



COSATU

JUST TRANSITION

We demand decent jobs

BLUEPRINT FOR WORKERS 2022
SUMMARY DOCUMENT

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Acronyms

AFADWU - Agricultural Food and Allied Democratic Workers Union
BEE – Black Economic Empowerment
BUSA – Business Unity South Africa
COSATU - Congress of South African Trade Unions
CSA – Climate Smart Agriculture
CTL – Coal to Liquids
DMRE – Department of Mineral Resources and Energy
EIUG – Energy-Intensive Users Group
EV – Electric Vehicle
FBE – Free Basic Electricity
GEAR – Growth, Employment, and Redistribution
GHG – Greenhouse Gas
ICE - Internal Combustion Engine
IEJ – Institute for Economic Justice
ILO – International Labour Organisation
IPP – Independent Power Producer
IRP – Integrated Resource Plan
ITF – International Transport Federation
LNG - Liquefied Natural Gas
MACUA – Mining-affected communities united in action
MEC – Mineral energy complex
NALEDI - National Labour and Economic Development Institute
NBI – National Business Initiative
NDC – Nationally Determined Contributions
NDP – National Development Plan
NUM - National Union of Mineworkers
PCC – Presidential Climate Commission, which originated in the Jobs Summit Framework Agreement as the Presidential Climate Change Coordinating Committee
PGM – Platinum Group Metals
PPA – Power Purchase Agreement
PRASA - Passenger Rail Agency of South Africa
RDP – Reconstruction and Development Plan
REIPPP – Renewable Energy Independent Power Producer Programme
RMIPPP – Risk Mitigation Independent Power Producer Programme
SAREM – South African Renewable Energy Masterplan
SARS – South African Revenue Service
SATAWU - South African Transport and Allied Workers Union
SATRI - Sam Tambani Research Institute
SLP - Social and Labour Plan
SSEG – Small-scale embedded generation
UBIG - Universal Basic Income Grants
UNFCCC – United Nations Framework Convention on Climate Change
US – United States

1 Introduction

1.1 CONTEXT

The Confederation of South African Trade Unions (COSATU) has developed this document as a “Just Transition Blueprint for Workers”. The just transition is a concept that aims to address how a transition to a low-carbon and climate-resilient economy can occur in a manner that is fair, just, and inclusive, and places workers and communities at its centre. This document is targeted towards workers who are also part of communities. It thus prioritises the interests of workers and communities which are inherently linked constituencies.

With this project, COSATU seeks to build on the Policy Framework on Climate Change adopted in 2011 that began identifying the broad principles of a just transition for workers. The project has been led by a panel of experts and aims to deliver a policy blueprint and toolkit for the just transition, particularly for workers in energy/mining, transport, and agriculture. This long version of the Blueprint is targeted at the policy unit of COSATU, their affiliates, and other researchers, while the summary document will be targeted at workers and shop stewards. The Blueprint and toolkit includes examples, best practices, and concrete policy proposals and will be used by COSATU and affiliates in negotiations on climate-related policies. The Institute for Economic Justice (IEJ) has conducted the initial research and drafting of this Blueprint.

The transition to a low-carbon economy cannot take place without workers and people at its centre, as they are likely to be most affected by the transition and the impacts of climate change. Despite rhetoric around a just transition to a low-carbon and climate-resilient economy, the unfortunate reality is that the planning and implementation of a just transition has been slow. Accelerating a just transition that centres the needs of workers requires that trade unions have the tools to negotiate for worker demands within bargaining and policy structures. Without these tools, worker and community demands and voices will be side-lined and excluded, resulting in unjust outcomes.

This has resulted in COSATU advocating for a just transition within policy negotiations at the national level. COSATU is also aiming to support and drive the political process and ultimately the delivery of a just transition on the ground. Therefore, the project has two phases. Phase one will produce a Blueprint and toolkit for a just transition in South Africa with a focus on energy and mining, transport, and agriculture. This will be followed by phase two, which will deepen worker engagement and produce detailed, worker-led agreements on key issues. This report has been compiled by the IEJ for the first phase of the project.

1.2 RESEARCH OBJECTIVES AND QUESTIONS

The main objective of this study is to provide workers with tools to navigate negotiations on the just transition at the national (for example, the Presidential Climate Commission (PCC)), sectoral (for example, bargaining councils and Masterplans), and workplace level (for example, firms). The three sectors selected identify the core demands of a just transition for that sector.

In order to achieve this objective, the study responds to the questions posed by COSATU:

1. What is the just transition?
2. Why do workers need to be concerned about a just transition?
3. What is the key demand for the just transition in the mining and energy, transport, and agriculture sector?
4. What are the broad opportunities for workers in the just transition?
5. What are the opportunities for the sectors through the sector value chain?

1.3 RESEARCH METHODS

The methods used in this study have been guided by, and designed in consultation with, the panel of experts and relevant individuals at COSATU and its affiliates. Given the theoretical approach and research questions, a combination of qualitative methods has been used. For more details on how these methods were used to answer the research questions, please see Appendix A. A summary of the methods is as follows:

1. Reference group: panel of experts

As part of the research process, COSATU established a panel of experts that have provided input to ensure the quality of the just transition Blueprint. The panel is composed of the affiliates of COSATU, the COSATU research unit, the National Labour and Economic Development Institute (NALEDI), the Just Transition Centre (an initiative of the International Trade Union Confederation), as well as various pro-worker academics and civil society members. See Appendix B for the full list of experts. The IEJ met with this panel on a monthly basis where they provided input on the research process and outputs. It has also acted as a form of focus group, providing insights on the content of the document and responses to the research questions.

2. Focus groups

Focus groups were conducted predominantly with workers along with some union officials from each of the sectors, as well as a research think tank attached to a union affiliate. The workers and union officials were members of the:

- National Union of Mineworkers (NUM) and the Sam Tambani Research Institute (SATRI) for mining and energy analysis;
- South African Transport and Allied Workers Union (SATAWU) for transport analysis; and
- Agricultural Food and Allied Democratic Workers Union (AFADWU) for agriculture analysis.

The focus groups were set up by COSATU's relevant union affiliates for each sector. Five focus groups were held in the form of learning exchanges. The first focus group was held in Cape Town, Western Cape and included agriculture workers mostly involved in the citrus industry, and coming from Ceres and Citrusdal. The second focus group was held in Bloemfontein, Free State and included agriculture workers involved in vegetable production, livestock, and agri-processing. We held the third focus group in Johannesburg, Gauteng and included workers from the transport sector including aviation, rail, and logistics. The second transport workshop took place in Gqeberha, Eastern Cape and included workers in rail and road freight. The last focus

group for energy and mining was held online due to the COVID-19 third wave and included researchers and union officials.

3. Document and data analysis

The research has also included document and data analysis. These analyses focused on the period between 2009 until the present, covering the period when the just transition and climate change discourses rose to prominence in South Africa. Documentary analysis also included reports and literature on international experience and best practice.

4. Case studies

An in-depth analysis was conducted for each of these three sectors: agriculture, transport, and energy/mining. These sectors were proposed by COSATU as the key sectors requiring transition in order to both mitigate and adapt to climate change. Energy and transport are some of the biggest contributors to South Africa's carbon emissions, while the agriculture sector is extremely vulnerable to the effects of climate change. Given the broadness of these sectors, a criterion was developed to select key sub-sectors within each for the foci of the study. The criteria used to select the sub-sectors were: 1) relevance to COSATU's affiliates; 2) size of sub-sector's contribution to greenhouse gas (GHG) emissions; 3) number of affected jobs; and 4) size of low-income communities reliant on the sub-sector in question.

Based on these criteria, the coal value chain was selected in mining/energy due to coal being the primary energy source in the country; the fact that the value chain employs 120 000 workers; and a large number of communities are dependent on coal and are thus vulnerable in a transition. In the transport sector, the focus is on road transport because it contributes about 90% of GHG emissions in the sector; employs over 1.1 million people across the value chain; and plays an important role in the economies of rural towns. In agriculture, we selected the livestock value chain because it has the highest GHG emissions in the sector; will be severely impacted by climate change due to heat and water stress; and includes major crops in the value chain.

1.4 AN APPROACH WHICH CENTERS WORKERS' PERSPECTIVES

This Blueprint centres the perspectives of workers as a counterweight to the many studies which are being conducted by the government and the private sector. The focus groups were designed to be an engaging learning exchange where the research team could learn from workers about critical workplace concerns and community needs. Information about climate change was shared and workers discussed the impacts of climate change and an unjust transition. Lastly, the learning exchange included a discussion of the demands that workers have for the just transition as well as alternative visions of the future. These sessions were the starting point for the research so that worker's issues would be central to the Blueprint and demands would form the backbone of the recommendations made.

When reflecting on the learning exchange workshops, we found that workers from the transport and agriculture sectors were far less familiar with the issues of climate change than workers in the energy and mining sectors. This is not completely surprising due to the emphasis on the

energy systems in the current just transition debates. However, it means that agriculture and transport workers are less aware of the preparation required for a transition than energy and mining workers. Worker perspectives on a just transition varied across the different learning exchange workshops. Workers in energy and mining expressed concern that South Africa's transition is being greenwashed and will contribute to a new wave of capital accumulation for the wealthy. There was acknowledgement that workers have an important role to play in the current debates over a just transition in order to ensure that it will be transformative. The views of workers are incorporated throughout the Blueprint.

1.5 REPORT STRUCTURE

In Section 2, the Report starts with an outline of COSATU policies on climate change and a vision for the end state of the just transition. Section 2 also provides an overview of the history and debates on the concept of just transition, and explains the impacts of climate change, as well as the impacts of an *unjust* transition for workers. This provides important background to understand why advocacy for an economy-wide just transition by workers is so necessary. Section 3 outlines key characteristics of the South African economy. The section provides an important context and framing for the analysis of the three sectors. Section 4 contains detailed analyses of three key sectors in the economy which are pivotal to a just transition, namely mining and energy, transport, and agriculture. For each of these sectors, a value chain analysis is conducted, the sector's contribution to climate change is discussed, international examples are provided, and proposals are made to inform advocacy by workers at different levels. Section 5 then captures the key cross-cutting proposals for workers to advocate for a just transition as well as strategies to approach this. Section 6 concludes.

2 A just transition for workers

The just transition is a radical concept that can represent a unifying force for social movements in South Africa. Workers have led this movement in the past and can continue to do so now. This section will outline the history of the concept of a just transition and various debates on its definition. It will then discuss the history of COSATU's advocacy on climate change, particularly looking at its 2011 Policy Framework on Climate Change. It will also unpack COSATU's vision for what a transformative and deep just transition must achieve - an eco-socialist future. The impacts of climate change and an unjust transition will then be outlined. Lastly, the need for a systemic change and an economy-wide transition is reiterated.

2.1 HISTORY OF THE JUST TRANSITION

The just transition is a principle and practice that has been widely used to describe the shift away from our current state, to a low-carbon and climate-resilient society and economy. Most importantly, it also describes how this transition should be done. It allows us to clearly plan for the processes and means by which this is achieved. Pursuing a *just* transition attempts to ensure that climate change is not only tackled as a technical problem with technical solutions, but incorporates the voices of those most affected by it. This section will outline the history of the just transition concept, as a worker's movement, and some of the debates about the definition of the term, as well as the COSATU position and the progress made in South Africa.

The concept of a just transition originated in the trade union movement in the United States (US), borne out of struggles to improve worker health and safety in polluting industries during the 1970s. This led to legislation on environmental protections which businesses said would cost them money and reduce jobs. Unions fought against this by arguing that one cannot have a transition without justice; and that it is essential to protect workers, jobs, and the environment simultaneously. Numerous unions in the US and Canada took up this fight by adopting just transition resolutions in the late 1990s. The principle of the just transition then spread around the world. This was largely through the labour movement and global union federations, which saw the principles of the just transition being outlined at an international level by the International Labour Organisation (ILO) in 2015.

During this time, concerns about climate change were growing and there was increasingly a realisation of the need for a change in the structure of our global economy. It was recognised that a shift to a low-carbon economy could have detrimental impacts on many workers and communities who rely on high-emitting industries. Therefore, in 2015, union movements successfully fought for the inclusion of the principle of a just transition into the Paris Agreement¹, which notes the necessity of "Taking into account the imperatives of a just transition of the workforce and the creation of decent work and quality jobs in accordance with nationally defined development priorities".²

¹ The Paris Agreement is an international treaty on climate change adopted in 2015. It includes commitments to climate change mitigation, adaptation, and finance. The goal of the agreement is to limit global warming to well below 2, preferably to 1.5 degrees Celsius, compared to pre-industrial levels.

² UNFCCC. *The Paris Agreement*. United Nations, 2015.
https://unfccc.int/sites/default/files/english_paris_agreement.pdf.

As the term has become increasingly mainstreamed, it has also been adopted by a wide variety of groups. This has resulted in several points of tension and divergence in how it is used. These differences have been summarised by showing how different conceptions vary according to 1) the scope of transition, 2) the depth of transition, and 3) participation and inclusion in the transition.

In terms of the scope and depth of a just transition, definitions range from narrow and superficial to broad and deep. Narrower definitions tend to have a specific focus on protecting workers (and sometimes communities) facing the burden of decarbonisation within fossil fuel industries. Others, however, take a much broader approach, addressing the need for the just transition principles to be applied across the economy and society as a whole. In terms of depth of the transition, some view the transition only affecting a certain level of the economy, restricted to a certain sector or the types of changes required. This applies particularly to energy, which has been a significant area of focus due to its high level of emissions. This transition is generally viewed as requiring a move away from fossil fuel to renewable energy production, often connected to ideas of a transition towards a 'green' economy. On the other end of the spectrum, there are those who advocate for a much deeper and more holistic transition, which ultimately results in the structural transformation of our economies (across sectors and scales) and society. A broader and deeper definition is also a result of the understanding of the climate change problem as caused by capitalism. As the economic system is the cause, it thus necessitates a broad and transformative transition which changes the economic system.

In terms of participation, there are more divergences in practice than in theory. While most, if not all, groupings advocate for inclusive and participatory processes, this is often not borne out in practice. Shallow participation can occur if only workers and no other community members are invited to participate, or if participation consists of only a single workshop with no follow-up or inclusion into a broader process. To achieve meaningful participation, relevant stakeholders must not only participate, but must play a guiding role in how the process is designed and implemented.

2.2 SITUATING A VISION FOR THE END STATE IN THE SOUTH AFRICAN CONTEXT

In the South African context, one can find a similar history and set of debates around the just transition. As in the rest of the world, it was the union movement that brought the term into debates on climate change and popularised its use. This can most clearly be seen with COSATU's Climate Change Policy Framework, a foundational document for action on climate change and the precursor to this Blueprint document. The Framework outlined the impacts of climate change, its causes, the international politics of climate change, possible solutions, and a vision for a future economic and social system (what we call the 'end state' being sought) that centers the working class in a low-carbon and climate-resilient economy. Importantly, it centres capitalism as the cause of the climate crisis, advocates for a holistic and transformative transition, and offers particular components of an end state, captured in its 15 Principles represented in Box 1 below.

Box 1. COSATU Climate Change Policy Principles, 2011

- 1 Capitalist accumulation has been the underlying cause of excessive greenhouse gas emissions, and therefore global warming and climate change.
- 2 A new low-carbon development path is needed which addresses the need for decent jobs and the elimination of unemployment.
- 3 Food insecurity must be urgently addressed.
- 4 All South Africans have the right to clean, safe, and affordable energy.
- 5 All South Africans have the right to clean water.
- 6 We need a massive ramping up of public transport in South Africa.
- 7 The impacts of climate change on health must be understood and dealt with in the context of the demand for universal access to health.
- 8 A just transition to a low-carbon and climate-resilient economy is required.
- 9 We need a carbon budget for South Africa.
- 10 African solidarity is imperative.
- 11 An ambitious legally binding international agreement designed to limit temperature increases to a maximum of 1.5°C is essential as an outcome of the United Nations Framework Convention on Climate Change (UNFCCC) process.
- 12 We reject market mechanisms to reduce carbon emissions.
- 13 Developed countries must pay for their climate debt and the Green Climate Fund must be accountable.
- 14 We need investment in technology, and technology transfers to developing countries must not be fettered by intellectual property rights.
- 15 The South African government's position in the UNFCCC processes must properly represent the interests of the people.

The Framework document argues strongly that the transition should not disadvantage the working classes, or developing countries. Within the COSATU Policy Framework on Climate Change, the just transition means:

“changes that do not disadvantage the working class worldwide, that do not disadvantage developing countries, and where the industrialised countries pay for the damage their development has done to the earth's atmosphere. A just transition provides the opportunity for deeper transformation that includes the redistribution of power and resources towards a more just and equitable social order.”

Discussions held with the panel of experts and worker focus groups for this Blueprint reinforced, clarified, and expanded upon the foundational vision captured in some of the climate change principles in Box 1. These discussions asserted that the just transition is a practice and process, but must also provide a vision for a better future for all that centres justice and equity. This Blueprint therefore adopts the definition of a just transition as a transformative and economy-wide concept which is based on social dialogue, social protection, protection of worker's rights, and importantly job retention and creation. A just transition is not possible without addressing the key social challenges of poverty, inequality, and unemployment in South Africa.

The focus groups with workers revealed similar themes across sectors when discussing a vision for the future. Decent work was a central theme which captures the second principle of the

Framework document (see Box 1). This vision of decent work is something that has long been on the agenda of the labour movement. Workers highlighted the need for a living wage, job security, more jobs to address the unemployment crisis, and a limit to the number of hours which should be worked per week. The desire for decent work is not only driven by income. It was clear in the focus groups that what workers enjoy about work is a feeling of purpose from rendering a service, engaging with people, working with colleagues, seeing the outcomes of good work, contributing to broader society, and having the opportunity to grow and learn. Thus, the vision for the end state should incorporate decent and meaningful work opportunities.

Poverty eradication and equality were central to the vision put forward by workers, which, amongst other consequences, was believed would lead to less crime. This can be closely linked to community empowerment which includes better education, processes of engagement, and a sense of freedom in society. The ideas of well-being, inclusion, skills, and resilience highlighted by the panel of experts can also be tied to this vision of a more socially just society.

Access to resources is an important issue which must be addressed through a just transition, captured in principles three through seven of the Framework (see Box 1). Some ideas that workers had for a vision of the future included accessible, affordable, and clean public transport; a different view of ownership where workers own more resources, particularly land; and a food system which has urban and community gardens and fruit trees available for all. This vision will require redistribution of ownership of key resources such as land, food, and infrastructure.

Lastly, a vision of eco-socialism was expressed by workers during the focus groups, which informed this Blueprint. This is in contrast to the current capitalist economy, referenced in the first principle. It was suggested that the emissions we do release should be used to provide a better life for people, and not for profit. In this way, society will be less polluting, use less fossil fuels and allow for occupational health and safety at work. Furthermore, greed and corruption will not be allowed as companies will be held responsible and accountable for the harm they cause the environment and workers. This eco-socialist vision should also incorporate feminist ideas, which acknowledge unpaid care work and the social reproduction of the labour force by women, challenging the undervaluing of this largely unpaid and unrecognised work.

In terms of targets, COSATU is aligned to the Paris Agreement and the target of net-zero by 2050. However, this is on condition that the just transition creates decent work and there is also social protection available for those who are negatively impacted by the transition. Net-zero 'at all costs' is not supported if inequality and unemployment persist. Therefore, job plans are a fundamental part of a just transition.

What is Eco-Socialism?

Eco-socialism is a radical vision for a better life which can be achieved through the mobilisation of workers and communities. It requires a restructuring of the economy to support people, not profit. Eco-socialism is a system structured around meeting human needs, where everyone can live a healthy and productive life. This includes decent work; clean air and water; and quality and affordable education, housing, and energy. It is not just about land redistribution and a

universal basic income grant, although these may be important components, but about shifting how humans relate to each other and to the environment.³

In this way, it aims to ensure ecological sustainability by rethinking human's relationships to nature. Humans are not separate from nature, but a part of it. Rather than just protecting natural resources, we also need to ensure that they are used for the benefit of all, not just the few. This is a direct challenge to the view of nature as a resource to be conquered and extracted for profits.

Eco-socialism further requires a shift in how humans relate to one another. The capitalist system brings out the worst in people and mainstream economics assumes self-interest and competition. This alternative system entails mutual support, sharing, reciprocity, and cooperation. This form of eco-socialism supersedes previous conceptions of socialism, some of which have been criticised for being insufficiently democratic. A new African eco-socialism can be democratic and participatory.

The key principles of this alternative eco-socialist vision are:

- Economic transformation towards democratic ownership;
- Sustainable worker livelihoods and well-being; and
- A low-carbon and climate-resilient economy.

These principles will be used to shape recommendations and proposals for workers to fight for a just transition in South Africa.

2.3 SITUATING JUST TRANSITION IN THE SOUTH AFRICAN CONTEXT

Since its introduction by the labour movement, the just transition narrative has been widely adopted within South African government structures and forms a key part of its discourse around climate change. This can be seen in all its climate change policies since 2010: The National Climate Change Response Green and then White paper; the first iteration of its Nationally Determined Contributions (NDCs); and most recently the Climate Change Bill which is waiting to be approved this year (2021). The objective of the Climate Change Bill is stated:

“To build the Republic's effective climate change response and the long-term, just transition to a climate-resilient and lower carbon economy and society in the context of an environmentally sustainable development framework; and to provide for matters connected therewith.”⁴

³ Cock, Jacklyn. “The Climate Crisis and a ‘Just Transition’ in South Africa: An Eco-Feminist-Socialist Perspective,” in *The Climate Crisis: South African and Global Democratic Eco-Socialist Alternatives*, ed. Vishwas Satgar (Johannesburg: Wits University Press, 2018).

⁴ Department of Environmental Affairs. *Climate Change Bill*, 2018. https://www.environment.gov.za/sites/default/files/legislations/climatechangebill2018_gn41689.pdf.

In all of the above cases, the term just transition is given little explanation. It is only within Chapter 5 of the National Development Plan (NDP) that the concept is more fully developed.⁵ This section of the NDP outlines key principles for a transition to a low-carbon economy which were developed in consultation with various stakeholders. The principles include the need for a transformative approach that addresses the structural flaws of the economy; global and regional solidarity and integration; ecosystem protection and full cost accounting, which internalises the environmental and social costs of investments; a managed transition that is opportunity-focused, and balances evidence collection with quick action and sound policy-making; and the effective participation of social partners.

In 2018, additional social dialogues were held in order to develop a more detailed plan and vision for South Africa's transition.⁶ This resulted in a vision which outlines that a just transition must have the following key features: it must happen across the economy, and not just in the energy sector; it must be proactively managed and negotiated; political will and the involvement of all social partners is essential; and policy alignment and the mobilisation of resources are required. It also highlights areas of agreement and disagreement between social partners. Some of these include: the level of private sector involvement and influence; the municipalisation of resource control and use; and the continued level of inclusion of fossil fuels in the energy mix into the future. These dialogues also recommended that a PCC should be developed, with a mandate to carry this work forward. In late December 2020, the members of the Commission were announced and have now started their work. Despite not having a very clear mandate, a core part of the Commission's work is to "advise on and facilitate a common understanding of a just transition".

The private sector in South Africa is a more recent adoptee of the just transition language. In a relatively short amount of time they have managed to take up a significant amount of space in the just transition debate. The two key private sector coalitions associations involved include the National Business Initiative (NBI) and Business Unity South Africa (BUSA). Both of these bodies are represented on the PCC, and utilising the services of the Boston Consulting Group, have launched a Just Transitions Pathway project which aims to "unlock and channel both local and international support towards high impact areas while mobilising co-ordinated cross-industry collaboration".⁷

The new involvement by business in this sphere has raised concerns by many in civil society and the labour movement, of greenwashing - the superficial commitment to environmental reform which disguises the deeper ongoing harms to the environment and society - and the dilution of the term's radical potential. Some of the climate change principles in the COSATU Framework document make clear both the implications of the greenwashing by the private sector and the types of actions labour rejects from the private sector. An implication of greenwashing the just transition would be the continuation of capitalist accumulation and a superficial transition which does not address the core cause of the climate crisis, as captured in principle one (see Box 1). The business approach to the just transition, both in South Africa and abroad, has tended to be

⁵ National Planning Commission, *National Development Plan 2030*, 2012. <https://www.gov.za/documents/national-development-plan-2030-our-future-make-it-work>.

⁶ National Planning Commission. *Social Partner Dialogue For A Just Transition*, 2019. <https://oneworldgroup.co.za/wp-content/uploads/2019/10/NPC-JT-Vision-and-Pathways-draft-2-final.pdf>.

⁷ "Launch of the NBI Just Transition Pathways Project | National Business Initiative". *National Business Initiative*, 2021. <https://www.nbi.org.za/launch-of-the-nbi-just-transitions-pathways-project/>.

a more technical exercise, using market-based mechanisms to map out industry shifts and technological developments.⁸ Principle 12 in the Framework document rejects the use of market mechanisms to reduce carbon emissions; while principle 14 rejects the constraints imposed by Intellectual Property Rights in much needed investments in technology, and technology transfers to developing countries (see Box 1).

Importantly, the business approach focuses exclusively on threats and opportunities that businesses face in the transition, which results in a narrow focus on risk management and maintaining profits, thus using the profit incentive as its core justification. This carries the risk that the 'justice' element is seen as additional, as opposed to a core element of the just transition, or that it is limited to shallow conceptions of justice. This is contrary to the spirit of a just transition, where justice is integral and guides the process. If justice is not central to a just transition, inequality and unemployment will continue to grow. The next section will provide a reminder about why a just transition is needed to address climate change by highlighting the impacts of climate change for workers and communities.

2.4 IMPACTS OF CLIMATE CHANGE FOR WORKERS AND COMMUNITIES

The ecological crisis of climate change looms as a threat to livelihoods and well-being. This section highlights why it is vital to address climate change and its underlying cause of capitalist accumulation. The key impacts of climate change are:

- Rising temperatures;
- Water scarcity;
- Increased extreme weather events;
- Number and frequency of pests increases;
- Reduced biodiversity; and
- Sea level rise.

Climate change leads to temperatures rising; precipitation (rainfall) reducing/becoming less predictable; and the distribution of pests and germs carrying diseases changing, and in some cases conditions for them to flourish growing. This impacts crop and livestock production, resulting in food insecurity and reduced productivity in the agricultural sector. Shortages of water will also increase due to climate change. Higher temperatures can contribute to heat stress, which has a number of health risks for humans and animals. Climate change will impact biodiversity, affecting ecosystem services like pollination. Lastly, climate change will lead to sea level rise which can affect infrastructure and livelihoods in coastal areas.

Many of these impacts are already being felt in South Africa. Workers shared experiences of droughts and severe weather events like storms that have resulted in job losses and business closures. In many cases, it is workers who bear the burden of these kinds of events, as business owners are able to claim from insurance and often decide to retrench workers. These impacts will be experienced differently across sectors, and while this Blueprint zooms in on agriculture, transport, and mining/energy, there will be impacts across all sectors of the economy. Therefore, the just transition must be economy-wide.

⁸ David Wei, *Climate and the Just Transition: The Business Case for Action*. (San Francisco: BSR, 2018).

Some of the top climate risks in South Africa affect workers and communities by negatively affecting their health. For example, crop and livestock failures result in food insecurity and inadequate nutrition, as well as a reduction in the viability of the agricultural sector. Increased water insecurity reduces access to sanitation and clean water; and heat stress results in numerous physical symptoms including an increased heart rate, cramps, dizziness, fatigue, nausea, damage to key internal organs, and in the worst case scenario, can lead to death. In addition to this, climate change can lead to increased spread of certain diseases. Climate change is thus a public health issue. These impacts will be experienced by different groups differently, depending on race, class, and gender. Black women face the highest rates of unemployment in South Africa compared to any other group, with a (narrow) unemployment rate of 38.3% while the national unemployment rate is 36.2%.⁹ This can lead to financial dependence on men or social grants. In relation to climate change vulnerability, “low levels of employment, location away from major sources of employment, as well as high susceptibility to unpaid care work are major contributors to vulnerability” faced by women.¹⁰ Therefore, Black women face disproportionately increased risk due to climate change. Figure 1 shows an important table from the COSATU Climate Change Policy Framework which is still relevant in this sense.

Figure 1: Climate change effects on women

Climate change effects: Direct	Examples	Potential effect on women
Increased ocean temperature	Increasing coral bleaching due to heat stress	Jobs: Loss of coral reefs can damage the tourism industry, where women are 46% of the workforce.
Increased drought and water shortage	Morocco 10 years of drought 1984-2000 Northern Kenya 4 severe droughts 1983-2001	Workload: Women and girls in developing countries are often the primary collectors, users and managers of water. Less available water will increase their workloads and jeopardise family livelihoods leads to lower school enrolment for girls, or loss opportunity for women to do income-generating activities.
Increased extreme weather events	Greater intensity and quantity of cyclones, hurricanes, floods, and heat waves	Deaths: A sample of 141 countries over 1981-2002 found that natural disasters (and their subsequent impact) kill more women than men on average or kill women at an earlier age than men.
Climate change effects: Indirect	Examples	Potential effect on women
Decreased crop production	In Ainca, crop production is expected to decline 20-50% in response to extreme conditions	Food: Rural women do half the world's food production, and between 60-80% of the food in most developing countries. In Africa, climate-related crop changes could affect from 48% of women in Burkina Faso, to 73% in the Congo.
Loss of species	By 2050, climate change could result in a species extinction rate from 18-35%	Resilience: Women may often rely on crop diversity to adapt to climatic variability, but permanent temperature change will reduce agro-biodiversity and traditional medicine options, potentially affecting food security and health.
Increased epidemics	Climate variability played a critical role in: <ul style="list-style-type: none"> malaria epidemics in East African highlands Bangladesh cholera outbreaks 	Health and nursing: Women have less access to medical services than men. Their workloads increase when they have to spend more time caring for the sick. Poorer households affected by HIV/AIDS have few resources to adapt to climate change effects. Adopting new ways to produce crops or farm livestock is harder for female-headed and infected households.

Source: COSATU Climate Change Policy Framework, 2011

⁹ Stats SA, *Quarterly Labour Force Survey Q1:2021*, 2021.

http://www.statssa.gov.za/publications/P0211/Presentation%20QLF5%20Q1_2021.pdf

¹⁰ Nokwanda Maseko, *Just transition in South Africa: the case for a gender just approach*, TIPS Policy Brief 4/2021, 2021. <https://www.tips.org.za/policy-briefs/item/4145-just-transition-in-south-africa-the-case-for-a-gender-just-approach>

2.5 IMPACTS OF AN UNJUST TRANSITION FOR WORKERS

According to the Global Change Institute, based at the University of the Witwatersrand, one of the top five risks of climate change is “a badly-handled transition to low-carbon energy”.¹¹ South Africa’s energy generation is dominated by coal-powered electricity. The coal value chain (as will be discussed under Section 4) employs over 120 000 workers and has created indirect support for many communities, particularly in Mpumalanga, where mining and power generation have been concentrated. The transition to a low-carbon energy system holds significant risks for workers, economies, and regions who are dependent on coal if it is not undertaken in a just manner.

The key risk for workers includes retrenchment due to businesses closing and power stations being decommissioned. Unionised workers face the risk of losing their jobs, however, there are different categories of workers which will be affected differently. Contract workers in particular, are at risk as employers do not take responsibility for their ongoing support or for upskilling. The small businesses in these communities will also lose their source of income and livelihoods if this transition is not managed and does not include their perspectives and account for their needs. Support industries such as logistics, railways, port, and shipping companies and their workers, are also put at risk. Job losses in the mining and energy sectors would also potentially mean that the traditionally strong labour movement in South Africa could lose strength in numbers. This could significantly change the political balance in the country.

A further risk of an unjust transition is the loss of value if mining towns become ghost towns and infrastructure from decommissioned coal-fired power plants is left unused. Leaving these assets without rehabilitation or re-purposing would be a significant loss. Unplanned decommissioning could lead to a migration of workers and communities into the nearest urban centres which would be unprepared for the influx and struggle to provide housing and basic services.¹²

An unjust transition represents a lost opportunity to democratise ownership within the energy sector. At present, the transition to renewable energy is being led by the private sector through the Renewable Energy Independent Power Producer Programme (REIPPP). While the REIPPP has included local content requirements, conditions for local development, and even local ownership, these conditions have been often eschewed by private renewable energy companies. Therefore, the socio-economic shift which is vital to a transformative just transition must include plans for public or socially-owned alternative energy sources.¹³ A public entity is mandated to provide a service for all who need it, which means a public entity prioritises access and affordability. Similarly, locally and socially-owned providers will prioritise people’s needs. A private entity, by contrast, prioritises profit even if this means price increases or narrowing provision, often denying access and affordable energy to the impoverished.

¹¹ Global Change Institute. *The Climate Risks we face in the 21st Century*. University of the Witwatersrand for the Daily Maverick, 2021.

¹² Ibid.

¹³ Baker, Lucy and Benjamin K. Sovacool. "The Political Economy of Technological Capabilities and Global Production Networks in South Africa's Wind And Solar Photovoltaic (PV) Industries". *Political Geography* 60 (2017): 1-12.

Although these concerns have been most articulated around the energy transition, it similarly applies to other sectors. For example, in the automotive industry, an unmanaged shift to electric vehicles (EVs) could result in extensive job losses. Most estimates suggest that EVs require fewer jobs to produce and less maintenance and service, and impacts worsen if all parts or assembled vehicles are imported.¹⁴ This could impact many parts of the Eastern Cape where automotive manufacturing is a key employer. There also exists a risk if the automotive sector can no longer export petrol/diesel cars because of reduced demand, also leading to job losses.

Furthermore, an unjust transition will mean the continuation of an unsustainable and exploitative economic system. The current status quo cannot continue. The high rates of poverty, inequality, and unemployment are also a symptom of capitalist accumulation and the just transition presents an opportunity to both address these existing crises and improve sustainability. Therefore, the just transition is vital for the realisation of workers' rights and both social and climate justice. The just transition however, cannot be narrow or shallow, but must be systemic and economy-wide to address these crises.

