively and regularly updating the identified KPIs and roadmap to address the next steps in the energy system decarbonisation process and associated social and economic consequences as they arise.

In this regard, this framework does not seek to commit to a fossil fuel phase down design or pathway beyond that implied by existing policy commitments in the IRP, nor dictate the policy position that the country should adopt going forward, but rather seeks to outline the institutional arrangements and the leadership the DMRE will provide, as well as the actions that will be taken to achieve the above stated objectives, actualised through key performance indicators (KPIs). The framework is for all affected stakeholders, most notably directly impacted workers and communities. Key outputs of the JET pathway include:

- a. Outlining the global JET and how this is contextualised for South Africa.
- b. Inclusive stakeholder engagement.
- c. Defining the JET's institutional framework and key performance indicators (KPI), which provides a mechanism that is able to respond to changing dynamics to achieve the overarching objectives.

The framework report is therefore structured as follows: Having defined the DMRE's objectives, Section 2 offers an overview of the national and international JET context by identifying the key drivers and imperatives. Section 3 then contextualises this by providing an overview of the national policy, legislation, and financing options. The structure of the JET framework and detailed KPI to manage implementation is then presented in Chapter 4.





#### 2.1 BACKGROUND

The National Development Plan (NDP2030), which was adopted by Parliament in 2012, guides and frames all policy and planning for the country, up to 2030. Chapter 5 of the NDP–Ensuring Environmental Sustainability and an Equitable Transition to a Low Carbon, Climate Resilient Economy and Society—states that by 2030 South Africa will have transitioned to an environmentally sustainable, climate-resilient, low-carbon economy and just society. This ideal unequivocally commits national policy towards seeking a Just Transition.

This commitment in the NDP recognises the fact that coal has a long history in South Africa, having provided the cheap primary energy needed to industrialise the country, and that it remains an important component of the economy. Not only is coal the main source of electricity production, with its value chain creating tens of thousands of direct indirect and induced jobs, especially in the province of Mpumalanga, but that it has also surpassed gold as the biggest export commodity. More recently, the coal industry has successfully implemented black economic transformation. This 120-year history has created a strong path dependency, and consequently reforming institutional and political arrangements towards decarbonisation become 'sticky', with a sluggish start a likely outcome (Prado, 2009).

While the role of coal in supporting economic development is well documented, the utilization of this commodity has on the other hand come at a high social and environmental cost. Locally, this manifests in high air and water pollution levels leading to premature deaths, health, and social problems; and major environmental degradation affecting marine, land life and alternative sectors such as agriculture. Overall, the environmental, including water, and health impacts of coal mining in South Africa are well-documented (Pone et al. 2007; Ochieng et al. 2010; McCarthy, 2011; Ashton & Dabrowski, 2011; Colvin et al, 2011; BFAP 2012; McCarthy and Humphries 2013; Dabrowksi & de Klerk, 2013; Lebepe et al, 2016; Shongwe 2018; Simpson et al, 2019; Mpumalanga Provincial Government, 2020) and costly (Nkambule & Blignaut, 2017; Naidoo, 2019).

Furthermore, given the global commitment to transition to a low carbon economy, the economical use of coal is beginning to shift towards other sources in the production of especially electricity, albeit at different pace for different countries, given their national circumstances and available alternatives. In South Africa it has been observed that through a combination of higher extraction and maintenance costs from aging coal mines; mandatory rehabilitation and mine closure requirements; and the increased risk of investing in new coal mines where demand in the medium- to long-term is, at best, uncertain, coal prices have risen sharply in recent years, especially for Eskom. Conversely, the costs of alternate energy sources continue to decline. For example, year on year (2019 to 2020) concentrating solar power (CSP) fell by 16%, onshore wind by 13%, offshore wind by 9% and solar PV by 7% (IRENA, 2020). In the US, over the last decade natural gas consumption has outpaced coal primarily on price; and while in 2006, coal generated 50% of the country's electricity and gas 19%, by 2021 the former dropped to 19% and latter increased to 40%, primarily due to pricing. Over the same period, renewables (excluding hydro) went from not being reported to 20% (Freme, 2006) (EIA, 2021).

Most major economies have also seen the contributions of wind and solar rise due to falling costs, including developing countries such as China, India, Mexico, and Brazil (Jones, 2021). Global cost trends have been replicated in South Africa, with price reductions through the various renewable energy bid rounds; since 2011 and 2021, prices have fallen 78% for wind and 91% for solar. In addition, the country will need to consider accelerating research and development to appraise full cost of other technologies in the energy mix such as CCUS, Nuclear, etc. To this effect, a detailed analysis/assessment of the viability/feasibility of small modular reactors as part of retrofitting coal plants should be pursuit.

It is in this context that South Africa as a signatory to the Kyoto Protocol and the multilateral Paris Agreement (PA), has committed to reducing its emissions in line with its domestically set and regularly updated Nationally Determined Contribution (NDC). The country, led by the National Planning Commission (NPC) in 2018 has since 'embarked on a process to deepen the initial work in Chapter 5' of the NDP2030 to define a Just Transition. This took the form of national social partner dialogues, workshops, and bilateral meetings to discuss pathways for a JT with civil society, business, government, labour, communities, and experts. (NPC, 2019). The outcome of this initiative, detailed in Section 3.3, created the foundation for future discussions amongst all affected stakeholders 'to ideally develop a social compact for South Africa's JT.'

#### 2.2 WHAT IS MEANT BY A JUST TRANSITION?

"A just transition is the principle of easing the burden decarbonization poses to those who depend on high-carbon industries." (Eisenberg, 2018)

The concept of a JT was developed in the USA in the 1990s as a programme of support for workers who lost their jobs due to the enactment of environmental protection policies i.e., softening job losses in sectors such as coal and chemicals. Since then, JT has developed into a deliberate effort by unions to plan for and invest in a transition to environmentally and socially sustainable jobs, sectors, and economies. As understanding of the climate change crisis grew, unions aligned JT specifically to action on climate change, inserting the concept into international regimes, including UNFCCC negotiations (Smith, 2017).

In June 2010, the International Trade Union Confederation (ITUC), at its world conference, adopted a resolution on "combating climate change through sustainable development and just transition." JT is thus not only at the core of international labour's solution to dealing with environmental challenges but has become the mainstream narrative for UN Environment, CEDEFOP¹ (an agency of the EU), the OECD, UNFCCC, and has found a place in the UN Sustainable Development Goals (Goals 1, 7, 8 and 13) and was included in the Preamble to the 2015 Paris climate agreement (ILO, 2018). The principle was further solidified by the Solidarity and Just Transition Silesia Declaration adopted by the UNFCCC in 2018 (UNFCCC, 2018).

For the fossil fuel sector, transitioning a deeply embedded supply chain is not straightforward and local context matters, so managing it through a predetermined, or one size fits all, approach would most likely yield an inequitable outcome that would exacerbate South Africa's current socio-economic challenges, or possibly be rejected outright by key stakeholders. Consequently, the International Labour Organization and many local and international institutions, agencies, academia, and consultancies have developed guidelines to assist and guide the development of national masterplans. For example, COSATU published its JT Call to Action in 2012 (COSATU, 2012).

## 2.3 COMPONENTS OF A JUST TRANSITION AND THE EVOLUTION TO A JUST ENERGY TRANSITION

Instructively, the ITUC articulates its 'demands' from a JT (Smith, 2017), which *inter alia* includes: Recognition of the historical contribution of fossil fuel workers to current prosperity and acknowledgment through the provision of income support, retraining, redeployment and secure pensions for older workers; involving workers in the development of sectoral plans; recognition that community renewal requires investment; that social protection and human rights are guaranteed; the adoption of any plan is the outcome of social dialogue, collective bargaining with workers and their unions; and that agreements are public, legally enforceable and its implementation monitored. In the words of Sharan Burrow ITUC General Secretary (2013): "Just transition plans are a first step to generate the confidence that people need for backing structural change."

