TRADE & INDUSTRIAL POLICY STRATEGIES

SECTOR JOBS RESILIENCE PLAN:

METALS VALUE CHAIN

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Trade & Industrial Policy Strategies (TIPS) is a research organisation that facilitates policy development and dialogue across three focus areas: trade and industrial policy, inequality and economic inclusion, and sustainable growth

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FOREWORD

The National Climate Change Response White Paper requires the development of Sector Jobs Resilience Plans (SJRPs). These plans aim to protect vulnerable groups that may lose their jobs or livelihoods as a result of climate change impacts, related either to physical effects or to the transition to alternatives.

The proposals for the SJRPs, and the evidence supporting them, are presented as a suite of related documents. These are *The SJRP toolbox: Summary for Policy Makers* and proposals for five value chains that seem particularly likely to be affected: coal, metals, petroleum-based transport, agriculture and tourism.

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ABBREVIATIONS

dti (the)	Department of Trade and Industry
DMRE	Department of Mineral Resources and Energy
EPWP	Expanded Public Works Programme
GHG	Greenhouse Gas
IPPs	Independent Power Producers
M&E	Monitoring and Evaluation
NCPC-SA	National Cleaner Production Centre South Africa
NERSA	National Energy Regulator of South Africa
OEMs	Original Equipment Manufacturers
PGMS	Platinum Group Metals
R&D	Research and Development
SEIAS	Socio-Economic Impact Assessment System
SJRPs	Sector Jobs Resilience Plans
SLPs	Social and Labour Plans
UIF	Unemployment Insurance Fund

EXECUTIVE SUMMARY

The transition to a low-carbon world will reshape the metals value chain, from shifting demand for specific metals to the methods of production to access to essential inputs, such as energy and water. Supply-side impacts would lead to increased cost pressures, as a result of increased input and regulatory costs. Demand-side impacts could generate a degree of market risk with a move away from carbon-intensive products and/or jurisdictions. That said, the actual trends are affected by a host of other factors. A particular challenge has arisen around platinum group metals (PGMs), with global demand affected by uncertain and fast-changing technological trends.

At the mining stage, South Africa's metals value chain is heavily dominated by gold, PGMs, iron, manganese and chrome. The metals value chain directly employed around 740 000 people in 2018. Miners made up half the jobs, with the rest equally divided between refineries and downstream machinery production.

Table 1. Employment in the metals value chain

Stage of the value chain	Employment (number of jobs)
Mining	370 000
Refineries	185 000
Downstream machinery	185 000

Because mining and refining are highly concentrated, a few companies dominate them. The machinery sector, in contrast, is relatively diverse. The most vulnerable groups comprise miners, their communities, and small businesses that supply goods and services to the companies or miners' households. Nine districts are particularly dependent on the value chain, especially mining: John Taolo Gaetsewe (iron ore) and Namakwa (copper) in the Northern Cape; Bojanala (PGMs) and Dr Kenneth Kaunda (gold) in the North West; Waterberg (iron ore), Sekhukhune (PGMs) and Mopani (copper) in Limpopo; Lejweleputswa (gold) in the Free State; and West Rand (gold) in Gauteng. This concentration has deep consequences for the communities relying on such activities, particularly rural towns.

Workers in the mines are better paid and benefit from better employment contracts than employees in other industries, particularly relative to their qualifications, which may make it more difficult to find alternative jobs. In contrast, despite higher education levels, workers in machinery and equipment experience working conditions in line with other formal workers.

Five proposed interventions to improve resilience emerge from this situation.

1. Establishing a structure to drive the SJRP for the metals value chain, based in a revision of the requirements for Social and Labour Plans (SLPs) to extend them to smelters and refineries, ensure stakeholder participation in design and implementation, and include the need to address climate-change related downsizing with a just transition.
2. Proposals to promote technological innovation to reduce job losses in the longer run include addressing changes to input and production costs as a result of policies that internalise the cost of greenhouse gas (GHG) emissions, diversification of platinum use, and improved water security for the value chain.
3. The municipalities in the platinum belt should be supported to diversify their economies and build long-term resilience and sustainability, and a similar process should be initiated for other rural mining towns.

4. Active labour market measures should be strengthened and targeted, based on learnings from the proposed SJRP in the coal sector, to assist miners in transitioning to other livelihoods when necessary due to climate-change related impacts.
5. Finally, income support should be made available for vulnerable workers and communities during transition to new livelihoods, among others through establishing sites for the Community Work Programme and/or the social sector of the Expanded Public Works Programme (EPWP).

1. KEY DYNAMICS

The transition to a low-carbon world will reshape the metals value chain, from shifting demand for specific metals to the methods of production to access to essential inputs, such as energy and water. In South Africa, reliance on coal-fuelled electricity will require substantial changes as domestic and foreign policies increasingly require the internalisation of the costs of GHG emissions. Electricity accounts for just over 10% of costs in most of the value chain. It is, however, 5% or less in open-pit mines and machinery production but reaches up to half of total costs for electricity-based smelters. Some activities, such as primary steelmaking, are moreover inherently carbon-intensive (due to the chemical reactions at play).

Climate change impacts would likely affect both supply- and demand-side dynamics.

On the supply side, key impacts would lead to increased cost pressures across the value chain, as a result of increased input and regulatory costs. They would encompass increased pressure to decarbonise as a result of direct domestic policy development (such as the carbon tax and carbon budget); short-term rise in energy prices due to heightened environmental pressures on fossil fuels; rising bulk transports from the tightening of the global climate change regime; increased pressure to disclose risks from stakeholders and shareholders; and climatic events, with clear impact on water security.

On the demand side, climate change dynamics could generate a degree of market risk with a move away from carbon-intensive products and/or jurisdictions (such as South Africa). Overall, this may be countered by increased demand for minerals. Technological trends may, however, have a dramatic impact on the demand for PGMs, which is heavily linked to petroleum-based cars. Future PGM demand remains uncertain as recycling becomes a central supply strategy, demand for catalytic converters declines and new demand streams, such as fuel cells, emerge.

At the mining stage, South Africa's metals value chain is heavily dominated by gold, PGMs, iron, manganese and chrome. Sales for all metals were heavily affected by the end of the global metals boom that lasted from around 2002 to 2011. In 2011, prices reached 30-year peaks, then dropped by between half and two thirds in dollar terms. South Africa's gold has faced a longer-term decline from the 1980s. PGMs are now seeing falling demand as recycling increases and auto manufacturers reduce the amount of platinum used in catalytic converters. In contrast, iron ore and manganese sales climbed rapidly from the early 2000s, mainly to supply the Chinese steel boom.

Because mining and refining are highly concentrated, they are dominated by a few companies. The machinery sector, in contrast, is relatively diverse, with a number of smaller specialist firms as well as large subsidiaries of foreign original equipment manufacturers (OEMs).