2.6 THE NEED FOR SYSTEMIC CHANGE AND AN ECONOMY-WIDE JUST TRANSITION

The COSATU Climate Change Policy Framework outlined the impacts and causes of climate change in great detail. The document also outlined climate change principles that must guide a transformational agenda for a just transition and a better future that centres workers and affected communities. An important principle in the discussion on the causes of climate change is the fact that it is not simply a 'human' issue, but rather relates to the economic system of capitalism. This means that while humans do breathe out carbon dioxide, which is a GHG, the high levels of GHGs in the atmosphere have been created due to capitalist accumulation based on the extraction and burning of fossil fuels. Capitalism has caused climate change, as well as other types of ecological degradation, including air pollution and ecosystem destruction. As stated in the COSATU Climate Change Policy Framework:

“COSATU recognises that the fundamental cause of the climate crisis is the expansionist logic of the capitalist system. Capitalism is a system that constantly seeks to expand production by the cheapest means possible. This means that it depends on the exploitation of workers around the world as well as the depletion of the natural resource base of the planet. What is produced is very often not really needed by people, but becomes desirable through advertising and marketing. It is also a system that creates massive waste – either in the form of production that exceeds demand, or in the form of goods that are bought but thrown away.”

Therefore, in order to address climate change, it is necessary to tackle capitalism. An eco-socialist future represents an alternative to capitalism and a significant systems change. What has happened so far in the response to climate change is that policy has focused on technical solutions to the increased amounts of carbon dioxide in the atmosphere. However, technical fixes which reduce carbon emissions incrementally will not be enough on their own to prevent disastrous climate change impacts. The impacts of climate change are already being experienced in the form of droughts, heat waves, and more intense storms across the world.

¹⁴UAW Research Department, *Taking the High Road: Strategies for a Fair EV Future*, 2019. <https://uaw.org/wp-content/uploads/2019/07/190416-EV-White-Paper-REVISED-January-2020-Final.pdf>

If the just transition will aim for an eco-socialist future and dramatic systemic change to achieve this, the entire economy will be affected. The economy-wide just transition is also influenced by the interconnections between sectors. For the purposes of this Blueprint, three priority sectors were selected based on their contribution to emissions and their vulnerability to climate change. However, a systemic change of this nature will impact all sectors and all levels of the economy.

Not only will all sectors be affected, but the way value chains operate and the linkages between sectors will also change. For example, the agriculture, mining, and energy sectors all rely on transport as fundamental to their value chains. In the transport sector, there is a need to reduce the distances travelled in order to reduce carbon emissions. This means shortening supply chains and localising industry which would affect almost all value chains.

Furthermore, as we shift towards an eco-socialist vision of the future, sectors which have been large employers will no longer be the priority in the economy and new jobs must be created. The One Million Climate Jobs initiative identifies opportunities for employment in various low-carbon sectors including electricity and renewable energy, transport, construction and repairs, agriculture, waste, industry, and education.¹⁵ A further category of jobs which we argue is vital for an eco-socialist future are jobs in the care economy. Care work goes beyond doing health-related work. Broadly defined, it includes any work that involves looking after the “physical, psychological, emotional and developmental needs of one or more other people”, and can even include care for the environment through jobs such as environmental rehabilitation and restoration.¹⁶ Care work has traditionally been under-valued and under- or unpaid, despite being a fundamental part of the economy. Women have largely carried the burden of unpaid care work, vital to the reproduction of labour, such as, cooking, cleaning, childcare, and care for the elderly or the sick. Therefore, care work must form an essential part of any society and economy that values well-being, solidarity, and people’s development.

Systemic change can be a daunting task, but we have to start somewhere. In line with this idea of breaking down the problem, this Blueprint has selected three key economic sectors which are particularly relevant to a just transition because of their contributions to climate change and their vulnerability to the impacts of climate change. These will be discussed in section 4. However, before we can discuss each sector in detail, it is important to understand the state of the South African economy at present and the key characteristics which have been historically defined.

¹⁵ Brian Ashley, Dick Forslund, Thembeke Majali, Lucia Winkler, Jonathan Neale (editor), Jeff Rudin and Sandra van Niekerk, *One Million Climate Jobs: Moving South Africa forward on a Low-carbon, wage-led and sustainable path*, AIDC, 2016. <https://energy-democracy.net/one-million-climate-jobs-campaign/>

¹⁶ "Care Work". *European Institute for Gender Equality*, 2021. <https://eige.europa.eu/thesaurus/terms/1059>.

3 Key characteristics of the South African political economy

This section will highlight three characteristics of South Africa's political economy in order to frame the sector-specific sections. The mining and energy, transport, and agriculture sectors have all been shaped by the energy intensive, fossil fuel-based economy, the spatial dislocation of the economy and populace based on historic and present policy, and the economic policy which has guided the trajectory of social and economic policy since 1994. These characteristics are entrenched and must be challenged in order to achieve a just transition.

South Africa's economy is in a desperate position. Prior to the COVID-19 pandemic, the economy had experienced two quarters of recession, where the economy did not grow. Thereafter, the COVID-19 pandemic and strict lockdowns plunged the economy further into crisis. The economy contracted by 7% and 1.4 million jobs were lost in 2020. In the second quarter of 2021, the unemployment rate reached the record level of 34.4% (expanded definition is 44.4%).¹⁷ Since the onset of the pandemic, levels of hunger have increased and remain high despite positive economic growth in the first quarter of 2021.¹⁸ The implementation of lockdown Level 4 in July 2021 once again restricted economic activity and is impacting the economic recovery. Political unrest, which spread throughout KwaZulu Natal and Gauteng in mid-July 2021, has also affected food supply chains. These issues are caused by, and contribute to, the severity of the economic and social crises in South Africa.

During the focus groups, workers reflected on their lived experiences of these crises. In the workplace, job insecurity was among the key issues raised, caused by retrenchments and contracts which are not understood and pay too little. Further issues included a lack of opportunities for skills development, working long hours, lack of benefits, poor leadership, low wages, poor health and safety, mistreatment by managers, and increased outsourcing. These working conditions are not conducive to well-being and show that the struggle for decent work is as important as ever. Furthermore, issues faced in communities where workers live include high levels of unemployment which leads to crime, violence, and substance-abuse. A lack of basic services, infrastructure, and power supply due to load shedding makes life harder for workers.

3.1 AN ECONOMY BASED ON FOSSIL FUELS

South Africa's economy has been shaped by the Minerals-Energy Complex (MEC), which still dominates. The MEC is a system of capital accumulation based on the alignment of political and economic vested interests within the mining, energy, and related sectors that has been fundamental to the structure of the South African economy¹⁹ and have shaped the exploitation of labour, nature, and reproductive labour (see Box 2).

¹⁷ Stats SA. *Quarterly Labour Force Survey, Quarter 2: 2021*.

¹⁸ Nic Spaull and Reza Daniels, *NIDS-CRAM Wave 4 Synthesis Report*, 2021. <https://cramsurvey.org/wp-content/uploads/2021/05/1.-Spaull-N.-Daniels-R.-C-et-al.-2021-NIDS-CRAM-Wave-4-Synthesis-Report..pdf>

¹⁹ Ben Fine and Zavareh Rustomjee, *The Political Economy Of South Africa: From Minerals-energy Complex To Industrialisation* (London: C. Hurst and Co., 1996).

Box 2: How the MEC shaped the exploitation of labour, nature, and reproductive labour

With the discovery of gold in South Africa in the late 19th century, there was a massive push by the settlers to mine the gold for profit. In order to do so, they required large amounts of labour and energy. In order to force Black men to work on the mines, land dispossession alongside a tax system was instituted which meant people were forced to work in order to pay their taxes in cash, where otherwise they were outside the monetary system. At the same time, mining companies were able to pay a lower wage due to the subsidisation of the reproduction of labour by the 'family' in the former 'homelands'. Black women's unpaid care work and a meagre income from subsistence farming allowed for the cheap labour that supported the mining sector. This system led to the establishment of a migrant labour system.

Source: Harold Wolpe, "Capitalism and cheap labour-power in South Africa: from segregation to Apartheid", 1972.

The MEC has several key features that have an impact on employment, the environment, and access to clean and affordable energy – all issues which directly affect workers. First, the MEC can be empirically identified as an industrial structure that consists of a set of core sectors in mining, energy, and related industries with strong interlinkages that operate in relative isolation of non-MEC sectors, particularly labour-intensive manufacturing consumer goods. These sectors dominate the economy's industrial structure as they have made up between 50% and 62% of total manufacturing output since the 1970s.

Second, the MEC's industrial structure is capital-intensive heavy industries (i.e. employs more machinery than workers) that have limited labour absorption. This industrial structure not only explains the high levels of monopoly-type concentration levels characteristic of the South African economy, but also, in part, explains the structural unemployment that persists in the South African economy.

Third, we argue that the MEC is also based on the exploitation of labour and nature, and the devaluing of reproductive labour. The MEC has exploited workers through low wages and provided limited job creation due to its capital-intensiveness. It has also created pollution due to extractive industries which affects the health of workers and their families. Lastly, it has created a system where the costs of pollution and low wages have fallen on workers and their families. The low wages were only possible due to the unpaid care work carried out in the home (most commonly women). The failure to cover these costs within the cost of energy contributes to the cheap access to energy for the energy-intensive users in the economy. The ability to produce cheap electricity based on the exploitation of labour, and abundant coal reserves, and an industrial structure composed of high intensive energy users has created a uniquely energy-intensive economy.

Fourth, the MEC has seen an entrenchment of the interests of large mining conglomerates, the corresponding industrial holding companies, and related financial institutions, and the industry-specific companies to which they gave rise after unbundling. The dominance of the MEC and the interests attached to it have meant that South Africa's economy is heavily dependent on fossil fuels.

Mining and energy represent the largest emitting sectors in the South African economy. Eskom remains the single biggest emitter in South Africa, closely followed by Sasol with approximately 80% of our emissions coming from energy production. It is also important to understand who is benefiting from that electricity. The Energy Intensive Users Group (EIUG) is a group of 29 companies, who use up over 40% of South Africa's electricity. This group has historically benefitted from special agreements and extremely low electricity costs, owing to the linked political and economic interests within the MEC.²⁰ On the other end of the spectrum are the coal mining companies who sell their coal to Eskom, dominated by five major companies who produce 85% of the country's coal.²¹ Recent findings have shown Eskom loses billions in its coal contracts due to varying prices of coal of the same grade from different companies which are extremely lucrative for the coal mining companies.²² Several of these companies are also headquartered in the Global North, which has allowed for their profits to be enjoyed elsewhere.

Together, the high costs paid to coal mining companies by Eskom and therefore the public, and the low costs paid by large firms in the EIUG mean that it is citizens and consumers (workers) who essentially cross-subsidise the cost of electricity and who bear the financial burden of the MEC.

This is true both from the perspective of production and consumption. Emissions are overwhelmingly produced by high-income earners, both across the globe and in South Africa.²³ Data from the Emissions Inequality Dashboard shows that while 50% of people in South Africa who earned the least income were responsible for only 11% of cumulative emissions, the top 10% accounted for a whopping 54%.²⁴

This shows that the causes of climate change and high carbon emissions are not only a question of failures in technology, but are deeply rooted within the history and political economy of South Africa and the world. The high emissions of the EIUG, Eskom, Sasol, and the coal mining companies have disproportionately benefited the elite, both in South Africa and globally. These elites have made a fortune on South Africa's natural and mineral resources, while exploiting the productive and reproductive labour of Black people and their consumption.

South Africa has recently updated the Nationally Determined Contribution (NDC) which includes adaptation support and mitigation targets – specifically the target range for overall GHG emissions in 2025 and 2030 in line with our commitment to the Paris Agreement. However, the proposed target range is argued by most civil society organisations to be too high and not a 'fair share' contribution to limit global temperature increases to 1.5°C. The NDC has committed to a target of 398-510 Mt CO₂-eq between 2021 and 2025, and a target of 350-420 Mt CO₂-eq

²⁰ Jonas Mosia, *Should Energy Intensive Users have such a large say in Energy Discourse?* <https://hsf.org.za/publications/focus/focus-64/JMosia64.pdf>

²¹ Department of Mineral Resources and Energy, *Coal Reserves*, 2021. http://www.energy.gov.za/files/coal_frame.html

²² Sabelo Skiti, "Eskom Loses Billions On Coal Contracts". *The Mail & Guardian*, 2021. <https://mg.co.za/article/2019-04-05-00-eskom-loses-billions-on-coal-contracts/>.

²³ Oxfam, *Confronting Carbon Inequality report*, 2020. <https://oxfamilibrary.openrepository.com/bitstream/handle/10546/621052/mb-confronting-carbon-inequality-210920-en.pdf>

²⁴ Sivan Kartha, *Emissions Inequality Dashboard*, 2020. <https://www.sei.org/projects-and-tools/tools/emissions-inequality-dashboard/>

between 2026 and 2030.²⁵ This process will be followed by the establishment of Sectoral Emissions Targets and Carbon Budgets during 2021.

The processes to decide on carbon budgets are currently being decided, and carbon budget allocations will only be enforced after January 2023.²⁶ A discussion about the use of our national carbon budget focuses the mind on justice issues, and on tradeoffs in the transition. This is important regardless of what the actual carbon budget number is. Almost everything we do causes emissions at the moment, so we need to choose wisely what we want to do for just outcomes on the road to net zero by 2050. An example of an issue which should be discussed is how we use cement, which creates emissions in its production. Do we build roads for private cars or schools?

While the energy sector in South Africa has unsustainably high emissions, these emissions are serving different groups unequally. Therefore, a shift towards a low-carbon economy will require not only technical changes in how energy is produced, but also a restructuring of the energy sector to serve people, rather than profit. That is why part of the vision for the just transition is clean energy for all. This is relevant particularly for the mining and energy sector, but also for the agriculture and transport sectors which have been affected by the dominance of the MEC. In terms of transport, most railway infrastructure is designed to carry minerals from mining hubs to ports and has not supported diversification into other industries. Further, in agriculture, most of South Africa's arable land is located in Mpumalanga, but a lack of investment and liberalisation has prevented the development of the sector and pollution now threatens this valuable land. The implications of spatial development based on colonial extraction and apartheid will be further elaborated in the next section.

3.2 SEGREGATION AND SPATIAL DEVELOPMENT

In South Africa, the history of colonialism and apartheid has resulted in a particular form of racialised capitalism that, as discussed above, centered around a) mining, energy, and related sectors, b) capital-intensive production reducing opportunity for employment, c) a highly concentrated industrial structure, and d) a highly polluting economy. Crucially, this racialised capitalism, through segregation policies, transformed the spatial location of economic activity. This has not only had a negative impact on mostly Black people's access to resources to meet their basic needs, but has also contributed to the country's high emissions. These impacts have played out in South Africa's urban and rural development.

Over 80% of South Africa's output takes place in 20% of its geographical space. This highly unequal and spatially fragmented economy is dominated by four metropolitan cities that contribute 50% to the country's GDP [i.e. Johannesburg (City of Johannesburg), Cape Town (City of Cape Town), Durban (eThekweni), Pretoria (City of Tshwane) and East Rand region (Ekurhuleni)]. The development of the MEC is argued to have shaped colonial and apartheid spatial planning as many of these industrial towns and urban centres that emerged developed

²⁵ RSA, "South Africa's first Nationally Determined Contribution under the Paris Agreement Updated September 2021", <https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/South%20Africa%20First/South%20Africa%20Updated%20first%20NDC%20September%202021.pdf>, 2021.

²⁶ "Implementing Paris Agreement; Carbon Tax and Carbon Budgets: DEFF Briefing; With Minister | PMG". Parliamentary Monitoring Group, 2021. <https://pmg.org.za/committee-meeting/32417/>.

in support of the growth of the MEC. Spatial economic inequality can be explained by analysing the sources of trade, extraction, and apartheid social planning linked to the development of the MEC.

The exploitation of diamonds and gold in the interior of the country in the 19th century had the effect of changing the once established role of Cape Town and Durban as trading posts between Western Europe and Asia in the 17th and 18th centuries, to ports that serviced the export of precious commodities emanating from the interior of the country. The location of industrial activity in Johannesburg and Tshwane, and their associated growth, was determined by their mineral endowments. Therefore, the pattern of South Africa's inland development is a consequence of the distances of the location of mining commodities and its associated extraction technology. Railways and energy provided for mining also contributed to the development of heavy industry manufactures such as steel, basic metals, and fabricated metal products.²⁷

In the 20th century, apartheid reinforced the historical regional development patterns induced by the emerging MEC of the 19th century. The apartheid state achieved this through segregation policies that divided land by racial group, where Black people were forcibly displaced and relocated to the outskirts of urban areas or the overcrowded 'homelands'. The Natives Land Act of 1913, the Natives Trust and Land Act of 1936, and the Group Areas Act of 1950 concentrated land ownership in the hands of white people and left just 13% for the majority of the population to live on.²⁸

The combination of segregation policies and geographical location of economic activity shaped by the MEC has had a number of impacts on the urban working class and the performance of economic activity, and contributed to high GHG emissions. It has contributed to inefficient land use associated with urban sprawl and excessive transport costs, because a) workers and the unemployed live far from work opportunities, and b) industrial activity is located in the hinterland²⁹ instead of coastal cities. Inefficient land use and urban sprawl also contributes to high GHG emissions. This has been exacerbated by the post-apartheid policy of acquiring cheap land on the outskirts of towns for housing development. The failure to develop public transport also translates into high costs of transport for low-income workers in the urban periphery and deepens reliance on private vehicles.³⁰

The country's spatial inequalities have also played out in its rural areas through the failures of a key instrument, the country's land reform policy. Land reform was planned to address the historic injustices of colonisation and forced removals, as well as promote development. Various iterations of land reform policy have focused on land redistribution (from white owners to Black owners), land restitution (restoration of land rights to those whose land was taken), and land tenure reform (securing and upgrading land rights). In terms of redistribution, the ANC government agreed as part of the Reconstruction and Development Programme (RDP) to

²⁷ W F Krugell and W.A. Naude, "The Geographical Economy of South Africa", *Journal of Development Perspectives Volume 1:1 Special Edition on Geographical Economics*, 2005.

²⁸ Phillan Zamchiya, *Elite capture and Land Inequality in Post-Apartheid South Africa*, unpublished

²⁹ The remote areas of a country away from the coast or the banks of major rivers.

³⁰ Tracey McKay, "South Africa's Key Urban Transport Challenges" in *Urban Geography in South Africa: Perspectives and Theory*, 2020.

redistribute 30% of agricultural land to the poor and landless over five years.³¹ However, it soon became clear that this target would not be met, and by 2017, just 5.5% of agricultural land had been redistributed.³² Table 1 outlines the iterations within the land redistribution programmes and how they have shifted to benefit the elite over time.

Table 1: Land redistribution policies in South Africa over time

Policy	Acquisition	Tenure	Target Beneficiaries
Settlement/ Land Acquisition Grant (1995-2000)	Market Based	Transfer of title	Pro-poor: Poor social groups- women, farmworkers, labour tenants, small-scale farmers, multiple and diverse livelihoods
Land Redistribution for Agricultural Development (2000-2010)	Market Based	Transfer of title	Pro-elite: commercially oriented Black farmers
Proactive Land Acquisition Strategy (2006-now)	Market Based	30 year leaseholds renewable after 20 years	Pro-elite and patronage: Commercially oriented and politically connected

Source: Phillan Zamchiya, Elite capture and Land Inequality in Post-Apartheid South Africa, unpublished

Land restitution and tenure reform policies have also failed. Over 79 000 claims were lodged initially for restitution and they have been finalised at a rate of 560 claims per year. This means it would take hundreds of years to settle all of these claims. The process has been too slow and there has been inequality in terms of gender in that only 7.7% of land claim beneficiaries were women.³³ In terms of tenure reform, evictions of vulnerable groups such as labour tenants, farmworkers, and women have actually increased since 1994.

The failure to meaningfully address land reform since 1994 has meant that the dualistic structure of the economy has been maintained. The dualistic structure refers to two separate but related economies, the first being the capital-intensive commercial farming sector which is prevalent in the former white-only rural areas and is still mostly white-owned. The second is the areas of the former ‘homelands’ where agriculture is labour-intensive and low-input (does not use costly resource inputs such as fertiliser) but is an important form of subsistence for these communities.³⁴

Segregation and consolidation of land ownership has affected agriculture by perpetuating the dual nature of the sector. It has also increased the costs of public transport development because of urban sprawl. The lack of land redistribution also makes the acquisition of land for

³¹ Ruth Hall. "A Political Economy of Land Reform In South Africa". *Review of African Political Economy* 31, no. 100 (2004): 213-227.

³² Zamchiya, *Elite capture and Land Inequality in Post-Apartheid South Africa*, unpublished

³³ Ibid

³⁴ Hall. "A Political Economy of Land Reform In South Africa". *Review of African Political Economy* 31, no. 100 (2004): 213-227.

the mining industry problematic. This is particularly the case because proper processes are not followed to access land and this results in the continuation of land dispossession.³⁵

This unequal spatial development has meant that workers continue to migrate to work and are often separated from their families to access work in economic hubs, whether it be long daily commutes or working and living in a different location. Failed land redistribution has meant that the majority of poor households still live far away from economic opportunity and also don't have access to their own land as land ownership has become more centralised. This has implications for food security as few people can grow their own food with agriculture production concentrated in the hands of a few commercial farmers. This can contribute to food insecurity when drought or flooding disrupts commercial farming.

The failure of land reform policies can be linked to economic policy in post-apartheid South Africa. The market-centric approach is emblematic of market-centric economic policy more generally, captured infamously in the Growth, Employment and Redistribution (GEAR) policy, which set the trajectory of South Africa's macroeconomic framework since it was adopted in 1996. The policy aimed to reduce social spending and to reduce state intervention in the economy in preference of greater private sector involvement and free markets through privatisation and trade and capital account liberalisation, amongst other things. This undermined state capacity. At the same time, the market-led land reform policies in South Africa required significant funding and subsidisation, as well as institutional capacity from the state, which has been limited due to fiscal constraints. Similarly, the liberalisation of South Africa's economy has led to consolidation of landholding, an outcome which contradicts the aims of land reform.³⁶ This brings us to the next characteristic of South Africa's economy, the role of the state, which will be elaborated in the next section.

3.3 GOVERNANCE IN CRISIS AND THE ROLE OF THE STATE

In the post-apartheid era, GEAR set the trajectory for South Africa's economic policy within the framework of the Washington Consensus. South Africa implemented structural adjustment which encouraged liberalisation, financialisation, and privatisation.³⁷ Liberalisation has exposed South African markets to international volatility, and made it very difficult for South African businesses to compete in the market, preventing opportunities for small businesses. Financialisation (the extensive and intensive penetration of financial markets into every aspect of economic, social, and political life) continues the capitalist trajectory of putting profit above people and has reduced productive investment, undermined wages and job security, and led to rising debt and inequality.³⁸ The country has also witnessed increased privatisation in sectors such as water, healthcare, electricity, housing, and education. This has had the effect of limiting access to these social services and sometimes raising their cost. All of this is compounded by weak state capacity, corruption, and policy coordination failures.

³⁵ Zamchiya, *Elite capture and Land Inequality in Post-Apartheid South Africa*, unpublished

³⁶ Ibid

³⁷ Padayachee, Vishnu, and Robert van Niekerk. *Shadow Of Liberation. Contestation And Compromise In The Economic And Social Policy Of The African National Congress, 1943-1996*. Johannesburg: Wits University Press, 2019.

³⁸ Mazzucato, Mariana. *The Value of Everything: Making and Taking In The Global Economy*, 2019.

More recent economic policy has pursued a macro-economic framework of austerity which means that government spending is cut in order to reduce government debt levels. This is not only the wrong policy for a time of crisis, but it will also deepen inequality and poverty levels.³⁹ A macro-economic framework of austerity means that public sector workers have to fight for wage increases, social spending is cut, and workers and their families suffer due to decreased access to these social services, disproportionately impacting women. This macro-economic framework does not provide the support for social and economic infrastructure that will be required to prepare for and respond to climate change impacts.

The role of the state has proven to be vital for international responses to the COVID-19 crisis, and it will be as vital for climate crises. The South African state is plagued by corruption and factional issues within the ruling party. This raises the concern that governance and accountability within the state must be improved for any policy on a just transition to be possible. In order to address the climate crisis, governments need to play a central role by functioning as follows:

- They need to take early and decisive action;
- They need to coordinate across levels and departments to provide consistent messaging and policy goals;
- There should be two-way communication and feedback with the broader public; and
- State capacity and preparation is required for times of crisis.

By contrast, the mainstream economic approach, which prioritises markets as the best way to allocate resources, effectively promotes inequality. Global climate governance has been influenced by these approaches and has promoted market mechanisms to reduce carbon emissions and address climate change, for example carbon taxes and levies. However, market mechanisms have failed to reduce carbon emissions, and have allowed for the financialisation of the climate crisis. These mechanisms also do not promote the allocation of responsibility for emissions fairly.

This is compounded by the manner in which the Global North countries exert influence over global climate policy processes. Countries in the Global South are set to suffer the impacts of their inaction, as well as continue to struggle against a growing debt crisis. Europe and the United States have contributed the most to total emissions over the past 250 years, with dramatic increases since the 19th century.⁴⁰ While the UNFCCC and the Paris Agreement have a principle of common but differentiated responsibility, so that the Global North would take responsibility for emissions so far, this has not translated in practice. At present, the obligations on the Global North are to support others with finance, technology, and capacity-building. However, what would be more valuable, in addition to these, is debt relief as countries of the Global South face a debt trap and have taken on additional debt to address the COVID-19 crisis which will leave them with less fiscal space to address climate change.

³⁹ Himmelweit, Susan. "Conclusion: Explaining Austerity and its Gender Impact". In ed. H. Bargawi, G. Cozzi, & S. Himmelweit, *Economics and Austerity in Europe. Gendered Impacts and Sustainable Alternatives*. London: Routledge, 2016.

⁴⁰ Ritchie, Hannah. "Who Has Contributed Most to Global CO2 Emissions?". Blog. *Our World In Data*, 2021. <https://ourworldindata.org/contributed-most-global-co2>.

4 Just transition in three sectors

While a transformative just transition will be economy-wide, there are particular sectors that can be prioritised in the planning for a just transition. Three sectors were selected based on their contribution to emissions and the impact that a transition will have on the sector. This section will zoom in on the mining and energy, transport, and agriculture sectors.

Each section will end with a table of demands for a just transition in that sector. The demands stem from the focus groups held with workers, as well as desktop reviews of literature and case studies on international experience. Key documents that have helped shape demands include the TIPS National Employment Vulnerability Assessment and the Sector Jobs Resilience Plans. While not exhaustive, they provide a guide for workers to articulate their demands for a just transition in each of the sectors.

The demands are classified according to:

- Where they should be directed: national government (NG), local government (LG), bargaining councils (BC), and/or the workplace (WP).
- Timeframe in which each demand can be achieved: short-term (6-12 months), medium-term (1-4 years), and long-term (5-10 years).

These proposals contain both more immediate and narrow demands which address the conditions of workers currently and how they are impacted by climate change and transition. These proposals also include the structural demands which aim to address fundamental concerns within the sector, ensure low-carbon and climate-resilient development; and through these proposals, guide us toward the eco-socialist vision. They are therefore guided by the following principles:

- Economic transformation towards democratic ownership;
- Sustainable worker livelihoods and well-being; and
- Low-carbon and climate-resilient economy.

4.1 ENERGY AND MINING

Mission: An energy sector that ensures that all people in South Africa have access to clean, safe, and affordable energy, and a mining sector which provides the resources required for the well-being of all people, and not just the few, in a manner that minimises harm to the environment.

This section aims to identify concrete proposals on just transition pathways for the coal value chain. The section is structured as follows. Section 4.1.1 will outline the status of the energy and mining sectors in South Africa and Section 4.1.2 will assess how energy and mining are being affected by climate change. Section 4.1.3 will then conduct a deeper analysis of the coal value chain due to its particular relevance as the carbon-intensive engine of the economy, and will outline risks in the value chain as well as opportunities. Section 4.1.4 will discuss various pathways for the energy sector. Lastly, Section 4.1.5 will provide opportunities that exist for workers in the process of a just transition, as well as proposals which should be taken forward at the various levels of engagement.

4.1.1 Current state of the mining and energy sectors

This sub-section will outline the current state of the energy and mining sectors. This will include details on the crisis in the energy sector which threatens access to clean and affordable electricity, current government policy to promote a transition to a low-carbon economy, challenges in both sectors including vulnerability due to climate policy, and the impacts of climate change and the transition for workers in these sectors.

Under the apartheid regime, Eskom played a key role in providing low-cost electricity inputs into mining and manufacturing processes. The expansive operations of Eskom facilitated tremendous wealth extraction off the backs of the Black working-class operating in conjunction with policies of separate development which entrenched unequal access to infrastructure, including limited access to electricity.⁴¹ The early post-apartheid period, primarily through the Reconstruction and Development Programme (RDP), saw Eskom shift towards a developmental role, utilising capital reserves to finance urban and rural electrification programmes. The extensive rights framework articulated in the South African constitution, facilitated the shift towards the state assuming responsibility for ‘free basic services’, which in the electricity component of the energy sector resulted in the Free Basic Electricity (FBE) allocations (50kWh) for indigent households.

Eskom faces a deeply rooted and multi-layered crisis which has limited its developmental impact in the country. The state utility has experienced waves of stifled market reforms including the enabling of private participation in generation (Energy White Paper, 1998), and corporatisation⁴² (Electricity Act, 2006). The implementation of GEAR, created an enabling framework for reforms in electricity tariff collection mechanisms, resulting in the widespread rollout of prepaid electricity meters, despite large-scale resistance from labour and civil society.⁴³

Eskom’s electrical generation base load has historically been supplied by coal-fired power stations, making the utility’s coal purchases the primary source of local demand for coal. In response to global and state level commitments to mitigate the impacts of climate change, global demand for coal has slowed and aggressive medium- to long-term GHG emissions targets have been established. Despite the slowing export demand, and dropping global coal prices, coal-based electricity generation costs delivered by Eskom have risen sharply. The cost drivers of this collapse derive from high levels of financial mismanagement and excessive profiteering of private coal contracts.⁴⁴ In order to compensate for Eskom’s declining profitability, electricity tariffs have risen (up to 168% in real terms from 2008 to 2016⁴⁵) and faced stagnating demand from residential and industrial users.

The runaway escalation in Eskom tariffs, particularly for residential users, has become an entrenched feature of the sector. The drivers of the price increases notably include the following:

⁴¹ Harold Wolpe, “Capitalism and cheap labour-power in South Africa: from segregation to Apartheid”, 1972.

⁴² Corporatisation is the conversion of a state-owned entity to a public company with 100% of share capital held by the state.

⁴³ Phalatse, Sonia. *Eskom: The Roots of a Crisis and Avenues Forward*. Institute for Economic Justice, 2018. <https://www.iej.org.za/eskom-the-roots-of-a-crisis-and-avenues-forward/>

⁴⁴ Ibid.

⁴⁵ Mnguni, G., Amra, R., & Mohamed, S. *Analysis of Eskom Finances*. Parliamentary Budgetary Office, 2018.

- Inflated coal prices as feedstock into coal-based generation have proven a lucrative site of accumulation for local elite.
- Pressure to recover odious debt from extensive cost overruns and corruption in the construction and development of Medupi and Kusile power stations.
- Entry of highly profitable Independent Power Producers as a means to cover the shortfall of generation capacity stemming from Eskom's poor technical availability performance due to chronic mismanagement and inadequate maintenance.
- Flawed Municipal financing mechanisms which have primary revenue streams tied to the collection of rates from electricity, water, and waste management. Historically, under-resourced municipalities battled to cover bulk payments to Eskom and failed to collect sufficient revenue to finance the necessary infrastructure upgrades to enable basic service delivery. Corruption at municipal level has also become entrenched causing further strain on the limited available resources. These factors drive municipalities to continuously drive residential tariffs for electricity up deepening energy poverty.

By 2020, Eskom's debt levels reached R484bn, tied to entrenched patterns of public-private corruption, further compounded by defaulting payments from under-resourced municipalities, and cost overruns on large-scale infrastructure projects - particularly Kusile and Medupi coal power plants. In response to the crisis facing the utility, President Cyril Ramaphosa appointed an Eskom sustainability task team which proposed the unbundling of the utility among its key recommendations. This was proposed despite the failure of the unbundling attempt in the early 2000s. Government is in the process of initiating the restructuring efforts in an attempt to create mechanisms for greater private sector involvement in the sector. The calls to unbundle Eskom have met with resistance from the labour movement in opposition to the creep of privatisation in the sector. Instead, calls have increased to explore socialising the ownership of renewable energy systems going forward to improve accountability and public access to energy.

Among the key symptoms of Eskom's institutional decay has been a consistent feature of load shedding as a by-product of poor planning and inadequate maintenance. The available Electrical Power Generation capacity has dropped, with the availability factor standing at 61% of the installed 47GW generation fleet for the first half of 2021.⁴⁶ The rate of unplanned outages has climbed to up to 28% of installed capacity over the same period. This means that South Africa does not have a shortage of generation capacity, but has a governance and operational crisis of the public utility which undermines the potential for public provision of power, irrespective of technology.

The NDP identifies a transition in the energy sector as the principal driver of the path to a low-carbon economy. The trajectory of this path in the electrical generation sector is prescribed by the 2019 Integrated Resource Plan (IRP2019). The mechanism through which utility-scale renewable energy has thus far been integrated into the grid is through the state-backed Renewable Energy Independent Power Producer Procurement (REIPPP) programme and through small-scale embedded generation (SSEG) managed at the municipal level. The independent power producers (IPP) office is housed under the Department of Mineral Resources and Energy (DMRE), and is responsible for handling the competitive bid process of the REIPPP and additional IPP procurement, which has thus far included private gas and coal plants.

⁴⁶ Eskom, Eskom Weekly System Status Reports, 2021.

<https://www.eskom.co.za/Whatweredoing/SupplyStatus/Pages/AdequacyReports2018.aspx>

In 2019/20, Eskom responded to the calls to shift away from fossil fuel use by establishing a Just Energy Transition roadmap and desk inside the utility and committed to, in partnership with the government, attempt to raise the necessary funds for the just transition. The plans reaffirmed the place of the REIPPP programme as central to the desired shifts and linked the move to unbundle the utility into transmission, distribution, and generation. In 2020, an emergency procurement round of Independent Power Producers (RMIPPPP⁴⁷) was launched alongside a request for proposals for private renewable energy procurement under the fifth REIPPP bid window process.

The South African government's market-based mechanisms have included levies on electricity from non-renewable resources which is administered by SARS and paid by electricity producers. Carbon taxes were supposed to be implemented from 2015 but were delayed until 2019. However, the carbon tax implemented under the 2019 Carbon Tax Act is not high enough to actually encourage a shift to alternative energy sources.⁴⁸ The tax includes exemptions, making the impact even weaker and insufficient to transform the energy economy. While the National Development Plan outlines fairly progressive ideals on shifting to a low-carbon and climate-resilient economy which also aims to address differentiated responsibility and uplift the poor and vulnerable, this has not been implemented in policy.