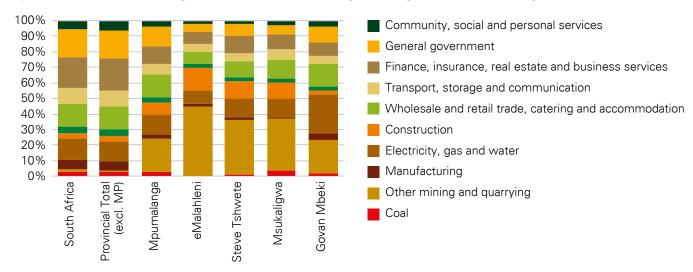
In the power sector, for instance, the IRP sets the country's coal plant retirement schedule; in response to this, Eskom has recognised its responsibility and created an internal JET office which has committed to no forced job losses. However, Eskom is just one part of a large, entrenched value chain that is deeply intertwined with local economies. In Mpumalanga, where more than

<sup>1</sup> European Centre for the Development of Vocational Training

80% of coal is mined, some local and district municipalities depend on coal for upward of a third of value add (Figure 1) and up to 25% of employment (e.g. in

eMalahleni) (Patel, 2020). Thus, the knock-on effects of coal plant closure on economies and societies are not only a DMRE but also a national priority.

Figure 3: Gross value add by sector in South Africa, Mpumalanga, and local municipalities

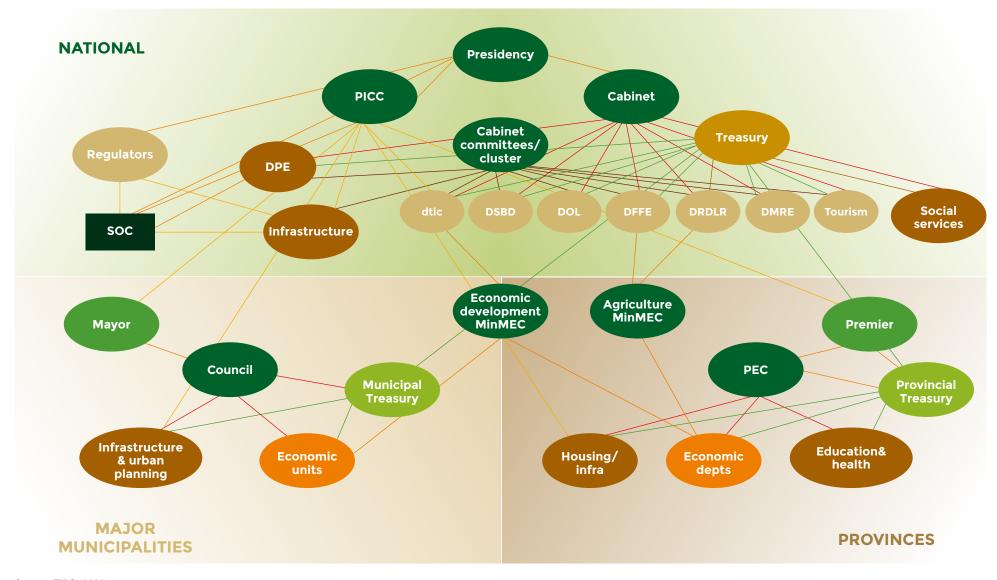


Source: TIPS (2020)

The NPC in developing a vision and pathway adopted a broad approach (to reflect the country's three challenges of unemployment, poverty, and inequality) namely a low carbon, climate resilient economy and society (NPC, 2050 Vision and Pathwaysfor a Just Transition to a low carbon, climate resilient economy and society, 2019). This, and a multitude of additional literature, are all united in the view that any meaningful JT must include mitigation and adaptation; and the cross-cutting nature of this challenge necessitates government alignment

and coordination, supported by labour, civil society, and the private sector. However, as pointed out in the toolbox for policy makers implementing sector jobs resilience plans (SJRP) (TIPS, 2020), functions are divided amongst numerous institutions not only making alignment more difficult, as illustrated in *Figure 2*, but also creating the potential for friction when policy or regulatory implementation results in competing and conflicting priorities.

Figure 4: Sector Job Resilience Plan - Government Functions



Source: TIPS (2020)

Following the publication of the NPC final report, the Presidential *Climate* Commission (*PCC*), a "statutory body formed to coordinate and oversee the just transition towards a low-carbon, inclusive, climate change resilient economy and society", was formed in December 2020 and is chaired by the President. The 22 committee members include affected ministries, unions, civil society, and business. The PCC is developing a national JT framework for the President's and Cabinet's consideration, which is due for release during the first quarter of 2022.

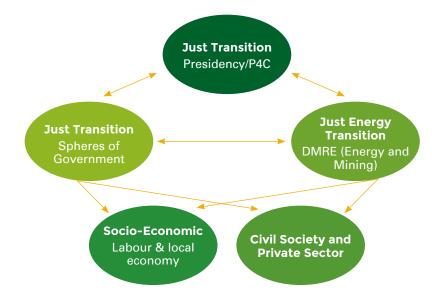
It is with this backdrop and at the realisation of the ongoing and comprehensive work done by other stakeholders - albeit informed by a different policy interest that the DMRE's JET framework is being developed to **provide a structure to monitor the socio-economic impacts of the transition and to support the decarbonization of the minerals and energy sectors in a socially acceptable manner while contributing to the economic development of the country. The framework will seek to align with and support the broader national effort on mitigation and just transition, minimise and mitigate against the social risks inherent in structural transformation, whilst seeking to identify and maximise the opportunities that the change brings.** 

The Government of South Africa, and the DMRE, recognises that climate change will affect the poorest disproportionately as they do not have adequate, and in many cases any resources to adapt. Likewise, the broader economy will, and already is being negatively impacted by climate change and local pollution, for which a transition to a low carbon economy is imperative. While there is some uncertainty regarding the scale of adverse environmental and economic impacts from climate change, as previously mentioned, NT estimates that by 2050 the cumulative cost will be in the order of US\$37billion, or 10% of 2012 GDP.

With mining and energy at the core of DMRE's mandate, it is necessary to balance the competing interests and contribution of each to the national

economy. This is not straightforward given: 1) The enormity and complexity of the challenge of transition; 2) that climate change response falls under the mandate of the Ministry of Environment, while the PCC is providing at the highest level an advisory role on the planning and implementation of a transition that includes future energy pathways, and thus extends beyond the DMRE; and 3) That Just Transitions are multi-faceted and cross-sectoral. Therefore, this approach adopted by the DMRE prioritises its constituency and avoids conflicting approaches with other state organs on matters not directly related to mining and energy. On this basis, South Africa will distinguish between a JT and JET, as shown in the figure below.

Figure 5: Structural approach for JT in South Africa



<sup>2</sup> PCC http://www.thepresidency.gov.za/press-statements/presidential-climate-change-coordinating-commission-appointed

Taking this approach, the DMRE's primary role is to develop and carefully manage a planned and coordinated energy transition process, ensuring that it manages the socio economic impacts of the decarbonisation of the minerals and energy sectors in line with current policies and measures; whose success will

ultimately be determined by consensus amongst all the stakeholders to achieve the objectives of a JET which complies with national policies and regulations, delivers social justice, and protects the long-term interests of local economies, civil society, state-owned enterprises and the private sector.