The most vulnerable groups comprise miners, their communities, and small businesses that supply goods and services to the dominant companies or to miners' households. Close to 90% of workers are men.

Nine districts display a particularly high share of value added from the metals value chain, especially mining, and would be hard hit by a decline in the industries. They are John Taolo Gaetsewe (iron ore) and Namakwa (copper) in the Northern Cape; Bojanala (PGMs) and

Dr Kenneth Kaunda (gold) in the North West; Waterberg (iron ore), Sekhukhune (PGMs) and Mopani (copper) in Limpopo; Lejweleputswa (gold) in the Free State; and West Rand (gold) in Gauteng.

This concentration has deep consequences for the communities relying on such activities, particularly rural towns that depend on mining. They include Thabazimbi in Limpopo, with 50% employment in mining in 2018; Rustenburg in the North West with 49%; and Moses Kotane (also in the North West) with 38%. In Greater Tubatse in Limpopo, mining and metals account for 31% of employment. Most mining towns have weak resources with lower than average budget per capita. A notable exception is Gamagara (John Taolo Gaetsewe) due to ongoing mining expansion and economic diversification.

The metals value chain directly employed around 740 000 people in 2018. Miners made up half the jobs, with the rest equally divided between refineries and downstream machinery production. The value chain shrunk from over 900 000 in 1993, mostly due to downsizing in gold and to a lesser extent the metals refineries. The losses were partially offset by growth in PGMs, iron ore and machinery production.

Miners are well paid relative to their qualifications, which may make it more difficult to find alternative jobs. In 2017, the median pay for miners came to R11 000 a month. The median for workers in refineries and downstream manufactures, in contrast, was around R5 000, more or less the same as earnings for other formal workers. Miners were also more likely than other workers to have pension funds and Unemployment Insurance Fund (UIF) protection.

In terms of physical assets, case studies of the platinum belt suggested that small rural towns often do not provide land for miners to build houses. Instead, many miners said they lived in informal slums while constructing housing in other regions (Makgetla and Levin 2016).

Employees in mining and refining have lower levels of education than other formal workers. Between 45% and 50% of workers in these industries do not have matric, compared to under 40% for other formal employees. Most of the rest have matric, while 12% to 13% have a diploma or degree. In machinery and equipment, in contrast, education is generally higher than for other formal workers. The share of employees with a higher education (diploma or degree) is about a third, compared to a quarter for formal workers in other industries.

Workplace relations again serve as an indicator of social capital. As with coal, miners were more likely to belong to unions, have pension funds and UIF membership than other workers. In contrast, in the metals and machinery industries, union membership, access to pension funds and UIF membership were in line with other formal workers.

2. PROPOSED INTERVENTIONS

This section presents proposals on mobilising capacity to drive the implementation of the SJRP for the metals value chain; promoting technological adjustments to minimise the loss of jobs and livelihoods as far as possible; assisting towns in the platinum belt as well as other mining towns to diversify their economies; active labour market policies to assist miners to transition to alternative activities if necessary; and income support to assist miners and their communities during the transition.

Implementing the SJRP will require coordination across a range of state agencies in all the spheres of the state. For most proposals, success also depends on the ability to mobilise stakeholders in the value chain. For this reason, it is important to be clear about the overall responsibility for implementing the SJRP as well as the roles of the various public and private stakeholders. The first proposal responds to this necessity.

Each proposal is followed by tables that provide a brief impact analysis and a description of the phases and risks for implementation, derived from the underlying theory of change.

The impact assessment uses the Socio-Economic Impact Assessment System (SEIAS) methodology, which centres on evaluating costs, benefits and risks for different stakeholders, using detailed descriptions when meaningful quantification is not possible. In this case, the aim is primarily to identify potential costs and risks as well as benefits, without attempting an in-depth discussion.

The tables on phasing lay out each step from the initiation of the proposal to the achievement of the desired socio-economic impact. For these steps, it identifies the requirements for success and the main risks. The aim is to enable both a better understanding of key implementation steps, and to indicate where risk mitigation is required.

2.1. Mobilising implementation capacity

1. Stakeholders to establish structure to oversee SJRP for the metals value chain

Proposal: The stakeholders in the metals value chain, including refineries and downstream fabrication, are relatively well organised and resourced. In coordination with Presidential Climate Change Co-ordinating Commission (PCCCC), they should establish an oversight body to take forward the SJRP for the metals value chain. The oversight body should monitor the effects of climate change on the value chain; decide on priority responses; and oversee their implementation, including assistance with unblocking and course correction as required.

it is important that an independent, multi-stakeholder, state-led entity manage the design and implementation of just transition interventions. Its functions would include strengthening and upgrading SLPs and mine rehabilitation plans, as discussed in the following proposal. The key stakeholders in the mining value chain for this purpose include organised business, organised labour, the mining-dependent municipalities and their provincial governments, the Department of Mineral Resources and Energy (DMRE), the Department of Trade and Industry (the dti), the Department of Employment and Labour and the PCCCC.

To be effective, the system should extend to all phases of the metals value chain, from mining to refining and smelting. It could also be tasked with helping to manage closures and downsizing from causes other than climate-change related impacts. In addition, it should

develop a strategy for strengthening support for labour-sending areas, which may see a share of workers returning in the case of loss of employment, combined with a loss of resources.

The new institutional structure would be in charge of mobilising state as well as private resources around projects (identification of hotspots, identification of projects, fund-raising, implementation, monitoring and evaluation (M&E)), from active labour market policies to infrastructure building and local economic development. Existing opportunities, linked to SLPs and mine rehabilitation, should be fully harnessed. The entity should aim to leverage existing initiatives in other areas, as discussed in in the SJRP for the coal value chain, from the 11 Renewable Energy Development Zones identified throughout the country (which includes traditional mining areas such as Klerksdorp, eMalahleni, and Kimberley) (Creamer 2019) to the repurposing of the land and the development of alternative economic activities, including agriculture.