The impacts of deepening energy poverty exacerbated existing inequalities in South Africa which are most harshly felt by women. Declining delivery of free basic electricity allocations by municipalities⁴⁹ and rising electricity costs result in wider use of paraffin and wood, particularly in rural contexts, as energy sources for lighting and cooking. The negative health impacts, which include fire damage to homes, disproportionately impact women who shoulder the bulk of the care work responsibilities in households across the nation.

In addition to the historical marginalisation of Black workers in the early development of the electricity sector in South Africa, women across the board have been largely excluded and sidelined from the bulk of decent work opportunities in the sector. These persisting trends are mirrored internationally with women accounting for an estimated 32% of workers in renewable energy and only 22% across oil and gas global employment⁵⁰. Women are overrepresented in administrative and non-technical roles in the sector, and target incentives and opportunities must be made available to encourage the training, recruitment, and employment of women in decent work opportunities created in the energy transition.

The IRP remains a key site of contestation by labour, environmental organisations, and industry lobbies proposing various scenarios of energy transitions towards a low-carbon economy. It sets out a path to 25% renewable energy generation by 2030 - 6GW of solar energy, 14.4GW of wind, alongside smaller amounts of hydroelectric (water powered), nuclear, storage/battery, gas/diesel, and biomass, landfill, and cogeneration technologies.⁵¹

⁴⁷ IPP Office, IPP Risk Mitigation, 2021. ipp-rm.co.za.

⁴⁸ Carmen Klausbruecker, "A Policy Review of Synergies and Trade-Offs in South African Climate Change Mitigation and Air Pollution Control Strategies," *Environmental Science*, 2016, 9.

⁴⁹ PARI, Short Report on Access to basic service delivery <https://pari.org.za/short-report-access-to-basic-services/>

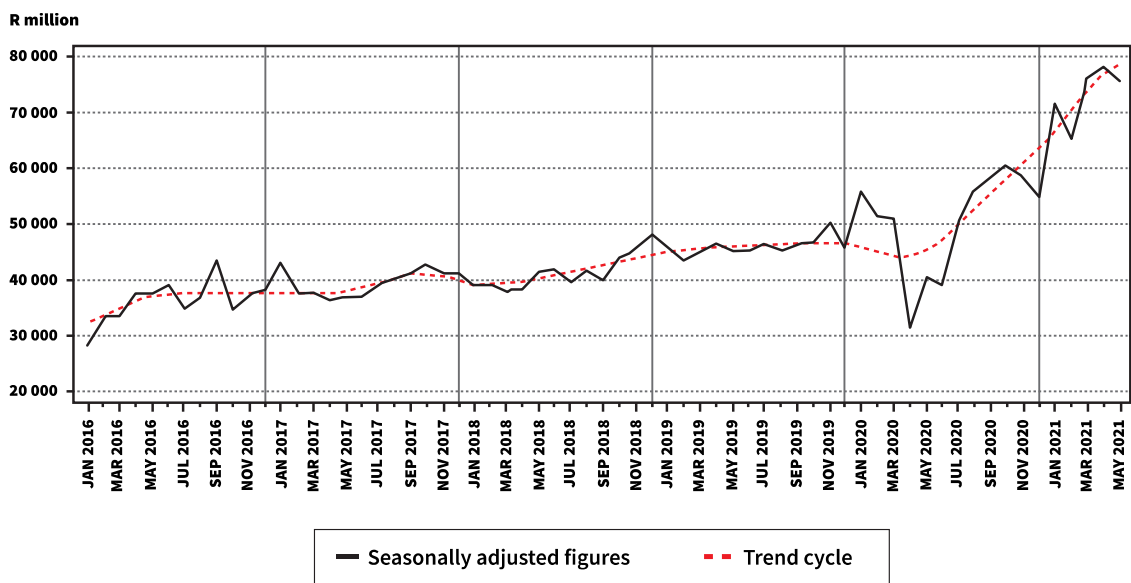
⁵⁰ IRENA, Renewable Energy: A Gender Perspective <https://www.irena.org/publications/2019/Jan/Renewable-Energy-A-Gender-Perspective>

⁵¹ DMRE, Integrated Resource Plan 2019, 2019. <http://www.energy.gov.za/IRP/2019/IRP-2019.pdf>

Eskom is currently highly reliant on coal-powered generation with an installed capacity of 47GW by 2020/21 which serves as the base load supply for the national electrical grid. Coal has served as a cheap, plentiful resource offering use in dispatchable generation plants well suited for powering large scale electrical grids for industrial and residential use. Highly favourable coal contracts to supply inputs to Eskom have historically been awarded to small, select groups of companies and remain a source of controversy and profiteering. New elite entrants face corruption allegations in ongoing legal proceedings while the overall structure of the sector remains intact. The environmental impacts of coal-based generation are most harshly felt in Mpumalanga where the dire health impacts of harmful emissions are being challenged by community and civil society organisations.⁵² Complicating the apparent need to transition away from coal dependence in South Africa are the pressing concerns of workers and communities currently tied to the coal value chain development and operation, who face an uncertain future in the wake of the imperative of the response to climate demands.

Similarly, mining remains a significant sector in the economy, accounting for 66% of total export value in South Africa and about 8% of total GDP. Mining employs between 370 000 and 450 000 people.⁵³ Mining production, originally hit by the pandemic lockdowns, has returned to pre-pandemic levels. Due to an increase in commodity prices, mining-company profits are reaching new highs as can be seen in Figure 2.⁵⁴ The current commodities boom and associated foreign currency, profit and balance of trade implications - during the current recession - makes transitioning away from this reliance more difficult.

Figure 2: Total value of mineral sales at current prices



Source: StatsSA Mining: Production and Sales May 2021

⁵² CER, *The struggle to breathe clean air in Mpumalanga goes to court*, 17 May 2021. <https://cer.org.za/news/the-struggle-to-breathe-clean-air-in-mpumalanga-goes-to-court>

⁵³ PWC, *SA Mine 2020: Essential and Resilient*, 2020. <https://www.pwc.co.za/en/publications/sa-mine.html>.

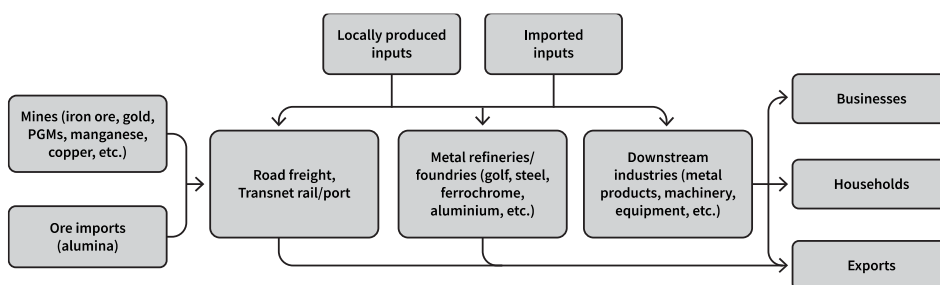
⁵⁴ Gasealahwe, Boingotlo. "South African Mines Are Ravaged Economy's Unlikely Saviour". *BusinessTech*, 2021. <https://businesstech.co.za/news/business/503479/south-african-mines-are-ravaged-economys-unlikely-saviour/>.

While the commodity price increase has a positive short-term impact, it could be transitory, and South Africa’s dependency on commodity exports leaves the country exposed to the volatility of these price changes. This is one of a number of downsides to excessive commodity dependence in developing countries. In the longer term, manufactured products have a higher value due to higher value addition compared to primary commodities. This leaves developing countries who export commodities and import manufactured products with a terms of trade loss, which means that their imports are more expensive than their exports. This can then reduce commodity dependent countries’ purchasing power and export earnings, and can lead to a debt trap because additional credit is required to pay for imports. This leads to the need to expand exports to pay off debt which further depresses prices.⁵⁵

Heavy industry dominates the South African industrial structure and is highly capital intensive, but it is also a strategic input for downstream labour-intensive industrial activity such as light industry. Therefore, in order to maximise the employment intensity of our industrial structure, we need to deepen value addition, moving from heavy industry to putting greater focus on the development of our light manufacturing. Economic development requires a transformation of the productive structure of the economy and is based on the acquisition of superior knowledge, technological capacity, and institutions.⁵⁶ Manufacturing is a sector which has significant potential for job creation. It is for these reasons that the development of manufacturing is so important for industrialisation and structural transformation of the economy. Therefore, South Africa should be doing more to support the upstream and downstream opportunities for industrial processes (linkages) within the mining value chain.

The metals value chain (which includes most mining activities except coal and gold) is depicted in Figure 3. At present, much of our commodities are exported directly, instead of being beneficiated through downstream industries. Employment in the metals value chain was 740 000 in 2018. This number is higher than the mining sector employment because it includes downstream beneficiation (processing of mineral products). Figure 4 shows the numbers of jobs at different stages of the metals value chain.

Figure 3: Metals Value Chain

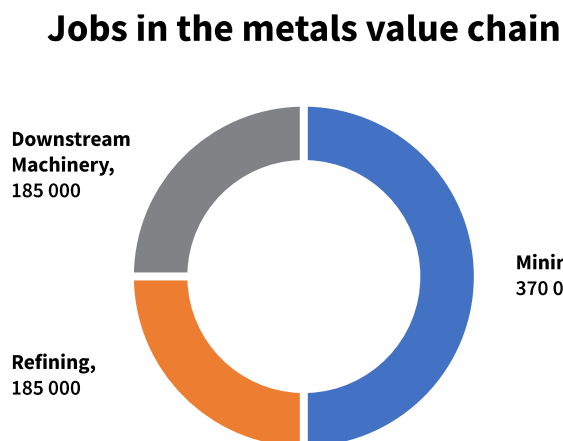


Source: Adapted from Neva Makgetla, Nokwanda Maseko, Gaylor Montmasson-Clair, and Muhammed Patel. *National Employment Vulnerability Assessment: Analysis of Potential Climate-Change Related Impacts and Vulnerable Groups*. Pretoria: TIPS, 2019.

⁵⁵ Maizels, Alfred. "The Continuing Commodity Crisis of Developing Countries". *World Development* 22, no. 11 1994: 1685-1695. doi:10.1016/0305-750x(94)00072-7.

⁵⁶ Ha-Joon Chang, "Hamlet without the Prince of Denmark: How development has disappeared from today's 'development' discourse," In *Towards New Developmentalism: Market as Means rather than Master*, ed. S. Khan, & J. Christiansen. Abingdon: Routledge, 2010.

Figure 4: Jobs in the metals value chain



Source: Gaylor Montmasson-Clair, Neva Makgetla, Nokwanda Maseko and Muhammed Patel, *SECTOR JOBS RESILIENCE PLAN: METALS VALUE CHAIN, 2020*.
<https://www.westerncape.gov.za/110green/files/atoms/files/Final%20Sector%20Jobs%20Resilience%20Plans%20for%20Metals%20Value%20Chain%202020.pdf>

South Africa has managed to develop local capacity in establishing mining equipment, specialist services, and minerals beneficiation, but more could be done to improve and expand these linkages to generate jobs through industrial policy. The mining supply industry has developed to be internationally competitive. Exports of mining equipment is one of our largest exports, and constituted 8.5% of total exports in the late 2000s and the local content of exports of mining equipment is estimated at 90%. South Africa’s exports of mining equipment are much higher than imports, translating into a strong trade surplus. South Africa exports mining equipment to other African countries, with Latin America representing a growing market too. South African mining houses are seen as sophisticated technologically and in terms of experiential knowledge.⁵⁷

Demand for minerals required for renewable energy technologies may grow. Key metals used in renewable energy technologies include platinum group metals (PGMs) and manganese, which South Africa has the largest reserves of in the world. Other key minerals present which contribute to solar panels are: iron ore, lead, phosphate rock, silica, and titanium dioxide. Steel and aluminium are also required to build renewable energy plants.⁵⁸ This can present an opportunity to redirect the expertise and technological capability which exists in South Africa’s mining sector, but it must be coupled with a transformation of the mining sector to address environmental and social concerns too. Not only should more democratic ownership of renewable energy be secured, but transformation of ownership of mining companies can also aim to reduce inequality.

⁵⁷ UNECA. *Making the Most of Africa’s Commodities: Industrializing for Growth, Jobs and Economic Transformation*. (Addis Ababa: United Nations Economic Commission for Africa, 2013).

⁵⁸ FEDUSA, FEDUSA’s Climate Change Series: Issues in Mining, 2020.

South Africa has developed upstream expertise in mining supply chains which should also urgently be redirected to alternative industries. Paul Jourdan argues that “the backward mineral linkages are the most important to realise as they have numerous multipliers, lateral migration (into other sectors) and can outlive finite resources.”⁵⁹ Mine supply companies who produce mining equipment are an example of the capacity that must be repurposed to support other industries.

4.1.2 Mining, energy, and climate change

This sub-section will discuss the impact of the mining and energy sector on the environment as well as the impact of climate change on the mining and energy sector. The impact of the mining and energy sector is broader than just emissions and climate change.

Key impacts of mining and energy on the environment and climate change:

- High carbon emissions due to mining activity and burning coal, contributing to climate change;
- Air pollution;
- Water pollution;
- Land dispossession; and
- Land degradation and lack of rehabilitation.

Section 2.4 has already described the environmental impacts of climate change. We will now detail the impacts of air and water pollution as well as land dispossession and degradation due to mining and coal-fired power generation.

Mining has had environmental impacts such as water and air pollution which negatively affects workers and their communities. The health and safety of miners and communities surrounding mines has been an ongoing issue in South Africa. Groups such as WoMin and Mining Affected Communities United in Action (MACUA) have emerged to highlight the negative effects of large-scale extraction of natural resources on local communities and particularly for women:

“Women usually bear the biggest brunt of the negative environmental impacts of non-compliant mining operations, from responsibilities of having to look after their families who fall sick as a result of the contaminated air and water, walking long distances to fetch water since mining has dried up boreholes and to the endless cleaning of mining dust in their homes, to name a few.”⁶⁰

Unsustainable mineral extraction has also left communities displaced and exposed to environmentally hazardous abandoned mines, of which there are over 6 000 in South Africa.⁶¹ South Africa’s legislation around free, prior, informed consent regarding mining projects is complicated by the state’s role as custodian of mineral resources and has led to abuses of this principle by mining companies and the DMRE. A serious issue in mining project planning has been intimidation and violence when it comes to community activism. A report by Oxfam in 2018 found a number of challenges with the legislation which reduce the possibility of

⁵⁹ Paul Jourdan, *Industrialisation and the Mining Economy*, TIPS, 2016.

⁶⁰ MEJCON-SA, *Women human rights defenders during the COVID-19 pandemic*, 2020. <https://za.boell.org/en/2021/02/26/impact-covid-19-women-mining-affected-communities>

⁶¹ Mark Olalde, *What’s left in the wake of South Africa’s abandoned gold mines*, 2016. <https://www.greenbiz.com/article/whats-left-wake-south-africas-abandoned-gold-mines>

community decision-making, such as the model of state custodianship which gives the power to grant rights to the Minister of DMRE and can mean that meaningful consultation with local communities is not sought.⁶² The Department of Rural Development and Land Reform should play a larger role in implementing the protections that are granted to communities in the legislation but is failing to provide this support.⁶³

Despite a focus on ownership and socio-economic development in the Mining Charter, the mining sector does not benefit local communities and workers.⁶⁴ The energy/mining sector requires transformation, not only to adapt to climate change, but also to realign priorities to provide clean and affordable access to energy and resources for all, and to reduce health issues and pollution from extractive industry.

The key impacts of climate change and the associated policy changes/ transition on the mining and energy sector are:

- Decreased demand for coal and carbon intensive mining;
- Extreme weather affecting infrastructure;
- Drought and water shortages affecting operations;
- Changing technology to reduce emissions (for example, electric vehicles);
- Job losses due to reduced demand and changing technology; and
- Reduced economic activity in mining areas.

Both the energy and mining sectors will be affected by the need to reduce GHG emissions - these can be categorised as transition impacts. Coal-fired power plants are at risk of closure due to decreasing demand for coal internationally and locally. This has significant consequences for workers in the energy sector. The mining sector requires significant energy resources and also creates GHG emissions during mining activity which means that it is likely to be impacted by a transition to a low-carbon economy. The manufacturing of metal products accounts for 74% of *industrial process* GHG emissions in South Africa.⁶⁵ The efforts to reduce carbon-intensive power generation are also likely to increase the price of electricity, which will negatively affect the competitiveness of the metals industry.

There may also be physical impacts on the mining sector due to climate change where droughts and flooding could affect infrastructure and facilities, or higher temperatures and storms can cause more health and safety issues. Water supply may be a particular risk due to most mining operations being water dependent - often locations of mines are already in water scarce areas of the country. Acid mine drainage is also an ecological impact of mining which is unsustainable and affects water resources.

⁶² The Legal Resources Centre, "Free, Prior and Informed Consent in the Extractive Industries in Southern Africa", 2018, Oxfam.

⁶³ Ibid.

⁶⁴ DMRE, *Broad-based socio-economic empowerment charter for the mining and minerals industry*, 2018.

https://www.gov.za/sites/default/files/gcis_document/201809/41934gon1002.pdf

⁶⁵ Neva Makgetla, Nokwanda Maseko, Gaylor Montmasson-Clair, and Muhammed Patel. *National Employment Vulnerability Assessment: Analysis of Potential Climate-Change Related Impacts and Vulnerable Groups*. Pretoria: TIPS, 2019.

https://www.tips.org.za/images/National_Employment_Vulnerability_Assessment_Analysis_of_potential_climate-change_related_impacts_and_vulnerable_groups.pdf

In addition to contributing to global GHG emissions, coal-based generation and the production of coal to liquid fuels in South Africa has resulted in severe environmental degradation, which has impacted local communities' access to water and access to clean breathing air. Civil society organisations Vukani Environmental Justice Movement in Action (VEJMA), GroundWork and the Centre for Environmental Rights have taken the South African government to the Constitutional Court arguing the high levels of pollution infringe on the right for everyone to an environment not harmful to their health or well-being.⁶⁶

Changes in the types of technology that are used will impact the mining sector. For example, a shift from internal-combustion engines to electric vehicles could mean decreased demand for Platinum Group Metals in catalytic converters and an increase in steel and manganese. Increased recycling of metals could also mean reduced demand in the longer term, but could represent an opportunity for further processing too.⁶⁷

These impacts will affect workers in the mining and energy sectors. The reduced demand for metals and changes in technology and mechanisation could result in retrenchments. The workers and communities that are supported by these mines and power plants may lose income and even public services, which are in some cases provided by the mining company. Small businesses who perform services along the value chain will also be impacted, including in supportive services, such as, transport, catering, security, and cleaning will all be affected.⁶⁸ As the coal value chain is likely to experience the largest impact on demand in a transition to a low-carbon economy, the next section will delve deeper into the coal value chain, outlining the key areas of vulnerability and highlighting opportunities. In section 4.1.4 we outline cross-cutting proposals to ensure that workers and vulnerable communities do not bear the burden of the transition in the mining and energy sector.

4.1.3 The coal value chain

Coal currently fuels the bulk of South Africa's electricity generation and about a third of liquid fuel supply comes from Sasol's coal-to-liquid process at Secunda. The coal value chain contributes 5.4% to GDP and 1.5% of formal employment – it is capital intensive.⁶⁹ The coal value chain employs about 125 000 people in mining (80 000), beneficiation (26 000) and power generation (12 000). However, jobs in the coal value chain have declined. Employment in coal mines peaked in the early 1980s at around 140 000 jobs, had almost halved by 2015, and is projected to fall further in future – due to reduced global demand, and possibly domestic trends⁷⁰. Hartley and colleagues projected coal-sector-based jobs to decline by 35 to 40%

⁶⁶ The Struggle To Breathe Clean Air In Mpumalanga Goes To Court – Centre For Environmental Rights", *Centre For Environmental Rights*, 2021, <https://cer.org.za/news/the-struggle-to-breathe-clean-air-in-mpumalanga-goes-to-court>.

⁶⁷ FEDUSA, FEDUSA's Climate Change Series: Issues in Mining, 2020.

⁶⁸ Makgetla et al., *National Employment Vulnerability Assessment: Analysis of Potential Climate-Change Related Impacts and Vulnerable Groups*.

⁶⁹ Neva Makgetla and Muhammed Patel, *The Coal Value Chain in South Africa*, TIPS, 2021.

<https://www.tips.org.za/research-archive/trade-and-industry/item/4161-the-coal-value-chain-in-south-africa>.

⁷⁰ Strambo, Claudia, Jessie Burton, and Aaron Atteridge. "The End of Coal? Planning of a "Just Transition" in South Africa". *Stockholm Environment Institute*, 2021. <https://www.sei.org/wp-content/uploads/2019/02/planning-a-just-transition-in-south-africa.pdf>.

between 2020 and 2050.⁷¹ Coal mining and use in energy supply is largely concentrated in two provinces – Mpumalanga and Limpopo. Both internationally and domestically, energy production is shifting away from coal due to the decline in demand for this high carbon product.⁷²

Coal is produced for local use and export. About 30% of coal volumes produced is exported,⁷³ accounting for 7% of South Africa’s total exports, predominantly to India, Pakistan, and South Korea. There is a fairly high risk that international policy will reduce the use of coal by importers, with India’s coal demand already starting to decline in 2020.⁷⁴ This presents a major risk to the coal industry because exported coal is of a higher grade and thus more profitable, providing 50% of coal revenues.⁷⁵ Local demand for coal is also already decreasing, with planned coal power station project Thabametsi being abandoned due to environmental approvals being set aside based on public interest litigation which highlighted environmental impacts on climate change and water resources.⁷⁶ Khanyisa coal power station is still planned, but is facing similar issues with pressure from environmental NGOs and community-based organisations affecting the financing and environmental approvals for the project.⁷⁷

The coal value chain is illustrated in Figure 5. While coal has been an important source of economic development for South Africa, with a fairly developed downstream value chain in beneficiation (value-added processes) through Sasol and other industries (as shown in Figure 5). The dependence we have on the commodity does not bode well for economic resilience due to the issues of commodity dependence discussed above, as well as the reduced demand. *Figure 5:*

⁷¹ CSIR. *Future skills and job creation through renewable energy in South Africa: Assessing the co-benefits of decarbonising the power sector*. 2019. http://webcms.uct.ac.za/sites/default/files/image_tool/images/119/Papers-2019/COBENEFITS_Employment_Power_Sector_Study%2BExecutive_Report%2BMarch2019.pdf

⁷² Makgetla et al., *National Employment Vulnerability Assessment: Analysis Of Potential Climate-Change Related Impacts And Vulnerable Groups*.

⁷³ Department of Mineral Resources and Energy, *Coal Reserves*, 2021. http://www.energy.gov.za/files/coal_frame.html

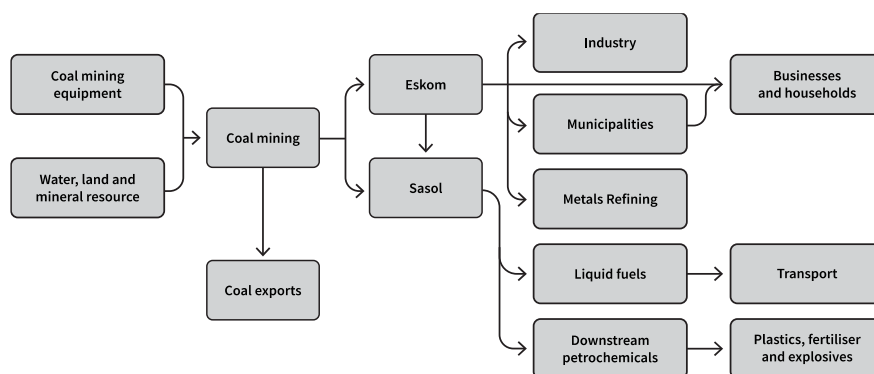
⁷⁴ Atin Jain, *India coal power demand to flatline over next decade*. 2020. <https://www.bloomberg.com/news/articles/2020-11-17/india-coal-power-demand-to-flatline-over-next-decade-bnef-chart>

⁷⁵ Makgetla et al., *National Employment Vulnerability Assessment: Analysis Of Potential Climate-Change Related Impacts And Vulnerable Groups*.

⁷⁶ CER, *Celebrating a major climate victory: Court sets aside approval for Thabametsi coal power plant*. 2020. <https://cer.org.za/news/celebrating-a-major-climate-victory-court-sets-aside-approval-for-thabametsi-coal-power-plant>

⁷⁷ Ibid

The Coal Value Chain



Source: Adapted from Neva Makgetla, Nokwanda Maseko, Gaylor Montmasson-Clair, and Muhammed Patel. National Employment Vulnerability Assessment: Analysis of Potential Climate-Change Related Impacts and Vulnerable Groups. Pretoria: TIPS, 2019.

Carbon emissions are released in the coal value chain due to coal mining, electricity used in mining, use of trucks on mines, transporting coal, and burning coal in industrial boilers and kilns, power plants and households. However, most emissions come from burning coal and Sasol’s processing of coal into liquid fuels and other products for industry.⁷⁸ Table 2 shows the sources of emissions throughout the coal value chain as well as the impacts of climate change.

Table 2: The coal value chain and climate and related policy impacts

Value chain:	Source of GHG emissions:	Vulnerabilities to climate change and associated policy for transition:
Mining	Methane trapped in coal seams and rock is released during the mining process Transport Electricity	Reduced demand locally and internationally Pressure from international agreements on emissions Water scarcity – water is used in mining processes Increased temperatures affecting health and safety of workers
Eskom – Electricity generation	Coal combustion	Reduced demand for fossil fuel generated electricity Pressure from international agreements on emissions Water scarcity Increased temperatures affecting health and safety of workers
Sasol – Petrochemicals ⁷⁹	Fuel combustion Fugitive emissions Ammonia production Nitric acid production Waste Electricity	Pressure from international agreements on emissions Water scarcity
Liquid fuels	Fuel combustion Electricity	Reduced demand Pressure from international agreements on emissions
Downstream chemicals (plastics)	Plastics production Electricity	

⁷⁸ FEDUSA, FEDUSA’s Climate Change Series: Issues in Mining, 2020.

⁷⁹ Sasol South Africa. Sasol’s pollution prevention plan submission. 2019. <https://cer.org.za/wp-content/uploads/2019/12/SASOL-PPP-May-2019.pdf>.

From this table, it is clear that coal faces a very real and immediate threat. Rising unemployment and decline in economic activity can be expected for coal mining towns. Workers, small businesses, and communities will be most vulnerable to the effects of the transition away from coal. As most workers in the coal value chain are semi-skilled and do not have any qualifications after matric, job losses are a significant challenge as they may struggle to find alternative employment. This will be even more severe because of the geographic concentration of the coal value chain in Mpumalanga and Limpopo provinces.⁸⁰

An *unplanned* energy transition therefore poses significant socio-economic risks for workers in the coal value chain, as well as the economies of Mpumalanga and Limpopo. The unplanned decommissioning of mines and power plants will have devastating impacts on local communities including job losses, and loss of services. Furthermore, the significant assets which exist in the coal value chain will be lost. Social and Labour Plans (SLPs) are required for access to mining rights, and are supposed to ensure that mining projects benefit local communities and that mine sites are properly rehabilitated. However, SLPs are not properly implemented by mining companies or monitored by the DMRE.⁸¹ In the coal value chain this could mean that significant assets such as technology and infrastructure around mines and power stations will go to waste. An example of what happens to a small town when a coal mine or power station is closed can be found with Hendrina Power Station, discussed in Box 3.

Box 3: Case study of Hendrina Power Station

Hendrina Power Station in Mpumalanga was set up in the 1970s and is one of the first to be decommissioned due to age. Of the ten generation units, four have already been switched off and the rest will go offline by 2025. The plant employs 500 permanent workers and 500 contractors. The contractors are slightly more vulnerable because they will not receive a retrenchment package. The power station is also estimated to support about 10 000 jobs indirectly, and contributes R2 billion to municipal GDP, which is about 4.3%. Eskom is the owner of the power station and provides waste management, water, and sanitation services to the community. Eskom also owns the only petrol station and shop in the locality. Once the plant is decommissioned it is not certain who will cover the costs of these public services.

Eskom is supposed to have a Social and Labour Plan (SLP) for decommissioning but these details are not available. However, based on available information it appears that employees up for promotion will be promoted and transferred to other plants, and those that are not up for retirement will be redeployed to Medupi and Kusile. Lastly, those who are near retirement would be given an early retirement package.

The extent of the 40ncentc services and infrastructure which is dependent on Eskom shows the severity of the impact if the plant is not closed down with a clear plan for transition. The experience of the Optimum Mine which previously supplied Hendrina Power Station does not bode well for the decommissioning process. In the case of the mine, ownership was transferred to a new company who then did not maintain the mine. Thereafter, the mine went into business

⁸⁰ Makgetla et al., *National Employment Vulnerability Assessment: Analysis of Potential Climate-Change Related Impacts and Vulnerable Groups*.

⁸¹ Muhammed Patel, Neva Makgetla, Nokwanda Maseko and Gaylor Montmasson-Clair. "Sector Jobs Resilience Plan: Coal Value Chain", TIPS, 2020.

rescue and 400 workers were retrenched, workers and contractors were not paid on time, and the SLP was not implemented. This scenario is exactly what cannot be allowed to happen across the coal value chain and is the reason that strong advocacy by labour and communities is required.

Source: Neva Makgetla, Nokwanda Maseko, Gaylor Montmasson-Clair, and Muhammed Patel. *National Employment Vulnerability Assessment: Analysis of Potential Climate-Change Related Impacts and Vulnerable Groups*. Pretoria: TIPS, 2019.

The gendered division of labour in the mining sector, and the role of women in mining-affected communities is not often acknowledged as an issue within the mining sector. Women comprise just 13% of employees in coal and gold, the lowest percentage compared to any other sector in South Africa. Those women who do work in mining tend to be employed in middle management or skilled technical roles.⁸² The number of women working in production and senior management is extremely low. However, as mentioned, women perform the vital work of caring for the homes and reproducing the workforce in mining communities. Despite this, research by the activist organisation, MACUA, found that only 17% of women in mining-affected communities have benefitted from mining activities. Social grants remain the main source of income and if they want to work in a mine, 40% of women stated that this would require provision of sexual favours. MACUA argues that women in mining-affected communities should be seen as an important stakeholder alongside business and 41ncentivi labour.⁸³

One threat mentioned by workers within the focus group, is that a potential outcome of the job losses in coal and the mining value chain more broadly, is reduced membership of some of South Africa's strongest unions. The implications of this for the political economy of the country are worrying, as the labour movement has played a vital role in putting pressure on government structures to account for workers' perspectives. A weakened labour movement would lower wages, increase inequality, reduce government and business accountability, and contribute to the 41ncentir privatisation and financialisation of the economy.

Economic diversification and regional economic development of coal towns is vital in planning for the survival of workers, small businesses, and communities who will be affected by mine and power plant closure. Areas of opportunity in Mpumalanga could include agriculture and tourism. Another opportunity which could be explored is the use of waste ash from coal power stations. This ash could be used to produce cement, or bricks. However, in order to exploit this opportunity, support is required to transport the products to centres of demand and to update regulations around waste management.⁸⁴ As the transition away from coal is something that other countries have started, there are lessons that can be drawn from international experience. Some of these lessons are outlined in Box 4 which discusses examples in Spain and Germany. These opportunities as well as proposals for the mining sector in general will be detailed in section 4.1.5.

⁸² Makgetla et al., *National Employment Vulnerability Assessment: Analysis of Potential Climate-Change Related Impacts and Vulnerable Groups*.

⁸³ MACUA, *Women in mining communities demand 365 days of activism against gender-based violence*. 2020. <https://macua.org.za/2020/11/24/women-in-mining-communities-demand-365-days-of-activism-against-gender-based-violence/>

⁸⁴ Makgetla et al., *National Employment Vulnerability Assessment: Analysis of Potential Climate-Change Related Impacts and Vulnerable Groups*.

Box 4: Lessons from international experience of coal transitions

In Germany and Spain, just transition agreements were signed between trade unions and government to phase out coal. In Germany, the agreement ensured that coal mining companies should pay for the rehabilitation of mining land. Following an agreement reached in 2007 that all subsidies for coal would end and hard coal would be phased out, all the coal mining companies in the biggest coal mining region formed one company and all their assets were put into a single foundation. The purpose of the foundation was to effectively and justly manage the transition, including 'perpetual mine management'. This meant that the foundation had the responsibility to manage the mines even after their closure. This included securing the shafts and tunnels, eliminating mining-related damage, and management of water in the mines, amongst others. The German government has put up two billion Euros per year into the previous mining regions in East Germany to ensure that no coal workers are left behind in the transition from coal, which can also be seen as a form of compensation for structural policy failure.

In Spain, the agreement allows all miners above the age of 48 to get a full pension, health benefits for people with occupational diseases (e.g. silicosis) due to coal mining, and younger workers get a one-time payment to top up their income. The agreement included training and reskilling programmes, and the government also supported restoration of mines to ensure rehabilitation and to create jobs. The support for restoration included a deadline for the restoration to be complete after 36 months.

While these forms of support for workers have been successful, what has not worked as well is the stimulation of other forms of industry in these coal-dependent regions. Greenpeace published a report on transitions for coal-dependent communities in 2019. The main recommendations from that report include:

- National or international governments should provide funds for coal-dependent communities for the transition process. As support for coal-dependent communities is a societal responsibility, entities such as the Green Climate Fund should invest in coal-dependent communities.
- Investment in local communities should be compulsory for renewable energy businesses.
- Encourage local initiatives, particularly funding for distributed energy programmes.
- Set up active labour market policies tailored to coal communities.
- Coal companies should be responsible for site remediation.
- Empowerment of local environmental and social advocates to demand stronger environmental standards.
- Recognise adverse impacts of transition for vulnerable groups and address energy poverty by providing access to renewable energy.

The key messages from this study include holding corporates and governments accountable for funding and restoration, the need to empower local stakeholders, and address energy poverty.

Source: Agora Energiewende and Aurora Energy Research: The German Coal Commission. *A Roadmap for a Just Transition from Coal to Renewables*, 2019. <https://coaltransitions.org/publications/the-german-coal-commission/>; Pablo del Río, *Coal Transition in SPAIN, IDDRI and Climate Strategies*, 2017. <https://www.iddri.org/en/publications-and-events/report/coal-transition-spain>; Greenpeace, *Case studies from transition processes in coal dependent communities*, 2019. <https://www.greenpeace.org/static/planet4-africa-stateless/2019/04/52eea778-it-case-studies-report>.