#### 2.4 INTERNATIONAL PERSPECTIVES AND BEST PRACTICE OF JET IMPLEMENTATION PROGRAMMES

To adequately inform the development of the JET framework a two-part research process was undertaken. The first was an analysis of the experiences from seven coal economies as shown in Table1 below (i.e., Germany, Poland, USA, India, Vietnam, Spain, and Greece). This was then supplemented by interviews and preliminary consultations with key local stakeholders and social partners, to contextualise the international findings, ensure relevance, and gather their views on the JET vision, process and needs. Although this study did not intend to focus solely on zero emitting energy technologies in the energy mix, the research also noted the efforts some G20 countries have put in providing their energy needs through nuclear and renewable energy technologies as something that South Africa could consider as part of the efforts in the transition.

#### 2.4.1 Case Study Analysis

JET is at the forefront of most climate change discussions and has been for some time. Accordingly, it has received significant attention from international agencies, national and local governments, academia, civil society, and the private sector (companies and consultancies). In addition, there is a plethora of detailed and useful literature to support transition actions. Much can be learned about universal key success factors, such as the imperative to include labour (leave no one behind). And although the latter is seemingly obvious and has become a mantra, it is generally agreed that it is not straightforward in practice.

One clear finding from studies is that if not well managed, energy transition can easily result in leaving local communities, workers, and the most vulnerable worse off (Sartor, 2018).

In examining international case studies, the table below lists the countries selected to demonstrate key features of the transition away from coal and the associated impacts. This includes a short explanation as to the criteria that make them appropriate and relevant, followed by a summary below (in bullet points) of the findings. The individual case studies are presented as an Annex.

**Table 1: Case study countries** 

Country	Reason of interest
Germany (39%) <sup>3</sup> Poland (80%) <sup>4</sup> USA (18%)	Countries that combine extensive use of coal as a fuel for power generation with a significant history of coal mining – Aided by national policy, subsidies, or both
India (74%) Vietnam (36%) <sup>5</sup>	Major export markets for SA coal
Spain (<5%) Greece (22% <sup>6</sup> )	Group A country attributes but with a negotiated coal phase down and a transition settlement
Canada, France, Italy, United Kingdom	G20 Countries with Paris-Agreement compliant JET plans that consider the blend of nuclear and renewable energy technologies

Note: The figure in brackets is the percentage of coal or lignite used for electricity generation in 2020

<sup>3</sup> https://www.res4africa.org/2020/09/23/a-just-energy-transition-in-south-africa/ including India and USA

<sup>4</sup> https://www.sciencedirect.com/science/article/pii/S0301421520303578

<sup>5</sup> https://www.iea-coal.org/vietnam-to-rely-on-coal-fired-power-for-future-decades/

<sup>6</sup> https://www.powerengineeringint.com/gas-oil-fired/greece-to-phase-out-lignite-power-generation-by-2023-with-eib-loan/

- Location and local economy: Coal mining is generally developed in isolated areas, concentrated and far from major economic areas, resulting in limited alternative employment opportunities. These regions become overly reliant on coal and any related closures (mining or power plant) have an overly adverse knock-on effect on the local economy. 'Coal ghost towns' abound, which lag socially and economically after mines have closed.
- **Jobs and status:** Coal mining jobs are well paid relative to the skill set required (Pai, 2021). Consequently, they are highly prized as miners are unlikely to find alternate employment without having to retrain and / or take a pay cut. Moreover, mining tends to be generational with long family standing and family identity to coal.
- Labour unions and struggle credentials: Miners, and especially those from the coal industry, have a long association with workers' rights and democratic movements. This provides leverage for government negotiations and public sympathy often resulting in subsidies and decommissioning delays.
- **Delaying the transition costs (a lot) more:** New renewable and gas electricity generation, has for some time, provided a lower levelized cost than new coal in most countries, making most coal operations uneconomical and uncompetitive. This price differential will widen with environmental imperatives and as consumers start driving the transition.
- Private and Development Finance Institutions have increased their social corporate responsibility targets: Consequently, they are unwilling to finance new coal power plants and associated facilities.
- The role of other sources: Countries which share similar natural resource profiles with South Africa, namely high coal reserves with very minimal oil and gas deposits, became highly reliant on coal as a primary energy source. The case studies found, that sectoral decarbonization and reduced local pollution was achieved through a combination of renewable energy and natural gas. A caveat to South Africa is that the countries started transition

- in the 1990's, and with ~2050 net zero emission goals gas infrastructure will either need to be repurposed (for green hydrogen) or abandoned. Transitioning (to the greatest extent possible) directly to renewables arguably provides the greatest cost and environmental returns over the long term under a 1.5 to 2°C scenario, with a carefully planned JET creating jobs in coal regions switching to alternative sources of energy including renewables<sup>7</sup>. Here, the viability of nuclear and the contribution it can make towards South Africa achieving its decarbonization targets should be assessed regularly as technology advances could reduce upfront capital costs and implementation times.
- Where Government policy lags the transition does not stop, it makes it unjust: Financial realities and technology advances in RE, EE energy storage and embedded generation are transforming the power sector, even if they are not supported by appropriate energy policy. Ultimately leading to the real possibility of stranded fossil fuel assets, creating ghost towns.
- South Africa is not Poland (despite the similarities): The two countries share structural, social, and economic policy dynamics which places them at a similar transition point. Furthermore, the two countries have a long coal tradition; concentrated coal regions; strong association between labour movement and democracy; embedded and powerful coal lobbyists and vertically integrated utilities; limited domestic natural gas and oil reserves; strong notion to be energy secure through mineral endowments; coal jobs are prized and well paid, and the economics of coal are declining. Despite these similarities, South Africa has an enormous potential in the non-coal mining sector. In addition to a substantially greater RE potential, achieving the 2°C scenario will create demand for more than 3 billion tons of minerals and metals, which South Africa has many in abundance. Shifting from coal to other mining creates a just transition within the sector.

<sup>7</sup> Solar has greater techno-economic resource suitability than wind for replacing coal mining jobs https://iopscience.iop.org/article/10.1088/1748-9326/ab6c6d

#### 2.4.2 Stakeholder Consultation

In recognising that a JET can only be successful if it reflects the views of all South Africans, DMRE held preliminary consultations with government (three national ministries and the PCC), labour (2 federations), industry (8 including industry associations and the minerals council), civil society (7) and development financial institutions (1). The interviews took the form of a qualitative approach of semi-structured interviews, using pre-set open ended to questions:

- 1. What are your views on the future of the coal industry in SA & globally?
- 2. What do you believe is inevitable and therefore would need to be carefully managed?
- 3. What does a JT mean to you and your organization / members?

- 4. What would you want the DMRE to consider in the development of its roadmap?
- 5. What are the obligations of government, private sector, and labour in the rollout of a JT?

Table 2 is a collection of views from the stakeholder meetings. A rough grading which demonstrates the level of consensus is provided, to allow for differentiation between commonly shared views and ones that have limited support.

Empty = no support; one tick = limited support; two ticks = half the stakeholders share this view; three ticks = most or all.