Table 2. Impact evaluation

Dimension	Vulnerable groups and mine towns	National and provincial departments	Organised business	Organised labour
Benefits	Improved alignment to promote of measures designed to benefit them	Reduced difficulty of coordinating with other departments and spheres	Single point of engagement Improved alignment across state agencies	Single point of engagement Improved alignment across state agencies
Costs	Time and energy required to engage on SJRP and its implementation	Might have to compromise on disagreements with other state agencies Time and energy required to engage on SJRP and its implementation	Time and energy required to engage on SJRP and its implementation	Time and energy required to engage on SJRP and its implementation
Risks	Structure becomes a talk shop or deadlocks, so that it does not respond to needs Need to compromise leads to internal conflict	Structure becomes a talk shop or deadlocks, so that it does not respond to needs	Structure becomes a talk shop or deadlocks, so that it does not respond to needs Need to compromise	Structure becomes a talk shop or deadlocks, so that it does not respond to needs Need to compromise

Table 3. Phasing and risks

Action	Requirements	Risks
Phase 1: Decision on stakeholder body to drive SJRP	Stakeholders reach agreement on structure for efficient engagement Stakeholder body includes representative of PCCCC and mining-dependent municipalities	Stakeholders cannot agree on structure Stakeholders establish systems that are ineffective or require excessive time and resourcing Body excludes important stakeholders
Phase 2: Stakeholder body is allocated clear responsibilities and is adequately resourced	Stakeholders define responsibilities clearly Stakeholders agree to provide adequate resources Stakeholder body employs adequately capacitated staff and has efficient systems for administration and for facilitating engagements	Stakeholders are unable to agree on responsibilities or define them too vaguely to ensure appropriate action Stakeholders do not provide adequate resources Inadequate systems and staff lead to long delays and means disagreements between stakeholders end up in deadlock
Phase 3: Stakeholder body promotes responses to climate change that protect jobs and livelihoods	Stakeholder body monitors impacts of climate change Stakeholder body develops and agrees on responses that protect jobs and livelihoods for vulnerable groups and do not seek to block reasonable policies to reduce emissions Stakeholder body manages implementation of agreed on measures efficiently, effectively and responsively	Stakeholder body lacks capacity to monitor climate change and/or cannot agree on the evidence Stakeholder body cannot agree on responses or prioritise impacts on vulnerable groups Stakeholder body seeks to stop policies to reduce emissions rather than improving them and making them increasingly sustainable Stakeholder body fails to resource or drive agreed on measures
Phase 4: Climate-change related impacts do not lead to long-term job loss and regional decline in mining regions	SJRP is well-designed and implemented	Stakeholder body is unable to design a strong and viable SJRP or implement it effectively

2. Strengthen Social and Labour Plans and rehabilitation plans to respond better to needs of workers and communities

Proposal: Revise requirements for SLPs and rehabilitation plans to (a) extend to smelters and refineries; (b) ensure stakeholder participation in design and implementation, including communities and workers; and (c) explicitly include the need to address climate-change related downsizing and the need for a just transition.

Operations in the metals value chain are highly concentrated geographically and functionally specialised. As a result, entire communities directly rely on the economic activity generated by the metals value chain. Moreover, this is often linked to a limited number of operations, like a mine, a refinery or a smelter. In addition, skills in the value chain are highly specialised, rendering the reconversion of workers more difficult. This puts workers and communities particularly at risk in the case of the closure or downsizing of operations in the metals value chain.

These factors mean that plans are required to ensure a just transition in the mining value chain and associated communities. Some mechanisms, in the form of SLPs and rehabilitation plans/funds, exist to minimise the negative socio-environmental impacts of mining as well as reduce the negative impacts of downsizing or closure on workers and communities. The SLPs are meant to stimulate the local economy and ensure that mine-affected communities are left better off by mining. They aim to compel companies to offer opportunities for mine workers and communities to meaningfully benefit from the resources in their area, such as human resources development and infrastructure development. Rehabilitation plans require mining companies to set aside funds at the onset of a project for the rehabilitation of the local area once the mine has reached the end of its life.

To support the SJRP, the requirements for the SLPs and rehabilitation plans would need strengthening. Neither system has proven able to promote meaningful social and economic advancement of communities. (See CALS 2016, 2017 and 2018). The SLP process remains highly undemocratic, exclusive and largely shrouded in secrecy. Implementation also appears to be failing, due to lack of consultation, monitoring and alignment with existing structures and the needs of communities. Similarly, the mine rehabilitation system is highly flawed, from the legal and accounting frameworks to the actual monitoring of implementation. (See Intellidex 2018 and CER 2018).

Table 4: Impact assessment

Stakeholders	Benefits	Costs	Risks
Workers	Plans are more responsive to needs Implementation is more likely to succeed	Participation in the development and M&E of plans	Plans cannot protect against all costs of downsizing Plans are not adequately resourced

Stakeholders	Benefits	Costs	Risks
Communities	Plans are more responsive to needs Implementation is more likely to succeed	Participation in the development and M&E of plans	Plans cannot protect against all costs of downsizing Plans are not adequately resourced
Small business	New economic opportunities and additional business	Investment in new economic activities	Plans do not adequately protect against costs of downsizing
Large business	Reduced contestation over plans and consequently over mining operations	More capacity required for engagement with stakeholders	Pressure to increase resourcing for SLPs and rehabilitation
National and provincial government	Mining closures does not lead to economic slowdown at regional or national level Increased social cohesion and less resistance to mining operations	Quality control of SLPs and rehabilitation plans Oversight of implementation and associated dispute resolution processes	Lack of capacity to oversee planning processes and implementation Demands for greater resources to protect vulnerable groups in case of downsizing or closure Business resists reforms to existing system

Table 5: Phasing and risks

Action	Requirements	Risks
Phase 1: SJRP structure works with relevant departments to develop specific proposals to strengthen SRPs and rehabilitation plans to protect vulnerable groups from downsizing or closure	Clear mandates and aims for reforms Relevant departments agree on need for change and engage with process Adequate capacity, expertise and resourcing to develop strong proposals	Lack of clarity about need for change Departments do not agree that any change is needed or viable Unable to tap into required capacity and expertise

Action	Requirements	Risks
Phase 2: Government engages with industry stakeholders on proposals	Mandates for engagement and agreement on proposals within government Stakeholders are willing to engage constructively Government and stakeholders find win-win compromises	Government unable to agree on mandate and establish coherent team for engagement Stakeholders are not willing to engage constructively Parties deadlock
Phase 3: Reform of requirements for SLPs and rehabilitation plans to improve response to climate-change related impacts on vulnerable groups and communities	New rules ensure that affected groups and mine towns have stronger voice in developing and implementing plans Plans are required to analyse and ensure improved responses to losses of jobs and livelihoods from climate-change related impacts Changes in regulations are appropriate and introduced as quickly as possible	Reforms do not reflect requirements of the just transition Departments do not prioritise changes in regulations, leading to long delays
Phase 4: SLPs and rehabilitation plans protect vulnerable groups from loss of jobs and livelihoods if mining value chain downsizes	SLPs and rehabilitation plans reflect needs of, and give voice to, vulnerable groups and communities	Reforms fail to empower relevant groups adequately Vulnerable groups and mine towns lack capacity to engage effectively Plans are not feasible or lack adequate resourcing

2.2. Technological adjustment

1. **Address the effects on investment and production of policies that internalise the cost of GHG emissions, which could increase input and production costs.**

Proposal: Design and implement measures to decarbonise both the electricity supply and transport systems, and to optimise production along the value chain. The measures should include a review of the regulatory framework for electricity to incentivise own generation of renewable energy and evaluate the implications of subsidies for energy-intensive refineries, as currently proposed by Eskom.