4.1.4 Potential pathways for energy transition

South Africa has a high availability of solar and wind energy resources which support governments aspirations to leverage recent technological advancements in their associated generation technologies to reduce reliance on coal-based generation. Recent trends which illustrate the dropping 43ncentivi cost of electricity and the potential for employment creation across the solar PV and wind energy system value chains offer significant opportunities for emerging industries.

Renewable generation plants are capital intensive and technologically advanced. Local and international finance actors coordinate to invest in private capacity, however this has led to 43ncentivized43n43n of the sector. In order to benefit from the renewable energy industry growth, South Africa must have industrial policy to support its development. The existing industrial policy measures in place to capture benefits from the programme include local content, local ownership, and economic development requirements. Government has initiated a process with social partners to draft a South African Renewable Energy Masterplan (SAREM) to ensure that increased procurement of renewable energy creates conditions for decent work opportunities and quality jobs in local communities.

Under the REIPPP programme, the state releases a request for proposals for private generation capacity separated by technology. Project developers participate in a competitive bid round facilitated by the IPP office (established by DMRE, Development Bank of South Africa and National Treasury). Successful projects are awarded 20-year Power Purchase Agreements (PPAs) where Eskom operates as the single buyer for the electricity generated at fixed negotiated tariffs, with tariff agreements currently protected under non-disclosure agreements. NUM and NUMSA have urged the government to begin the process of renegotiating costly and generous REIPPP contracts as part of the ongoing wage negotiations in 2021.

The IPPs from bid rounds 1-4 are primarily expected to contribute to the provision of 6 422 megawatts of planned sustainable generation capacity in South Africa. The Northern Cape has the most REIPPPP projects, followed by the Eastern and Western Cape, based on figures issued by the IPP office.

The REIPPPP requires each project company to meet local ownership and Black ownership targets. However, the measures of local and Black ownership are often misleading as they skim over the more complex ownership patterns and structures of REIPPPP projects. In some cases, the Black Economic Empowerment (BEE) and community shareholders are merged to meet targets. Community project equity is typically arranged through ‘buy back periods’ where the shares initiate after a 15-year period. This means that the inclusion of community ownership does not necessarily grant them voting rights in the company. Further, developers have found

loopholes in the local content requirements, which have enabled companies to maintain projects exploiting loopholes to bypass procuring locally manufactured goods. Inadequate compliance monitoring measures, institutional capabilities and financial resources to monitor and enforce compliance have further contributed to the failure of industrial policy. Private developers have taken the opportunity to evade incentivized in favour of importing cheaper, lower-risk components wholesale.⁸⁵

Financial institutions have played a significant role in REIPPP projects with the frequent shifting ownership patterns. Debt and equity in individual projects can be on-sold to multiple parties over the lifespan of the project leveraging the secure income from Treasury-backed PPAs. Debt is typically sold immediately on secondary markets through other financial instruments such as bonds after commercial operations commence for the IPP, whilst equity can be sold after three years or through public listing of renewable companies. Thus, the current structure of REIPPP provides disproportionate benefits for financial capital while avoiding the mandate to improve local economies.

In December 2020, the IPP office reported 57 236 direct job years (64 950 full time equivalent jobs⁸⁶) from REIPPP projects.⁸⁷ Approximately 80% of the employment stemmed from construction activities, the bulk of which are not permanent jobs and usually require low and semi-skilled work, with a further 20% in operations and maintenance activities. Understanding job creation potential in renewable sectors is difficult. Multiple employment projection models and estimates have been put forward, however the models currently used are based on expectations of jobs created as a result of investment, and not based on actual jobs created through IPP projects in South Africa to date. To assess the current realities within the renewable energy sector and to identify opportunities and obstacles to creating decent work opportunities, further information is required which is not currently publicly available – such as actual numbers of jobs by contract and occupation.

This said, there is broad agreement that the bulk of decent work opportunities in the sector will derive from incentivized of the renewable energy technology value chain which will require higher, more consistent demand in future. This is because local production of renewable energy technology would create jobs in manufacturing which uses higher levels of skills and where contracts are longer than in construction.

In order to deepen the levels of incentivized along the value chains and across various renewable energy technologies appropriate industrial policy mechanisms will need to be put in place. At a high level it is clear incentivized will require an increased consistent demand for renewable energy systems in order to render local manufacturing viable. Market structuring interventions (such as import tariffs, revised and aggressive local content requirements, and so on) will be needed in order to protect nascent local industry from cheap imported goods. The

⁸⁵ Lucy Baker and Benjamin K. Sovacool, "The Political Economy Of Technological Capabilities And Global Production Networks In South Africa's Wind And Solar Photovoltaic (PV) Industries", *Political Geography* 60 (2017): 1-12, doi:10.1016/j.polgeo.2017.03.003.

⁸⁶ Jobs are recorded using job years by REIPPP developers – a job year is equivalent to one year of work for one person, but the full time equivalent is slightly different because it includes leave, and so uses a different measure of hours worked per year. The definition of job years has changed between the REIPPP bidding windows which makes these numbers difficult to understand.

⁸⁷ IPP Office, *Quarterly Report, Independent Power Producers Procurement Programme (IPPPP) An Overview*, 31 March 2021. <https://www.ipp-projects.co.za/Publications>

primary mechanism for ensuring a consistent demand for these systems will be through the demand for utility-scale power plants, which in turn is shaped by the IRP. In alignment with the slowing economic growth and the increasingly unaffordable electricity tariffs, current electricity demand is stagnating. This implies that the increasing demand for renewable energy systems will need to be closely tied to the imminent plans to replace ageing coal fleet generation plants with renewable energy systems.

In order to ensure the principles of a just transition are upheld any prospects of decommissioning must be tied to commitments to a net of social protection policies and decent work opportunities. These mechanisms would require increased social welfare schemes, targeted employment benefits, and reskilling opportunities in the emerging renewable energy sector and investment in manufacturing capacity in impacted areas. Reskilling and redeployment of workers directly employed in the coal value chain facing loss due to decommissioning must be implemented in line with the agreed SLPs and monitored strictly by government. Opportunities in the public post-school education and training sector must be resourced and aligned and tied to jobs in transition activities and emerging industries.

Contestation around the role of social ownership of the sector, and the ability of the state to control economic rents from existing projects remains at the heart of the challenge going forward. A major risk for the current 45ncentiviz renewable energy transition based on REIPPP is its relationship to the broader unbundling of Eskom, potential to increase tariffs, and meagre downstream benefits for workers and communities. Including only a handful of social ownership experiments in the context of the proposed 45ncentiviz renewable energy transition runs the risk of simply 45ncentivized market reforms in the sector. In order to make future development viable in high solar and wind yield areas, massive public investment in enabling transmission infrastructure is required. Without subsidies, state guarantee programmes (such as REIPPP), and policy certainty, renewable energy deployment has shown to slow internationally. Further public investment and support must be accompanied by a coherent just transition strategy and social ownership regimes which ensure tangible and direct benefits are seen by workers and communities and not in service of financial capital.

The renewable energy industry remains fairly new in South Africa with none of the utility scale projects facing imminent decommissioning. End of life plans are required by the government as part of the implementation agreement of the REIPPP project that prescribes the requirements for safe disposal and rehabilitation of the environment. To date South Africa has no industrial facilities capable of recycling wind turbine blades and solar photovoltaic modules. The need for creating mechanisms for safe and environmentally friendly disposal of Solar PV modules is especially concerning given the proliferation of rooftop solar modules in high income households and a growing portion of commercial enterprises.

Alternative 45ncentivized45n45 strategies currently include proposals to retrofit existing coal plants to “clean coal” facilities and increase the component of liquified natural gas (LNG) fuels into grid operation. “Clean coal” technologies 45ncenti carbon capture and carbon storage technologies to partially mitigate against emissions from coal fired power stations. Further research and feasibility studies are required to determine the technical and economic viability of these technologies for limited application in the existing coal fleet.

Due to the increased introduction of variable energy resources (solar and wind technologies) there has been an increase in interest and demand from the state for the use of fully

dispatchable gas plants. Multinational manufacturers and utilities are encouraging the inclusion of gas (alongside increased renewable penetration) as part of a 46ncentivized46n46 strategy.

Both the entry of “clean coal” and gas technologies have received criticism from environmental organisations as maintaining and extending the harmful dependence on fossil fuel generation. The retrofitting of “clean coal” technology will prove costly which will need either subsidies or increased consumer tariffs. This may potentially divert funds which could be used to build renewable energy infrastructure which may offer longer-term benefits, if structured appropriately. The prospect of increasing gas technologies into the energy mix threatens to create dependence on imports from foreign reserves (in Africa largely Nigeria, Mozambique, and Angola). Given the levels of conflicts that have emerged in Mozambique over control of gas reserves, increased inclusion of gas technologies may drive interest in aggressive state and local capital intervention in the region.⁸⁸ Gas technology, while fully dispatchable, is typically expensive and will likely be recovered through electricity tariff increases.

Given the centrality of the coal value chain, a task force focused on this sector including business, 46ncentivi labour, government, and affected communities, should be established to promote the proactive planning of mine closures, implementation of SLPs, and other proposals for a just transition. In Canada, a task force was set up for the Just Transition for Canadian Coal Workers and Communities. The task force included 46ncentivi labour, industry, civil society, academia, and local and national government. For these entities to be successful, support from the government and clear terms of reference are required. Further, institutional capacity, proper funding, and a champion from the lead ministry in the national government can support the success of the task force approach.⁸⁹

4.1.5 Proposals

It is clear that there is a significant tension between the gravity and reality of guaranteed job losses across the coal and energy value chains and the promise of worker absorption in emerging industries.

Areas of guaranteed job losses anticipated:

- Losses along the coal value chain due to decreased local and international demand for coal inputs due to decommissioning and 46ncentivized46n46 commitments;
- Planned decommissioning of the existing coal fleet (in alignment with the IRP2019); and
- Other decommissioning which may result from the premature decommissioning of mines or parts of the coal generation fleet.

Areas of worker absorption anticipated:

- Development, construction, operations, and maintenance of renewable energy systems;

⁸⁸ Joseph Hanlon, *Mozambique’s Frelimo gambled everything on gas – and lost*. 8 April 2021.

<https://www.dailymaverick.co.za/article/2021-04-08-mozambiques-frelimo-gambled-everything-on-gas-and-lost/>

⁸⁹ Richard Halsey et al., *Remaking Our Energy Future: Towards a Just Energy Transition (JET) in South Africa*, n.d., 66.

- Recycling activities (across coal and renewable energy plants) and mine rehabilitation activities;
- Manufacturing from 47ncentivized of renewable energy systems;
- Public employment programmes investing in infrastructure for basic services, site rehabilitation, and provision of social services in mining affected towns; and
- Construction of enabling infrastructure for renewable energy systems in areas of high yield in wind and solar energy resources (expansion of the transmission network).

Despite the wide array of opportunities emerging in the energy transition in new industries, it is necessary to acknowledge that the use of renewable energy systems will not solely make up for the job destruction anticipated in the coal value chain. This is the case even with significant improvements in 47ncentivized. An economy-wide approach to the transition is therefore necessary and provision of social security measures to buffer communities from the worst of the shock and the extent of the shift will be necessary.

The top five areas of opportunity in this sector include:

1. **Localisation and manufacturing of renewable energy technology.** Localisation of the renewable energy manufacturing base must be established. Poor performance of existing industrial policy impacting renewable energy systems must be transformed to ensure workers capture the benefits of increased public procurement of the associated technologies. Stakeholders would include the DTIC, unions, and local manufacturers. *Time-scale: Medium term – 4-year horizon.*
2. **Recycling of metals to reduce waste and environmental harm.** National Government to support the recycling industry. Opportunities to advance public ownership should be pursued where recycling activities are dependent on high levels of subsidy, particularly for local municipalities (such as in solar PV recycling). This can also present an opportunity for job creation. *Time-scale: Short-term.*
3. **Drive publicly-owned renewable energy systems.** Combating the rise of 47ncentivized47 in the electricity sector by ensuring public ownership becomes the dominant mechanism for developing, constructing, operating, and maintaining utility-scale renewable energy plants to ensure affordable and clean energy access for all. Ensuring support mechanisms exist to help facilitate the development of community energy projects where appropriate and beneficial towards meeting the imperatives of basic service delivery. *Time-scale: Medium-term – 2-year horizon.*
4. **Job creation through mine rehabilitation and regional economic development.** Ensure the financing of mine rehabilitation is provided by mining companies or the government in line with the principle of “polluter pays”. Regional economic development should be carefully planned in coordination with local and national governments to create incentives and opportunities for diversifying the economies of mining affected towns. *Time-scale: Short-term.*
5. **Implement a job guarantee for a just transition.** A job guarantee programme must be implemented to ensure that all job losses associated with plans for decommissioning are responded to with a negotiated quantum of guaranteed jobs. It can be facilitated and monitored by the government, in partnership with labour, the business entity facing closure and the site of redeployment. These guaranteed jobs can be in the sustainable energy systems, recycling and rehabilitation, renewable energy manufacturing, or public

employment programmes to enhance basic service delivery. *Time-scale: Medium-term – 2-year horizon.*

These opportunities are expanded upon in Table 3 below, together with other key demands which place workers at the centre of the just transition mining and energy, grouped within key interventions including the transformation of energy access and ownership, transformation of the mining industry, regional economic development and industrial policy, and support for workers and communities.

Table 3: Demands for workers in the mining and energy sector, grouped by theme.

	Demand	Description	Time frame	Level
1	Establish a task force to manage the transition within the coal value chain	A task force to manage the coal transition is urgently needed, and should include government (including vulnerable municipalities), business, labour, and mining affected communities.	Short term	NG and BC
Transform energy access and ownership				
2	Revise the Integrated Resource Plan in line with affordable and clean energy access	The IRP as planned no longer provides the most cost effective pathway to low-carbon electricity and must be updated.	Short term	NG
3	Support development of municipal-owned renewable energy	Prevent re-privatisation through replication of REIPPP at municipal level.	Short term	NG, LG
		Investigate models of increasing democratic participation in planning of infrastructure development at municipal level.	Medium term	NG, LG
4	Support development of publicly-owned renewable energy systems	Financing for Eskom’s Just Energy Transition plan should allow for, and prioritise, funding for publicly-owned renewable energy generation capacity and supporting infrastructure.	Short term	NG
5	Investment in grid upgrading to increase opportunities for renewable energy in Northern Cape	Eskom must upgrade the grid to allow for additional renewable energy in the Northern Cape where solar resources are most abundant.	Medium term	NG, BC, LG and WP
		Public investment in upgrades to transmission infrastructure must be leveraged for greater public ownership of future generation projects.	Medium term	NG, BC, LG
6	Challenge 48ncentivized48 and 48ncentivized48n48n of the sector	Demand the renegotiation of IPP contracts that profit off unfair prices for Eskom.	Medium term	NG and BC
		Control economic rents from private energy producers by implementing a ‘reasonable rate of returns’ policy for all generation projects which limit the allowable rate of profit on public infrastructure projects.	Medium term	NG and BC
7	Address energy affordability and access	Urgent expansion of the grid to those who do not have access.	Short term	NG, LG and BC
		Review municipal funding models, increase Free Basic Electricity to 200KWh and monitor municipal implementation.	Medium term	NG, LG

Transform mining				
8	Redirect mining capacity to minerals for renewable energy	Identify inputs into the renewable energy technology value chain for industrial policy support measures.	Short term	NG and BC
9	Localisation of mining industry linkages	Implement competitive pricing to promote local steel value chains (for example Arcelor Mittal pricing).	Medium term	NG and BC
		Identify 49ncentivized opportunities in emerging industries (for example solar module frames).	Medium term	NG and BC
10	Implement Free and Prior Informed Consent (FPIC)	The Department of Rural Development and Land Reform must play a larger role in implementing protections of local communities in the mineral rights application process.	Short term	NG and BC
		Rather than the unclear process we currently have, FPIC should be a stated requirement.	Short term	NG and BC
11	Revise guidelines for Social and Labour Plans	Revise the Mineral and Petroleum Resources Development Act (MPRDA) and the mining charter to increase participation from mining communities and workers.	Short term	NG and BC
		Ensure SLPs adopt a gendered approach and include plans for provision of basic services for local communities.	Short term	NG, BC and WP
		Improve enforcement and monitoring of SLPs.	Short term	NG, BC and WP
		Extend SLPs to include smelters and refineries.	Short term	NG and BC
12	Mine rehabilitation	Financing of mine rehabilitation must be provided by mining companies or the government.	Short term	NG, BC and WP
		An audit should be conducted of abandoned mines and the status of rehabilitation – then they should be urgently rehabilitated and land should be redistributed.	Medium term	NG and BC
13	Increase worker ownership and representation in mining companies	Implementation of Employee Share Ownership Plans (ESOPs) and demand representation of workers at the board level.	Medium term	NG, BC and WP
Regional economic development and industrial policy				
14	Incentivise manufacturing of renewable energy technologies	Impose a schedule of targeted import tariffs on renewable energy components to increase local manufacturing.	Short term	NG and LG
		State backed green finance offering cheap debt and loan guarantees comparable to bond rates for utility scale renewable energy and renewable energy manufacturers paired with public ownership.	Medium term	NG, LG and BC
15	Incentivise recycling of metals and renewable energy technology	National Government to support the recycling industry. Significant subsidies are required to make recycling viable and strategic partners for public ownership must be identified.	Medium term	NG and BC

		Funds available for R&D on the recycling of renewable energy technology.	Medium term	BC and WP
		Local governments to start solar PV recycling depots.	Medium term	LG
16	Increased investment in Research and Development in improved mining efficiency and industrialisation	Employers should provide access to R&D plans and include workers in decision making.	Short term	BC & WP
		Government should also be investing in R&D for the mining sector to improve efficiency.	Short term	NG and LG
17	Provide support for recycling of ash from coal power stations	Ash recycling should be included in all SLPs with the aim to promote employment.	Short term	BC and WP
18	Research on economic diversification in Mpumalanga and the Platinum belt	Request that the Coal Transition Task force commissions an analysis of mining dependent towns to identify opportunities for other economic activity. Opportunities must be employment intensive.	Medium Term	NG and BC
19	Waive international intellectual property agreements to allow for local manufacturing and provision.	Demand international sharing of IP to allow for innovation in renewable energy technologies, as well as improved efficiency in water usage etc.	Short term	NG
20	Technology transfer strategies	A coherent technology transfer system which enhances the technical capabilities of the existing manufacturing base. Incentives for research and development must be targeted at enhancing local knowledge bases in favour of building scientific and engineering expertise	Medium term	NG
Support for workers and communities				
21	Job guarantee	Investigate the options for the implementation of a job guarantee scheme in mining towns.	Medium term	NG, BC, and LG
22	Social protection and provision of services	Social protection and improved provision of services would increase resilience for vulnerable communities. This could include a Universal Basic Income Grant and National Health Insurance in addition to obligations that environmentally harmful industries might have to specific communities.	Medium term	NG
23	Active labour market policies for coal communities	The coal transition task force should conduct a skills audit of all vulnerable workers and communities to design programmes for reskilling in partnership with unions.	Short term	NG, BC
		Skilling programmes designed according to capabilities and options for geographic context.	Short term	NG, BC
24	Include community stakeholders in consultations and decisions	Through the coal transition task force, communities should also be included. In order to meaningfully participate they should also access information (shared in the language of their preference).	Short term	NG, BC, LG, WP
25	Public employment programmes to support infrastructure development,	Public employment programmes to support rehabilitation and provision of public services – communal gardens, early childhood development centres and health workers could reduce burden on	Medium term	NG, BC, LG and WP

rehabilitation and social services in mining towns.	women.		
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Note: The target level indicates where this demand should be directed: national government (NG), local government (LG), bargaining councils (BC) and the workplace (WP). The time frame also highlights which demands are achievable in the short term (6-12 months), vs the medium term (1-4 years), vs the long term (5-10 years)

4.2 TRANSPORT

Mission: An environmentally sustainable transport system that provides all people in South Africa with affordable, accessible, reliable, and safe transport for work, services, and recreation and ensures that products are available where they are needed.

This section will first outline the status of the transport sector in South Africa in Section 4.2.1. Section 4.2.2 explains how the sector both impacts and is impacted by climate change and how this affects workers. Section 4.2.3 will then conduct a deeper analysis of the road transport value chain due to its particular relevance as the most widely used and carbon-intensive sub-sector, outlining the threats to the industry and some opportunities. Section 4.2.4 will examine possible pathways for transition to a more sustainable transport system. Section 4.2.5 will provide opportunities that exist for workers for a just transition, as well as demands which should be taken forward at the various levels of engagement.

4.2.1 Current state of the transport sector

Primary modes of transport include road, rail, maritime and air. In South Africa, the majority of transport occurs on roads. There are two largely distinct services operating across these modes – the transport of goods (freight) and the transport of people (passenger). In this sense, the transport sector plays a fundamental role across society and the economy – by transporting goods required for life and work, and ensuring people have access to places of work, school, religious institutions, clinics, community, and recreation.

As discussed in Section 3, apartheid spatial planning and labour policies relegated the working class to the peripheries of most cities far from work, with poorly integrated transport networks resulting in most people spending between one and two hours travelling to work in the mornings.⁹⁰ The 51ncentiviz nature of most transport, pricing structures, and distances impact on the cost of transport provision, with the poorest households spending more than 20% of their incomes on transport. Rural communities, particularly in the former homelands, remain isolated from rail and bus networks. In urban areas, the pervasive, low-density sprawl in municipalities makes it more expensive to support an effective public transport system and makes non-motorised transport for example through walking or cycling, more difficult and time-consuming.⁹¹ Therefore, rethinking and 51ncentivized these spatial realities is fundamental to addressing the problems facing users of the transport system.

⁹⁰ STATS SA, *The National Household Travel Survey in South Africa (NHTS)*, 2021. <http://www.statssa.gov.za/?p=14063>

⁹¹ STATS SA, *Measuring household expenditure on public transport*, 2015. <http://www.statssa.gov.za/?p=5943>; Tracy McKay. "South Africa's Key Urban Transport Challenges" in R. Massey and A. Gunter (eds.) *Urban Geography in South Africa*, GeoJournal Library, 2020. https://doi.org/10.1007/978-3-030-25369-1_12

Passengers in South Africa make use of minibus taxis, private vehicles as either passenger or driver, bus, and rail. Walking is an often overlooked form of transport despite the fact that the majority of South Africans (an estimated 17.4 million people) reported that walking was their main mode of transport in the seven days prior to the survey to get all the way to their destination.⁹² This is largely due to the fact that the majority of children in all provinces walk to school. In addition, all public transport users rely on walking for the beginning and ends of their journeys. In the case of learners going to school and workers going to work, 92% and 88% respectively walked for 15 minutes or less to get to their first public transport. Private vehicles (not including buses, taxis, or rail, but rather individually owned cars and trucks) are the main form of transport used to get workers to their workplaces, either as drivers or as passengers, with 43.5% of workers using them.

Public transport remains an essential part of travel in South Africa. Each component of public transport is structured differently. Minibus taxis are a less centralized and more fragmented sector but play the largest role in mass-commuter transport. Taxi owners are organized into associations who are responsible for managing the routes. The minibus taxi industry is one of the only sectors in the South African economy which is largely Black-owned so supporting the transition of the industry is key to broader transformation of ownership and wealth redistribution. Train services are largely run through a state-owned entity, the Passenger Rail Agency of South Africa (PRASA). PRASA was formed in 2009 and consolidated Metrorail, Shosholoza Meyl, and Autopax. The Gautrain, the commuter rail in Gauteng linking Johannesburg and Pretoria, is implemented as a public-private partnership with the Gauteng Provincial Government and Bombela Concession Company.

The bus system in South Africa is more heterogeneous. There is no singular entity, and most vary by municipality and province. There are commuter bus systems (for example Golden Arrow in Cape Town and Algoa Bus in Gqeberha), bus rapid transit systems (for example Rea Vaya in Johannesburg), and interprovincial buses (for example Intercape). These are owned by a mix of private companies (for example Golden Arrow), municipal governments (for example Metrobus), and public-private partnerships (for example Rea Vaya).

The most popular modes of public transport have shifted substantially in the past few years. Between 2013 and 2020, there has been an increase in the proportion of taxi use (68% to 80.2%), with a drop in both bus (20% to 17%) and trains (13% to 3%).⁹³ Overall, this illustrates that the transport sector in South Africa is increasingly dominated by road transport and low-capacity vehicles, but also the shift towards more private provision and usage of transport, away from state-owned and run capacities.

This is despite the fact that taxis were the most expensive form of public transport in 2020, with passengers spending approximately R960 per month, compared to R745 for buses and R581 for trains.⁹⁴ Furthermore, households reported that travel cost was the most important factor in the choosing mode of transport (above travel time and flexibility). However, this is clearly overwhelmed by the poor coverage and unreliability associated with bus and rail. The high cost

⁹² STATS SA, *The National Household Travel Survey in South Africa (NHTS)*, 2021.

<http://www.statssa.gov.za/?p=14063>

⁹³ Ibid.

⁹⁴ Ibid.

of taxis is partly due to their lack of incentivized and that, in comparison to buses and trains, they are a low-capacity mode. Despite the fact that public transport is considered a social service and that taxis are by far the largest provider of mass transport in South Africa, they receive no operational subsidy and only 1% of total transport subsidies through the taxi incentivized programme.⁹⁵

The incentives for the increase in taxi usage and road travel more generally, and the decline in bus and rail is multifold.

Rail use has historically played a substantial role in the transport sector. There was a marked decline since the 1970s, due to underinvestment, inconsistencies in upgrades, and obsolete technologies resulting in incentivized.⁹⁶ This lack of investment is most clearly illuminated by the fact that most of the country's rail routes have been in place since before 1900, and since the end of apartheid no new railways or train stations have been built, apart from the Gautrain. This means that passenger rail networks are bound by the historical geographies that merely acted as a way of ensuring Black labour could get to work in the cities.⁹⁷ Freight rail remains structured between mines and ports due to the main aim of mineral extraction for export during incentivized and which persisted through the MEC.

In the past decade the declining trend in rail has accelerated. After the formation of PRASA in 2009, large new investments were made into the railways. However, in 2015 the Public Protector's office released an exposing report titled 'Derailed', following allegations of corruption and maladministration made by SATAWU.⁹⁸ The report found evidence of systemic mismanagement and maladministration within the procurement process. Further investigation found that of the 216 contracts made between 2012 and 2015, worth approximately R15 billion, only 13 were found to be compliant.⁹⁹ Due to this, PRASA suffers from a significant backlog of maintenance and underinvestment, as well as increasing theft and vandalism.¹⁰⁰ Corruption has meant that much of the money that is spent, is wasted. For example, PRASA ended up spending billions on trains that were too tall for South African railways, in a contract that implicated Swifambo Rail Company.¹⁰¹

⁹⁵ Competition Commission South Africa, *Market Inquiry into the Land Based Passenger Public Transport*, 2017. <http://www.compcom.co.za/wp-content/uploads/2020/02/Executive-Summary-Final-Combined-Reports.pdf.pdf>

⁹⁶ Dept. of Transport, *National Rail Policy Green Paper 2015*. <https://www.transport.gov.za/documents/11623/21629/NationalRailPolicyGreenPaper.pdf/ea72ecab-2990-41cd-a0dd-f5e7a2c3e82a>

⁹⁷ McKay. "South Africa's Key Urban Transport Challenges" in R. Massey and A. Gunter (eds.) *Urban Geography in South Africa*, GeoJournal Library, 2020.

⁹⁸ Public Protector South Africa, *Derailed: a report on an investigation into allegations of maladministration relating to financial mismanagement, tender irregularities and appointment irregularities against PRASA*, 2015. https://www.opensecrets.org.za/wp-content/uploads/Public-Protector_Derailed-2015.pdf

⁹⁹ Open Secrets, *How PRASA was looted and left for scrap*, 13 April 2021. <https://www.dailymaverick.co.za/article/2021-04-13-how-prasa-was-looted-and-left-for-scrap/>

¹⁰⁰ TB George, R Mokoena and FC Rust, *A review on the current condition of rail infrastructure in South Africa*, CSIR, 2018. https://repository.up.ac.za/bitstream/handle/2263/69554/2C_Mokoena_Review_2018.pdf?sequence=1

¹⁰¹ Aphiwe Deklerk, *Prasa to recover a fraction of R2.3bn for 'tall' trains*, 17 February 2021. <https://www.businesslive.co.za/bd/national/2021-02-17-prasa-to-recover-a-fraction-of-r23bn-for-tall-trains/>

In this context, rail services continue to be old, run down, and underserved, leading to complaints from commuters about access, scheduling, and safety. The effect of this has been detrimental to working class communities. For example, the central line in Cape Town which served some of the poorest communities, stopped all services between October 2019 and February 2021. Although somewhat more heterogeneous, the bus system in most areas is similarly overcrowded, unreliable, not maintained and serving partially outdated routes linked more to apartheid planning than to actual demand.¹⁰²

This is intensified by increasing 54ncentivized located at these peripheries, which worsens the burden on transport systems with impacts such as long wait times, increased congestion, worsening safety, and overcrowding. This structure and characteristic of the transport system has ripple effects – affecting the working classes’ ability to access services, look for jobs, and impacts the amount of leisure time people have after working hours. The implication of this is the increased reliance on, and desire for, personal cars for those who can afford it, as well as a transport system that is catered towards private cars.

This increased reliance on the roads has also created safety concerns and worsened the state of the road network. An estimated 60% of South Africa’s urban road networks are in need of repairs, which translates into increased fuel use, high wear and tear costs, and road accidents.¹⁰³ This has been worsened by the shift of freight from rail to trucks which increases the damage to roads. The issue with road networks is closely linked to infrastructure such as poor water drainage systems and bad management of maintenance of roads. A related issue is the lack of infrastructure and safety of walking and cycling in cities: “currently around 5 600 pedestrians die on South Africa’s roads annually, double the world average”.¹⁰⁴ Regulations (notably the National Road Traffic Act) also do not give pedestrians and cyclists the same rights as vehicles on public roads. The possibility of being a victim of crime and violence on the streets also reduces the desirability of walking or cycling.

Freight rail has faced a similar fate to passenger rail. Transnet, the majority government-owned rail, port and pipeline company, is responsible for maintaining the country’s more than 30 000 km of rail network, providing freight services and rolling stock manufacturing. However, this too has gone into decline. By 2013, the only industry left that only used freight rail was bulk mining, with other industries and transport routes having less than 15% of their operations via rail.¹⁰⁵

Transnet has been plagued by corruption, mismanagement, and maladministration. For example, in May 2014, Transnet bought 1 064 new locomotives from the Chinese Railway Rolling Stock Corporation for almost R40 billion as part of its Road to Rail initiative. The deal was implicated in a number of corruption, fraud, and money laundering scandals. In addition, it failed to deliver the needed infrastructure. For example, only 249 of the 359 electric locomotives were eventually delivered and they were largely defective. Despite the late delivery and poor quality, Transnet did not get the penalties due to them, estimated at R54 million.

¹⁰² George et al. *A review on the current condition of rail infrastructure in South Africa*, CSIR, 2018.

¹⁰³ Ibid

¹⁰⁴ Ibid, p.193

¹⁰⁵ Department of Transport, *Freight Transport*, 2017.

https://www.transport.gov.za/documents/11623/39906/7_FreightTransport2017.pdf/a3f7cb55-8d77-4eea-b665-4c896c95a0d8

Altogether, Transnet has underperformed. Between 2005 and 2010, it saw a 55% project failure rate and during the 2018/19 financial year it only reached 61% of its tonnage target.¹⁰⁶ The overall decline in rail has ripple effects across the economy, and has even impacted bulk mining, with reduced rail services severely hindering the ability of exporters to transport chrome, ferrochrome, coal, and manganese to ports.¹⁰⁷ This has been worsened by track infrastructure defects such as rail breaks, rail kick-outs, track geometry, gauge widening, and defective points and crossings, leading to collisions and derailments.¹⁰⁸ This further encourages a shift to trucks for freight.

In parallel, road freight has experienced deregulation which, prior to 1987, was regulated. In the subsequent decades, the road freight industry increased its competitiveness through lobbying for increased road space, infrastructure for large trucks, and increasing size and weight limits.¹⁰⁹ However, it too has faced increasing constraints. These include increasing road congestion which increases travel time, the damage caused by trucks to the quality of roads, diesel shortages, and lack of adequate staffing.¹¹⁰

The transport sector currently employs around 800 000 people (directly employed, not including those in the broader value chain), according to the Stats SA Quarterly Labour Force Survey for Q1 of 2021. A breakdown of employment by mode of transport is shown in Table 4, however, these numbers might not be accurate because of the level of disaggregation. Essentially, air, sea, and coastal forms of transport have very low numbers of people employed in these sub-sectors compared to road, railway, and supporting transport services. Road transport is clearly the largest employer, in line with being the most used mode of transport. This, along with the fact that it is the largest transport contributor to GHG emissions, is why we will be doing a deep dive into the road transport value chain in the next section.

Table 4: Employment in the Transport Sector in South Africa

Transport sub-sector	Number of people employed (formal and informal)
Railway transport	48 854
Other land transport (Road)	664 986
Sea and coastal water transport	950*
Air transport	20 908
Supporting and auxiliary	69 000
Total	804 698

*Source: Stats SA, QLFS Q1 2021, *Note that the sea and coastal transport figure is from the QLFS for 2020 as the 2021 QLFS did not include this metric*

¹⁰⁶ M. Xaba, *Root cause analysis of major capital projects failure at Transnet Freight Rail*, University of Pretoria, 2011.
<http://uir.unisa.ac.za/bitstream/handle/10500/4447/2011%20MBA3%20Research%20Report%20M%20Xaba.pdf?sequence=1&isAllowed=y>

¹⁰⁷ Allan Seccombe, "Merafe Warns About Freight Train Crisis As It Lays Off Nearly 1,000 Staff", *Business Day*, August 3, 2021, <https://www.businesslive.co.za/bd/companies/mining/2021-03-08-merafe-warns-about-freight-train-crisis-as-it-lays-off-nearly-1000-staff/>.

¹⁰⁸ George et al., *A review on the current condition of rail infrastructure in South Africa*, CSIR, 2018.

¹⁰⁹ "Chapter 7: Freight Transport", in *National Transport Masterplan: Synopsis Update*, 2016, https://www.transport.gov.za/documents/11623/39906/7_FreightTransport2017.pdf/a3f7cb55-8d77-4eea-b665-4c896c95a0d8.