#### **Table 2: Stakeholder responses**

Stakeholder views / responses to matters pertaining to a JET	Rating
STATUS / DRIVERS	
Globally, climate change is being prioritised with the financial sector responding to pressure to limit and end financing to governments, utilities, and large private sector emitters	<b>///</b>
The coal transition has started, cannot be managed away and cannot be reversed. At best it can be slightly delayed, but this will make the outcomes worse	<b>///</b>
A poorly managed transition will create unnecessary hardship and destabilise coal mining areas i.e., if a plan is not developed by SA then one will be imposed on SA	<b>///</b>
BAU for SA's coal mining and coal generation will not exceed 5 years, after which rapid decline in coal exports, coal generation plants and mines	$\checkmark\checkmark\checkmark$
Conversely, SA's coal mining and coal generation will decline but more moderately due the large coal reserves and the structure of the economy under the MEC	✓
Local communities in coal areas are being adversely affected (health, environment etc) and feel unprotected from a lack of policy and regulation or implementation thereof	<b> </b>
Renewable energy is cheaper than new coal and this will drive investment away from coal	$\checkmark\checkmark\checkmark$
Government (specifically DMRE) understands the issues and is taking appropriate action to manage the transition. There is evident commitment from the DMRE for net zero emissions	

Stakeholder views / responses to matters pertaining to a JET	Rating
RISKS / CONSEQUENCES	
The definition used to quantify jobs lost to a coal transition is too narrow. Figures quoted by the mining sector do not consider the impact of lost obs due power outages, impacts of climate change, and lost economic opportunities due to environmental degradation	<b>///</b>
oss of jobs is being used effectively (manipulated) to maintain status quo	$\checkmark\checkmark\checkmark$
Coal industry has already started shedding jobs	<b>//</b>
nvesting in new coal mining, coal generation plants and transitioning through gas comes with a high risk of stranded assets	<b>//</b>
ligh levels of socio-economic distress, unemployment, GBV, alcohol abuse etc in coal mining regions will be exacerbated if the transition is not ust and orderly	$\checkmark\checkmark\checkmark$
A lack of coal mining policy, compliance with environmental commitments & new coal mining applications still being considered creates expectations and contradicts other messages sent out by government	$\checkmark\checkmark\checkmark$
Power shortages, affordable self-generation will hasten the utility death spiral and impacting the local government funding model the hardest	<b>///</b>
here are too many independent actors and experience has demonstrated that a JT cannot be centrally planned, coordinated, and managed. It nust take the form of targeted initiatives, starting with Mpumalanga	<b>///</b>
Globally and locally coal is no longer competitive for power generation	$\checkmark\checkmark\checkmark$
Coal provides baseload power, without its SA energy intensive economy will suffer	✓
The word transition is inappropriate as it implies a slow, considered process. In reality, it will be abrupt. A failure to respond timeously will be abrupt the country's competitiveness	$\checkmark\checkmark\checkmark$
Unions within the confederation have competing priorities, which must be balanced otherwise the status quo will persist, with the worst possible outcome for labour and the environment. For a plan to be accepted it must have engaged directly with labour	$\checkmark\checkmark\checkmark$
DPPORTUNITIES CONTROLL OF THE PROPERTY OF THE	
ransition to a low carbon economy and exit coal mining before it is forced upon South Africa. Don't waste a good crisis	$\checkmark\checkmark$
mplement an appropriate industrialization plan for Mpumalanga. Including (not limited to) RE generation and manufacturing, green hydrogen, and ther energy services. Agriculture and tourism are also viable options but subject to reversing environmental degradation	<b>///</b>
Grow RE sector to support industry (previous point), stabilise economy (no blackouts) and export excess power to neighbours (as opposed to mporting gas)	<b>///</b>
iming is right to seek and receive international technical assistance, grant funding, finance, and other support – which must be exploited given the hallenges the country is facing	<b>///</b>
xit the Minerals Energy Complex trap which socialises costs and privatises profits	<b>√</b> √
xpand other mining as the demand of certain metals will increase under a net zero context	$\checkmark\checkmark\checkmark$
Vind and solar are the natural endowment South Africa should be harnessing	$\checkmark\checkmark\checkmark$



#### 3.1 DEFINING POLICIES AND MEASURES

South Africa has put in place a well-defined set of mitigation policies and measures. These measures have informed the country's NDC as part of its effort to contribute to the global goal of limiting global temperature increase to well-below 2°C and pursuing efforts towards 1.5°C. Thus, the DMRE's JET Framework is being developed within the bounds of these policies and measure as the framework seeks to mitigate the socio-economic impacts associated with the implementation of current and future energy and climate policy decisions.

The DMRE therefore affirms the view that the JET implementation can only succeed if it is supported by a well-conceived strategy which maximises the use of all the mechanisms available to government. Table 3 below provides a summary of those existing policies and measures which were considered for the JET framework as well as proposed policies and measures for the management of social consequences of the energy and mineral transition:

Table 3: Policies and measures that could support the management of social consequences of the energy and mineral transition

Category	Sub-category	Explanation	Examples
Regulatory Measures	Legislation, plans, strategies, and standards	Measures developed to implement the Constitution or national policy (NDP) & objectives and compliance with international climate commitments (NDC). They will ensure inter-governmental cohesion and collaboration through clear and enforceable directives	Supply side (IRP, IEP, SAREM, GUMP <sup>8</sup> etc)  Demand Side (National Energy Efficiency Strategy)  Mining Mineral exploration audit, coal mine assessment, mine rehabilitation funds
Economic Measures	Tax, allowances, subsidies, offsets, concessional finance	These measures provide economic incentives or disincentives to drive decarbonization	Carbon Tax, 12L tax rebates, carbon credits, tax incentives, mine rehabilitation
Direct Government Actions	Government procurement infrastructure investments	Government prioritises decarbonization and creates investment opportunities (in addition to supportive policy) with targeted investment infrastructure and offtake projects	Green hydrogen, REIPPPP, transition fuels, carbon capture and utilisation/storage. National Treasury policy directives for procurement (EE). REIPPPP dedicated to Mpumalanga Province
Support measures	Voluntary actions, support for research and development	Anchored in stakeholder consultation, and with labour at the centre, this refers to a wide range of actions related to education, capacity, research development and deployment or government support for voluntary actions	Upskilling, training & education to support workers to transition into new economic opportunities for all but focused on towns & labour affected by decarbonization. Data collection e.g., databases of mines and social labour plans. Worker Livelihood Protection Policy and Fund. Promotion of industrialisation of Coal Regions (dtic). Coal Pact between labour, Eskom, Coal companies and Govt
Information programmes and dissemination		Awareness raising programmes explaining why a JET and how labour is at the centre	Public stakeholder engagement, press, social media etc Knowledge exchanges/ study tours

<sup>8</sup> GUMP Gas Utilization Master Plan; IEP Integrated Energy Plan; SAREM South African Renewable Energy Masterplan

### 3.2 CHARTING THE EVOLUTION OF SOUTH AFRICA'S ENERGY TRANSITION POLICY AND DEFINING THE NEXT STEPS

Chapter 5 of the NDP 2030 recognises the country's historic ties to fossil fuels and the inequitable society it has created. It goes on to warn that the key challenge is the way South Africa goes about achieving these objectives, and to avoid taking decisions which lock South Africa into "an unsustainable and

carbon-intensive path (pg. 213)". To achieve a Just Transition, the NDP notes the importance of careful planning and provides a detailed timetable to guide national ministries, state entities, the private sector, labour, and civil society. These are summarised in Table 3 below.

#### Table 4: Proposed phasing to achieve a low carbon, resilient economy – NDP (2012)

#### 2015

- The institutional arrangements identified by the Climate Change Response White Paper have been established, institutionalised, legislated, and staffed appropriately. With implementation processes
- Climate change adaptation and mitigation policy base is developed
- Mitigation commitments have been defined with actions
- Assessing the implications of a limited carbon space between sectors and economic activities through a carbon budget approach, to guide infrastructure spending and develop business plan for appropriate mitigation actions which avoid sunken costs
- Policy and regulation aligned to actualise a just transition

- A carbon tax is in place, with additional instruments to target specific mitigation reductions opportunities aligned to the carbon budget approach
- Climate change mitigation project are under way
- International support for mitigation and adaptation is being accessed
- Climate change issues is coordinated regionally
- Two additional IRPs have been completed inclusive of carbon constraints aligned to the overall mitigation effort and the price of carbon
- Strengthened institutional capacity due to the above

#### 2025

- Carbon budget approach is accepted as a reliable planning took and as such informs policy development and implementation and as such contributing to the country's international commitments
- State capacity has improved, with active and rigorous national skills development
- Climate data collection is informing national policy and regulation