Efforts to limit climate change can lead to higher costs, which materialise through energy (electricity and fuel) prices, carbon pricing and heightened environmental requirements. As raised, these supply-side impacts are negative across the different stages of the metals value chain. Due to the marginal nature of many operations in the value chain, such cost increases could lead to closure.

A mix of measures is required to alleviate these impacts by improving the climate-compatibility of companies operating in the metals value chain. Implementation should leverage existing processes, mechanisms and programmes, which should limit capacity and budgetary requirements.

Companies' climate compatibility hinges first on the decarbonisation of their electricity supply. This can happen by decarbonising the national electricity grid and by allowing firms to commission and/or procure their own low-carbon electricity supply. The 2019 Integrated Resource Plan for Electricity (IRP) has set the course for the transformation of South Africa's electricity grid to 2030, introducing a greater share of renewable energy technologies and reducing the country's reliance on coal-fired electricity. With the Roadmap for Eskom in a Reformed Electricity Supply Industry, the space for industries (among others) to play a greater role in the generation of electricity is set to open.

In the near future, firms should be able to easily install their own power generation and/or procure from independent power producers (IPPs). Regulations should also be enacted to enable prosumers to sell back to the grid surplus power (to Eskom and/or municipalities). In addition, a tax incentive, in the form of accelerated depreciation, is available for businesses investing in renewable energy technologies.

The implementation of such plans, under the leadership of the DMRE, the Department of Public Enterprises and the National Energy Regulator of South Africa (NERSA) should be prioritised to fast-track the decarbonisation of the electricity supply. In the long run, this process would result in a material reduction in the carbon intensity of electricity supply as well as lower electricity prices for industries (and the country at large) due to the competitiveness of new renewable energy technologies.

Second, the climate compatibility of firms in the metals value chain depends on their fuel consumption. This is particularly important for open-pit mines which rely on extensive trucking operations. Little to no room exists to reduce the price of fuel in the country due to the reliance of South Africa on imported petroleum products and the crucial role of fuel levies for the road network. Opportunities, however, exist to move to more sustainable transport operations, either based on electricity and other alternative fuel (such as biogas), including hybrid systems.

Mines are increasingly looking at the possibility of electrifying both underground and surface transport needs. Electric trucks and forklifts are for instance already available on the market. To maximise the benefits, such carriers should ideally be powered through renewable energy.

Third, over and beyond energy sources, the sustainability of operations in the value chain could be materially improved by optimising production processes. Rising energy prices have already triggered significant improvement in energy efficiency, essentially through the rollout of energy-efficient equipment in non-core operations as well as non-disruptive improvement at the operational level. Further improvements are possible by implementing more disruptive production changes, such as new production methods. Technologies are, however, at

different stages of development. While new processes exist for PGM refining, new steelmaking production techniques (such as hydrogen-based routes) are still being developed.

Continued and enhanced support is required for industrial modernisation to leverage best-available technologies and solutions. Some mechanisms are already in place. Most prominent measures are the 11D tax incentive for research and development (R&D), the 12L tax incentive for energy efficiency investment, the 12I tax incentive for energy efficient greenfield investment and plant expansion, and National Cleaner Production Centre (NCPC-SA) programmes on resource efficiency.

Last but not least, South Africa's climate change regime should be designed to be a) in line with global trends; and b) conducive for modernisation investment by firms in the metals value chain.

Firms in the metals value chain operate in a heavily globalised environment, competing internationally for market access and finance. On the one hand, this requires firms not to fall behind in terms of modernisation and climate compatibility in order to remain competitive and not be negatively affected by rising green protectionism threats (i.e. the rise of border carbon taxes and shifting trade patterns). On the other hand, the domestic climate change regime should be cognisant of current economic conditions and not overly burden firms operating in the value chain.

This balancing act requires understanding the global climate change regime under which the metals value chain operates. In most countries, it is vastly different from other sectors. International policy development on metals and climate change, particularly border carbon taxes, should be actively monitored. This also necessitates designing South Africa's own climate change regime in line with the socio-economic realities of the value chain. Special consideration should be given to the impact of the climate change framework (primarily the carbon tax and carbon budget) on marginal operations.

Table 6: Impact assessment

Stakeholders	Benefits	Costs	Risks
Workers	Employment maintained in metals value chain Safer and healthier work environment New economic opportunities in electricity supply	Loss of employment in coal-fuelled electricity system Retraining / reskilling to work with new technologies	Possible job losses linked to mechanisation Technologies do not succeed in protecting mining value chain and jobs
Mining towns (except coal)	Livelihoods derived from mining are protected Safer and healthier environment		Intervention could be insufficient to maintain activity in metals value chain, leading to decline

Stakeholders	Benefits	Costs	Risks
	New opportunities in home-based generation and other renewables		in mining town economies
Small business	Sustained demand from mining value chain Increased sustainability New business opportunities	Pressure to improve climate compatibility through lead firms' supply chain management	Loss of business if cannot improve climate-compatibility
Large business	Increased competitiveness in the long run Reduced carbon liability Access to support programmes for modernisation New business opportunities in electricity supply	Upfront investment in resource efficiency, new production processes and alternative energy supply Engaging to improve the climate compatibility of supply chain	Disruption to production and/or energy supply Short-term investment could be insufficient to maintain competitiveness
Local government	Maintain revenues and employment from metals value chain Increased revenue from incorporation of lower-cost renewable electricity sources	Restructuring electricity distribution systems Reduced revenue from on-scale of Eskom electricity	New electricity funding model could lead to lower revenues or to higher tariff increases from Eskom
National and provincial government	Maintained economic activity in metals value chain Reduced investment in electricity generation	Restructuring electricity system Ongoing support for modernisation, with monitoring on outcomes	Long-term reduction in revenues from carbon tax Support programmes could be insufficient to maintain activity in metals value chain

Stakeholders	Benefits	Costs	Risks
	Increased climate-compatibility and resilience	Revision of climate framework and monitoring of implementation	
Eskom	Increased electricity supply reduces constraints Opportunities in renewables generation	Increased pressure to hold down costs and prices to compete with renewables	Reduced demand for coal-fuelled electricity leads to write off of some assets

Table 7: Phasing and risks

1. Innovation to alleviate supply-side cost pressures

Action	Requirements	Risks
Phase 1: R&D investment into new, efficient production processes and solutions for metals mining	Clear mandates and institutional responsibility directing national innovation system Adequate resourcing and technical capacity	Government and stakeholders do not set unambiguous priorities or do not resource them Because gains are long term and cost is high up-front, private sector may not act without government support and/or incentives
Phase 2: Investment in more appropriate technologies and solutions	Able to identify and acquire technologies	Government and stakeholders do not set unambiguous priorities and resource them Because gains are long term and cost is high up-front, private sector may not act without government support and/or incentives
Phase 3: Reduced downsizing and job losses in mining	New technologies succeed in maintaining competitiveness Reasonably stable international demand in long run	Demand drops globally for South Africa's main minerals