¹¹⁰ *Ibid.*

Employment in the transport sector varies significantly by skill level, pay, and working conditions. While some workers are highly skilled, employed in formal work and have contracts with employment benefits, others, particularly in the taxi industry, are employed with less formality and security. Taxi drivers, together with many informal workers in other sectors, experience complete work insecurity, do not have contracts and face the threat of being fired at any time. They also suffer from a lack of safety measures, long hours, no benefits, poor pay (often below the sectoral determination), and low unionized rates.¹¹¹ While there have been attempts to increase union membership of taxi drivers, this has often been met with intimidation by taxi owners and operators.

4.2.2 Transport and climate change

The transport sector is a major source of GHG emissions, contributing approximately a quarter of global energy emissions and 17% of South Africa's energy emissions.¹¹² These emissions more than doubled between 2000 and 2017. Due to the overwhelming dominance of road transport, this sub-sector's emissions comprise the vast majority of emissions by the sector (91%). Petrol and diesel are used to power internal combustion engines (ICE) which dominate road transport in South Africa. Rail on the other hand only accounts for approximately a quarter of freight revenue and under 5% of personal transport, but contributes a disproportionately low percentage of emissions at 1%. Aviation and water-based transport account for 6% and 2% of GHG emissions respectively.¹¹³

The main impacts of the transport sector on climate change and the environment come from:

- Refineries and coal-to-liquid fuel plants (Sasol);
- Fuel combustion;
- Electricity use throughout the value chain;
- Use of concrete in road infrastructure; and
- Air pollution.

Transport contributes to climate change through refineries, fuel combustion, electricity use throughout the value chain, and use of concrete in infrastructure. The impacts of climate change on the environment, workers, and their communities has been explained in previous sections so will not be repeated here. Transport emissions also have more immediate impacts. Petrol and diesel-fueled cars release particulate matter and chemicals into the air which can cause serious health problems, such as cancer, lung disease, and even premature death.¹¹⁴ These concerns are particularly prevalent in the major metros which face urban congestion from traffic. In Johannesburg, the air quality is considered to be dangerous half of the time, and the lifespan of

¹¹¹ Siyabulela Fobosi, "Employment Practices Within The Minibus Taxi Industry In Johannesburg: A Study Of Precariousness Of Jobs In South Africa", *Sociological Review* 23, no. 2 (2020): 99-119.

¹¹² Hannah Richie, "Cars, Planes, Trains: Where Do CO2 Emissions From Transport Come From?", *Our World In Data*, October 6, 2020, <https://ourworldindata.org/co2-emissions-from-transport>; Department of Environment, Forestry and Fisheries, "Draft 7Th National Greenhouse Gas Inventory Report" (Pretoria, 2020), <https://cer.org.za/wp-content/uploads/2020/09/Draft-7th-National-Greenhouse-Gas-Inventory-Report-for-the-Republic-of-South-Africa-for-public-comment.pdf>.

¹¹³ Ibid.

¹¹⁴ Union of Concerned Scientists, "Cars, Trucks, Buses And Air Pollution", July 23, 2008, <https://www.ucsusa.org/resources/cars-trucks-buses-and-air-pollution>.

residents is approximately three years shorter due to the impact of air pollution on their health.¹¹⁵ This is linked not only to vehicles, but also to pollution from local power stations, dust, and fires.

Transport workers have noticed the signs of climate change. They report higher temperatures, more extreme weather, strong winds, drought, heavy rains, severe sun rays, and longer cold seasons. The weather is generally less predictable. They also report other forms of environmental damage, for example, the cutting down of trees and the effects on marine life of industrial chemicals.

Transport workers experience the negative impacts of smoke and pollution inhalation coming from power stations and trains. This has very negative impacts on workers' health, and can even result in death. This also means that the cost of healthcare is high and can even be inaccessible to workers.

The main impacts of climate change or the low-carbon transition on transport are:

- Extreme weather events damaging infrastructure;
- Reduced demand for ICE and fossil fuels; and
- Rising costs due to incentivized GHG emissions.

Due to the nature of transport, it is fundamentally reliant on large, connecting, mostly immovable infrastructure such as roads, railway lines, stations, and stops. Extreme weather events associated with climate change, particularly flooding and storms, can have negative impacts on this infrastructure thus requiring that climate adaptation measures be instituted.

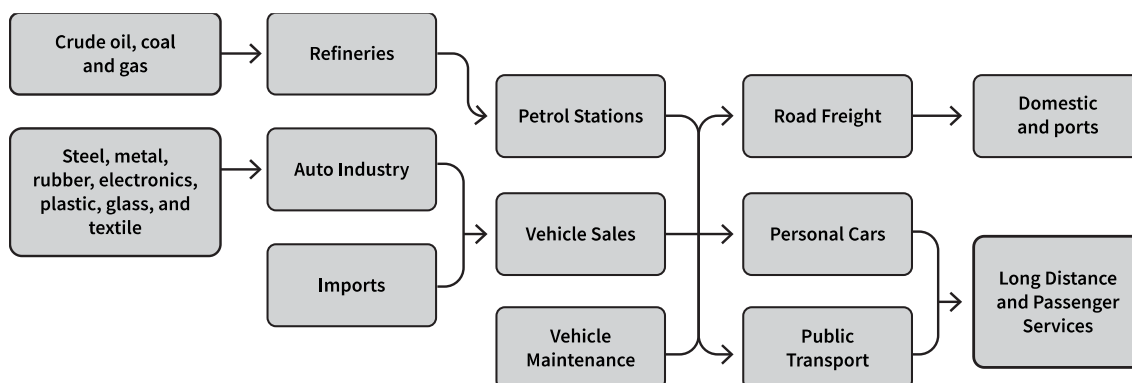
4.2.3 Road transport value chain

The value chain in the road transport sector is long and varied. In total, it was estimated that in 2017, 1.2 million people were employed in the value chain. Some of the highest employing sections include freight and taxi businesses (625 000 people), petrol stations (130 000 jobs), repairs and maintenance (250 000 people), and the auto industry (100 000 people).¹¹⁶ The road transport value chain added about 8% to Gross Value Added in the late 2010s. Within transport services, most revenue was generated by freight transport although personal transport contributes more to employment and small businesses. The largest portion in terms of value is land transport, followed by sales and maintenance, auto assembly, and parts. However, the auto assembly was the fastest growing part of the value chain up until 2018 and expanded more rapidly than economic growth. Figure 6 shows the linkages of the road transport industry to fossil fuel inputs and networks of global trade.

¹¹⁵ "Air Quality In Johannesburg", IQair, 2021, <https://www.iqair.com/south-africa/gauteng/johannesburg>.

¹¹⁶ Makgetla et al., National Employment Vulnerability Assessment: Analysis of Potential Climate-Change Related Impacts and Vulnerable Groups.

Figure 6: Diagram of the road transport value chain



Source: Adapted from Neva Makgetla, Nokwanda Maseko, Gaylor Montmasson-Clair, and Muhammed Patel. National Employment Vulnerability Assessment: Analysis of Potential Climate-Change Related Impacts and Vulnerable Groups. Pretoria: TIPS, 2019.

Most of the jobs in the road transport value chain are in road transport services, followed by maintenance and repairs. Both of these areas of the value chain have high levels of informality and small businesses. In maintenance, employers and the self-employed constituted over a third of total employment, which is much higher than the national economy where they constitute 15%. Of drivers in the transport industry, 200 000 were minibus taxi drivers, 160 000 other bus, van, and taxi drivers, and 90 000 formal freight drivers. Most of these jobs are distributed across the country in line with population, but the auto manufacturing sector is particularly concentrated in Gauteng, Eastern Cape, and KwaZulu-Natal.

As discussed above, the transport sector is a large contributor to GHG emissions and the road transport sector is the largest contributor in South Africa due to the use of ICEs which require fossil fuels. The prevalence of private cars within our transport sector is also a reason for high emissions. Table 5 outlines the main sources of GHG emissions within the road transport value chain as well as the ways in which these activities are vulnerable to climate change.

Table 5: Road transport value chain contributions to climate change and vulnerabilities.

Value chain:	Source of GHG emissions:	Vulnerabilities to climate change and associated policy responses:
Refineries	Fuel combustion Electricity	Rising costs due to policy to incentivize cost of GHG emissions for example carbon tax Reduced demand due to move away from ICE
Auto industry	Electricity	Reduced demand due to move away from internal combustion engines
Road freight	Fuel combustion	Reduced demand due to shift towards train freight Extreme weather events affecting infrastructure
Personal cars and sales	Fuel combustion	Reduced demand due to shift from ICE Extreme weather events affecting infrastructure
Public transport	Fuel combustion	Insufficient capacity due to increased demand Extreme weather events affecting infrastructure
Petrol stations	Electricity	Reduced demand for petrol due to shift from ICE

As shown in Table 5, the road transport value chain will be significantly impacted by climate change and policies to reduce GHG emissions. The main risks outlined in the table include:

- Rising costs due to policy to incentivize cost of GHG emissions for fuel and ICEs;
- Reduced demand for vehicle manufacturing due to move away from ICE/shift to rail;
- Extreme weather events affecting transport infrastructure; and
- Reduced demand for petrol due to shift away from ICE.

The policy response to climate change in the transport sector should adopt a holistic approach driven primarily by the “Reduce, Shift, Improve” framework, in that order. In terms of the impact of this policy response on workers in this industry, reducing distances travelled would require significant urban development, housing construction, and infrastructure which would create jobs. Shifting from high-carbon modes of transport to low-carbon modes, particularly non-motorised transport (walking and cycling) or public transport, would also lead to job creation due to construction, but curtail employment due to the reduction of the number of taxis, private vehicles, and petrol stations. Improving vehicle efficiency would decrease demand for ICE vehicles in auto manufacturing in favour of alternatively fueled vehicles. We will now assess the key risks and opportunities in line with climate policy in the transport sector.

The two big changes in powering vehicles used in the road transport industry are expected to be the shift to electric vehicles and the use of alternative fuels, such as sustainable biofuels, natural gas, and green hydrogen. The Green Transport Strategy proposes the use of dual-fuel systems for taxis which use a mix of natural gas and normal diesel.¹¹⁷ There has also been substantial interest in the potential of green hydrogen, a fuel that is produced from water and electricity which has the potential to produce a ‘clean’ fuel if renewable energy is used. The main areas of interest for green hydrogen are in heavy-load and long-distance vehicles, with potential for maritime and aviation transport.¹¹⁸

Internationally, the focus of efforts to reduce GHG emissions in the transport sector has unfortunately been on technological changes, the ‘improve’ end of the mitigation spectrum. This is as opposed to reduction of transport and modal shift to lower-carbon forms of transport, both of which offer much greater opportunities for emissions reductions. An example of the technology focus is the shift to electric vehicles. As South Africa exports over half of the vehicles assembled here, many to Europe, the vulnerability of our auto industry is a concern, particularly as it is one of the few endeavours in manufacturing which has been successful.

The shift to EVs has the potential to affect several parts of the value chain as they “qualitatively change the technology used in road transport, and consequently employment in manufacturing, petrol stations, maintenance and repairs”.¹¹⁹ The auto industry in South Africa contributed 6.4% to GDP in 2019. It has been one of the only successful incentivized programmes which has increased manufacturing capacity in the country, concentrated in the Eastern Cape,

¹¹⁷ Department of Transport, *Green Transport Strategy For South Africa: (2018-2050)*, 37.

¹¹⁸ Muhammed Patel, "Green Hydrogen: A Potential Export Commodity In A New Global Market Place" (Trade & Industrial Policy Strategies, 2020), https://www.tips.org.za/images/TIPS_Green_hydrogen_A_potential_export_commodity_in_a_new_global_market_place.pdf.

¹¹⁹ Trade & Industrial Policy Strategies (TIPS), "Sector Jobs Resilience Plan: Petroleum Based Transport Value Chain", 2020, https://www.tips.org.za/images/TIPS_for_DEFF-dtic_-_SJR_P_for_petrol_based_transport_VC_final_May_2020.pdf.

Gauteng, and KwaZulu-Natal. The industry currently produces 0.68% of the global output, and aims to increase this to 1% by 2035, producing between 1.3 and 1.5 million units per year, according to the Automotive Masterplan. Through this, it also aims to double jobs to 224 000 in the sector by 2035, based on increasing productivity and 60ncentivized.¹²⁰ How a transition to Evs and more fuel efficient vehicles is aligned with this process, is not clear.

The National Employment Vulnerability Assessment has highlighted several key employment risks in a transition to Evs.¹²¹ Evs require less maintenance and are more likely to be charged at home instead of using petrol stations. This has the potential to significantly impact workers in these two parts of the value chain. In addition, unless substantial investments and shifts are made in the manufacturing sector to account for a shift in export demand away from petrol vehicles to Evs, jobs could be lost in the automotive industry. Some of these concerns have already been raised by workers in the transport industry, particularly around job losses. In addition, concerns were raised about the costs of Evs, the cost of electricity, and energy security given recurring load shedding.

These risks are expected to bear out both due to a reduction in export demand for high-emitting, low-efficiency cars, as well as domestic regulations shifting towards 60ncentivized60 of Evs and other low-emitting vehicles. However, these impacts are only likely to happen in the 2030s as the NDCs stipulate that the transition in transport is only planned for the 2030s and therefore business associations expect limited progress before then, unless the government provides strong incentives.¹²² In the interim, it will also be necessary to increase electrification infrastructure and supply in order to meet increased demand from the transport sector. It will also be necessary in this period for the industry, in collaboration with government, to identify priorities for niche product development in the EV space to ensure that South Africa plays a value addition role in the value chain.¹²³ One challenge to the shift to increase electrification of transport is the risk of volatile electricity supply and instability. In this sense, the transition in the transport sector will be dependent on the energy transition and stability of electricity supply too. However, even if electric vehicles run off of coal-based electricity, overall emissions are still lower than petrol and diesel vehicles.

4.2.4 Pathway opportunities for just transition in transport

In order to address the impacts on transport of climate change, numerous legislative and policy measures have been introduced and advocated for.

¹²⁰ Justin Barnes et al., "Geared For Growth: South Africa'S Automotive Industry Masterplan To 2035" (Department of Trade and Industry, 2018), https://www.afsa.org.za/Downloads/SA_Auto_Masterplan.pdf.

¹²¹ Makgetla et al., *National Employment Vulnerability Assessment: Analysis of Potential Climate-Change Related Impacts and Vulnerable Groups*, 75.

¹²² Makgetla et al., *National Employment Vulnerability Assessment: Analysis of Potential Climate-Change Related Impacts and Vulnerable Groups*; Department of Forestry, Fisheries and the Environment, "South Africa'S First Nationally Determined Contribution Under The Paris Agreement", 2021, https://www.environment.gov.za/sites/default/files/reports/draftnationallydeterminedcontributions_2021updated.pdf.

¹²³ Barnes et al., *Geared For Growth: South Africa'S Automotive Industry Masterplan To 2035*.

The International Transport Workers' Federation (ITF) uses a framework for reducing GHG emissions in transport through the method of 'Reduce, Shift and Improve'.¹²⁴ This framework focuses on reducing the amount of transport required based on poor social and environmental conditions, changing the modes of transport from high-carbon to low-carbon modes, and using technology to help reduce emissions. Within this, they have also released a People's Public Transport Policy, which articulates demands for a publicly-owned and financed transport system that promotes decent work and employment.¹²⁵

The South African government's approach to transport through its Green Transport Strategy has followed a similar approach of 'Reduce, Shift and Improve', advocating for interventions that involve "lessening the movement of goods and people; shifting to low carbon modes of transport and improving energy and fuel efficiency".¹²⁶ The Green Transport Strategy will also be used as an implementing tool for the Transport Flagship Programme which aims to increase the usage of public transport by commuters and ensure that it is more user-friendly, less environmentally damaging, cheaper, and more integrated.¹²⁷ Prior to this, there was little planning for how to reduce emissions in the sectors, despite the ongoing acknowledgement that it was required.

However, not all government outputs have aligned with this framework. The Auto Green Paper on the Advancement of New Energy Vehicles in South Africa makes no reference to the Green Transport Strategy despite the obvious need to link electric vehicle (EV) development to broader strategic and developmental goals within transport. It has been incentivized as seeing EVs as a "techno-fix", and that it "fails dismally to promote a just transition in ways that support local production, increase local content, and promote employment, based on the decent work agenda and value addition".¹²⁸

Additional policy devices with impacts on the transport sector, are the carbon tax, fuel levy, and an environmental levy on new cars. While the carbon tax and the environmental levy are targeted at the manufacturer, all have the potential to increase costs for the consumer. While some of these have the potential to be progressive, for example it taxes the wealthier who are more likely to own cars, it also has the potential to be regressive as it will also impact commuters who use taxis as the costs of increasing fuel prices are passed down to them. The progressiveness of the tax could be increased through more targeted ones, such as one specifically for luxury cars.

¹²⁴ ITF Climate Change Working Group, "Transport Workers And Climate Change: Towards Sustainable, Low-Carbon Mobility", in ITF Climate Change Conference, (2021), <https://www.itfglobal.org/en/training-education/towards-sustainable-low-carbon-mobility>.

¹²⁵ ITF, "People's Public Transport Policy Demands", accessed 8 November 2021, <https://www.itfglobal.org/sites/default/files/node/page/files/People%27s%20Public%20Transport%20Policy%20Demands.pdf>.

¹²⁶ Department of Transport, "Green Transport Strategy For South Africa: (2018-2050)", 2018, https://www.transport.gov.za/documents/11623/89294/Green_Transport_Strategy_2018_2050_onlineversion.pdf/71e19f1d-259e-4c55-9b27-30db418f105a.

¹²⁷ Department of Environmental Affairs, "South Africa's 1st Annual Climate Change Report: Near-Term Priority Climate Change Flagship Programmes" (Pretoria, 2016), https://www.environment.gov.za/sites/default/files/reports/themeH_flagship_programme.pdf.

¹²⁸ Alex Mohubetswane Mashilo and Dinga Sikwebu, "SA Joins Race To Electric Cars, But State Policy Means It'll End With A Crash", Sunday Times Daily, 2021, <https://www.timeslive.co.za/sunday-times-daily/opinion-and-analysis/2021-06-01-sa-joins-race-to-electric-cars-but-state-policy-means-itll-end-with-a-crash/>.

Significant opportunities exist in the efforts to reduce travel distances and shift to more non-motorised transport and public transport. The first opportunity to reduce travel is through smart urban planning and development. Travel can be reduced when residential houses, offices, shops, and public services are mixed within close proximity – called ‘mixed land use’. This requires improved, more equitable spatial planning of housing to reduce urban sprawl, and urban infrastructure that prioritises safety and ease for pedestrians and cyclists. Ensuring access to public transport hubs is important, and ensuring that all public transport nodes such as train stations, bus stations, and taxi ranks are surrounded by higher density residential housing. Improvements to these transport nodes also promotes accessibility, such as ensuring good lighting, safety, and cover.¹²⁹ Other options for reducing travel include incentivizing production of food, and other goods, as also discussed in other sections. These urban planning interventions require the management of local governments or municipalities as they understand their local contexts and transport needs. The involvement of local government is highlighted as a vital component of a successful public transport drive based on lessons from the 2010 World Cup in South Africa, outlined in Box 5.

Box 5: Lessons from the 2010 FIFA World Cup for Transport Investment

The 2010 Soccer World Cup hosted by South Africa led to a significant investment in transport infrastructure. While there were many successes in the transport for the event, there are also lessons for the transport sector which should be kept in mind in planning the integration of public transport.

The pressure of the deadline of the World Cup meant that public transport plans were hurried up and implemented sooner than they would have been otherwise. National government spent R13.6 billion directly on transport in the lead up to the event, and indirect spending on transport also increased through municipalities and other entities. Another positive outcome of the World Cup investment in transport was a boost to the incentivized of transport management to the cities. Cities were able to implement Bus Rapid Transit (BRT) systems, proving their capacity to take on more responsibility in the transport sector. It is felt that cities are better placed to manage transport due to their understanding of contextual needs.

There were, however, negative consequences of the World Cup deadline and the roll out of the BRT. First, the rushed rollout meant that all stakeholders were not engaged properly, particularly in the minibus taxi industry, which has meant limited benefits for taxi owners and increased conflict. Second, the rollout of the BRT systems incentivize routes linking stadia and economic hubs, which are now not in use. Third, the limitation of funding to BRT systems meant that cities did not have the option to review whether BRT was actually the best solution for their transport needs, but went ahead with it anyway and in retrospect incentiv that it is not suitable.

The lessons we can draw from this experience are:

¹²⁹ Holger Dalkmann et al., "Module 5E: Urban Transport And Climate Change", in *Sustainable Transport: A Sourcebook For Policy-Makers In Developing Cities* (GIZ, 2014).

- The improvements to public transport should be based on experience and evidence at the local level.
- Transport planning should include the local government and key stakeholders in the transport sector, particularly minibus taxi drivers and owners.
- Financing should be made available which is flexible depending on the local context, and the most appropriate solutions should be assessed and implemented.

Source: Astrid Wood, "Advancing Development Projects Through Mega-Events: The 2010 Football World Cup And Bus Rapid Transit In South Africa", *Urban Geography* 40, no. 4 (2019): 428-444

Improved local land use and urban planning can be supplemented by creating infrastructure which prioritises public transport via bus and rail, minibus taxis, walking, and cycling over private vehicles. Well-lit pedestrian footpaths or cycle paths and pavements which are accessible for wheelchairs and prams would improve use by pedestrians. Bicycles present a zero-carbon and healthy option for short-distance transport. Further, the value chains around bicycle use support jobs in repairs and maintenance and the barriers to entry for local fabrication are also relatively low. An opportunity may exist in electrical bicycles for fabrication, repairs, and maintenance.

In passenger transport, extensive job opportunities exist through the promotion and increased provision of public transport, including bus, rail, and minibus taxis. This has been promoted through the One Million Climate Jobs campaign which estimates that at least 390 000 new jobs can be created in the transport sector.¹³⁰ Although they are lower capacity than buses and trains, minibus taxis are a lower carbon form of transport compared to private vehicles. While the emissions of these forms of transport are substantially lower per person, they continue to produce GHG emissions in their current form. Therefore, it will be necessary to invest in the improved efficiency or electrification of taxis and buses, as done in Schenzen, China, shown in Box 6. In freight, a shift to rail would necessitate an extensive upgrade to the rail network, creating construction, maintenance, and operations jobs.

Box 6: Case study of electrification of public transport in Schenzen, China

The entire bus and taxi system in the city of Shenzhen, China has switched to electric vehicles. This comprises 16 000 buses and 22 000 taxis, the biggest electric vehicle fleets in the world. The vehicles produce less noise, fewer GHG emissions and no dangerous air pollutants, contributing to an increased standard of living for residents. The transition was made possible by large government subsidies for vehicle purchases as well as public investment into charging infrastructure. While this made the upfront costs of the transition large, operations and maintenance costs are lower than diesel and petrol vehicles. In addition, manufacturers and not only operators were responsible for bearing some of the maintenance costs, incentivized improved performance.

Source: Lulu Xue and Weimin Zhou, "How Did Shenzhen, China Build World'S Largest Electric Bus Fleet?", *World Resources Institute*, 2021, <https://www.wri.org/insights/how-did-shenzhen-china-build-worlds-largest-electric-bus-fleet>.

A study found that with the full implementation of the Green Transport Strategy, GDP growth is improved and an additional 229 000 new jobs are created in the economy by 2030, and 1.6

¹³⁰ Alternative Information and Development Centre (AIDC), "One Million Climate Jobs" (Cape Town, 2016), <https://aidc.org.za/download/climate-change/OMCJ-booklet-AIDC-electronic-version.pdf>.

million jobs by 2050.¹³¹ However, they also highlight that in order for many of the interventions to succeed in significantly reducing GHG emissions, it is necessary that the electricity sector is incentivized. This is supported by international findings which show that increased investment in public transport, and the electrification of vehicles has the potential to cause substantial job creation.¹³²

In freight transport, a shift from predominantly road transport to rail transport will be an essential part of reducing the carbon emissions from road transport. This is part of the government's transport strategy and is also articulated in Transnet's Road to Rail Strategy. Although this may negatively affect jobs in road freight (by reducing the number of truck drivers required) an expanded rail network has the potential to significantly increase employment throughout the economy and country through its important effect as a multiplier of jobs, as well as directly through the construction and supply of the rail network (the majority of which requires replacement or repair), as well as the associated rolling stock and locomotives.¹³³

While there are areas in the transport sector where jobs will be lost in the transition, there are also areas where jobs may be created. Areas of worker absorption include: housing construction and infrastructure to densify cities; bus and train drivers for expanded public transport; local manufacturing of Evs; upgrading of the rail network – creating construction, operating, and maintenance jobs; and manufacturing of railway infrastructure and locomotives. These sectors where opportunity exists are further described in the next section alongside key social protection measures and other interventions to transform the transport sector to improve sustainability.

4.2.5 Proposals

In the context of a changing climate and associated policy within the transport sector, it is necessary for unions to provide policy suggestions and make demands at varying levels to ensure that workers do not bear the brunt of these impacts (Table 6).

While timeframes represent what might be possible in the short-term, they do not represent what should be incentivize. Based on an assessment of where the biggest shifts and opportunities might be and consultation with workers in the transport sector, we have highlighted the top five demands which workers could prioritise below.

The top five priority demands in the transport sector relate to the Reduce, Shift and Improve framework:

¹³¹ Fadiel Ahjum, Faaqqa Hartley and Bruno Merven, "The Green Transport Strategy Of South Africa: GHG Mitigation Potential Of Road Transport Interventions And Their Economy-Wide Impact" (repr., Climate Compatible Growth, 2021), <https://climatecompatiblegrowth.com/wp-content/uploads/2021/07/4B-COP26-Policy-Brief.pdf>.

¹³² International Labour Organization, "Jobs In Green And Healthy Transport: Making The Green Shift", 2020, https://www.ilo.org/wcmsp5/groups/public/---dgreports/---dcomm/---publ/documents/publication/wcms_745151.pdf.

¹³³ Department of Environmental Affairs, "Freight Shift From Road To Rail" (Pretoria, 2021), https://www.environment.gov.za/sites/default/files/docs/publications/freightshift_roadtorail.pdf.

1. **Reduce transport use by improving urban planning and ease of walking and cycling.** Reduced demand for transport would be possible if urban planning developed cities which had mixed land-uses and made non-motorised transport the easiest way to get around. This is complicated to implement, particularly when these interventions (mixed land-uses and non-motorised transport) are constrained by cities that have significant urban sprawl. One important focus of improved urban planning should be the densification of cities. Johannesburg's Nodal Review is an example of progressive policy in this respect. Policy which facilitates the sub-division of existing properties within cities and encourages mixed-income housing should also be considered. A shorter term intervention which could be advocated for is the improvement of pavements and walkways so that they are safe and accessible for all (including wheelchairs and prams). The key stakeholders for this demand are national and local government. Opportunities for job creation exist in the construction and maintenance of this infrastructure.
2. **Shift to lower carbon modes of transport.**
 - **Develop an integrated, efficient, accessible, and affordable public transport system via bus and rail.** The expansion and integration of public transport represents a significant emissions saving opportunity and an opportunity for job creation. This is not a new demand by unions as public transport has long been a focus of union campaigns, but framing this within the urgent need to reduce fuel consumption and emissions makes it even more urgent. Key stakeholders to implement this demand include national and local governments.
 - **Reform of PRASA and Transnet to eradicate corruption.** The reform of PRASA and Transnet is also not a new demand but is vital to revive commuter and freight railway transport. This would help to increase commuter and freight rail transit. The revenues generated from an increase in demand arising out of better governance would be reinvested towards the expansion and improvement of rail services which could also create jobs.
 - **Climate finance towards rail expansion.** There could be an opportunity to argue for the directing of climate finance to support the expansion of rail which could also create jobs. There is perhaps a campaign for railways to be revived that the transport unions could support.
 - **Increased manufacturing of railway infrastructure and locomotives.** As manufacturing jobs in the automotive industry are at risk, there should be a focus on development of local manufacturing of railway infrastructure and locomotives. This should be part of the Master Plans currently being designed to inform South Africa's industrial policy. As such, the stakeholders who would need to be engaged are the Department of Trade, Industry and Competition and the PCC at the national government level.
3. **Improve: Support for electrification of transport infrastructure and vehicles.** While the improvement of land-use planning and the expansion of public transport are priorities which would have a significant impact on the emissions in the transport sector, it is also known that even coal-based electric vehicles have lower emissions than ICEs. Within this demand is a potential opportunity to work with minibus taxis who could upgrade their taxis to be safer and also to be electric. Minibus taxis are vital to the functioning of the SA transport system and they cannot be left out of the conversations about a just transition. A

forum should be held with transport workers and minibus taxi associations to discuss opportunities for transition of the minibus taxi industry.

Table 6: Demands for workers in the transport sector, grouped by theme.

	Demand	Description	Time frame	Level
Reduce				
1	Densification of cities with affordable housing	More affordable housing must be developed in city centres and other economic hubs in order to address historical injustices, and reduce the time, distance and resources spent in commuting.	Medium term	NG, LG
		Redesigning municipal financial incentives for affordable housing development and densification.	Medium term	NG, LG
2	Mixed land-use planning	Land-use planning should promote mixed land-use which allows for commercial, housing, and services land use in close proximity.	Long term	LG
		The integration of transport and land-use planning is complex and requires further understanding. Further research is needed on the constraints on enabling infrastructure.	Short term	LG
3	Encourage employment generating activities along transport corridors ¹³⁴	Incentives and improved infrastructure should be used to encourage business operations along transport corridors.	Medium term	NG, LG
4	Support infrastructure for rural towns	Investment in infrastructure and economic activity in rural towns particularly around train stations and truck stops.	Medium term	NG, LG
5	Create infrastructure for non-motorised transport	Infrastructure targeted towards pedestrians and cyclists should be created, particularly in city centres, to help reduce pedestrian accidents, relieve congestion and reduce air pollution.	Short term	LG
6	Increase safety of roads and transport	Improved regulation of road users and a shift to prioritise pedestrians, cyclists and public transport over private vehicles.	Short term	LG
Shift				
7	Expanded and integrated public transport	An extensive, high quality, well-priced public transport system based on buses and trains, and integrated with taxis and non-motorised transport.	Medium term	NG, LG
		An integration of the public transport system must be accelerated and implemented, as articulated by all	Medium Term	NG, LG

¹³⁴ Mercy Brown-Luthango et al., "Spatial Dimensions Of Equitable Access: Planning For Sustainable Transport" (Cape Town: WWF-SA, 2017), https://wwfafrica.awsassets.panda.org/downloads/wwf_2017_spatial_dimensions_of_equitable_access_planning_for_sus_transport.pdf?31803/spatial-dimensions-of-equitable-access-planning-for-sustainable-transport.

		government policy on transport. Focus should be placed on cash-based systems.		
8	Public transport must be made more accessible, particularly for the vulnerable	Investment is required in order to ensure physically and financially accessible transport for those most vulnerable. Transport should be made free/heavily incentivized for children, the elderly, and the people with disabilities.	Medium term	NG, LG
9	Improved organization of minibus taxis	The taxi industry should be legislated, unionized and professionalized. This should include improved infrastructure for taxi stops and routes.	Medium term	NG, LG and BC
10	Realign subsidies to support taxi industry with decent work conditions	Realign subsidies to support taxi industry with decent work conditions in the short term and in the medium term, assisting the shift to EV taxis (for example through the tax incentivized programme).	Medium term	NG
11	Security on public transport	In order to address vandalism, violence and harassment on public transport (particularly experienced by women), security must be improved in taxi ranks, at bus stops, at train stations and on trains. Security should be in house, and not outsourced.	Short term	LG
12	Increased incentivized amongst all transport workers, particularly taxi drivers	Increased efforts must be made to encourage incentivized amongst transport workers, particularly taxi drivers to help improve working conditions. This could be part of the conditions made when negotiating subsidies with taxi associations and owners.	Short term	BC, WP
13	Reform PRAS and Transnet	Both PRAS and Transnet require extensive reform to address the corruption, mismanagement and maladministration	Medium term	NG
14	Increased manufacturing capacity of railways and locomotives	New railway infrastructure must be premised on incentivized of these manufacturing industries, as opposed to imports	Medium term	NG, LG, BC
15	Shift passenger rail management to municipalities	Assess opportunities to shift PRASA functions to municipal management.	Medium term	NG, LG
16	Encourage shift in freight from road to rail	The shift from road freight to rail, in accordance with Transnet's road to rail strategy, must be implemented and closely monitored – mechanisms such as incentives and taxes should be considered. As part of this shift, protective and transition measures must be put in place for affected workers.	Short term	NG
17	Alignment of transport policy	Core elements regarding the greening of transport, the shift to EVs, and the promotion of public transport must be mainstreamed across policies (for example the Green Transport Strategy, EV White Paper, and Auto Masterplan) to ensure alignment.	Short term	NG
18	Review and update energy plans	The Integrated Energy Plan (IEP) and Integrated Resource Plan (IRP) should be reviewed and updated with	Medium term	NG

		consideration of a carbon budget for the South African economy.		
19	Policy implementation and financing	The Green Transport Strategy provides for many of the proposals outlined above, however has seen little effect in practice. Further attention needs to be paid to demand for successful implementation.	Short term	NG, LG
		Reduction of hidden subsidies for unsustainable modes of transport, like cars (less funds for parking and roads). Redirect funding to more sustainable modes.	Short term	NG, LG
Improve				
20	Incentives for local production of Evs	The existing subsidies for the automotive industry should be changed to promote local production of Evs	Short term	NG, BC
21	Investment into Evs for public transport specifically ¹³⁵	Incentives should be instituted for the manufacturing of EV minibus taxis and other commercial vehicles	Short term	NG, BC
		The automotive sector should be planning to manufacture Evs. Internationally, governments have started setting deadlines for when the manufacture and/or use of ICE will no longer be permitted. There is a need for further research on what kind of deadline would be realistic for South Africa and how this could impact workers.		
22	Charging infrastructure, associated with current petrol stations	The establishment of rapid charging stations, at current petrol stations along long distance routes must be incentivized. Ensure that petrol stations adapt to the electrification of vehicles, so that these stations do not become ghost stations and ensure adaptation in the long term.	Medium term	NG, LG
23	Reskilling those in the auto industry to work in Evs	Current automotive workers must be skilled and retrained to work in Evs.	Medium term	BC, WP
24	Future projections of automotive companies	Workers must demand that companies provide projections and forecasts for how they intend to respond to changing demand and regulations, plans for shifts in production and put mechanisms in place to help workers transition.	Medium term	BC, WP
25	Tax on luxury vehicles	A tax on luxury vehicles and SUVs should be implemented to discourage private vehicle use and emissions.	Short term	NG, LG
26	Additional research on Evs	Additional research is required in order to establish EV manufacturing impacts on labour and potential opportunities and educational workshops are required for workers.	Short term	NG
27	Use of alternative, lower carbon fuels for public transport	Increased research and innovation is required in the field of alternative fuels and their viability, including biofuels and green hydrogen, and their implications for jobs.	Medium term	NG
28	More research into adaptation measures required	Research is required to understand the potential impacts of climate change on South Africa's transport infrastructure, including roads, railways, platforms and taxi ranks.	Short term	NG, BC

¹³⁵ Fadiel Ahjum et al., "A Low Carbon Transport Future For South Africa: Technical, Economic, And Policy Considerations" (Energy Systems Research Group, University of Cape Town, 2020), <https://www.climate-transparency.org/wp-content/uploads/2020/08/CT-Low-Carbon-Transport-SA-DIGITAL.pdf>.

	to secure transport infrastructure			
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Note: The target level indicates where this demand should be directed: national government (NG), local government (LG), bargaining councils (BC) and the workplace (WP). The time frame also highlights which demands are achievable in the short term (6-12 months), vs the medium term (1-4 years), vs the long term (5-10 years).