- International financial and technical support at a level which contributes sufficiently to global mitigation activities
- Post-2030 planning, with a strong regional perspective, has commenced
- Energy efficiency is established

#### 2025-2030

- Investments in low carbon and climate resilient infrastructure deliver benefits
- International assistance has been fully exploited
- The transition has prioritised the triple challenge (poverty, inequality, and unemployment)
- National state competency to manage and implement policy, regulation, and support functions
- Carbon budget approach has matured and is aligned with international best practise
- Having acted early, South Africa is well positioned to meet its commitments

Source: (NPC, 2012)

The NPC progressed the JT agenda through a series of social partner dialogues (NPC, 2018) which explored stakeholder perspectives from government, the private sector, the labour movement, and civil society. Having initiated, developed, and agreed the fundamental JT principles with stakeholders the NPC's oversight role was achieved, with the focus shifting to implementation. The importance of a JT to South Africans is deemed of such a magnitude that the NPC concluded that it should not reside within a single ministry as its success requires the application of inter-governmental coordination with access to the policy tools available to each and supported by an adequately resourced technical team and financial support. Since its inception the PCC has successfully initiated an inclusive national decarbonisation debate, which is yielding tangible outcomes. In September 2021, the Cabinet approved the following (DFFE, 2021):

- The Nationally Determined Contribution Target (NDC) for 2025 from the original value of 398-614 Mt CO2-eq, to a range of 398-510 Mt for 2025. More significantly the 2030 mitigation target range has been tightened from 398-614 Mt CO2-eq to a range of 350-420 Mt CO2-eq. The revised targets were based on the recommendation of the PCC (PCC, 2021).
- The Draft Climate Change Bill, South Africa's architecture to manage and combat climate change, was approved and will be table before Parliament for adoption.
- The country's negotiating position at the 26<sup>th</sup> COP negotiations were discussed and agreed, providing the DFFE the time and mandate to prepare and negotiate in a transparent, inclusive, and balanced manner where core issues are prioritised.

The PCC is currently developing a national JT framework, which although independent, and an outcome of a different process, will be coordinated with the DMRE's JET framework to ensure governmental alignment. There are currently several government-led initiatives underway that aim to assess, coordinate, and manage the process of national energy transition. Besides the PCC's national framework process, and specific sectoral or value chain applications of that framework, there are also municipal, provincial, and national processes that inform JT planning, for example, the phase one Provincial Strategy on Just Transition (part of the Mpumalanga Climate Change Strategy process); South African Renewable Energy Masterplan; Gas Utilization Masterplan; Green Hydrogen Roadmap and Eskom's JET project office.

Within this context, the DMRE whilst taking cognisance of these developments, and indeed the primary stakeholder of some, as per Decision 4 of the IRP 2019 calls for coherent policy development in support of the development of a JET framework. As such, in exercising its mandate, the DMRE takes ownership of and will lead South Africa's JET in the context of the broader JT led framework by the PCC. This Framework was informed by several internal research reports, including: a JET scoping report; a study to determine appropriate KPI's for monitoring the impact of IRP2019 transition targets; modelling and scenario planning to assess the socio-economic impacts of the energy transition in the power sector (ongoing); multiple stakeholder engagement and intergovernmental (national, provincial, and local) consultations.

#### 3.3 IDENTIFYING THE MOST APPROPRIATE INTERVENTIONS - A CONSULTATIVE APPROACH

In so far as South Africa can gain valuable insight from international experiences, it is crucial that the JET is context specific. In this regard, stakeholder identification and regular and ongoing consultation is crucial. Mapping the landscape to

identify role players and affected parties to understand their fears and concerns is thus a core foundational priority. Initial work in this regard (*Figure 4*) is very helpful and will form the starting point for the JET unit.

Figure 6: South Africa's Just Transition landscape



Source: CSIR (2021)

#### 3.4 FINANCING THE JET

Climate finance flows in South Africa are estimated at R62.2 bn (\$2.4bn) per year in 2017 and 2018 (Cassim, 2021). Most climate finance has thus far come from the private sector and is concentrated in clean energy investments, while the majority of public finance has come from the South African government itself. Of total flows in 2017/18, only 5% was in the form of grants (primarily for new sectors and domestically funded), and 12% as concessional debt. International donor governments have provided 20% of all public financial flows (i.e., 7% of total climate finance in South Africa), around ~\$300 million. A further ~\$340million in blended finance came from international governments and their agencies investing in South Africa, almost all as concessional debt (96%). In 2018/19, South Africa received \$4.8bn in international climate finance flows, made up of bilateral loans (75%) multilateral loans (14%), bilateral grants (10%), multilateral grants (<1%) ( (RSA, 2020). Overall, the scale of international flows to support climate action will need to increase, as will the quantum of grants and concessional finance.

There is a need to find a common approach on public policy and finance that is oriented toward addressing both the historical injustices and the new risks associated with potential high number of jobs losses in coal mining and coal-powered energy sectors. Financing requirements for the JET include for i) mitigation programmes ii) adaptation, and iii) interventions to manage the socio-economic consequences of transition, i.e., social inclusion programmes (Lowitt, 2021).

Finance needs to enable the achievement of the mitigation portion of the NDC over the period to 2030 are concentrated especially in the power sector (PCC, 2021). Implementation of the IRP will require considerable investment in grid infrastructure and strengthening (Eskom estimates R140bn this decade) (Eskom, 2021) and new generation capacity, while Eskom considers power plant repurposing at sites where plants have reached the end of their lives, as well as full implementation of the NEES. To reach the low end of the NDC range in 2030 (~350 Mt) may imply accelerated implementation of IRP 2019 and even greater investments in new generation capacity by 2030 than currently contemplated, as well as mitigation action in sectors such as transport and industry (PCC, 2021).

Alongside investments in decarbonising the energy sector, there is a strong need for scaling up social inclusion programming for a JET. Here, a national just transition roadmap is under development which is assessing project contributions to key indicators, including: jobs created, new livelihoods created, increased access to services and utilities, skills upgrading, new skills creation, increased income levels at a household level, and increased community asset ownership. In the minerals value chain, funding needs may also need to consider worker transition related funding (focused training especially for the youth, retraining, reskilling, relocation allowances, retirement packages), social protection (notably access to affordable energy), economic diversification, mining rehabilitation and social closure processes and social dialogue (Burton, 2019; Montmasson-Clair, 2021).

One key international support mechanism is the newly announced Just Energy Transition Partnership (JETP). This raises the potential for significant financial flows to support a Just Energy Transition in South Africa through partnership between the South African government and the governments of the UK, EU, US, France, and Germany. The \$8.5bn (R131bn) deal is proposed to in its first phase (3-5 years) support Just Transition, power system decarbonisation and economic diversification opportunities.

The core of the deal is based on South Africa's application to the Climate Investment Funds Accelerating Coal Transition programme, to support Eskom with up to \$500m for coal plant repurposing. South Africa will need to submit an investment plan outlining its needs and plans for JT in the country as part of the process to access the CIFs funding.

The DMRE will assess and consider the potential support requirements in the energy and minerals value chain for new energy supply projects, worker transition, mine closure and rehabilitation, whether such funding can be used to support energy access and whether/how such funding can be used to protect poor households from price rises.