2. Decarbonise electricity supply

Actions	Requirements	Risks
Phase 1: Government embeds decarbonisation in IRP with plan to promote just transition in coal	Revised plan based on least-cost modelling Government prioritises the just transition in coal value chain, with adequate resourcing and communication plan for vulnerable groups and communities	Failure to link plan to just transition in coal leads to intense lobbying and possibly even legal challenges by stakeholders in coal Relevant departments do not prioritise IRP, so long delays and uncertainty
Phase 2: Government facilitates IPPs and small-scale embedded generation	NERSA and DMRE revise regulatory framework	Regulatory delays
Phase 3: Eskom, IPPs, other enterprises and households invest in renewable energy	Mandate and regulatory framework to invest Appropriate pricing Availability of financing and appropriate technologies Access to national or municipal grid	Failure to reform regulations and pricing Financing and technologies are not available Municipalities and Eskom do not revise access to grid to facilitate new generation
Phase 4: Electricity prices and international pressure on metals value chain ease	New system leads to more affordable and cleaner electricity Changes are measurable, visible in reduced taxation and internationally recognised	New generation takes long to come on line Changes are insufficient to reduce taxation or achieve international commitments
Phase 5: Metals mining value chain is stabilised, preventing further job losses and potentially increasing employment	Metals value chain sees lower costs and higher investment	New system fails to reduce electricity prices and effects of carbon tax International growth slows, leading to lower metals prices

3. Decarbonise transport

Actions	Requirements	Risks
Phase 1: Understanding of possible alternative transport solutions	Stakeholders resource research into transport solutions to minimise emissions	Stakeholders unable to agree on resourcing and mandate for research Inadequate capacity and/or poorly designed terms of reference lead to inadequate findings
Phase 2: Identification and finalisation of alternative solutions	Agreement on alternative transport solutions, including feedstock and technologies	Research process does not provide evidence to support decision Stakeholders do not have capacity, mandates or efficient platform to engage constructively
Phase 3: New transport solutions established	Mandate to Transnet Funding Appropriate incentives and regulatory frameworks for mining companies, Transnet and Sanral	Short-term costs with long-run pay off make Transnet and mining companies delay investment in absence of government support or requirements

d. Align climate-change regime

Actions	Requirements	Risks
Phase 1: Government analyses relevant international developments	Analysis of the current economic context and global climate change framework Engagement within government to agree on broad mandates for climate-change regime	Analysis is delayed or inadequate to guide South African decisions Unable to reach sufficient consensus within government to mandate necessary revisions in climate-change regime

Actions	Requirements	Risks
Phase 2: Choice of instruments and design of integrated, coherent framework with specific measures	Knowledge and consistent evaluation of possible instruments and their costs, benefits and risks for different socio-economic groups (SEIAS) Adequate agreement and unambiguous mandates as the basis for alignment across government departments and agencies	Inadequate capacity or incentive to undertake investigation of all options or rigorously analyse instruments Failure to consult stakeholders means do not have full evidence on costs, benefits and risks of instruments Cabinet does not require departments to reach agreement or establish unambiguous mandates on instruments to ensure consistent implementation Failure to consult with main economic stakeholders leads to opposition and delays
Phase 3: Implementation of framework and measures	Public and private stakeholders broadly support innovations Coordination between government departments Adequate monitoring, unblocking and course correction mechanisms built in to ensure successful and timeous implementation	Failure to consult with stakeholders or generate clear evidence leads to disagreement, delays and contradictory decisions by government departments and economic stakeholders Inadequate evidence-based responsiveness in implementation leads to unintended consequences, higher costs and delays
Phase 4: Stable regulatory framework reassures investors	New framework is successfully implemented and communicated Emerging blockages and concerns are dealt with constructively and rapidly	New framework is not implemented consistently Blockages and concerns are ignored or rejected rather than being resolved
Phase 5: Increased investment in mining prevents job losses	Investor certainty with respect to climate-change framework Sustained global growth and no other factors lead to downturn in mining value chain	Climate-change framework remains heavily contested within government Global growth slows or other domestic factors affect growth in mining value chain

2. Diversify options for platinum

Proposal: SJRP structure to improve alignment between government and stakeholders to support existing initiatives and stimulate local market demand for new technologies.

As the demand trajectory for PGM remains uncertain in the coming decades, plans should be in place to prevent a decrease in demand and, if inevitable, manage a decline. Initiatives by the public and the private sector are already in place to support the development of PGMs, but they are not fully coordinated and resourcing remains limited. Demand support, notably through procurement and incentives, would essentially rely on existing mechanisms, displacing support towards old technologies, and would be highly cost effective.

South Africa's production of PGMs has already flattened out as a result of increased recycling and reduced demand due to more efficient use in catalytic converters. Demand in the coming decades is highly uncertain as it hinges on technological trends in the automotive industry, with the decline of internal combustion engines and the rise of electric vehicles. Recycling, which already accounts for a quarter of supply, is set to grow further. Catalytic converters now comprise about 40% of demand, but are not required for electric vehicles. If platinum, however, becomes the metal of choice for fuel cells, which are critical for renewable energy, it would offset the potential decline.

The PGM industry has been actively pursuing diversification options to develop new demand streams for the minerals. In 2009, Anglo American Platinum launched the PGM Development Fund with an initial endowment of R100 million. In 2018, efforts to find alternative demand streams were significantly ramped up with the establishment of two venture capital funds of US$100 million each, co-funded equally by Anglo American Platinum and the Public Investment Corporation. The Department of Science and Innovation (formerly Department of Science and Technology), in collaboration with research councils (Mintek and the CSIR) and universities, has also actively supported R&D into the value chain, through the Advanced Materials Initiative (which includes a Precious Materials Development Network) and the Hydrogen South Africa (HySA) research, development and innovation programme aimed notably at developing fuel cell technologies.

Such efforts should be actively pursued and synergised in future, particularly by looking at opportunities beyond fuel cells. The potential of using hydrogen (through electrolysis) to decarbonise carbon-intensive industrial value chains, such as iron and steelmaking and petrochemicals, is a possible avenue. Apart from enabling the modernisation and climate-compatibility of key South African industries, as proposed in the previous section, the development of hydrogen electrolysis could lead to increased demand for PGMs.