4.3 AGRICULTURE

Mission: An agricultural sector that is low-carbon, climate-resilient, and does not harm the environment, in order to provide all people who live in South Africa with nutritious, affordable food in a manner that supports rural livelihoods.

This section examines the need for a just transition in the agricultural sector. Section 4.3.1 outlines the current state of the sector. Section 4.3.2 provides an analysis of the relationship between the sector and climate change. Section 4.3.3 examines the policy responses to climate change in agriculture. Section 4.3.4 provides a deeper analysis of the livestock value chain due to its particular relevance as the most carbon-intensive and vulnerable sub-sector, outlining the threats to the industry. Section 4.3.5 examines possible pathways for transition. The last section, 4.3.6, illustrates the opportunities that exist for workers for a just transition, as well as proposals which should be taken forward at the various levels of engagement.

4.3.1. Current state of the agricultural sector

In the first quarter of 2021, South African agriculture contributed 2.8% to GDP, slightly increased from the previous ten years where the contribution consistently remained between 2 and 2.5%.¹³⁶ Despite this relatively small proportion, the agricultural sector plays an important role in the economy for a number of reasons. First, its employment impact is high relative to its contribution to GDP, and the employment it creates is located largely in rural areas where there are high levels of poverty and few other job opportunities. Second, it has downstream linkages to food processing and beverage industries, which make up one of the largest components of the manufacturing sector by employment, providing approximately 20% of formal manufacturing jobs.¹³⁷ Third, agriculture makes up approximately 10% of export revenues (in 2018), largely from citrus, wine, grapes, corn, and wool.¹³⁸ And last, agriculture makes up the majority of South Africa's land (38%) and water (60%) use, and therefore has a disproportionate spatial and environmental impact.¹³⁹

¹³⁶ StatsSA, Gross Domestic Product: 1St Quarter, 2021, [http://www.statssa.gov.za/publications/P0441/GDP%202021%20Q1%20\(Media%20presentation\).pdf](http://www.statssa.gov.za/publications/P0441/GDP%202021%20Q1%20(Media%20presentation).pdf); "Agriculture, Forestry, And Fishing, Value Added (% Of GDP) - South Africa | Data", Data.Worldbank.Org, 2021, <https://data.worldbank.org/indicator/NV.AGR.TOTL.ZS?locations=ZA>

¹³⁷ Quantec 2019 data

¹³⁸ "South Africa - Agricultural Sector", Export.Gov, 2021, <https://www.export.gov/apex/article?id=South-Africa-agricultural-equipment>.

¹³⁹ StatsSA, Census Of Commercial Agriculture, 2017: Financial And Production Statistics (Pretoria, 2020), <http://www.statssa.gov.za/publications/Report-11-02-01/Report-11-02-012017.pdf>; Hannah Baleta and Guy Pegram, Water As An Input In The Food Value Chain, Understanding The Food Energy Water Nexus (WWF-SA, 2021), <https://www.environment.gov.za/sites/default/files/docs/waterasaninputintothefoodvaluechain.pdf>.

In addition to this economic impact as a sector, the most important function of agriculture is to feed people. Access to food is a human right, recognised by the Universal Declaration of Human Rights and enshrined in the International Covenant on Economic, Social and Cultural Rights.¹⁴⁰ Although there is sufficient food produced to feed the planet, in 2020, between 720 and 811 million people suffered from hunger.¹⁴¹

South Africa is defined as a food secure country, meaning that it produces enough food to feed all its people at a national level. Although the country is a net exporter of food, it also imports significant quantities of wheat, rice, chicken, sugar, and soya.¹⁴² Despite this, in 2017, almost 20% of households had inadequate access to food, with half of these vulnerable to hunger.¹⁴³ This has been worsened by the COVID-19 pandemic. Food insecurity and hunger is not only about lack of access to food, but also about lack of nutritious, good quality food. The main reasons reported for this are:¹⁴⁴

- Lack of income and employment, together with rising food prices, which means people cannot afford food;
- Gender inequality, which means that women and children in particular experience hunger and food insecurity;
- Lack of access to land, water, and information, which means households cannot produce their own food; and
- The concentrated and profit-driven structure of the economy, which means that people have to travel far to buy food, low-quality food is encouraged, and smaller producers cannot compete.

South African agriculture is widely described as having a 'dual structure'.¹⁴⁵ This is due to two distinctly different modes of production that represent two extremes. On the one hand, there is a highly industrialised, commercialised, largely white-owned, and internationally competitive sector. It is also highly concentrated, with approximately 2 000 mega farms accounting for 66% of agricultural value and more than half of employment; 70-80% of company income tax in the agriculture, forestry, and fishing sectors coming from just ten businesses; and 60% of income in the retail sector coming from just five supermarket chains.¹⁴⁶ This mimics the trends within the global industrialised food system which is characterised by increasing concentration and centralisation; as well as increasing profits, little investment into research and development, and decreasing growth in yields.¹⁴⁷

¹⁴⁰ Office of the High Commissioner for Human Rights, *The Right To Adequate Food* (United Nations, 2021), <https://www.ohchr.org/Documents/Publications/FactSheet34en.pdf>.

¹⁴¹ Food and Agriculture Organization, "The State Of Food Security And Nutrition In The World 2021", <https://www.fao.org/state-of-food-security-nutrition>.

¹⁴² "South Africa - Agricultural Sector", Export.Gov.

¹⁴³ StatsSA, *Towards Measuring Food Security In South Africa: An Examination Of Hunger And Food Inadequacy, 2019*, <http://www.statssa.gov.za/publications/03-00-14/03-00-142017.pdf>.

¹⁴⁴ Oxfam, *Hidden Hunger In South Africa: The Faces Of Hunger And Malnutrition In A Food-Secure Nation, 2014*, https://www-cdn.oxfam.org/s3fs-public/file_attachments/hidden_hunger_in_south_africa_0.pdf.

¹⁴⁵ Ruth Hall, "A Political Economy of Land Reform In South Africa", *Review Of African Political Economy* 31, no. 100 (2004): 213-227.

¹⁴⁶ Data comes from mid-2010s. Trade & Industrial Policy Strategies (TIPS), *Sector Jobs Resilience Plans: Agriculture Value Chain, 2020*, https://www.tips.org.za/images/TIPS_for_DEFF-dtic_-_SIRP_for_agricultural_value_chain_final_May_2020.pdf

¹⁴⁷ A. Haroon Akram-Lodhi, "The Ties That Bind? Agroecology and The Agrarian Question In The Twenty-First Century", *The Journal Of Peasant Studies* 48, no. 4 (2021): 687-714, doi:10.1080/03066150.2021.1923010.

On the other hand, a large part of the rural population (and to a lesser extent, urban population) engages in household agricultural production. Although generally inadequate to provide the basis for a livelihood, it forms an important supplement to diets and incomes. These producers are largely found in the historic labour sending regions (largely the former “homelands”), and produce on small areas of land, usually less than one hectare.¹⁴⁸ This dualism in South African agricultural production and land ownership spreads to inequities in water access, with white, industrial-scale agriculture accounting for the vast majority of water usage, while Black smallholders struggle for water access at the margins.¹⁴⁹

Estimates regarding employment within agriculture and within each of these fields vary. Within formal agriculture, estimates vary between 785 000 and 861 000 workers, with an additional 300 000 to 451 000 in agro-processing.¹⁵⁰ Within household production, between 1.7 and 2.2 million people are estimated to conduct agricultural activities of some form.

This dualism is the result of apartheid and colonial spatial and industrial planning, combined with massive state support for the modernisation of white agriculture during the 20th century. However, since 1994 agriculture has seen little racial and economic redistribution. South Africa shows some of the highest rates of private land ownership in the world, sitting at 79%. Of this, 72% is owned by white people.¹⁵¹ Land ownership is also highly gendered. Of all individual landownership, men own 72% of land, while women own only 13%.¹⁵²

In terms of agricultural production, Black farmers contribute only 4% of agricultural output, and are largely present in the beef and goat value chains.¹⁵³ This inertia is the result of a largely unsuccessful land reform programme and inadequate state support for agricultural development in the post-liberalisation period, as described in the previous section. These failures have been attributed to the increasingly market-orientated nature of land reform policies which is failing to address the dualistic nature of agriculture and land ownership that apartheid and colonialism created.¹⁵⁴

In the early 1990s, a process of deregulation and marketisation of the agricultural sector was initiated, culminating with the 1996 Marketing of Agricultural Products Act which abolished state marketing boards. Previously, white farmers received subsidies, loans, and drought relief, and were protected from price volatility through marketing boards which typically fixed pan-territorial prices. There were also extensive trade barriers to provide protection from import

¹⁴⁸ Makgetla et al., National Employment Vulnerability Assessment: Analysis of Potential Climate-Change Related Impacts and Vulnerable Groups.

¹⁴⁹ JS Kemerink, R Ahlers and P Van der Zaag, "Contested Water Rights In Post-Apartheid South Africa: The Struggle For Water At Catchment Level", *Water SA* 37, no. 4 (2011), doi:10.4314/wsa.v37i4.16.

¹⁵⁰ TIPS, Sector Jobs Resilience Plans: Agriculture Value Chain; Department of Agriculture, Land Reform and Rural Development (DALRRD), Agriculture and Agro-Processing Master Framework Agreement: Context and Approach for an Inclusive Growth and Sustainable Jobs, Draft Version 6: March, 2021.

¹⁵¹ Department of Rural Development and Land Reform (DRDLR), Land Audit Report Phase II: Private Land and Ownership By Race, Gender And Nationality (Pretoria, 2017), <https://africacheck.org/wp-content/uploads/2018/03/Land-Audit-Report-Draft-1.pdf#page=10>.

¹⁵² Other categories include male-female, co-ownership and other, to make up the remaining 15%. https://www.gov.za/sites/default/files/gcis_document/201802/landauditreport13feb2018.pdf

¹⁵³ DALRRD, Agriculture and Agro-Processing Master Framework Agreement: Context and Approach for an Inclusive Growth and Sustainable Jobs.

¹⁵⁴ Ruth Hall, "A Political Economy of Land Reform in South Africa".

competition. However, with the process of deregulation, South Africa became one of the most extensively liberalised agricultural industries in the world.¹⁵⁵ This has impacted the industry in a number of ways. For example, several sub-sectors have become extremely vulnerable to 'dumping', whereby the South African market is flooded with cheap imported products. This threatens the local industry, as has been observed with potatoes and poultry.

It has also contributed to further concentration of land ownership and agricultural production as small- and medium-sized enterprises struggled to compete and large farms became increasingly mechanised.¹⁵⁶ This had a disastrous impact on agricultural workers. Between 1985 and 1996, employment numbers dropped by an estimated 200 000 permanent workers and 200 000 casual and seasonal workers in the agricultural sector.¹⁵⁷ This trend of shedding jobs in the sector continued into the 2000s, before stabilising in the 2010s.¹⁵⁸

Workers in the agricultural sector experience some of the highest levels of precarity in the country. Until recently (February 2021), farm workers received a lower minimum wage than other sectors and even with the new minimum wage (R21.69 per hour), workers struggle to make ends meet. Employment is often seasonal, casualised, and conducted through labour brokers. Temporary workers often have no contract, or are unable to understand and negotiate the contract. This is particularly the case for female farm workers who are often employed for seasonal work, with or without a contract, and their employment is sometimes even linked to that of their father or husband. Therefore, female farmworkers often receive the lowest wages, and are the first at risk of casualised working conditions, reduced hours, and retrenchment.¹⁵⁹ This level of precarity and low income of agricultural workers is in contrast to the high incomes of many landowners and large-scale farmers. According to research by TIPS, households which owned more than 10ha had a median income of more than R40 000 per month, making them some of the highest earners in the country.¹⁶⁰

This is worsened by the low rates of unionisation in this sector, with less than 5% of farm workers belonging to a union.¹⁶¹ This has been attributed to the fact that unions in South Africa are largely urban-based, labour relations on farms are very paternalistic making unionisation difficult, and unions have largely been unable to organise seasonal workers and those employed

¹⁵⁵ J. Van Zyl, N. Vink and J.F. Kirsten, *South African Agriculture in Transition: The 1990s* (Department of Agricultural Economics, University of Pretoria, 2000), <https://ageconsearch.umn.edu/bitstream/18073/1/wp000006.pdf>.

¹⁵⁶ Nancy Andrew et al., "Land Consolidation And The Expansion Of Game Farming In South Africa: Impacts On Farm Dwellers' Livelihoods And Land Rights In The Eastern Cape", in *Africa For Sale? Analysing And Theorizing Foreign Land Claims And Acquisitions* (Leiden: Brill Publishers, 2021), 97–130.

¹⁵⁷ Van Zyl et al., *South African Agriculture in Transition: The 1990s*.

¹⁵⁸ DALRRD, *Agriculture and Agro-Processing Master Framework Agreement: Context and Approach for an Inclusive Growth and Sustainable Jobs*.

¹⁵⁹ Margaret Visser and Stuart Ferrer, *Farm Workers' Living And Working Conditions In South Africa: Key Trends, Emergent Issues, And Underlying And Structural Problems* (International Labour Organisation, 2015), https://www.ilo.org/wcmsp5/groups/public/---africa/documents/publication/wcms_385959.pdf.

¹⁶⁰ Neva Makgetla, "Inequality In South Africa: On Overview" (Trade & Industrial Policy Strategies (TIPS), 2020), https://www.tips.org.za/images/TIPS_Working_Paper_Inequality_in_South_Africa_An_Overview_September_2020.pdf.

¹⁶¹ Mercia Andrews, "Sleeping Giant Is Stirring: Farmworkers In South Africa" (La Via Campesina, 2013), <https://viacampesina.org/en/wp-content/uploads/sites/2/2013/05/EN-09.pdf>.

by labour brokers.¹⁶² Unionisation is even lower amongst migrant workers because of fear due to their employment statuses, a feeling that South African unions do not represent the interests of foreign workers, and limited access to information and resources.¹⁶³

Workers report mistreatment by supervisors including racism, rudeness, and interference with work. Working environments are often unsafe, where safety rules are not abided by and there is no, or inadequate, protective equipment. For example, one study in the Free State found that despite the use of dangerous chemicals, only 42% of farm workers said they received protective clothing, and even when they did, it was often in disrepair or missing key parts. Further, they received inadequate safety training.¹⁶⁴

Many farm workers live on the farms on which they work. This was more prevalent during apartheid, with an estimated 4.3 million Black people living on white-owned farms in 1984. However, since the 1990s, there has been an increasing trend to off-farm living. On-farm residence can have some benefits which reduce the cost of living for workers, such as access to land for gardens and free or subsidised electricity, housing, water, crèche, and in some cases, food. However, it also makes workers completely dependent on the employer/land owners. This can result in insecure land tenure despite legislation protecting farm dwellers, with many workers being evicted, both legally and illegally. Between 1994 and 2004, almost 1 million farm dwellers were evicted.¹⁶⁵ Children also have limited or no access to schools living on-farm relative to living off-farm. Therefore, off-farm living has generally been shown to increase school going.¹⁶⁶

The areas outside the farm in which other workers live show extremely high rates of unemployment and poverty. This leads to social problems such as crime and violence, drug and alcohol addiction, and gender-based violence. There is also a lack of services and basic infrastructure. Housing is poor quality and too close together resulting in fire risks. Clinics and schools are understaffed and under-resourced, there is a lack of sports and recreation facilities, sewerage, and waste services, and policing. Roads are often not maintained and there is inadequate access to water. Despite these conditions, the cost of living remains high compared to wages received.

4.3.2. Climate change and the agricultural sector

Agriculture and agro-processing is a significant contributor to climate change through greenhouse gas emissions (GHG). Globally, agriculture, forestry, and other land use (collectively known as AFOLU) are responsible for just under a quarter of global human-made emissions.¹⁶⁷

¹⁶² Christopher Webb, "Between Precarity And Paternalism: Farm Workers And Trade Unions In South Africa's Western Cape Province", *Global Labour Journal* 8, no. 1 (2017): 49-64, doi:10.15173/glj.v8i1.2842.

¹⁶³ Janet Munakamwe and Zaheera Jinnah, "A Bitter Harvest: Migrant Workers In The Commercial Agricultural Sector In South Africa" (MiWORC, 2014).

¹⁶⁴ Theresa Ulicki and Jonathan Crush, "Poverty, Gender And Migrancy: Lesotho's Migrant Farmworkers In South Africa", *Development Southern Africa* 24, no. 1 (2007): 155-172, doi:10.1080/03768350601165983.

¹⁶⁵ Marc Wegerif, Bev Russell and Irma Grundling, *Still Searching For Security* (Polokwane North: Nkuzi Development Association, 2005).

¹⁶⁶ Ibid.

¹⁶⁷ Pete Smith et al., "Agriculture, Forestry And Other Land Use (AFOLU)", in *Climate Change 2014: Mitigation Of Climate Change. Contribution Of Working Group III To The Fifth Assessment Report Of The Intergovernmental Panel On Climate Change* (Cambridge & New York: University City Press, 2014), 811-922.

In South Africa, the sector is estimated to produce between 7-13% of positive emissions. It is important to note however, that land use and forestry are not only emitters of GHGs, but also act as sinks - absorbing gases, particularly carbon dioxide (CO₂). Therefore, the net effect is estimated at 4.1%.¹⁶⁸

The main impacts of the agricultural sector on climate change come from:

- Methane emissions in the livestock sector (enteric fermentation);
- Fertiliser use and manure management;
- Energy use throughout the value chain; and
- Land conversion.

*Methane (CH₄) is the dominant gas emitted by the agricultural sector, unlike in most other sectors where CO₂ is predominant. Methane is known to be a stronger GHG than CO₂, the same amount of gas 'heats' the planet by more. However, it also has a much shorter lifespan in the atmosphere. Methane gas in this sector is produced by a process called enteric fermentation. This process happens in the digestive system of certain animals such as cows, sheep, and goats and is exhaled or burped out by the animals. This process is responsible for the large majority of GHG emissions in the agriculture sector. The result is that the livestock sector is by far the biggest contributor to emissions in this sector, making up 55% of emissions (excluding the role of carbon sinks).*¹⁶⁹

*Fertiliser and manure management are another source of emissions in the agricultural sector. Fertilisers produce N₂O, a long-lived GHG which is the third largest contributor to global climate change after CO₂ and CH₄. While this gas is also produced by natural processes, human activities have increased its concentration in the atmosphere by 30% in the past 40 years through the use of synthetic nitrogen fertilisers.*¹⁷⁰ This is not only a source of GHG emissions, but also has a polluting effect on water sources.

Energy used throughout the value chain is another source of emission. This happens across the sectors through the use of energy for machines, transport, and cooling throughout the different value chains.

*Land conversion influences GHG emissions because when land is converted, for example, from grassland to cropland or forest to urban settlement, this changes the amount of CO₂ that the land and vegetation can absorb. However, this goes both ways. For example, when grassland is converted to cropland it increases the amount of GHG emissions released, whereas the shift from grassland to forest decreases the amount of GHG emissions.*¹⁷¹

These emissions and the energy required to produce food through the mechanisms outlined above, are useless when food goes to waste and can even cause more methane emissions when food rots in landfills. In South Africa, approximately 10.3 million tons of food is wasted per year,

¹⁶⁸ Department of Environment, Forestry and Fisheries (DEFF), National GHG Inventory Report: South Africa 2000-2017, 2017, <https://cer.org.za/wp-content/uploads/2020/09/Draft-7th-National-Greenhouse-Gas-Inventory-Report-for-the-Republic-of-South-Africa-for-public-comment.pdf>.

¹⁶⁹ Ibid, 258. Calculations by author.

¹⁷⁰ Hanqin Tian et al., "A Comprehensive Quantification Of Global Nitrous Oxide Sources And Sinks", Nature 586, no. 7828 (2020): 248-256, doi:10.1038/s41586-020-2780-0.

¹⁷¹ DEFF, National GHG Inventory Report: South Africa 2000-2017.

equating to 34.3% of local produce, and 45.4% of all available food.¹⁷² Therefore, food waste can also be considered a significant contributor to the agricultural sector's impact on emissions. Approximately 82% of the waste is produced between the production and distribution phases, with almost half occurring during processing. This is largely due to the fact that this is where much of the value is added and involves processes of peeling, cleaning, getting rid of skin and bones, etc. This leaves 18% which is thrown away by consumers, which has grown from 4-5% in 2013. Cereals make up half of the waste produced, followed by fruit, vegetables, and milk.¹⁷³

While agriculture does contribute to GHG emissions, it is perhaps more important to understand how agriculture is vulnerable to the effects of climate change. Agriculture is, by its very nature, sensitive to changes in weather patterns due to its reliance on water, sunshine, and temperature, as well as exposure to the elements. The agricultural sector in South Africa already faces difficult conditions as a hot and water-scarce country. Large parts of the country are too hot or too dry for most agriculture, therefore only 13% of the land surface is considered arable, which means it can be used for crop production.¹⁷⁴ However, in 2017, only 6% of South Africa's land surface was used for crop production, while an additional 30% was used for commercial grazing land.¹⁷⁵

Climate change predictions for South Africa show high certainty for a hotter climate in the future. Because the Southern African interior warms at approximately double the global rate, even where GHG emissions globally are reduced quickly and substantially, temperature increases are expected to be between 2.5°C and 4°C.¹⁷⁶ This is coupled with an increase in the number of heat waves and extremely hot days.¹⁷⁷

Rainfall predictions are less certain. While some predictions estimate an overall drier future, others show marked differences between regions, with some even showing increases in extreme rainfall events resulting in overall increases in precipitation (which includes any water that forms in the atmosphere and falls to earth, including rain, snow, and hail). However, this too interacts with temperature, as with hotter temperatures evaporation also increases which could even out any effect of increased rainfall. Nonetheless, each of these phenomena are expected to have marked effects on different agricultural sectors. The main impacts of climate change on the agricultural sector in South Africa are: heat waves and extremely hot temperatures; drought; and extreme rainfall events.

Heat waves and extremely hot days have the following negative impacts:

¹⁷² Suzan Oelofse et al., Increasing Reliable, Scientific Data And Information On Food Losses And Waste In South Africa (Pretoria: CSIR, 2021), https://wasteroadmap.co.za/wp-content/uploads/2021/06/17-CSIR-Final_Technical-report_Food-waste.pdf.

¹⁷³ Ibid.

¹⁷⁴ Department of Agriculture (DOA), Sectoral Overview And Performance, Strategic Plan, 2007, <https://www.nda.agric.za/docs/StratPlan07/07sectoral.pdf>.

¹⁷⁵ StatsSA, Census of Commercial Agriculture, 2017: Financial and Production Statistics.

¹⁷⁶ Department of Environmental Affairs (DEA), National Climate Change Adaptation Strategy, 2019, https://www.gov.za/sites/default/files/gcis_document/201905/42446gon644.pdf.

¹⁷⁷ In South Africa, a heat wave is defined as "if the maximum temperature at a particular town is expected to meet or exceed 5 degrees C above the average maximum temperature of "the hottest month" for that particular place, as well as persisting in that mode for 3 days or more". "Weather Questions", Weathersa.Co.Za, 2021, <https://www.weathersa.co.za/home/weatherques>.

- Heat stress can cause physical ailments for workers such as increased heart rates, cramps, dizziness, fatigue, and nausea.
- It could cause a drop in the amount of food production per worker because physical labour capacity drops with high temperatures. As a result, an estimated 2% of the world's total working hours will be lost each year by 2030. In South Africa, 7% in working hours could be lost by 2030 which amounts to 13 000 full-time jobs.
- Milk and meat produced by cows and sheep will see a reduction in the quality and quantity. In extreme examples it can lead to reduced fertility and death, which is a threat to the livestock industry.
- There will be a reduction in crop yields, while changes in season timing, shifts in growing location, and length of the growing season could all affect yields, harvesting and planting dates.¹⁷⁸

Droughts have the following negative impacts on agricultural production:

- There will be less water available for agricultural production resulting in severe stress on the industry.
- Livestock will be affected directly as they require water to survive. Livestock farming will also be affected indirectly through the effects of drought on vegetation, as land is dry and does not produce enough fodder for grazing. This would be worsened in cases of fire.¹⁷⁹
- Livestock may also be affected by the impacts of drought on crop production, as most diets are supplemented with maize and soy.
- The production of both field and horticultural crops is sensitive to water stress.

Extreme rainfall events may also come from increasing precipitation and have the following negative effects:

- Extreme rainfall can destroy harvests and negatively affect quality. Workers report that flooding can destroy harvests by washing away seeds.
- Hail storms can destroy already grown produce, making it almost impossible to sell.
- Soil depletion and erosion can occur and change the kind of vegetation that grows in an area, with an increase in plants that animals do not eat, affecting grazing.¹⁸⁰

Overall, these impacts, coupled with the growing needs of the population, mean that there will be increased competition for different land and water uses. The direct impacts of climate change on yields and productivity increase the levels of risk and unpredictability impacts on farm incomes and price volatility. This is particularly true for smallholders who are more exposed to these problems as they already face limited water access, are less likely to afford modern machinery and inputs, and have less access to insurance or forms of financial security. This has the potential to drive further consolidation and concentration of agricultural production. These projected impacts in the agricultural sector are already affecting workers directly and also affect their households and communities.

¹⁷⁸ P.A. Johnston, Modelling Impacts Of Climate Change On Selected South African Crop Farming Systems (Water Research Commission &, 2016), <http://www.wrc.org.za/wp-content/uploads/mdocs/1882-1-161.pdf>.

¹⁷⁹ TIPS, Sector Jobs Resilience Plan: Agriculture value chain.

¹⁸⁰ Department of Agriculture, Forestry and Fisheries (DAFF), Draft Climate Change Adaptation And Mitigation Plan For South African Agricultural And Forestry Sectors, 2015, <https://static.pmg.org.za/150603climatechangeadaptation.pdf>.

Climate change is already manifesting in a number of ways - drought, too much rain, storms, hail, and changes in season timing.¹⁸¹ Overall, greater volatility, uncertainty, and financial strain in agricultural production is passed on to labour in various ways, if no safeguards are in place. This could be in the form of job losses (as already witnessed with droughts), working overtime, being temporarily laid off, even being evicted, and downward pressure on wages due to increases in other costs.

While many companies have insurance for crop failure or periods of crisis, which provides an essential role in allowing companies to stay afloat, this does not always benefit workers. Many temporary and seasonal staff suffer the impacts. Different parts of the value chain are also affected differently. For example, if a drought happens after planting then it is not the planters but the harvesters that are most impacted. And even when there is weather damage in another part of the country, it can affect employment further down the value chain. For example, damage to crops can affect canning and processing. In addition, sudden spikes in agricultural commodity prices, for example due to shortages, can put strain on processors, which could place downward pressure on wages.

Climate change worsens working conditions that are already highly strained. Workers report that these impacts mean they can no longer provide for their families resulting in food insecurity. In cases of working overtime, it means that workers cannot spend time with their children who are left alone. This is particularly the case for single mothers, who make up many of the women in the agricultural sector. Job losses can also be hard for men as they feel like failures for not being able to provide for their families. This can also lead to issues such as divorce, gender-based violence, poverty, and inequality.

There are also other problems caused by climate change not related to the workplace but that affect workers' households and communities. For example, the winters are colder and people cannot afford heating. Sea level rise can result in damage to houses and roads and an increase in accidents. Droughts mean that households have less access to water and can cause an increase in food prices.

These impacts are reported by workers themselves, which highlights the realities and concerns regarding job losses associated with climate change events. However, it is extremely difficult to estimate potential job losses attributable to these impacts due to the uncertainty regarding the magnitude and even direction of climate change in South Africa.¹⁸² This is exacerbated by the many different ways in which companies and farms will adapt or not, with divergent impacts on job loss and job creation. However, based on historical impacts of events such as droughts in the past decade, it is clear that without substantial intervention and adaptation, workers are likely

¹⁸¹ Department of Environment, Forestry and Fisheries (DEFF), National Climate Change Adaptation Strategy, 2019, https://www.environment.gov.za/sites/default/files/docs/nationalclimatechange_adaptationstrategy_ue10november2019.pdf; "South Africa: Hail Damages Orchards In Langkloof", Freshplaza.Com, 2019, <https://www.freshplaza.com/article/9082997/south-africa-hail-damages-orchards-in-langkloof.>; Siphos Kings, "Maize Vs Time: The Race To Feed SA", Mail And Guardian, 2019, [https://mg.co.za/article/2019-01-25-00-maize-vs-time-the-race-to-feed-sa/.](https://mg.co.za/article/2019-01-25-00-maize-vs-time-the-race-to-feed-sa/)

¹⁸² Makgetla et al., National Employment Vulnerability Assessment: Analysis of potential climate-change related impacts and vulnerable groups.

to be facing severe risks of job loss. For example, the 1991-1992 and 2018 droughts resulted in an estimated 50 000 and 30 000 agricultural jobs lost respectively.¹⁸³

The uncertainty associated with future climate and weather patterns is an essential part of agricultural planning for adaptation and the just transition. The variety of potential impacts outlined above illustrates that we are not planning for a singular future, with the same requirements across time and across different parts of the country. This means that any planning must include flexibility and responsiveness to changes and strong monitoring systems.¹⁸⁴

4.3.3. Policy responses to climate change within agriculture

There are numerous government policies that address the concerns of climate change for the agricultural sector. In 2016, the World Wildlife Fund - South Africa (WW-SA), conducted an analysis of these policies with a focus on adaptation, including: the National Development Plan (2012); the Integrated Growth and Development Plan (2012); Department of Agriculture, Forestry, and Fisheries Strategic Plan (2015/2016); the Agricultural Policy Action Plan (2015); the National Climate Change Response White Paper (2011); the Green Economy Accord (2011); the National Food and Nutrition Security Policy (2014); the National Water Resources Strategy 2 (2013); and the Sectoral Disaster Risk Management Plan (2012).

They concluded that “despite a comprehensive policy framework, its implementation demonstrates the lack of comprehensive strategic and integrated planning for the sustainable development of South Africa’s natural resources, compromising the country’s economic and social growth and potentially jeopardising the sustainability of the country’s natural capital”.¹⁸⁵ Furthermore, the authors find that while local governments and municipalities are at the frontline of mitigation and adaptation measures, they do not experience policy or financial support necessary to effectively and proactively address these concerns.

Since then, other more recent national plans have been developed. These include: the updated Nationally Determined Contributions (NDCs), the draft National Climate Change Adaptation Strategy, the draft Climate Change Bill, and the draft Climate Change Adaptation and Mitigation Plan for the South African Agricultural and Forestry sectors. Within these, the need for adaptation in the agricultural sector is highlighted, with broad aims to support the agricultural sector to implement more efficient, climate-smart and conservation agriculture practices, including the use of water resources and expansion of urban agriculture.

Numerous guidelines and handbooks have also been released by government to assist farmers and other entities with agriculture in approaches to climate change adaptation. These include the Handbook on Adaptation to Climate Change, the Actionable Guidelines for the Implementation of Climate Smart Agriculture in South Africa (volumes 1 and 2), and the

¹⁸³Kaylynn Palm, "30,000 Jobs Lost In WC Agriculture Sector Due To Drought", EWN, 2018, <https://ewn.co.za/2018/12/21/drought-costs-30-000-their-jobs-in-agriculture-sector-in-wc>. ; Food and Agricultural Organization (FAO), Drought And Climate Variability In The Limpopo River Basin, 2004, <http://www.fao.org/3/y5744e/y5744e04.htm>.

¹⁸⁴ TIPS, Sector Jobs Resilience Plan: Agriculture value chain.

¹⁸⁵ Gaylor Montmasson-Clair and Meshack Zwane, Climate Change Adaptation And Agriculture In South Africa: A Policy Assessment (WWF-SA, 2016), https://www.tips.org.za/images/WWF_PFU_Policy_brief.pdf.

Technical Report on the Implications of Climate Change for the Agriculture Sector in South Africa.

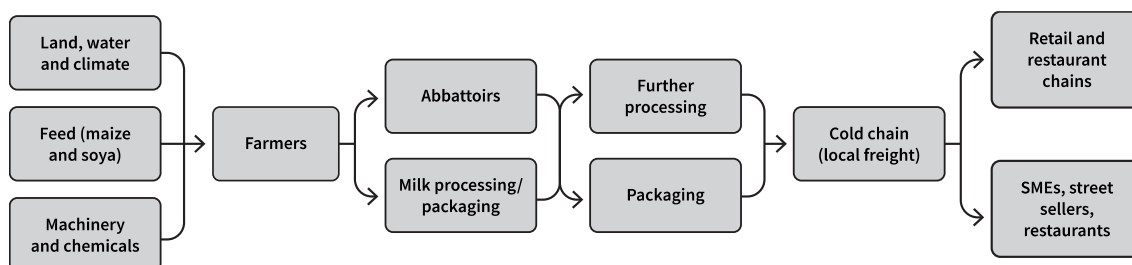
These reports highlight the potential for new practices in the agricultural sectors that have both mitigation and adaptation potential. Approaches promoted by these documents include Conservation Agriculture, Climate-Smart Agriculture, and Sustainable Farming systems, as well as improvement of water management practices.