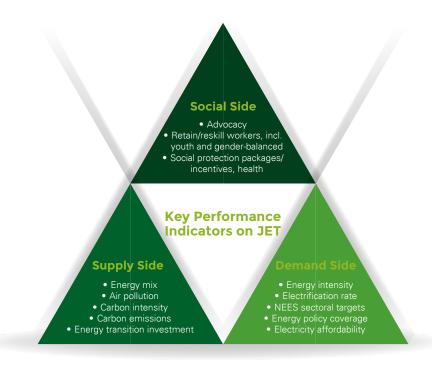


## 4.1 A KEY PERFORMANCE INDICATOR'S FRAMEWORK FOR A JET IN SOUTH AFRICA

Given the pivotal role that energy systems play in modern society, and especially in South Africa's energy- and carbon- intensive economy, they are understandably becoming increasingly more complex. More recently, South Africa's energy system is also being influenced and transformed by global trends and rising per capita incomes, which continue to liberalise and liberate trade and mobility. Simultaneously, environmental, and social concerns, new technologies (green hydrogen, renewable energy, EE, CCUS) and their declining costs, are collectively adding new dimensions. Thus, a local, in line with global developments, an energy transition is certain—regardless of the ultimate and dominant driver—however, it is the scale and pace at which it will occur which remains uncertain, and so it must be managed to ensure its justness.

Within this context, the DMRE developed a JET KPI framework, which groups related KPIs to provide context and to prioritize the implementation efforts of the JET Unit. These JET KPI consists of three layers as illustrated by *Figure 4* below. Firstly, underpinning the approach as base layer, is the collection of energy supply-side transition indicators. The second layer then focuses on the demand-side indicators via energy efficiency (EE). Demand-side management is an integral part of the energy transition, with its own unique attributes; and it is well established within the DMRE through the NEES. Here, both sets of indicators make use of internationally standardised and accepted metrics, thus allowing for straightforward comparisons. Finally, the third and last layer seeks to manage local socio-economic factors which, if left unattended, will result in a one-sided and unjust transition. Here, international experience is useful; but the process must ultimately satisfy local contexts and requirements.

Figure 7: South Africa's KPI framework for a JET



There are considerable concerns about the socio-economic consequences of not managing the energy transition in a manner that is just. The coal value chain includes a considerable number of jobs in power plants (~12 000), mining (~92 000), transport and associated industries. While the effects of decarbonising, the South African economy will cover many sectors, in the short and medium term a focus on the risks facing the minerals value chain is necessary given the planned closures of aging infrastructure. Not only are there direct risks to workers but local municipalities in Mpumalanga are often very dependent on the coal sector, both for employment and economic activity (Patel, 2020).

Four municipalities were identified as vulnerability 'hotspots' through the National Employment Vulnerability Assessment (NEVA). Emalahleni is highly undiversified and relies on coal mining for 44% of total gross value add (GVA) in the municipality. In Steve Tshwete and Msukaligwa, coal accounts for 35% and 33% of total GVA in those municipalities, respectively. In eMalahleni, Steve Tshwete, Msukaligwa and Govan Mbeki, coal employment accounts for 26%, 17%, 14% and 11% respectively (Patel, 2020).

Analysis by different research groups around the risks to the workforce can be built on but will depend on the quality of data that the DMRE can collect. The CSIR, UCT, TIPS, and the NBI have all analysed the employment effects of energy transition, with an emphasis on the power and mining sectors. However, the number of workers impacted is sensitive to assumptions such as how many mine employees are associated with Eskom's plants, mine productivity, life of mines, the performance of Eskom's coal fleet, and the age of retirement. The studies for the most part rely on highly aggregated national data that permits comparisons of the total number of workers affected each decade but needs to be supplemented by plant and mine-specific data. Enhancing the existing socio-economic analyses already undertaken needs to consider the life of mines associated with Eskom's plants, the age of the workers in those mines, and their skills. The pathway for the post-2030 period will also define the quantum of impacts on the workforce.

One key finding is that the IRP trajectory does not result in significant job losses in the mining sector at an aggregate level to 2030 (Makgetla and Patel, 2021; Schers and Burton, forthcoming); however, the closure of specific mines over the decade and the workers who leave the sector before retirement already imply the need for focused JET planning. Furthermore, the sector typically replaces older workers with younger workers, but the gradual reduction in coal demand in the IRP means that these 'new hires' will now look to alternate sectors for employment; this implies the need to already consider economic diversification options in the region to absorb younger workers not entering the

coal mining sector (Schers and Burton, forthcoming). For the purposes of JET planning, more detail on the links between power and mining, the age and skills of the workforce, and the potential risks and opportunities in the export sector thus need to be considered.

While South Africa has made considerable progress on electrification since the end of apartheid, there are still high levels of household use of coal for cooking, space- and water-heating (Nkosi et al 2021). However, this is an under-studied aspect of the JET, with important gender aspects related to the collection, informal commerce, and health impacts of domestic fuel use (Balmer, 2007). The scale, impacts, and strategy for ensuring access to affordable and modern energy services for households that lack these services will be a key focus area for the DMRE's delivery of a JET.

## 4.2 ESTABLISHING A DMRE JET STRATEGIC FRAMEWORK WITHIN THE BROADER NATIONAL JT EFFORTS

The energy transition is underway and while the pace of progression differs depending on a country's national circumstances and developmental position, all countries will face a rapidly changing sector in the coming years. As suggested by the literature, it will soon (if it has not already) reach a point of no return<sup>9</sup>; and how South Africa positions and manages its energy transition will have profound consequences for the economy, now and in the future. This not only will ultimately directly impact the ongoing battle to tame the triple challenges of poverty, inequality, and unemployment, but also have huge potential to either improve or exacerbate these challenges even further.

National public discourse on the JET, which to date has been largely (but not exclusively) led by other parts of government, business, labour, academia, and civil society, is welcomed by the DMRE as a positive outcome, but comes with both opportunities and risks. Whilst it is acknowledged that the current

<sup>9</sup> As explained by Professor Harald Winkler and Dr Andrew Marquard presenting at the Presidential Climate Change Coordinating Committee, 4 June 2021. The UCT advises the DFFE on its climate change policy including the development of the Nationally Determined Contributions (NDC)

just energy transition initiatives emanate from multiple constituencies, each with its own vision and interests; it is equally important to note that if not well coordinated, it might be difficult to effectively measure the national benefit of the transition. It is inevitable that the above-mentioned efforts will continue, which means that failure by the DMRE to act timeously and take a leadership role, will likely result in a less coordinated transition – thus exacerbating the socio-economic risks. In this regard, and no doubt the work done to date has provided a high quality and strong foundation for the DMRE to build upon and get off to a rolling start. The DMRE is therefore now in a position to evaluate available content and select what it deems most useful. This is especially and specifically so in the confluence of energy and mining matters, which both fall under the purview of the DMRE as the policy custodian in the sector.

In taking this task forward, it is useful to note the comments expressed by the Commissioners and experts at the PCC meeting held on June 4, 2021, that resonate with the DMRE's thinking on the JET framework as follows:

- 1. It is in the long-term national interest to respond to climate change appropriately and timeously.
- 2. South Africa must track international developments regarding energy transition. These range from coal exports to uptake rates of electric vehicles, the decommissioning of coal power plants, green hydrogen and other new technologies and finances. All these factors as they directly affect the future of coal mines in South Africa, whether supplying Eskom, exporting or both.
- 3. Given the IRP prioritising the decommissioning of the coal generation plants (most of which are located in Mpumalanga), it is appropriate for JET efforts to focus on the regional economy and local workers. They must undoubtedly have the strongest voice. However, government must recognise intra national equity and that the transition will deliver winners and losers. The high unemployment rate means that benefits must not be forsaken needlessly, on the basis that some may not be achieved in the priority area of Mpumalanga. Here job losses will be experienced, and the JET must prepare for this, like managing them through the JET fund.

- 4. Local ownership (economic empowerment) and local content must continue to be prioritised. This can be achieved, and especially so in Mpumalanga, if long-term policy certainty is provided. This includes ongoing REIPPP rounds, integrating industrial, energy and development policy priorities.
- 5. Government's JT and JET implementation plan must be articulated, and must explicitly state its expectations from labour, the private sector and civil society. Moreover, the implementation plan must be linked to the national ambition, because tipping the scale to achieve national objectives can be achieved through regulations and incentives. Understanding the implications of each, however, is crucial.
- 6. South Africa must reimagine its future industries and workforce. This means visualising and facilitating a shift away from coal mining and coal power plants to sustainable energy, agriculture, and other service industries in Mpumalanga, for example. And the DSI and Department of Basic Education should be consulted in this regard.