At the same time, local demand for PGM-based technologies should be stimulated, including demonstrating new technologies. A number of pilot projects have taken place in the country showcasing a fuel cell-based system at the Minerals Council, a fuel cell mini-grid in Kroonstad in the Free State, and the use of fuel-cell-powered forklifts at Impala Platinum. As the technological viability and cost competitiveness of the technologies gets established, the possibility of stimulating local demand for PGM-based solutions should be exploited. This could be through the procurement of battery systems by Eskom and the municipalities, the rollout of mini/smart grids in the country, particularly in remote areas, the procurement of fuel cell electric vehicles such as buses and trucks, and the modernisation of industrial production processes through hydrogen electrolysis.

Table 8: Impact assessment

Stakeholder	Benefits	Costs	Risks
Workers	Reduced risk of employment loss Potential for job creation in downstream manufacturing using PGMS Stabilised electricity supply	Investment in PGMs rather than in more labour-intensive industries means slower job creation persists	Failure to develop new demand streams leads to downsizing of PGMs
Communities	Access to new technologies Sustained economic and export growth	Investment in PGMs rather than in more labour-intensive industries means slower job creation persists	Failure to develop new demand streams leads to downsizing of PGMs
Small business	New business opportunities in PGM value chain Stabilised electricity supply	PGMs provides fewer opportunities for small business than more labour-intensive industries	Loss of economic activity/livelihood if unsuccessful
Large business	Development of new demand streams, maintaining PGM production	Cost of R&D and investment in new production processes	Failure to develop new demand streams leads to downsizing of PGMs
Platinum belt municipalities	Maintain local economic growth based on PGMs Increased employment in downstream industries Stabilised electricity supply	Most new investment will be capital intensive	Failure to develop new demand streams leads to downsizing of PGMs

Stakeholder	Benefits	Costs	Risks
National and provincial government	Sustained economic growth and exports Increased tax revenue from growing PGM industry Job creation in new industries Stabilised electricity supply with faster growth in renewables	Capacity to ensure coherent research programme across public and private sectors Resourcing of research and new investments Opportunity costs in terms of more labour-intensive industries	Failure to develop new demand streams leads to downsizing of PGMs and loss of revenue

Table 9: Phasing and risks

Action	Requirements	Risks
Phase 1: Development of coordinated programme for R&D and marketing new uses of PGMs, with adequate resources	Stakeholders agree on key steps and resourcing requirements Adequate capacity for quality research Coherent programme to identify viable new products and market them, with incentives as required (including public procurement)	Stakeholders unable to agree, leading to fragmented efforts and reduced chances of success Inadequate resourcing or allocation of funds to secure quality research Inadequate resourcing of marketing efforts and incentives
Phase 2: Demand for PGMs increases and downstream manufacturing grows	Programme to promote new uses succeeds	Fragmented and poorly resourced efforts, with lack of consistent state support, mean new products are not perfected or utilised on a large scale
Phase 3: Production along the PGM value chain grows	Demand increases Downstream manufacturing grows	Other factors, such as a global slowdown or higher costs, do not undermine growth
Phase 4: Employment in PGM value chain increases and platinum belt municipalities thrive	PGM value chain expands Platinum-belt municipalities improve services to households and industry as economic base revives	Expansion in PGM value chain fails because measures do not promote growth or because of other factors

Action	Requirements	Risks
		Unrest returns to platinum belt due to poor services despite improved economic conditions

3. Improve water security for metals value chain

Proposal: Review price incentives to promote more efficient water use by the mines, refineries and smelters. SJRP structure to work with stakeholders to find solutions that reduce waste, improve efficiency and expand recycling of water in the value chain.

The third intervention focuses on improving the water security of the value chain through the rollout of water demand management. It hinges on:

- Price signals;
- Support programmes for the implementation of water management; and
- An enabling framework for circular economy initiative.

The metals value chain is not only water dependent but also water intensive. In addition, many operations are located in the country's most water stressed areas. To ensure the long-term sustainability of the value chain, a water security plan, aimed at ensuring adequate water supply for the value chain as well as water management by users, is paramount. The design and implementation of a water security plan would require a large amount of funding (estimated at R855 billion over the 2015-2025 period), particularly to fix the supply side. Demand-side management would be primarily implemented by the private sector, reducing budgetary requirements on the fiscus. The cost of support programmes could moreover be offset, in the short term, by higher water prices to the mining industry.

A mix of measures aimed at improving water management in the metals value chain should be developed. It could encompass price signals (increased water prices), support programmes for resource efficiency, and establishing an enabling environment for circular economy initiatives by firms (such as treatment and reuse for acid mine drainage).

Water management remains largely suboptimal in South Africa. Support programmes targeting the improvement of water use in the country remain limited. The NCPC-SA runs one of the few initiatives in the field. More incentives are required to support water efficiency in the country. This could be done by widening existing energy efficiency incentives to cover other forms of resource efficiency (water but also material/waste and carbon).

In addition, the potential of circular economy initiatives should be unlocked. Large water users, like mines, have the ability to improve their water management by treating water (including acid mine drainage water) for reuse. This is already done by some companies, such as Anglo American (in Witbank), Glencore (in Hendrina) and Sasol (in Secunda). Water stewardship initiatives, which include interventions "beyond the fence" in order to improve the sustainability of the water catchment areas, should also be promoted.

To be effective, such programmes should be coupled with a strong price signal. Despite price increases triggered by the recent water crisis in the country, water prices remain low by international standards, particularly considering South Africa's water scarcity. Higher water prices would encourage the mining value chain to invest more in water efficiency and water

management. Tariffs could be structured to avoid negative impacts on low-income communities and small businesses.

Beyond the metals value chain, significant efforts are required to improve the water supply situation. Water losses stand at around 40%, hampering the ability of the system to ensure water security. In addition, most large dams and wastewater treatment plants are in poor condition, including in many mining towns.

Table 10: Impact assessment

Stakeholders	Benefits	Costs	Risks
Workers	Avoid downsizing in metals value chain due water challenges Stabilise water in mine towns		Process fails or leads to excessive water prices, leading to downsizing New tariffs do not protect low income
Mine towns	Sustained local economies Improved water supply for communities as well as industry Higher water revenues (if mark up on bulk cost)	Resources and capacity to upgrade water infrastructure Higher bulk water costs	Process fails or leads to excessive water prices, leading to downsizing New tariffs do not protect low income
Small business	Sustained economic activities Opportunities in water infrastructure projects	Mining firms require supplies to improve water management Higher water tariffs	Process fails or leads to excessive water prices, leading to downsizing Loss of business if cannot improve water management
Large business	Improved water security Increased competitiveness and resilience in the long run	Investment in water management initiatives Increased water prices	Improvement in water management is insufficient to ensure water security
National and provincial government	Reduced pressure on water systems More sustainable water systems	Resources to support water management and investment Regulatory changes to establish enabling framework for circular economy	Rising water prices lead to lower demand from mines, stranding some facilities Higher prices lead to pushback from consumers

Stakeholders	Benefits	Costs	Risks
Water sector	Increased revenues in the short term Increased sustainability and resilience of the systems Reduced need for investment in long run	Resourcing of new investments Reduced long run demand leads to slower growth	Reduced demand from mines makes it harder to fund water projects