However, in none of these policies and documents does job creation and security play a prominent role. While most acknowledge the importance of job creation within the context of the broader developmental needs of South Africa, they do not address the potential changes these practices and measures may have on job growth, skills required, or employment security. Only one, the Actionable Guidelines for the Implementation of Climate Smart Agriculture in South Africa (volume 1) provides an example of concrete job creation through the development of Agri-Parks.¹⁸⁶

4.3.4. Livestock value chain

Given the wide depth and breadth of the agricultural sector, encompassing sub-sectors ranging from wine, nuts, and goats, it is necessary to conduct a case study of a single, albeit still broad, sub-sector to illustrate in more detail the sources of emissions, and threats and opportunities in the context of climate change. The sub-sector selected is the livestock value chain as it is both an important contributor to climate change and extremely vulnerable to it.

Figure 7: Diagram illustrating value chain for livestock and dairy in South Africa



Source: Adapted from Makgetla et al. (2019). *National Employment Vulnerability Assessment: Analysis of potential climate-change related impacts and vulnerable groups*.

The livestock value chain can broadly be understood according to Figure 7. Livestock includes all farmed animals, including those produced for meat, dairy, and wool. The inputs required for livestock are land, water, feed, machinery and chemicals, and the farming is then followed by processing, packaging, freight and sale. There are six key features of the livestock value chain that make the sector particularly relevant to the just transition.

First, the livestock industry is one of the biggest land use sectors in South Africa. Due to the limited arability of most of South Africa's land surface, the vast majority (71% of all land) is only

¹⁸⁶ P.N.S. Mnkeni et al., Actionable Guidelines For The Implementation Of Climate Smart Agriculture In South Africa. Volume 1: Situation Analysis (Department of Environment, Forestry and Fisheries (DEFF), 2021, https://www.environment.gov.za/sites/default/files/docs/csa_volume1.pdf.

suitable for extensive livestock farming. Extensive livestock farming references to the rearing of livestock on pastures and grazing land, which is generally considered to be 'low-productivity' because it has a few animals over a large area, compared to intensive livestock which has lots of animals in a small area, requiring lots of inputs such as feed.

In practice, an estimated 30% of the land is used for commercial grazing.¹⁸⁷ In addition to the land used for grazing, arable land is also used to produce feed for livestock thereby expanding its spatial footprint. Approximately 40% of the maize produced in South Africa is used for animal feed.¹⁸⁸ This corresponds to approximately 869 348 ha, or 11%, of the arable land used for agriculture, not including the production of soya and sunflower which are also used for feed. This is mostly used for poultry, cattle, and sheep.

Second, the sector has a large water impact. South African agriculture uses 60% of the country's freshwater resources, of which the majority is used for irrigation. Water use by the livestock sector includes direct use for drinking, and the embedded water required to produce the feed. In addition, a large amount of water is used in agro-processing, where approximately 27 million kilolitres per year are used for dairy processing and animal slaughter.¹⁸⁹

Third, the ownership demographics within the livestock industry are substantially different to those of field crops and horticulture. Black farmers were, on average, responsible for 82% of goat production and 34% of cattle production between 2015 and 2019, compared to less than 5% for most horticultural and field crops.¹⁹⁰ Livestock also plays an important role in household agriculture, conducted predominantly by Black families. In 2019, an estimated 1.1 million households engaged in livestock farming.¹⁹¹ However, ownership of livestock, particularly of large animals such as cattle, is highly gendered. While women play a significant role in rearing and caring for livestock, these generally belong to their husbands or other male family members.¹⁹² This means that women do not have as much access to the positive economic benefits that livestock ownership entails. Livestock ownership remains important for rural livelihoods due to the diverse number of roles it fulfils (for example transport and financial security) and products it produces (for example manure, milk, hides, and meat). Livestock are also often more resilient to high climate variability and therefore, together with its multiple

¹⁸⁷ StatsSA, Census of Commercial Agriculture, 2017: Financial and Production Statistics.

¹⁸⁸ Department of Agriculture, Forestry and Fisheries (DAFF), South Africa Animal Feeds Market Analysis Report, 2018, <https://www.nda.agric.za/doiDev/sideMenu/Marketing/Annual%20Publications/Commodity%20Profiles/field%20crops/South%20African%20Animal%20Feeds%20Market%20Analysi%20Report%202018.pdf>.

¹⁸⁹ International Finance Corporation, South Africa Agri-Processing Resource Efficiency: Opportunities, Challenges And Outlook, 2019, <https://www.ifc.org/wps/wcm/connect/d9c48096-a57f-41a7-94f6-6cff88831cd4/202001-South-Africa-agri-processing-resource-efficiency.pdf?MOD=AJPERES&CVID=m-vr2oo>.

¹⁹⁰ DALRRD, Agriculture and Agro-Processing Master Framework Agreement: Context and Approach for an Inclusive Growth and Sustainable Jobs.

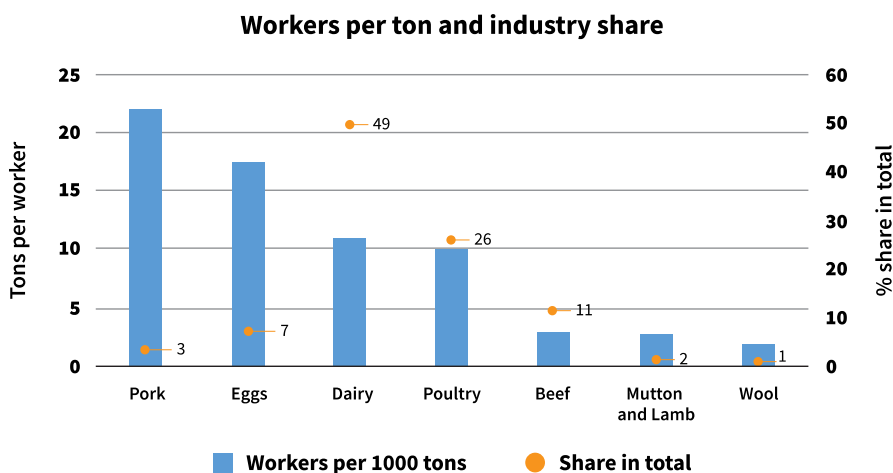
¹⁹¹ Ibid.

¹⁹² S. Mthi et al., "Women's Participation In Livestock Activities Under Small-Scale Farming System In The Eastern Cape Province, South Africa", *Applied Animal Husbandry & Rural Development* 11 (2018): 14-21.

purposes, ownership of livestock can play an important role in increasing the resilience to climate impacts.¹⁹³

Fourth, the livestock industry has a low labour-intensity but employs a large number of people. In 2018, the commercial livestock industry employed an estimated 162 116 people, with an additional 185 863 in mixed farming agriculture (where both crops and animals are farmed).¹⁹⁴ This represents 21.4% and 24.5% of total agricultural employment respectively. Employment occurs mostly in KwaZulu Natal and the Eastern Cape, followed by the Western Cape and then the Free State, Mpumalanga, and the North West. Figure 8 below illustrates the proportion of workers in each of the sub-sectors and the labour efficiency. While pork has the highest number of tons per worker, dairy employed the largest proportion of workers. The National Employment Vulnerability Assessment reports that the average number of employees per farm ranged from under 10 to 15, illustrating the low labour-intensity of livestock in comparison to horticulture and field crops, although this is partly made up for by the number of livestock farms.¹⁹⁵

Figure 8: Total number of workers in livestock per 1000 tons and industry share by percentage



Source: DALRRD (2021). Agriculture and Agro-processing Masterplan Framework.

Fifth, animal and animal products contribute more than 50% of agricultural incomes in all provinces except for Limpopo, the Northern Cape, and the Western Cape. Cattle in particular are concentrated in Eastern Cape, KwaZulu Natal, and the Free State, whereas poultry produce was mainly situated in the North West, Mpumalanga, and the Northern and Western Cape. For household farming, livestock is the major produce for households in KwaZulu Natal, the Eastern Cape, and the North West.¹⁹⁶

¹⁹³ C.M. Godde et al., "Impacts Of Climate Change On The Livestock Food Supply Chain; A Review Of The Evidence", *Global Food Security* 28 (2021): 100488, doi:10.1016/j.gfs.2020.100488.

¹⁹⁴ StatsSA, *Census of Commercial Agriculture, 2017: Financial and Production Statistics*.

¹⁹⁵ Makgetla et al., *National Employment Vulnerability Assessment: Analysis of potential climate- change related impacts and vulnerable groups*.

¹⁹⁶ Ibid.

Finally, South Africa is a net exporter of beef and wool, and a net importer of poultry meat, pork, mutton, lamb, and dairy products. In addition, the sector relies on substantial input imports, including fertilisers, animal feed, and animal vaccines. This reliance on global supply chains for agricultural inputs, particularly for livestock, makes the value chain vulnerable to disruptions, price volatility, and exchange rate fluctuations.¹⁹⁷

These trade dynamics have been fueled by changes in the meat and dairy consumption patterns. Globally and in South Africa, meat consumption tracks increase in wealth and income. Therefore, between 2000 and 2010, during a period of economic and income growth, meat consumption increased, growing at 4% per year. This was dominated by the growth in poultry consumption, which grew at more than 7% per year in this period, making chicken the most important protein source for most South Africans. However, since the economic slowdown following 2008, and worsened by the COVID-19 crisis, meat demand has dampened in the last decade.¹⁹⁸ This has been exacerbated by supply-side impacts, particularly drought and disease. Nonetheless, between 2000 and 2016, red meat consumption increased from 22 to 29kg per person per year, while chicken consumption almost doubled, from 22kg per person per year to 40kg.¹⁹⁹

Within each part of the value chain, there are different sources of GHG emissions and vulnerabilities to the impacts of climate change (Table 7).

Table 7: Livestock value chain, GHG emissions and vulnerabilities

Value chain:	Source of GHG emissions:	Vulnerabilities to climate change:
<i>Inputs (land, water and climate; feed; machinery and chemicals)</i>	Fertiliser use Land use change	Drought - lack of grazing material; reduction in feed production Increased CO ₂ - bush encroachment (increased woodiness) Fire - lack of grazing material
<i>Farmers</i>	Enteric fermentation (this applies to cattle, sheep and goats, not pigs and poultry) Manure Waste production	Drought - lack of water for animals Heat waves/high temperatures - animals grow more slowly, produce less milk, in extreme cases die New diseases - impacting animal health
<i>Abattoirs and milk processing</i>	Transport Electricity Waste production	Drought - less water available for processing
<i>Further processing and packaging</i>	Electricity	Increased prices or shortages caused by other vulnerabilities in the value chain

¹⁹⁷ Bureau for Food and Agricultural Policy (BFAP), BFAP Baseline Agricultural Outlook 2020 - 2029, 2021, https://www.bfap.co.za/wp-content/uploads/2020/08/BFAP-Baseline-2020_Final-for-web-1.pdf.

¹⁹⁸ "South Africa - Agricultural Sector", International Trade Administration, 2020, <https://www.trade.gov/knowledge-product/south-africa-agricultural-sector>.

¹⁹⁹ Shem Oirere, "Meat Consumption Rising In South Africa", World-Grain.Com, 2019, <https://www.world-grain.com/articles/12371-meat-consumption-rising-in-south-africa>.

	Packaging materials	
<i>Cold freight</i>	Transport Refrigeration	Higher temperatures - increase costs required to keep products cool
<i>Retail, restaurants and street sellers</i>	Electricity	Increased prices or shortages caused by other vulnerabilities in the value chain

Table 7 illustrates that the majority of emissions are produced further up the value chain through fertiliser use, land use change, enteric fermentation, and manure. Further down, the emissions are generally attributed to electricity use, transport, packing, and refrigeration. At all stages, the actual amount of emissions varies substantially by animal species and breed, manure management techniques, feed, and distances between production, processing, and retail.

In terms of the vulnerabilities to climate change, these too exist further up the value chain, particularly in the production of feed and fodder and in the rearing of the animals themselves. While these impacts are concentrated further up, they have the potential to ripple throughout the rest of the value chain through shortages in produce and/or higher prices.

Based on the analysis above, there are several major threats to this industry. It must be noted however, that substantially more research is required in order to quantify the likelihood and magnitude of each of these impacts. The main threat is the increasing difficulty or non-viability of livestock production due to heat stress, drought, and disease. Two additional impacts may be increased transport and processing costs and the reduction in demand for red meat, although both of these depend heavily on policy and consumer choices.

The largest threat to this sector is the impacts of climate change directly on the rearing of animals because of heat stress, drought and disease, which together can impact volatility.

- *Heat stress affects the health, productivity, and longevity of animals, pasture, and crops.* There is broad consensus that large parts of South Africa will become hotter in the medium- and long-term. Heat stress is not only a factor of temperature, but also humidity because heat stress worsens as relative humidity increases. Although climate projections vary and depend on actions taken until then, models suggest that by 2050 large parts of the northern periphery may no longer be viable for the industry.²⁰⁰
- *High temperatures also impact forage quantity and quality, including the availability and cost of feed.* One study on maize yields found that increases in temperature of 1-3°C, results in decreases in yields of between 12-28%.²⁰¹
- *Drought affects crop and pasture quality.* Lack of water also affects feed and forage availability. Most of the water consumed by intensive farming systems is through the

²⁰⁰ Council for Scientific and Industrial Research, "Agriculture, Forestry And Fisheries", Greenbook, 2021, <https://pta-gis-2-web1.csir.co.za/portal/apps/GBCascade/index.html?appid=aecf943672c2499f9cc73454f747d33f>; Aericia Bjurstrom et al., "Animal Handling During Heat Stress", 2021, <https://dairy.extension.wisc.edu/articles/animal-handling-during-heat-stress/>.

²⁰¹ Aaron M. Shew et al., "Yield Reduction Under Climate Warming Varies Among Wheat Cultivars In South Africa", Nature Communications 11, no. 1 (2020), doi:10.1038/s41467-020-18317-8.

growth of feed products (up to 90% in some systems). During times of drought, forage quality and availability reduces, increasing the reliance on feed, however feed production is also vulnerable to reductions in rainfall.

- *The impacts of drought and increased temperatures together multiply the challenges.* Under hotter conditions, there is more evaporation meaning that water availability is further reduced. This affects the livestock sector as under higher temperatures, more water is required by the sector. Animals consume more water under hotter conditions, with poultry, for example, drinking 50% more water when temperatures exceed 30°C.²⁰² Water use is an adaptive measure to help animals cool off and reduce heat stress.
- *Diseases are also expected to increase, particularly in areas expected to show both increased temperatures and increased precipitation.* This largely applies to the eastern parts of the country which are projected to have high probability of East Coast Fever (spread by brown ticks) and Rift Valley Fever (spread by mosquitos).²⁰³ Rift Valley Fever has the potential to also affect humans, and as animal to human contact largely occurs through the handling of the infected animal tissue, it is mostly workers involved in animal slaughter and processing who are at risk.²⁰⁴ Diseases have the potential to have devastating impacts both directly and through impacts on feed. For example, in Ethiopia in 2020, more than 350 000 tons of grain and 1.3 million hectares of pasture were affected by a desert locust infestation.²⁰⁵
- *These impacts can affect the volatility and price of feed supply and other inputs.* Although this is subject to large uncertainties, the impacts of climate change on crop production both in South Africa and globally has the potential to place pressure on the livestock sector. In cases where feed production is reduced in South Africa, the value chain may become increasingly reliant on imports making it susceptible to international volatility.

Additional threats include:

- *Transport and freight costs could increase.* Depending on how policy measures and transitions within liquid fuels and freight proceed, it is possible that fossil fuel costs increase substantially. Although the agricultural sector is currently exempt from carbon

²⁰²David Ward and Kevin McKague, "Water Requirements Of Livestock" (Ministry of Agriculture, Food and Rural Affairs, Ontario, 2007), <http://www.omafra.gov.on.ca/english/engineer/facts/07-023.pdf>.

²⁰³ International Center for Tropical Agriculture (CIAT), Climate And Livestock Disease: Assessing The Vulnerability Of Agricultural Systems To Livestock Pests Under Climate Change Scenarios, 2014, https://unfccc.int/files/documentation/submissions_from_non-party_stakeholders/application/pdf/516.pdf.

²⁰⁴ National Institute for Communicable Diseases (NICD), *Healthcare Workers Guidelines On Rift Valley Fever*, 2020, https://www.nicd.ac.za/wp-content/uploads/2020/01/RVF_2020_Guidelines_for_HCWs_oh_ak_200120_oh_vm.pdf.

²⁰⁵ Ministry of Agriculture, Government of Ethiopia, *Impact Of Desert Locust Infestation On Household Livelihoods And Food Security In Ethiopia*, 2020, https://reliefweb.int/sites/reliefweb.int/files/resources/desert_locust_impact_assessment_report_for_ethiopia.pdf

taxes, it could still be impacted by taxes on fossil fuel use.²⁰⁶ This could have ripple effects across the processing and distribution components of the value chain. However, if this were to apply across global value chains, there is a potential that this could favour local production and make it more competitive.²⁰⁷

- *Distribution costs could increase due to higher temperatures.* For the transport of live animals, high temperatures, high densities, and the lack of water can impact on animal welfare and quality, and reduce feasible distances for travel. For the transport of animal products, increasing temperatures results in worse conditions for storage which can lead to the degradation of food quality and shelf-life. In order to mitigate this, and to reduce food waste, increased refrigeration will be required during both processing and transport which needs to be maintained across the value chain.²⁰⁸ This substantially increases energy requirements and costs, with potential to further increase emissions unless conducted with renewable or other greener technologies.
- *Reductions in red meat demand.* Internationally, projections suggest a reduction in demand for red meat as consumption choices shift due to concerns regarding the climate and environmental impact of the industry and animal welfare. This may impact on the export of red meat. However, this does not appear to have similar effects in the South African market yet and for the foreseeable future as meat and dairy consumption increase. However, this is predicated on rising incomes and wealth which has slowed substantially in the past decade and has taken a further knock with COVID-19. This also impacts the industry which is therefore highly susceptible to changes in demand, unlike most other food products.

These threats impact household and smallholder farmers, and workers in the sector particularly. In terms of the first category, grazing land is already experiencing degradation and overgrazing due to limited availability and restrictions on movement that would allow for time for the pasture to recover. This is also often linked to insecure land rights. These groups experience lack of access to markets and poor integration into the food value chain in South Africa. Therefore, they are already existing on small economic margins.

Large farms generally do not have the same vulnerabilities, but nonetheless are exposed to the impacts of climate change, as well as volatilities of the international market due to their reliance on inputs as well as export markets. However, in this case, it is often workers who bear the burden of these impacts. This could take the form of job losses, reductions in hours and incomes, increased instability of employment leading to casualisation, as well as a reduced quality of life in these areas due to the heat and lack of water availability. This has ripple effects across the value chain and in rural economies as a reduction in livestock results in less production and fewer jobs downstream. These threats are worsened because of the geographic marginality of

²⁰⁶ Clare Rodseth, Carbon Tax And Agriculture (Blue North Sustainability, 2021), https://www.climatefruitandwine.co.za/Admin/Uploads/files/News/June%20-%20carbon%20tax_V6.pdf.

²⁰⁷ Makgetla et al., National Employment Vulnerability Assessment: Analysis of potential climate- change related impacts and vulnerable groups.

²⁰⁸ C.M. Godde et al., "Impacts Of Climate Change On The Livestock Food Supply Chain; A Review Of The Evidence".

the sector, which is located in areas where there is little other economic activity, offering few other job or livelihood opportunities.

4.3.5. Potential pathways for transition

The threats to the agricultural sector have been outlined in the previous sections. In order to meet the mission of a South Africa in which all people have access to affordable, nutritious food produced in a way that does not harm the environment within an eco-socialist vision, these threats need to be addressed and new opportunities utilised. In order to meet this vision, pathways for transition in agriculture must address issues of land use change, fertiliser use, enteric fermentation and waste production, as well as cope with a new reality of increased temperatures, reduced water availability, potentially more diseases, and cost and demand volatility.

Within the context of an overall reduction in the amount of arable land in South Africa, an integrated understanding is required to envisage and plan for food production, trade-offs, and prioritisation more broadly.

Three potential pathways for transition are listed below. These include: intensification, climate-smart agriculture, and agro-ecology.

Intensification

One solution offered is an intensification of livestock production together with the implementation of certain adaptation measures. In order to reduce emissions, proponents argue for the increased use of feedlots and improved feed mixes and supplements to increase the nutritional quality of the feed and reduce the fibre intake. Altogether, this means that animals produce less methane and convert feed more efficiently.²⁰⁹ This can also be helped by animal breeding using GHG emissions as a selection criteria. Additional methods include the increased efficiency in animal unit production, increasing calf-to-cow efficiency, and shortening growth periods.

While these systems usually require greater resources in terms of finances, technology, and information, they are also vulnerable to the impacts of climate change.²¹⁰ High-yielding animals used in industrial agriculture are more susceptible to heat stress, are more prone to disease outbreaks due to close proximity, are more reliant on electricity, and are more integrated into regional and international value chains making them vulnerable to disruptions and volatility. In order to address some of these impacts of climate change, suggestions include the selection of more heat tolerant breeds, shading, artificial cooling and reduced stocking densities for chicken and pigs to reduce heat stress and improve ventilation.²¹¹ In practice, these can reduce the economic efficiency of the intensification pathway.

²⁰⁹ Red Meat Research and Development South Africa (RMRD SA), Research And Development Plan For The Large And Small Livestock Meat Industries In South Africa: Version 2020-2024, 2021, <http://www.rmrdsa.co.za/Portals/0/New%20Programs/RD%20Plan%20Cattle%20%20Small%20Stock%202020-2024%20FINAL.pdf>.

²¹⁰ C.M. Godde et al., "Impacts Of Climate Change On The Livestock Food Supply Chain; A Review Of The Evidence".

²¹¹ Department of Environmental Affairs (DEA), Full Technical Report On The Implications Of Climate Change For The Agriculture Sector In South Africa, https://www.environment.gov.za/sites/default/files/docs/implications_climatechange_foragriculture.pdf.

Livestock intensification fits into a broader trend of intensification within agricultural production. This system generally improves efficiency of production, requiring fewer resources to produce more. While this has the potential to reduce resources used in production and thereby reduce environmental impact, in reality what often happens is that increases in efficiency result in increases in demand, and therefore increased production and consumption. For example, improvements in efficiency in the livestock sector may result in reduced prices of meat which drive up demand, increasing overall production. This increase can offset the environmental gains made in improving efficiency.

Further, strictly improving efficiency takes a narrow perspective of the livestock sector and does not consider it in the context of broader shifts needed in agricultural production. It does not address the underlying unequal structure of the agricultural sector as it is likely to increase consolidation and corporate control, because only the biggest and wealthiest companies will be able to manage the threats in this way, resulting in an unequal distribution of the risks and rewards of a transition. This would be an unjust transition.

Climate-smart agriculture

Climate-smart agriculture (CSA) is defined as “agriculture that sustainably increases productivity, resilience (adaptation), reduces/removes greenhouse gases (mitigation), and enhances the achievement of national food security and development goals”.²¹² Rather than a totally new type of agriculture, it is a new approach to address climate change considerations together with other agricultural concerns, such as, food security. The three pillars of this approach are: productivity, mitigation, and adaptation, with ‘sustainable intensification’ included in this approach. Sustainable intensification refers to the increase in agricultural productivity through methods that “conserves and enhances natural resources”.²¹³

In practice, this includes a wide range of methods ranging from integrated crop and livestock systems, reducing food loss and waste, increasing agricultural diversity at the regional, species and genetic level, more efficient irrigation systems, intercropping and crop rotation, and biotechnology, amongst others. CSA does not encompass any one thing in all contexts, “no interventions are climate-smart everywhere or every time”, but rather that they are context dependent.²¹⁴

Within CSA, one suggestion for improved livestock management in South Africa is Holistic Range Livestock Management.²¹⁵ This is an approach provided for in the CSA guidelines and provides an alternative approach to grazing planning aimed at using “grazing and other animal impacts (trampling, excretion of dung and urine) to restore or maintain the health and productivity of private or communally used grazing lands”. Through this method, the ability of soil to absorb

²¹² Food and Agriculture Organization (FAO), “Climate-Smart” Agriculture: Policies, Practices And Financing For Food Security, Adaptation And Mitigation”, 2010, <https://www.fao.org/3/i1881e/i1881e00.pdf>.

²¹³ Food and Agricultural Organization (FAO), Why Climate-Smart Agriculture, Forestry And Fisheries?, Climate-Smart Agriculture Sourcebook, 2014, <http://www.fao.org/3/i3325e/i3325e01.pdf>.

²¹⁴ “Climate-Smart Agriculture 101”, Climate-Smart Agriculture Guide, 2021, <https://csa.guide/>.

²¹⁵ P.N.S. Mnkeni et al., “Actionable Guidelines For The Implementation Of Climate Smart Agriculture In South Africa. Volume 2: Climate Smart Agriculture Practices” (repr., Department of Environment, Forestry and Fisheries, 2019), https://www.environment.gov.za/sites/default/files/docs/csa_volume2.pdf.

CO₂ can be improved and methane production reduced through improved forage quality, as well as resilience to climate change improved, by increased grazing quality and quantity.²¹⁶

One study by Green Skills suggests that there is significant scope for job creation in the implementation of CSA, along various parts of the value chain.²¹⁷ The hotspot areas for job creation include: production of alternative feed, training and extension services, climate-smart and mobile abattoirs, local production of machinery for conservation agriculture, and production of new bio-friendly inputs, amongst others. However, many of these require specialised skills and training which are currently not present locally. According to the report, none of the agricultural colleges in South Africa were offering courses in CSA at the time of publishing (2017).

Opponents of CSA, however, argue that it is reformist in nature, which has allowed for it to be fully co-opted by some of the largest agro-industrial companies, thus perpetuating the dependence of farmers on these corporations for external and expensive inputs, and subject to global commodity markets for the sale of their produce.²¹⁸ For example, large multinationals have been able to monopolise on the 'no tillage' movement within conservation agriculture in order to promote increased use of its herbicides.²¹⁹ Therefore, they argue that it does not adequately address the fundamental structure of the current agricultural model, and its underlying inequalities.

Agro-ecology

The last approach is agro-ecology. Agro-ecology takes a transformative approach to addressing climate change and the other environmental harms of conventional agriculture, "applying ecological concepts and principles to the design and management of sustainable food systems".²²⁰ In addition to being a practice and a way of farming, it is also a movement. It has formed the basis of resistance towards capitalist agriculture, which is increasingly depleting the biological foundations on which it relies; is not able to feed the world, particularly its poor; is under-developing and under-skilling its labour force; and relies on increasingly privatised and concentrated ownership of land and the means of production.²²¹ Instead, agro-ecology proposes a system of agriculture that:

- Relies less on external inputs, such as fertiliser, to maintain soil fertility;
- Uses indigenous and local knowledges;
- Uses crops and livestock in an integrated system to recycle resources and nutrients;
- Rejects mono-cropping;
- Absorbs carbon through improved soil health;
- Values and fosters biodiversity;

²¹⁶ Actionable guidelines for the implementation of climate smart agriculture in South Africa: Volume 2

²¹⁷ Leigh Cobban and Zoë Visser, "Green Skills For Climate-Smart Agriculture", 2017, <http://www.greenskills.co.za/wp-content/uploads/2017/08/Green-Skills-in-WC-CSA-Final-report-July-2017.pdf>.

²¹⁸ Michel Pimbert, "Agroecology As An Alternative Vision To Climate-Smart Agriculture", Blog, Cultivate Collective, 2017, <http://www.cultivatecollective.org/in-perspective/agroecology-as-an-alternative-vision-to-climate-smart-agriculture/>.

²¹⁹ African Centre for Biosafety, "Agroecology In South Africa: Policy And Practice", 2015, <https://www.acbio.org.za/wp-content/uploads/2015/03/Agroecology-SA-report.pdf>.

²²⁰ Stephen R. Gliessman, *Agroecology: The Ecology Of Sustainable Food Systems*, 3rd ed. (Routledge, 2015).

²²¹ Akram-Lodhi 2021. *The ties that bind? Agro-ecology and the agrarian question in the twenty-first century*.

- Increases resilience and reduces emissions;
- Emphasises the importance of ownership;
- Improves water efficiency, retention, and quality; and
- Rejects genetically modified organisms (GMOs).

Through these mechanisms, food sovereignty and cooperation are encouraged, to reduce reliance on the multinational corporations who otherwise control access to seeds, herbicides, pesticides, and fertilisers. In doing so, climate resilience can be fostered, and the harmful effects on the environment are reduced as less waste is produced, less fertiliser is used which pollutes waterways, and more biodiversity is encouraged. This has led to support for agro-ecological approaches coming from unions in other parts of the world, including Nigeria, as well as CSOs in South Africa, such as COPAC.²²²

The role of livestock in agro-ecology is generally focused on the role it can play in integrated crop and livestock systems, where chickens are particularly suited. This can lead to increased productivity, diversified income streams which reduce risk, and reduced need for external inputs (as manure can be used as a fertiliser). This can lead to improved overall economic performance as well as reduced seasonality of work as labour is required throughout the year. This can be enhanced by having different animal species with different feed preferences on the same land. Livestock ownership can also act as a climate risk-mitigation strategy, due to the multiple roles it fulfils in livelihood and asset diversification.²²³

For adequate grazing, reduced stocking densities, rotational grazing, the usage of crop residues for additional feed, and utilising indigenous breeds, may be required to adapt to the landscape. Rotational grazing requires access to large tracts of land, which has been limited due to shifts away from communal grazing and open pasture.²²⁴ Systems of mobility are required to ensure adequate time between grazing periods. In order to ensure well-being across the system, animal welfare must be ensured and animals must not be kept in cruel conditions.

Agro-processing is also an essential part of the food system. Within an agro-ecological model, food processing should be kept to a minimum to reduce external inputs, limit polluting materials such as plastics, and reduce food waste. In addition, it should also be more decentralised to ensure that smallholders can also access processing facilities. This can be done through government owned facilities and/or cooperatives.²²⁵ Agro-processing is labour-intensive and

²²² Godwin Uyi Ojo and Hauwa Mustapha, "Just Transition In Nigeria: Case Of Agriculture And Petroleum Sectors" (Nigeria Labour Congress & Environmental Rights Action, 2021), https://www.ituc-csi.org/IMG/pdf/210429_-_just_transition_in_nigeria.pdf. ; COPAC, "Food Sovereignty For The Right To Food: A Grassroot Guide To Activism", 2014, <https://copac.org.za/wp-content/uploads/2017/10/Food-Sovereignty-for-the-Right-to-Food-Activist-Guide-compressed.pdf>.

²²³ Valentine Debray et al., "Agro-ecological Practices For Climate Change Adaptation In Semiarid And Subhumid Africa", *Agro-ecology And Sustainable Food Systems* 43, no. 4 (2018): 429-456, doi:10.1080/21683565.2018.1509166.

²²⁴ R.F. Rohde et al., "Dynamics Of Grazing Policy And Practice: Environmental And Social Impacts In Three Communal Areas Of Southern Africa", *Environmental Science & Policy* 9, no. 3 (2006): 302-316, doi:10.1016/j.envsci.2005.11.009.

²²⁵ PLAAS, "Corporate Concentration And Food Security In South Africa: Is The Commercial Agro-Food System Delivering?", 2015, https://media.africaportal.org/documents/PLAAS_Rural_Report_Book_1_-_Stephen_-_Web.pdf.

adds significant value to products, allowing for further employment and income generation for smallholders.

However, two key questions arise when considering agro-ecology: does it create opportunities for employment, and does it produce enough food to feed the country? In terms of labour, agro-ecology is premised on substantive land reform that helps to secure land access and/or ownership for the majority of the population. This forms a key part of livelihood security for the working classes, especially in a context of increasing unemployment. Additionally, agro-ecological methods are labour-intensive in that many environmentally-friendly practices cannot be mechanised.²²⁶ This includes soil maintenance, composting, pest management, crop rotation and intercropping, amongst others.²²⁷ These methods are all knowledge-intensive, but vary in how technology and resource intensive they are. Therefore, application of these practices require training and support at all levels, from managers to farm workers, on both commercial and household farms.

Regarding whether agro-ecology is productive enough to feed South Africa, it is important to remember that many South Africans are in fact hungry. As previously mentioned, this is not due to a lack of food in South Africa, but rather due to lack of access to money; land and other resources to grow one's own food; and the concentrated nature of our food system. Even in rural areas, people often have to travel many kilometres to the nearest town to buy food at the supermarket.²²⁸ Therefore, agro-ecological methods coupled with land reform and the development of local markets can substantially contribute to alleviate hunger, particularly in rural areas where access is one of the biggest issues. Furthermore, the food most South Africans are able to access is of low nutritional quality. By placing particular emphasis on the growing of legumes, fruits, and vegetables (horticulture) within integrated systems, issues of malnutrition may be addressed.

However, in order to ensure the success of an agro-ecological approach, a framework is required that supports the adoption of these methods through incentives, training, and awareness raising. This needs to occur at multiple levels: at a governmental level there needs to be political will to support these practices, farmers and farm workers need to be made aware and trained, and extension officers also need to be trained in order to provide adequate support. Further reforms are required within land and water redistribution, in a manner that empowers smallholder farmers, including women, providing them with adequate access to quality land and water.

This also needs to be done in a participatory way, particularly with key stakeholders. This would include all those who are affected by, and have an interest in, the outcome. Smallholder farmers need to have adequate voice and powers within these spaces, to avoid top-down strategies which have continuously been to the detriment of the most vulnerable. Therefore, this cannot take the form of 'stakeholder engagement', whereby policies are simply presented to

²²⁶ International Panel of Experts on Sustainable Food Systems (IPES-Food), "The Added Value(S) Of Agro-Ecology: Unlocking The Potential For Transition In West Africa", 2021, http://ipes-food.org/_img/upload/files/IPES-Food_ExecSummary_WA_EN.pdf.

²²⁷ Rose Williams, Desiré Pelser and Vanessa Black, "Agro-Ecology Is Best Practice" (Durban: Biowatch South Africa, 2021), <https://biowatch.org.za/download/agroecology-is-best-practice/?wpdmdl=493&refresh=610c75f8991b71628206584>.

²²⁸ Oxfam, Hidden Hunger In South Africa: The Faces Of Hunger And Malnutrition In A Food-Secure Nation.

stakeholders and they have no power to meaningfully contribute. It must be done in a participatory way, that is truly empowering and transformative participation. This means that stakeholders should be able to influence the outcome of the process, in a manner that improves their social conditions and is based on equity and justice.