#### 4.3 JUST ENERGY TRANSITION INDICATORS

From the outset, the work done by the DMRE to develop a framework to manage and assess the implementation of the energy transition, (one that prioritises those most affected by the transition), was informed by the understanding that it is an iterative process. Therefore, the outcomes of activities and programs developed by DMRE must be evaluated through KPI's and be used to confirm their appropriateness and relevance. So, at this nascent stage, the recommended JET KPI's are structured in two parts: the first, required to recognise the need to align and resource DMRE's internal structure to respond to the JET; thus, the first order of business involves outlining the foundational activities. The second order of business will be to urgently act on defined priority areas. However, the priorities and KPIs will need to be reviewed on an annual basis to ensure relevancy and responsiveness to the changing needs of stakeholders as decarbonisation progresses and the social and economic consequences become clearer.

To give effect to the implementation of the JET framework, the following activities were identified for further action:

# 4.3.1 Creating a dedicated and appropriate institutional structure for the DMRE led JET (Internal Roadmap)

Establishing a dedicated JET unit within the DMRE: To ensure competence, accountability, and wide coordination, DMRE will establish a dedicated JET unit that reports directly to the Director General and Minister. The Unit will be tasked to oversee and coordinate all JET activities and programs as well as ensuring that JT complements energy planning, implementation, monitoring, and evaluation. Traditionally, energy planning would have been driven primarily by economics and, to a certain extent, geopolitics, which made the task somewhat straightforward. With environmental and socio-economic drivers now at the forefront, this is no longer the case – necessitating a realignment within the DMRE and, perhaps other ministries and stakeholders. Managing this process will require comprehensive, integrated, and proactive planning to incorporate all stakeholders' views. Inter-ministerial collaboration is a key success factor; so, the new unit will ensure proper coordination channels with colleagues from, amongst others: the dtic, DFFE, National Treasury, DSI, DPE, Eskom and Mpumalanga provincial and local government.

## 4.3.2 Internal Roadmap

1. Define the JET and set decarbonization targets: Although there are several international definitions, the concept is relatively new in South Africa and common understanding is crucial, especially in so far as mining and energy are concerned. Plotting a roadmap is difficult and will require a carefully negotiated target setting process that is embedded in a position that articulates the desired destination and also provides clarity and policy certainty. For example, the alignment with a 'ratchet mechanism' of the Paris Agreement that requires that successive NDC's show their highest possible ambition and progression on earlier NDCs.

- **2. Gauging progress:** With an overall goal in place, simple and straightforward benchmarks to monitor progress will be formulated. The DMRE will seek to prioritise Mpumalanga in the short-term given the planned closures but will need to extend its JET activities in the medium to long term.
- 3. Visibility and access to information: Feedback from stakeholders has revealed JT and JET to be currently nebulous concepts. An online and dedicated portal should be developed to disseminate information to stakeholders, which also supports transparency and accountability in the use of public resources. The JET message must reach all South Africans and be communicated across multiple channels and languages.
- **4. Create a stakeholder engagement forum:** Whilst recognising that broader stakeholders cannot be involved at all levels of government planning, decisions must be informed by stakeholder views, perspectives and needs.
- 5. Conceptualise and develop a JET fund: The proposed Eskom Just Energy Transition Transaction fund, and the recently announced financial offer at COP26 (Just Energy Transition Partnership) demonstrate that reducing the carbon intensity of the economy will require robust mechanisms for crowding in of financial resources from different channels (private, public, and international). Where public funding is deemed the way forward, a JET fund (or similar structure) can be developed to ensure transparency and accountability in the use of public sources as well as to catalyse concessional funding from the international community.

#### 4.3.3 JET priority activities

1. Coal mining and minerals exploration assessments: This will deliver two broad outcomes. Firstly, the coal assessment will assist the DMRE to undertake scenario analyses of mine lifetimes, economic viability, and the possible impact on miners under different export/global market/pricing scenarios. Concurrently, the minerals audit will provide the data for the DMRE to pursue mining that supports sustainable development and for which the

local and international demand is expected to increase as the world commits to net zero emissions. This will ensure that the mining sector continues to contribute to the economy and jobs, and to meeting minerals exploration targets.

- 2. Oversight: The JET Framework consists of three layers (Figure 4) Energy Supply, Energy Demand and Socio-Economic Equity. Progress in all three of these areas will ultimately determine the effectiveness of South Africa's energy transition. It thus follows that the JET unit must be an active and empowered participant in all three components if they are to ensure and ultimately take responsibility that the energy transition occurs at the speed and level required to meet the current policy objectives (as detailed in Chapter 1). To achieve this the unit must, for example, have direct inputs into the IRP; and the authority to evaluate NEES implementation targets and provide the support needed by the responsible unit to garner inter-ministerial and state agency support.
- **3. Universal energy access:** Developing a strategy to ensure the achievement of universal access to affordable, modern energy services in line with SDG7, to address energy poverty, residential coal, and fuel use (and especially address the health and gender impacts) and ending 'zama zama' activity (individuals illegally searching disused mines for valuable metals or minerals) is particularly important in Mpumalanga, KZN and Limpopo provinces.
- 4. Coal worker skills audit: Identifying new opportunities (considering all forms of energy technologies) for coal workers who do not retire or cannot be absorbed into other mines, is crucial. This requires an understanding of how workers can best be transitioned; with research needed to achieve reliable data on the number, age and skills profiles of current coal workers, and likely quantum of need based on coal mining production scenarios.
- 5. Identify new priority industries and maximise socio-economic value from them: It is imperative to provide national direction on the replacement activities, by identifying and providing support to industries that over time

will displace the economic and work opportunities offered by the sectors that are being displaced. In the energy and minerals sector, this comprises of manufacturing in supply and demand projects, including localisation rules; economic and socio-economic development criteria for new energy areas; 'climate smart' or critical green minerals opportunities as discussed above; green hydrogen; conversion of mining land to post-mining land uses. Research will be required in non-DMRE policy areas such as agriculture, biodiversity, water, and health, so as to achieve service delivery and development benefits. A suitable inter-stakeholder mechanism to ensure that the appropriate policy owners drive the process under their respective mandates is crucial.

- **6. Monitor environmental and socio-economic performance:** In cooperation with DFFE, air pollution levels and water quality standards will be monitored to measure environmental progress. Tracking progress of adaptation, mitigation, and regional integration, is vital to successful ongoing transition.
- 7. Jobs for the future: In cooperation with the DSI and Department of Basic Education, inform and redirect young South Africans towards new burgeoning energy transition opportunities. Many of the JT needs areas are covered by other department mandates and it is recommended that the DMRE assesses their mandate/authority over these key areas.