Table 11: Phasing and risks

Action	Requirements	Risks
Phase 1: Develop package of measures to improve water use in mining value chain (regulatory changes, tariffs, incentives and financing)	Sufficient agreement and unambiguous mandates across spheres and functions of the state to ensure coordination and consistency Stakeholders support programme because in the long run they benefit	Inadequate evidence to guide sound decision-making, including on impacts on consumers (business and households) and municipal budgets, and on priorities for investment Unable to reach agreement with public and private stakeholders due inadequate evidence and/or lack of role clarity
Phase 2: Package implemented	Sufficient mandates and agreement among stakeholders Adequate resourcing for investment and incentives Adequate mechanisms for monitoring, unblocking and course correction where required	Unclear responsibility for managing implementing Stakeholders inside and outside of government resist implementation, leading to delays or failure Higher tariffs extend to low-income communities, leading to protest action and public health crises Resources are not adequate to investments and incentives fail
Phase 3: Mining value chain no longer faces threat of water shortage	Package succeeds in improving sustainability of water supply	Package fails due to failure to implement programme or to revise measures that turned out to be inappropriate
Phase 4: Employment in mining value chain no longer	Mining value chain relieved of water problems	Package does not improve sustainability of water supply for mining

Action	Requirements	Risks
threatened by water shortages		

2.3. Diversification of local economies

1. Diversify platinum belt economy to build long-term resilience and sustainability

Proposal: SJRP structure provides resources for substantive, costed planning for economic diversification by platinum-belt towns. A second implementation phase will depend on proposals from the initial plan. The plans must specify the benefits for vulnerable workers and communities, especially retrenched workers and small businesses. They should indicate regulatory, funding and capacity requirements for implementation as well as the main risks and cost bearers. The planning process will require appropriate skills; close involvement of the affected communities and municipalities; and adequate testing by an expert review panel. Proposals for implementation must incorporate strong monitoring, unblocking and course-correction mechanisms.

The PGM value chain is the single largest employer in the mining value chains in the country. Within the metals value chain, it is also the one value chain which is potentially at risk from a demand-side perspective, as highlighted. Unlike the diversification of the demand stream for PGMs, which has attracted vast amounts of resources from both the public and private sectors, the diversification of PGM-dependent regions remains to be conceptualised, designed and implemented. While the planning and design processes would be relatively inexpensive, implementation will require extensive investment and management capacity.

In the event of the PGM industry downsizing in the coming decades, an economic diversification strategy should be pre-emptively developed for the regions directly dependent on the industry, most notably (but not only) the Bojanala region in the North West. Proximity to South Africa's leading industrial and population centres in Gauteng opens the possibility of developing or revising clusters to supply manufacturing and consumers located there. Before the PGM boom, the Bojanala region boasted significant agricultural activities, from tobacco to citrus farming. The broader region also hosts a variety of touristic attractions, from the battle fields to nature and game reserves.

Table 12: Impact assessment

Stakeholder	Benefits	Costs	Risks
Workers	New economic opportunities if PGMs downsize		New opportunities require different skills or provide lower pay Diversification generates few new jobs

Stakeholder	Benefits	Costs	Risks
Mine towns	More stable growth and higher employment More scope for emerging business New revenue streams	Resources to support diversification, including e.g. upgrading industrial sites	Diversification fails, leading to stranded investments
Small business	New opportunities emerge Support for new activities	Investment in new economic opportunities	Loss of investments and livelihood if new clusters fail New industries do not provide opportunities for small producers
Large business	New opportunities Increased social cohesion as employment rises	Investment in new opportunities Support for diversification programmes	If new industries fail, loss of investments and continued high joblessness and social divisions in platinum towns
National and provincial government	More resilient growth Greater social stability in platinum belt New revenue streams	Resourcing for diversification programmes, including through infrastructure, Development Finance Institutions and the dti incentives	If new industries fail, stranded investments and continued high joblessness and social divisions in platinum towns

Table 13: Phasing and risks

Action	Requirements	Risks
Phase 1: SJRP structure agrees process to identify opportunities and support measures with platinum towns	SJRP structure has capacity to engage with municipalities and prioritises process Municipalities see value of planning for diversification	SJRP structure does not contact municipalities or lacks capacity to engage Municipalities do not accept offer of support

Action	Requirements	Risks
Phase 2: SJRP structure supports municipalities in commissioning study of options and measures to promote diversification	Municipalities and SJRP structure agree on terms of reference SJRP structure has resources to support planning process Municipalities and SJRP structure manage procurement process Adequate capacity is available to develop an effective and viable plan	Municipalities and SJRP cannot agree on aims, outputs or methodology SJRP structure cannot mobilise sufficient resources Procurement process is delayed or fails Capacity is not available to develop a viable diversification plan
Phase 3: Diversification plan is approved, resourced and implemented	Municipalities accept proposals National and provincial departments and agencies support and prioritise plans Adequate capacity, resourcing and expertise for implementation Plan integrates strong management systems to ensure on-going monitoring, unblocking and where necessary course correction Stakeholders in the mining value chain and communities in the platinum belt support plan	Opposition by key stakeholders inside and outside of the state leads to delays or failure State fails to prioritise plan, so resourcing falls short Management systems are weak, leading to failure to implement or stranded investments
Phase 4: Platinum towns see higher employment and growth, and do not decline if PGMs decline	Diversification plan succeeds in developing new activities that generate jobs on a significant scale and provide opportunities for small business	Diversification plans fails or only support capital-intensive industries
Phase 5: Workers and communities in the platinum belt gain jobs and higher incomes over time	Diversification plan succeeds in promoting labour-intensive industries	Diversification plan fails or does not promote job creation or opportunities for small businesses

2. Begin to identify opportunities for other rural mining towns

Proposal: SJRP structure to commission an analysis of other rural mining towns (there are around 25) to identify existing structure of production, skills and infrastructure, and to identify likely climate-change related impacts over a 10 and 20-year time horizon. The analysis will be costly because the limited statistics at municipal level makes site visits unavoidable.