One way in which agro-ecological models can be developed and tested is through worker-owned cooperatives. This should be achieved by agricultural workers on redistributed land. Examples of worker cooperatives exist around the world, as well as in South Africa's own history. However, in order to be successful they require adequate financial support and training, and require monitoring to ensure that they do not replicate exploitative practices found in the private sector.²²⁹

Other considerations

This does not preclude the importance of ensuring that current commercial farms play an important role for South Africa's food security, particularly for urban populations, and rural employment. These too need to change and adapt their methods to become more climate-resilient and environmentally-friendly through new science and technology. This needs to be done in a way which is publicly accountable, ensures decent work, and is inclusive and accessible for emerging commercial farmers, rather than dominated by a select few corporate interests.

At a national level, planning for food systems must take into account the shifts in climate and ecosystem niches and the opportunity costs of what food is produced where. For example, in many parts of the interior, it may become increasingly difficult to farm crops due to lack of water and high temperatures, and therefore extensive livestock farming based on grazing may be more suitable as livestock are generally more resilient to climate variability. However, with increasingly limited arable land, growing crops for livestock feed substantially reduces the amount of land that can be used to feed humans. Therefore, it is necessary to prioritise the limited land that can be used to grow grains, legumes, fruits and vegetables to produce healthy and adequate food for the human population. In the medium- to long-term, this may require a flattening of meat and dairy consumption nationally and particularly by high income groups, as the landscape and natural resources cannot support ever increasing numbers of livestock.

This leaves space for the further development of other labour-intensive sectors such as horticulture on available arable land. Horticulture includes the production of fruit, vegetables, and nuts. This is the most labour-intensive and employment generating sub-sector within agriculture, is the most important in terms of export revenues, and is essential for a healthy diet. It is also an example where technological advancements have not reduced employment generation. However, it remains largely white-dominated and therefore emerging Black farmers require support to enter into this market.²³⁰

In all of these arrangements, economic, institutional and research support, including safety nets, are needed to aid the transition and development of low-carbon and climate-resilient

²²⁹ COPAC, "Create Work Through Worker Cooperatives: A Guide For Grassroots Activism", 2015, <https://copac.org.za/wp-content/uploads/2015/09/Worker-Coop-Guide-Final-Web-Version1.pdf>.

²³⁰ DALRRD, Agriculture and Agro-Processing Master Framework Agreement: Context and Approach for an Inclusive Growth and Sustainable Jobs.

agriculture. This is particularly important for workers, and smallholder farmers with limited resources to adapt.

4.3.6. Proposals

While the agricultural sector faces significant risks in the face of climate change, the analysis above has shown the challenges which were already inherent within these sectors. Therefore, the sectors and its workers need to be protected. The just transition to an environmentally sustainable and climate-resilient agricultural sector presents an opportunity to transform this sector as we know it, to focus on improved access to healthy and affordable food, increased land access, and improved working conditions for agricultural workers. Therefore, the top five priority demands are:

1. **Redistributive land reform.** Land reform should benefit all those who do not have secure access to land, both in urban and rural settings. In the agricultural sector, land reform must focus on: redistributing unused privately-owned land, increasing access to land for smallholder commercially oriented farms, and ensuring that access to land includes access to water rights. This must be supplemented by ongoing and long-term support to land reform beneficiaries, including extension and advisory services as well as investment and training into climate-friendly practices. Given the ongoing marginalisation of women, there must be dedicated policies which aim to increase ownership and support to women landowners and agricultural producers. While advocacy and policies for land reform already exist, they need to include integrated climate change planning to ensure that beneficiaries do not receive land that will no longer be viable due to climate change in the near future.
2. **Training and re-skilling of agricultural workers.** Extensive training and reskilling is required to empower lower-skilled and under-capacitated workers particularly for sub-sectors which may experience a decline in production or profitability due to climate change impacts. Training must be holistic, providing skills that stretch across many parts of the value chain and can be applied to numerous crops to allow for reduced seasonality of work. This is also an opportunity to increase the productivity and skills of workers, which contributes to the sector overall and the quality of rural livelihoods more broadly. While supported and enforced by the national government, this should be led by workplaces and demanded at bargaining councils, thereby including long-term skilling of workers as part of collective bargaining agreements and implemented in workplaces and industry associations.
3. **Insurance mechanisms for climate impacts.** Insurance mechanisms and temporary social support for agricultural producers and those dependent on land-based livelihoods, with explicit provisions and conditions that these also cover agricultural workers, should be developed. This needs to be implemented at a national scale by government, to ensure that it is comprehensive, covers all parts of the country and is adequately funded. Due to the devastation caused by climate impacts such as droughts, this must be designed with urgency with the aim to be implemented in the medium-term.
4. **Water equity, efficiency, and conservation.** Water equity needs to be addressed in parallel with increased investment in research and technologies for water conservation and efficacy. This needs to be combined with integrated planning to ensure adequate water is provided across the system for different uses. By focusing on economies of

water, new opportunities may arise in manufacturing of water saving equipment, planning, and water management. This requires planning at a national government level and is extremely urgent to ensure that existing water resources are no longer wasted and polluted.

5. **Monitoring of working conditions on farms.** It is essential that there is improved security and working conditions for agricultural workers, through bolstered legislation and improved monitoring by the government on the implementation of labour laws. It requires ensuring access to personal protective equipment for all workers, measures to account for climate impacts (such as shading and flexible working hours), and most importantly, contract security. It is at the level of the workplace and bargaining council that these measures need to be demanded and adopted.

While these are the top five priorities, they are supplemented by numerous other actions and policies that need to occur to ensure that workers do not bear the brunt of these impacts; these are unpacked in full in Table 8.

Table 8: Demands for workers in the agricultural sector, grouped by theme

	Demand	Description	Time frame	Target
Transformation				
1	Redistributive land reform	Land reform must a) increase access to land for smallholder commercially oriented farms, b) increase support for emerging farmers through extension and advisory services, c) focus redistribution on less productive farmers so as not to harm food production, and d) include access to water rights. Beneficiaries also need access to adequate investment and training support over the long-term. Prohibitive legislation obstructing this must be addressed. For example, the Subdivision of Agricultural Land Act of 1970 should be repealed as it acts to prevent the subdivision of agricultural land thereby acting as an obstacle to redistribution. ²³¹ Rather, land ownership ceilings should be imposed to enhance equality.	Medium term	NG, LG
2	Support for emerging Black farmers	Support and opportunities should be provided to emerging young Black farmers within the framework of agro-ecology to ensure that the just transition is socially owned. These farmers should be supported to create their own work.	Long term	NG, LG
3	Tenure security for rural	Tenure security for farm workers and rural households must be ensured through the implementation and monitoring of policies such as	Medium term	NG, LG

²³¹ <https://www.golegal.co.za/subdivision-land-reform-unconstitutional/>

	households and farm workers	the “Strengthening Relative Rights of People Working the Land” programme. ²³²		
4	Increased worker ownership	Mechanisms - such as community and worker cooperatives including on redistributed land - should be introduced to promote worker ownership of commercial farms, to help address the deep dualism in ownership in South African agriculture that has worsened the precarity of farm workers.	Medium term	NG, LG, BC
5	Development of rural food markets	Support for the development of rural food markets/networks for smallholder farms - for instance, through storage and market infrastructure, transport networks and cooperatives - should be instituted to help address lack of market integration and rural hunger.	Long term	NG, LG
6	Improved gender equality in the agricultural sector	Mechanisms such as improved monitoring of labour legislation, incentives for retaining workers, and financial support need to be put in place to address gender inequality in the sector.	Medium term	NG, LG, WP
7	Diversification of rural economies	Support to rural farm towns is required to develop viable and sustainable economic opportunities, with a focus on generating employment and livelihood opportunities.	Long term	NG, LG
Changes to agricultural production				
8	Diffusion of technologies, knowledge, and practices	Adaptive technologies, knowledge, and practices must be disseminated and made accessible to all farmers, both commercial and non-commercial. This must include local and indigenous knowledge, technologies appropriate for small scales, and low-carbon technologies. Owners must ensure that workers are trained to use and understand any new technologies.	Medium term	NG, BC, WP
9	Financial support to adopt climate-friendly strategies	A grant or credit system should be instituted to encourage adoption of climate-friendly strategies, focusing particularly on smallholders. For large commercial farms, regulations should be applied to reduce environmentally harmful practices.	Short term	NG
10	Financial support and research for improved water use	Further investment in infrastructure and training needs to be made across the agricultural system on methods of water efficacy and conservation. This includes practices such as reduced tillage and rain water storage, as well as improved technologies for both large and small farms.	Medium term	NG
11	Discourage GMO use	The state should discourage GMO use through awareness-raising, subsidise non-GMO production, ensure proper labelling on GMO products and consider a ban.	Medium term	NG

²³² “Strengthening Relative Rights of People Working the Land”

1 2	Promote urban agriculture	Community groups and urban gardening initiatives must be supported and incentivised through land provision, subsidies for water infrastructure, and awareness-raising for initiatives such as seed sharing. This should be coupled with a campaign and awareness raising for household farming.	Medium term	LG
1 3	Diversification of agricultural production, particularly focused on horticulture.	Diversified crops, and mixed livestock and crop systems, should be encouraged and supported through adequate training and incentives. Particular focus should be paid to the growing of fruits and vegetables as these are essential for nutritious food.	Long term	NG, LG, BC, WP
1 4	Prioritisation of arable land for growing food for human consumption	The use of arable land for growing food for direct human consumption should be prioritised. This could be done through incentives and subsidies. Production for goods such as feed for livestock and timber should be of secondary importance and be limited.	Long term	NG
1 5	Protect local industry from dumping of cheap imports	Restrictions on cheap foreign imports should be tightened and strictly monitored.	Short term	NG
1 6	Reduce food waste	Interventions should focus on encouraging full use of agricultural produce, diverting organic waste to farmers instead of municipal dumps, improving storage facilities, and increasing accessibility to markets. This requires a cross-departmental approach which looks at the entire system. More education, training, and research is required to improve food storage.	Medium term	LG, BC, WP
Social protection				
1 7	Secure housing	One suggestion is to transfer equity in housing to farmworkers who have been long-term renters. ²³³	Medium term	NG, LG
1 8	Social insurance against disruption to land-based livelihoods	During periods of crisis, as we have seen during COVID-19, temporary social grants should be used in areas most severely affected by drought and other extreme weather events. This could be targeted to the poorest households and those reliant on land-based livelihoods, last the duration of the drought, and be set at the level of the old-age pension. ²³⁴	Short term	NG
Labour support				
1 9	Job replacement schemes	Where workers lose jobs due to drought and other climate impacts, jobs must be made available through the Expanded Public Works Programme and/or other Employment Stimulus packages at the	Medium term	NG, LG

²³³ TIPS, Sector Jobs Resilience Plans: Agriculture Value Chain.

²³⁴ Ibid.

		same salary level. These programmes must be based on decent work principles.		
20	Recognition of work experience	Workers should receive recognition of experience and time worked, in the form of certification. This should be linked to work-integrated learning.	Long term	NG
21	Opportunities for relocating	In cases where climate change has reduced the viability of the sector in an area, support must be provided to move to areas with more employment and transition to new work.	Long term	PCCCC, LG
22	Reskilling and training	Education and capacity building is required for all agricultural workers. In addition, proactive reskilling and training must be provided for workers in sectors that are in decline due to climate impacts or associated regulation. This should include training across the value chain and for a variety of crops in different seasons to ensure workers are transferrable, as well entrepreneurship skills.	Medium term	BC, WP
23	Improved occupational health and safety	Access and implementation of personal protective equipment must be provided to all agricultural workers and enforced. This must include equipment and measures to account for climate impacts, such as shading, flexible working hours outside of hottest times of the day, and so on.	Short term	BC, WP
24	Improved contract security and working conditions	All workers must be provided with contracts, and be given the opportunity to retain a copy. In cases of seasonal workers, contract security should be enforced across multiple years to ensure that workers are contracted to work across years. This must be part of improved implementation of the Basic Conditions of Employment Act.	Short term	BC, WP
25	Disaster funds, compensation and insurance mechanisms must include workers	A national insurance system is required to protect farmers who lose crops due to drought or heavy rainfall. This must be made conditional on retaining all workers, and/or should include payouts to workers as well as employers, monitored by government.	Medium term	NG
26	Improved unionisation	Strategies must be established to encourage farmworker unionisation or membership at other supporting organisations. This will aid other demands including improved contracts, better working conditions, and enforcement of safety measures. This should be done through collaboration with farm worker's associations, recruiting workers in farm towns and social places, and assisting with key social and economic issues facing rural workers. ²³⁵	Medium term	BC, WP
Climate change research, governance and monitoring				

²³⁵ National Labour & Economic Development Institute (NALEDI), "Identifying Obstacles To Union Organizing In Farms: Towards A Decent Work Strategy In The Farming Sector", 2011.

2 7	Monitoring and early warning systems	While some early warning systems have already been established, these must a) be integrated into other planning processes, b) include monitoring of potential impacts on workers and communities, c) include protocol for dissemination of information including advice and support to farmers, such as on a platform which is easily accessed. These must be targeted at local government which must be capacitated to understand and apply the knowledge produced.	Short term	NG, LG
2 8	Research into more resilient forms of farming	More research and innovation is required into the most appropriate approaches to farming in the South African context, including ways to adapt to climate change and identify produce that is more climate resilient. This must be conducted by state agencies such as the ARC and CSIR, as well as universities, to ensure this meets social needs and can be widely distributed.	Long term	NG, BC
2 9	Support to local government to address climate change	More funding and resources are required for local governments to address the impacts of climate change, as they are usually on the frontlines of mitigation and adaptation measures. This should specifically cover increased support to local governments to assist with agricultural transitions, and support for household farming.	Medium term	NG, LG
3 0	Improved training opportunities	Many agricultural colleges have closed; these need to be reopened and more investment through the Sector Education and Training Authority is required. Agricultural colleges need to become equipped to train students to cope with, manage, and understand the impacts of climate change	Medium term	NG, BC
3 1	Inclusion of agriculture in the school curriculum	Agriculture should form a compulsory part of the curriculum. This must be coordinated with the Department of Education.	Medium term	NG
3 2	Improved monitoring of labour laws	There needs to be dedicated resources and capacity within the state to monitor and enforce implementation of the basic conditions of employment. Farmers who do not comply should be held accountable through fines, imprisonment, and even confiscation of land.	Medium term	NG, LG

Note: The target level indicates where this demand should be directed: national government(NG), local government (LG), bargaining councils (BC) and the workplace (WP). The time frame also highlights which demands are achievable in the short-term (6-12 months), vs the medium-term (1-4 years), vs the long-term (5-10 years).

4.4. CROSS-CUTTING IMPACTS AND OPPORTUNITIES

The three sectors covered in Section 4 have significant sectoral linkages. The impacts of climate change on the different sectors will have an effect throughout the economy. The

below table highlights this by discussing the top climate impact in each sector, as an example to show how this will have effects in other sectors too. This table does not include all climate impacts and cross-cutting issues, but aims to highlight key linkages for the three sectors discussed in this document and their relevance in relation to climate change impacts. Importantly, impacts in one sector can translate into risks and opportunities across the economy. This is why an economy-wide approach to a just transition is required.

Table 9: Linkages across sectors and impacts of climate change

Sector	Top climate change impact (biggest impact for each sector)	Negative impacts for other sectors	Opportunities for other sectors
Mining/energy	Reduced demand for coal	Transport – reduced demand for coal trucks and freight	Agriculture – increased investment in Mpumalanga and elsewhere and reduced air pollution, access to rehabilitated land, and improved water quality
Agriculture	High temperatures, water scarcity, and water variability	Transport and Mining and Energy – reduced agricultural production and food security affects workers	
Transport	Reduced demand for ICE vehicles	Mining and energy – reduced demand for coal and fossil liquid fuels (affects Sasol and refineries)	Agriculture – increased localisation of food
		Agriculture - increased difficulty in transporting food products resulting in increasing likelihood of waste	Mining and energy – improve electrical infrastructure to support transport, and increase manufacturing of renewable energy technologies and electric vehicles

5 Organising for a just transition

“For this report to have impact we have to show how a just transition is not only addressing immediate problems like unemployment, inequality and poverty, but also showing a way forward to an alternative society.” Quote from the Panel of Experts meeting

5.1 BROAD SYNTHESIS OF OPPORTUNITIES AND BARRIERS

Three key sets of opportunities emerge for worker advocacy across the sectors covered above. First is the support for workers which includes job security, education, training, re/up-skilling, and social protection. The second category is opportunities which support a just transition across the economy, particularly related to access to important resources such as water, land, and energy. The third category includes demands around the governance of the just transition. Detailed policy proposals in each of these three areas are given in Table 9 below. These demands put workers and people at the centre of the just transition, advocate for new ways of relating to one another and to the environment, and demand an accountable and democratic process for a transformative just transition. These are not organised in terms of priority, but based on the initial COSATU consultative workshop, we have highlighted the top five demands which should be prioritised for a just transition.

1. **Labour creating and sustainable industrial policy.** The demand for job creation can be addressed in a number of ways. First, government should provide support for sectors that create decent jobs through industrial policy. The current Master Plan development process should prioritise sectors that create jobs and are environmentally beneficial. Second, there should be a massive investment in public sector climate jobs which support a just transition as laid out in the One Million Climate Jobs Campaign. This campaign should be revived and taken up as part of the PCC just transition framework as the foundation for a jobs plan. Third, government should support the increased provision of social services (i.e. care work) that prioritises the well-being of all people and the environment. This type of investment would reduce the burden of care work which is largely carried by Black women in South Africa as previously discussed. Another option for job creation which was highlighted within the mining and energy section would be to trial a job guarantee in the Mpumalanga region.

This requires significant intervention from government at the national level. It would also require coordination with labour and local governments, particularly for a job guarantee where local government can identify areas where work is needed and direct those in need of work to address those issues depending on the local context. Job creation is a short-term priority, and the longer-term demand around work would be to address wealth inequality and shift how we value work so that more time is provided to support well-being and care for society and the environment.

2. **A Universal Basic Income Grant (UBIG).** A UBIG represents a vital social safety net for all South Africans. A just transition would ideally lead to a net job increase but there will still be those who are unemployed, underemployed, and those who do unpaid work. A UBIG provides a source of income which would support these groups. Research has shown that income support through cash transfers can alleviate hunger and poverty, and stimulate

demand in the local economy.²³⁶ A UBIG would increase resilience to climate and transition impacts such as natural disasters, drought, and job losses. The call for a UBIG has reached the Department of Social Development, which is why the demand is targeted at national government. A UBIG can also support the rethinking of how work is valued and provide options and space for workers and communities to choose how to spend their time. A UBIG forms part of an array of social protection measures to support workers and their communities.

3. **Reskilling and upskilling.** Workers who are most vulnerable to job losses can demand training programmes to equip them for jobs that will be created through a just transition. The first step in this process is for an audit of workers in vulnerable sectors to take place, that identifies workers' skills, interests, and areas of development. Thereafter, training programmes should be developed in line with the alternative industries identified to support economic diversification. The training should be coordinated at the level of the bargaining council for all workers in these sectors and should be certified and funded through SETAs.
4. **Land reform.** Lack of access to land undermines the ability of communities and individuals to adapt, utilise the opportunities of a just transition, and institute mitigation measures. This has impacts across sectors, determining how transport systems are designed and developed, where jobs can be obtained, who is able to capitalise on new opportunities in a variety of sectors, and who profits. Therefore, ensuring secure access and ownership of land through redistribution is essential to provide the security and flexibility to adapt to climate change impacts, improve resilience of individuals and communities, implement climate-friendly solutions, as well as address underlying problems of inequality in South Africa.²³⁷
5. **End austerity for a Just Climate Macro-economic Framework.** The investment required to ensure a just transition is significant and cannot be implemented in the context of austerity. A revised macro-economic framework which prioritises care and well-being is environmentally sustainable, and rights-based should be put in place. In the short-term the reduction of social spending must be stopped. However, in the long-term the macro-economic framework should be shifted even further to prioritise the well-being of people.

This macro-economic framework would include fiscal policy instruments which are expenditure raising and particularly target spending on climate-resilient infrastructure and social needs (public employment schemes, expansion of public services, and social protection). In terms of revenue generation, policy instruments should include progressive taxation such as a wealth tax, increased taxes on environmentally damaging activities, a resource rent tax, and even a global wealth tax. In terms of monetary policy, the South African Reserve Bank should align monetary policy to an agenda for climate justice by changing the main aim of monetary policy from inflation targeting to a mandate that supports employment and environmental sustainability. Monetary policy should reduce the costs of borrowing so that the state can take up its role to support a just transition through

²³⁶ IEJ, *Introducing A Universal Basic Income Guarantee For South Africa*, Social Protection Series (Johannesburg: IEJ, 2021), https://www.iej.org.za/wp-content/uploads/2021/03/IEJ-policy-brief-UBIG_2.pdf.

²³⁷ Almut Arneth et al., "Climate Change And Land: A Summary For Policymakers" (Intergovernmental Panel on Climate Change, 2019), https://www.ipcc.ch/site/assets/uploads/2019/08/4.-SPM_Approved_Microsite_FINAL.pdf.

public investment. Other monetary policy instruments include increased direct financing of green investments, increase capital controls for stability, implementation of disclosure mechanisms for financial risks associated with climate change, and prescribed assets to set a required level for green investment.

Shifting the macro-economic framework will require advocacy at the level of the PCC and national government. The role of the state is vital in a just transition as it must be planned with all stakeholders represented and providing input. In order to challenge the greenwashing of the just transition by the private sector, the state must step forward and leverage public investment for a just transition. A privatised transition would not be just.

Table 9: Demands for workers for an economy-wide just transition.

	Demand	Description	Time frame	Target
Support for workers, and people over profit				
1	Job creation	Continue support for the One Million Climate Jobs campaign and urge PCC to take this up as part of the just transition framework.	Short term	NG
		Support for job creation in the caring economy which prioritises well-being and care for all people and the environment.	Short term	NG, LG
2	Universal Basic Income Guarantee (UBIG)	Implement a UBIG for all adults, at least at the food poverty line of R585 per month. ²³⁸	Short term	NG
3	Reskilling and upskilling	An audit of workers' skills, interests and opportunities for development.	Short term	BC, WP
		Training to adapt to new methods, including where upskilling is required. There should also be additional training available in order to support all workers to enter other forms of work, such as environmental rehabilitation. This training must be certified. The relevant SETAs should be engaged on this.	Medium term	LG, BC, WP
4	Improved service provision and maintenance in rural areas	Provision of basic services such as accessible and affordable quality transport, recreational centres, electricity, health care facilities, and schools must be prioritised. This will not only improve standards of living but also has the potential to create rural jobs through maintenance.	Medium term	NG, LG
5	Early retirement packages/health packages	For those workers whose jobs are at risk, early retirement packages and health packages should be made available.	Medium term	NG, LG, BC, WP
6	Funded relocation of	If workers are stranded in an area where there are no jobs due to climate change or transition impacts, there should be plans and funding to support relocation.	Medium term	NG, LG, BC

²³⁸ https://www.iej.org.za/wp-content/uploads/2021/03/IEJ-policy-brief-UBIG_2.pdf

	workers and communities			
7	Implementation of decent work principles	The implementation of decent work principles must be pushed at all levels. Decent work includes principles of job creation, social protection, worker's rights and labour standards, and social dialogue.	Short term	NG, BC, WP
8	Public employment programmes	Enhance and extend the Presidential Employment Stimulus to create climate jobs. Climate jobs include jobs in electricity and renewable energy, transport, construction and repairs, agriculture and waste, industry, education and care more broadly.	Short term	NG, BC, LG
9	Education curriculum should tackle issues of human and nature relations.	School curricula should include deeper understanding of African spirituality and the protection of nature to redefine how we engage with nature.	Medium term	NG
Equitable use of land, water, and energy				
10	Improved water use and efficiency	Encourage and support improved water use efficiency through introducing improved irrigation schemes, fixing of leaks, and ensuring equitable access to drinking water.	Short term	NG, LG, BG and WP
11	Land reform	Workers call for a review of land reform to date, an assessment of key issues in carrying out land reform and then a revised land reform plan which incorporates climate resilience within its aims.	Medium term	NG
12	Improved access to electricity	Increase access to electricity which is affordable, reliable, and environmentally sustainable.	Medium term	NG, LG
Governance				
13	Clarity on the implementation of climate strategies and coordination with other processes	Clear guidance must be provided on who is driving the implementation of climate change strategies in different sectors, including coordination with SJRP and Masterplan processes.	Short term	NG
14	Implementation of the Sector Jobs Resilience Plans (SJRPs)	SJRP recommendations should be implemented by a just transition commission.	Medium term	NG
15	Participation of labour in determining Sectoral Emissions Targets and Carbon Budgets	Sectoral Emissions Targets and Carbon Budgets will be determined over the next few months. Labour and communities must be involved in order to ensure that carbon budgets are allocated for the benefit of all.	Short term	NG and BC
		Call for a national discussion on the use of the national carbon budget with labour and community stakeholders to be convened by the PCC.	Short term	NG
16	The planned national summit	The NPC national summit on Just Transition was postponed due to COVID-19 – this must now be	Short term	NG

	on Just Transition must take place	rescheduled and carried out ensuring worker and community engagement and participation.		
17	Motivate for use of carbon tax revenue for just transition initiatives	The carbon tax should not just be allocated to any programme, but should be ring-fenced to support climate jobs, reskilling and upskilling programmes specifically.	Short term	NG, LG
18	Reduce corruption	Demand accountability for corruption within government and the private sector. A capable state is required to plan and manage a just transition, which means that corruption must be addressed.	Short term	NG, LG, BC
19	Advocate for international climate justice	Demand debt relief and grant support rather than additional loans which shifts risk to government and supports profit-making in the Global North.	Short term	NG
20	End austerity now and implement a new macroeconomic framework	The investment required to ensure a just transition is significant and cannot be implemented in the context of austerity. A revised macro-economic framework which prioritises care and well-being, is environmentally sustainable, and rights-based should be put in place.	Medium term	NG
21	Financing for a just transition	Develop a just transition fund which prioritises job creation, social protection, and wealth redistribution.	Short term	NG

5.2 STRATEGIES FOR LABOUR ADVOCACY

While COSATU can use the above proposals in negotiating with other stakeholders, there are also some opportunities for change within the labour movement which would support a just transition. Key strategies include:

1. **Increasing membership and solidarity across unions and internationally.** A just transition will only be possible if there is unity amongst the working classes and labour. The demands made by labour will carry more weight if they are supported by other social movements such as climate justice organisations and community-based organisations such as mining-affected communities. Unions also need to increase membership by proactively incorporating workers in new sectors relevant to the 'green' economy to build the strength of the unions (particularly in renewable energy). There is also scope for unions to rethink the scope and demarcations of sectors and what that means for union membership and advocacy. Union federations should create a plan to manage worker membership shifting between sectors to avoid membership losses. In an increasingly globalised economy, global solidarity across union movements is required to secure decent jobs, job intensity, and union strengthening. Membership could also be boosted by balancing the representation of women within union leadership and aim to address gender equity in the workforce by highlighting the value of care work.
2. **Making use of bargaining councils to drive just transition.** Unions should continue to use collective bargaining to secure decent work, a living wage, and adequate social protection.

These aims would increase the resilience of workers and communities to climate and transition impacts. There is also an opportunity to use workplace and bargaining forums to ensure management keeps workers informed about changes to technologies. If workers negotiate that they are part of the conversation when it comes to shifts in technologies that would change the nature of work, they can support planning of reskilling and upskilling for those workers who may lose their jobs.

3. **Participating and engaging in policy platforms and debates on climate issues.** At present, the just transition debates in South Africa have been dominated by private sector stakeholders. It is important for union federations to participate and engage in climate policy debates at various levels, including within the PCC and through NEDLAC at the national level, and at bargaining council and workplace level too. Unions should engage with the private sector on these issues, highlighting contestation and opposition to ‘green-washing’. Labour should lobby for academics who support the interests of trade unions and communities to be part of the PCC meetings.
4. **Supporting education and awareness.** In order to strengthen the trade union movement, there should be ongoing trade union education and campaigns on key issues for a just transition. This would include the fundamentals on what climate change is, what the impact will be, and what a just transition could mean for workers. Other topics that should be covered are environmental and sector specific issues such as land and tenure security for all, climate change policies, and international agreements on climate change.

As one of the workers from SATAWU stated in the focus group: *“We must fight now, and even if we fail, the next generation will take up the fight!”*

6 Conclusion

This Blueprint provides a better understanding of the concept of a just transition, what this could mean for three key sectors, and ideas for workers to demand justice in the transition to a low-carbon and climate-resilient economy. This Blueprint should be used to ensure that thousands of workers are not left behind, and are even able to lead the way by making use of the opportunity to drive the agenda of a radical transformation of the economy towards eco-socialism. The Blueprint acts as a starting point for further debates and negotiation within labour, and will spark further research on key opportunities for workers within a just transition.

7 Appendix

7.1 APPENDIX A: DETAILED BREAKDOWN OF RESEARCH QUESTIONS, METHODS, AND CONTENT

Research Question	Method
1. What is a just transition?	<p>Documentary analysis, reference group and key informant interviews. This will draw on COSATU’s framework on Climate Change and related reports as well as more recent literature and will be updated through the focus groups and key informant interviews. International experience and best practice will also be drawn on.</p>
2. Why do workers need a just transition?	<p>Coal/Power Value Chain</p> <p>Documentary analysis and secondary data case studies of communities living near coal mines:</p> <p>We will draw on existing scholarly literature on the impact of the sector on climate change and the various policy proposals and actions taken by the government, and the international community to mitigate against climate change that are set to change the energy mix against fossil fuels in SA.</p> <p>We will draw on existing literature to analyse the performance and projections in the renewables sector that demonstrate renewables as a good value proposition/cheaper option that is likely to replace coal-fired power plants in electricity generation and the prospects for job creation in this sector.</p> <p>We will also make use of documentary analysis and secondary data to characterise the structure and performance of the mining/power value chain up until coal fired power station electricity generation to demonstrate livelihood losses at stake for workers should there be no just transition plan. For example, output, employment, commodity prices, wages, education level & worker skills profile, and profit share over time.</p> <p>We will use case studies of existing communities to highlight the challenges faced by workers and communities when a coal mine is decommissioned. An analysis of the economic structure and performance of the locality will draw from the environmental and social impact assessments of these areas (for example sectoral breakdown of GDP, employment at aggregated and sectoral level, unemployment) making prominent to the analysis the disproportionate contribution of coal/power value chain in the structure and performance analysis relative to other activities.</p> <p>We also make use of available data to highlight implications of inaction on affected communities by characterising the vulnerabilities of the locality by race, gender, income levels, settlement type, household size, employment status, education level, grant dependency, etc.</p>
	<p>Transport Sector</p> <p>Documentary analysis: We will make use of existing research on transport, covering key problems in different forms of transport including automotive and freight rail because of the major contribution to emissions. Documentary analysis will also be used to characterise the structure and performance of the transport sector to demonstrate livelihood losses at stake for workers</p>

	<p>should there be no just transition plan. For example, output, employment, commodity prices, wages, education level & worker skills profile, and profit share over time.</p> <p>A reference group of experts and key informant interviews: These methods will be used to identify opportunities for job creation in a decarbonised transport sector which will support the argument that a more sustainable transport sector with improved public investment will be in the interests of workers.</p>
	<p>Agriculture Sector Documentary analysis: We will draw on existing scholarly and government literature on the impact of the sector on climate change as well as its vulnerability to climate change. This will include an economic assessment of the geographic and sub-sector breakdown of employment. This should be disaggregated according to different vulnerabilities, to the extent possible. We will use the Western Cape drought as an example of the challenges faced by workers in the face of the impact of climate change.</p>
<p>3. What is the key demand for the just transition in the coal/power, transport and agriculture sectors?</p>	<p>Coal/power sector We will hold a focus group with 10 workers in the coal mining value chain to sense what a just transition in the sector looks like and to understand the key demands and issues for workers. We will take inputs from the focus group and together with input from the expert panel and documentary analysis, propose the key demand for workers in this sector. This will then be checked and validated in the stakeholder consultations later in the process.</p>
	<p>Transport Sector We will hold a focus group with 10 workers in the transport value chain to understand what a just transition in the sector looks like and to determine the key demands and issues for workers. We will take inputs from the focus group and together with input from the expert panel and documentary analysis, propose the key demand for workers in this sector. This will then be checked and validated in the stakeholder consultations later in the process.</p>
	<p>Agriculture Sector We will hold a focus group with 10 workers in the agricultural value chain to understand what a just transition in the sector looks like and to determine the key demands and issues for workers. We will take inputs from the focus group and together with input from the expert panel and documentary analysis, propose the key demand for workers in this sector. This will then be checked and validated in the stakeholder consultations later in the process.</p>
<p>4. What are the opportunities for the sectors through the sector value chain?</p>	<p>Mining/power sector We will use a sectoral value chain analysis and documentary analysis of existing work on employment modelling for the energy sector, including renewables. We will also draw on key informant interviews, the expert panel, and international experience and best practice reports and literature.</p>
	<p>Transport Sector We will use a sectoral value chain analysis and documentary analysis of existing work on employment modelling for the transport sector, focusing on automotive and rail. We will also draw on key informant interviews, the expert panel, and international experience and best practice reports and literature.</p>

	Agriculture Sector We will use a sectoral value chain analysis and documentary analysis of existing work on employment modelling for the agricultural sector, focusing on automotive and rail. We will also draw on key informant interviews, the expert panel and international experience and best practice reports and literature.
5. What are the broad opportunities for workers in the just transition?	We will synthesise findings from the three case studies to highlight the broad opportunities for workers in the just transition. We will also highlight important policy options for a just transition more broadly and for each sector based on documentary analysis, expert panel focus groups and key informant interviews.

7.2 APPENDIX B: Contributions by:

7.2.1 Institute For Economic Justice (IEJ)

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2. Katrina Lehmann-Grube
3. Brian Kamanzi
4. Basani Baloyi

7.2.2 COSATU Just Transition Panel of Experts

1. Lebogang Mulaisi – COSATU
2. Sandra Khoza – COSATU
3. Boitumelo Molete – COSATU
4. Amogelang Diale – COSATU
5. Siphokazi Duma – COSATU
6. Zico Tamela – SATAWU
7. Kamogelo Seitireng – SATAWU
8. Howard Mbana – AFADWU
9. Ndlela Radebe – NUM
10. Jacklyn Cock – University of the Witwatersrand
11. Samantha Smith – Just Transition Centre
12. Jacqui McLeod - Just Transition Centre
13. Happy Khambule – Greenpeace
14. Louise' Naude – WWF
15. Melisizwe Tyiso – NALEDI
16. Diana Junquera – Industrial Union