#### 4.3.4 Developing a transition pathway

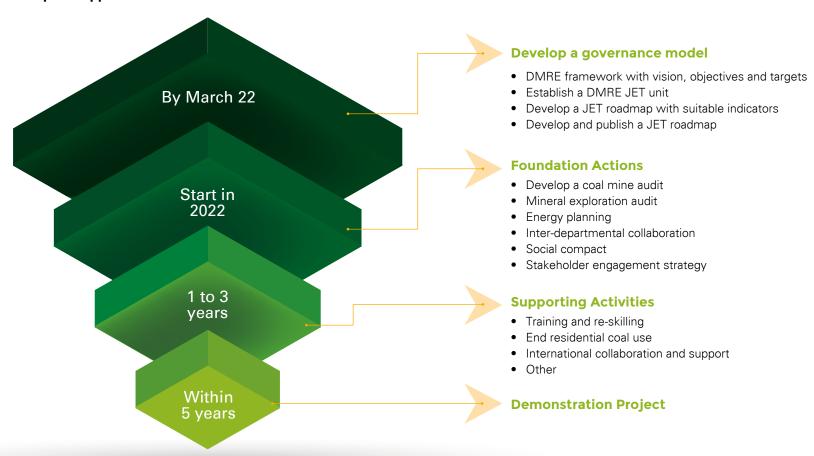
The creation of the JT unit, through the above-mentioned actions, has been used to develop a bottom-up approach to support and guide the DMRE's JET pathway. First and foremost, a governance model is required to facilitate the transition. Secondly, with a robust and adequately resourced structure, the DMRE JET activities may commence with carefully considered foundational actions which are based on collected data to develop a stakeholder and local economic regeneration strategy. Thirdly, broader and inclusive longer-term actions can be considered to embed the transition. Finally, demonstration

projects provide an opportunity to demonstrate the DMRE's will and ability to implement the transition in a balanced manner.

The rest of this chapter proposes a JET approach that the DMRE proposes to implement. The proposed list of activities below, which is not exhaustive or prescriptive provides type of actions that are based on the outcomes of

the endorsed stakeholder consultations during the development of a scoping report. This action list is to be augmented by the feedback received from the current DMRE's formal and direct stakeholder consultations. *Figure 6* provides a graphic representation of the bottom-up approach:

Figure 8: DMRE bottom-up JET approach



Having identified the key priority areas, developed an approach, and completed an evaluation to identify appropriate KPI milestones, *Table 4* prioritises these under foundational activities which are presented first, and so named as they are not deemed to be repetitive. These are then followed by the supply, demand and socioeconomic indicators.

## **4.3.5 Foundational Activities and Key Performance Indicators**

The DMRE will work with key stakeholders to implement over the next five years the following activities, which will be monitored through the identified Key Performance Indicators (as outlined in section 4, Figure 5, and Table 5 below) around social, supply and demand sides:

**Table 5: Key Performance Indicators** 

Foundational Indicators	Objective			
Socio Economic Indicators				
JET Communication plan	Develop an official portal which is regularly updated.			
	Identify (beyond online) communication channels & relevant languages to ensure inclusivity			
Coal mining audit & analysis	To be used for scenario analyses of mine lifetimes & economic viability			
Mineral's audit	Identify minerals of the future			
Coal worker skills audit, salaries etc	Detailed skills partnership audit in partnership with coal mine, salaries, incentives etc			
New industries & jobs of the future	<ul> <li>New industries study to complement skills study (3g) to identify appropriate economic activities for Mpumalanga</li> </ul>			
	Maintain a database of new initiatives being considered by other ministries, state owned agencies & private sector			
	Engage with DSI & Basic Education Ministries about reviewing / redirecting curriculums based on net zero emissions & energy transition mandates			
Review KPI's	Assess JET progress. Assess and expand activities supported by appropriate KPI's			
Energy Transition Indicators (Supply Side)				
Energy Transition Index	International energy transition readiness ranking			
Electricity affordability	Average household electricity tariff (c/kWh)			
Air pollution	Average air pollution levels in most affected towns in MP & Province as a whole			
Carbon intensity	CO2 intensity (kg/GJ TPES)			
Carbon emissions	CO2 emissions (total)			
	CO2 emissions (tonnes/capita)			

Energy transition investment	RE buildout (% of total)		
Energy mix	Share of electricity from RE (%)		
	Share of electricity from coal (%)		
Energy Transition Indicators (Demand Side)			
Energy policy coverage	~ % share of total final energy use subject to mandatory policies & regulations		
Electricity affordability	~ household electricity tariff (c/kWh)		
Electrification rate	~ % electrification of end use sectors (not just residential)		
Energy intensity	Energy intensity (MJ/ GDP)		
NEES sectoral targets	% Energy saving per NEES sectoral targets (compared to base year)		

# Table 6: DMRE Milestones towards achieving a JET

Activities (2021/2022)	Responsibility
Refine and finalise a clear definition of the JET with a framework disseminated to stakeholders for feedback	DMRE with stakeholders
Establish a dedicated JET office within the DMRE with appropriate political mandate, budget, staff, and resources to drive and support in the implementation of the JET strategy	DMRE, Treasury, ESKOM, DFFE, SoEs
Establish a communication platform from which the DMRE can effectively communicate and engage with stakeholders and the public in general regarding the implementation of the JET	DMRE, with stakeholders
Activities (2022/2023)	Responsibility
Supply: Ensure energy transition technologies are being deployed in accordance with national targets and country obligations	
Demand: Assess and accelerate the NEES implementation progress and track energy savings. Coordinate with DFFE to ensure that are captured.	DMRE with stakeholders
Develop a comprehensive verified knowledge database of the coal mining industry in terms of coal worker skills, employee numbers, coal life of mine plans etc.	DMRE with stakeholders
Assess the future planned industrial development within the Mpumalanga and Limpopo provinces that could provide alternative job opportunities for coal industry workers	DMRE with stakeholders
Collaborate with other government agencies to align on and support relevant initiatives driven by e.g., Department of Trade and Industry, Department of Public Enterprises etc.	DMRE with stakeholders
Establish a partnership with the Department of Basic Education to ensure the younger generation are appropriately equipped for jobs that support the lower carbon energy supply of the future	DMRE with stakeholders

Assess the national energy balance exposure to social (e.g., job loss) risks, such as job losses associated with coal-fired power plants decommissioned compared to the number of jobs that can be created in new energy-related industries	DMRE with stakeholders
Engage with the NPC to support consultation with relevant stakeholders on employment opportunities for communities affected by the energy transition, as well as previously marginalized communities.	DMRE with stakeholders
Identify barriers to lower carbon energy uptake such as cultural and awareness impediments	DMRE with stakeholders
Assess existing departmental programmes and funding and progressively re-allocate towards decarbonisation and JET aligned programmes	DMRE with stakeholders
Assess and monitor progress in executing the JET strategy.	DMRE with stakeholders
Activities (2023/2024)	Responsibility
Integrate findings from activities above into energy project development strategy	DMRE with stakeholders
Assess the social impact strategies of companies associated with potential early closures of fossil-fuel derived assets	DMRE with stakeholders
Create and monitor job creation and protection metrics for all energy supply infrastructure	DMRE with stakeholders
Assess the extent of household reliance on coal, the health and gender impacts, and barriers to uptake of modern energy services	DMRE with stakeholders
Identify financing options for household energy access	DMRE with stakeholders
Assess and report (by municipality/district) forthcoming mine closures, including details of available financial provisions, SLPs, rehabilitation and social transition plans of closing mines (to support provincial and municipal preparedness)	DMRE with stakeholders
Explore the viability of allocating new renewable auction rounds in areas at risk of mine closures	DMRE with stakeholders
Activities (2024/2025)	Responsibility
Identify and create competitive frameworks for investment in lower carbon energy development to overlay programmes such as the REIPPPP with a socio-economic development component.	DMRE with stakeholders
Identify and drive investment in infrastructure required to support new industries e.g., manufacturing, transmission and distribution, integration of hydrogen, etc.	DMRE with stakeholders
Assess a potential role for DMRE in a strategy for investing national revenues back into low carbon energy development	DMRE with stakeholders
Share lessons learned with other national governments to identify opportunities for improvement	DMRE with stakeholders
Implement targeted energy access programmes for households that depend on coal	DMRE with stakeholders
Assess available resources in rehabilitation funds and develop a financing model for rehabilitation of abandoned and closing mines (with DFFE SJRP on Working for Mine Rehab)	DMRE with stakeholders

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