Table 14: Impact assessment

Stakeholder	Benefits	Costs	Risks
Workers and mining communities	Study lays the basis for securing more sustainable growth if mines enter downturn or are heavily affected by climate change Improved information for SLPs	Engaging with research process	Analysis does not lead to effective action
Mining companies	Improved information for SLPs	Engagement with research process	Analysis does not lead to effective action
National and provincial government	Reduced risk of stranded municipalities if mining downsizes due to climate-related impacts Better planning in mine towns	Capacity to drive research Resourcing for research	Analysis does not lead to effective action

Table 15: Phasing and risks

Action	Requirements	Risks
Phase 1: SJRP structure develops terms of reference and commissions research	SJRP structure has capacity to develop and commission research Mine towns and stakeholders in the mining value chain agree to provide information to researchers Adequate funding Researchers have adequate capacity and expertise to identify viable ways to diversify mine towns	SJRP structure does not initiate project Stakeholders and mine towns do not agree to cooperate SJRP structure cannot mobilise sufficient resources Procurement process leads to researchers who cannot deliver

Action	Requirements	Risks
Phase 2: Researchers implement research programme	Mine towns and stakeholders in the mining value chain provide information as required Researchers manage project efficiently and deliver quality outputs as required Realistic, viable options exist for diversification of mine town economies	Towns and stakeholders do not provide information Research project does not deliver quality outputs SJRP structure lacks capacity to quality control outputs Research cannot identify realistic options for diversification
Phase 3: Research leads to development of diversification plans for mine towns	Mine towns and other stakeholders inside and outside of the state use research as basis for developing diversification plans Resources and technical support are available for municipal planning processes	Mine towns and other stakeholders do not prioritise diversification Research does not provide useful insights for planning process Mine towns cannot get resources required for effective planning
Phase 4: Mine towns continue to grow even if mines downsize due to climate-change related impacts	Diversification plans succeed	Diversification proves impossible Plans are poorly designed and/or implemented

2.4. Active labour market policies

Aim: Miners assisted in transition into other livelihoods where necessary due to climate-change related impacts.

Proposal: Mining stakeholders to review efforts to improve active labour market policies for coal mining after three years, and on that basis develop an approach for mining as a whole. In addition, the SJRP structure should monitor downsizing that is already underway, in part due to climate-change related impacts, notably in steel (as a result of higher electricity prices), and where necessary assist to strengthen support for affected workers.

As discussed in the accompanying review of the SJRP toolbox, current programmes for active labour market measures generally do not support industries or regions facing a downturn. The stakeholder body for the mining SJRP should identify ways to improve measures to assist miners to transition to new employment if climate-change related impacts or other causes

lead to a broader slowdown in a subsector of the industry. In this process, it can treat the SJRP for the coal value chain as a pilot.

In this context, options to redeploy workers to other sectors should also be explored. In the same way that the growth of PGM mining absorbed some of the gold workers and generated additional employment, the growth of other mineral mining (such as chrome and manganese) could help cushion a decline in PGM mining.

Table 16: Impact assessment

Action	Benefits	Costs	Risks
Workers and mining communities	Faster transition to new opportunities Increased access to retraining and income support for transition	Need to engage on proposals	New opportunities are not available Training opportunities do not help people without matric
Mining companies	Reduced conflict over downsizing	Engagement on proposals	Pressure to increase resourcing for active labour market measures
National and provincial government	Higher employment levels Less conflict over efforts to reduce emissions	Development and resourcing of new measures	Cost is higher than anticipated Unable to find viable new opportunities

Table 17: Phasing and risks

Action	Requirements	Risks
Phase 1: SJRP stakeholder body for the mining value chain review existing programmes based on experience in coal and propose improvements	Stakeholders prioritise process Stakeholders are able to access adequate capacity and expertise to review evidence and develop viable proposals Stakeholders are able to agree on reforms	Stakeholders do not initiate process Stakeholders do not provide resources or are unable to appoint competent experts to develop proposals Stakeholders cannot agree on reforms

Action	Requirements	Risks
Phase 2: Stakeholder body engages with relevant agencies (e.g. UIF, Skills Education Training Authorities and National Skills Fund, depending on proposals)	Stakeholders set aside time and capacity to engage Agencies are prepared and mandated to engage Parties are able to reach agreement on changes to existing systems to address possible downsizing in mining value chain	Stakeholders do not prioritise reforms Agencies refuse to engage because they disagree with need for reforms or lack capacity Parties cannot reach agreement
Phase 3: Reforms lead to faster transition to new employment for retrenched workers in mining value chain	Reforms are adequately designed and resourced Downsizing actually occurs in subsectors of the mining value chain Opportunities exist for retrenched workers	Reforms do not provide anticipated support for workers The mining value chain does not experience significant downsizing Even with support, retrenched workers cannot find new employment opportunities

2.5. Social protection

Aim: Income support available for vulnerable workers and communities during transition to new livelihoods.

Proposal: Mining stakeholders to review exercise in coal mining after three years and on that basis develop approach for mining as a whole. In addition, the SJRP structure should monitor downsizing that is already underway, in part due to climate-change related impacts, notably in steel (as a result of higher electricity prices) and where necessary assist to strengthen support for affected workers and communities.

As discussed in the accompanying review of the SJRP toolbox, current social protection programmes do not support industries or regions facing a downturn. The stakeholder body for the mining SJRP should identify ways to improve measures to provide income support for workers and communities if climate-change related impacts or other causes lead to a broader slowdown in a subsector of the industry. In this process, it can treat the SJRP for the coal value chain as a pilot.

Table 18: Impact assessment

Stakeholder	Benefits	Costs	Risks
Workers and mining communities	More extensive and targeted income support if retrenched or enter economic downturn Income support provides some stimulus for local economy	Need to engage on proposals	New proposals are too small to provide much support Resourcing for proposals is not available
Mining companies	Reduced conflict over downsizing Greater social cohesion in mining towns	Engagement on proposals	Pressure to increase resourcing for retrenchment packages and for mine towns
National and provincial government	Less conflict over efforts to reduce emissions Climate-change related impacts do not lead to impoverishment of vulnerable groups	Development and resourcing of new measures	Cost is higher than anticipated

Table 19: Phasing and risks

Intervention	Requirements	Risks
Phase 1: SJRP stakeholder body for the mining value chain review existing programmes based on experience in coal and propose improvements	Stakeholders prioritise process Stakeholders are able to access capacity and expertise to review evidence and develop viable proposals Stakeholders are able to agree on reforms	Stakeholders do not initiate process Stakeholders do not provide resources or are unable to appoint competent experts to develop proposals Stakeholders cannot agree on reforms

Intervention	Requirements	Risks
Phase 2: Stakeholder body engages with relevant agencies (e.g. Department of Social Development, UIF, EPWP depending on proposals)	Stakeholders set aside time and capacity to engage Agencies are prepared and mandated to engage Parties are able to reach agreement on changes to existing systems to support workers and communities in the event of downsizing in mining value chain	Stakeholders do not prioritise reforms Agencies refuse to engage because they disagree with need for reforms or lack capacity Parties cannot reach agreement
Phase 3: Reforms provide effective income support for communities in the mining value chain when required	Reforms are adequately designed and resourced Downsizing actually occurs in subsectors of the mining value chain	New programmes provide inadequate income support or do not reach sufficient numbers The mining value chain does not experience significant downsizing Red tape means eligible people do not get support or face long delays Inadequate resourcing means commitments are not met

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