CLIMATE POLICY INITIATIVE

Understanding the impact of a low carbon transition on South Africa

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A CPI Energy Finance Report

EXECUTIVE SUMMARY

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Descriptors

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About CPI

Climate Policy Initiative works to improve the most important energy and land use policies around the world, with a particular focus on finance. An independent organisation supported in part by foundation funding, CPI works in places that provide the most potential for policy impact including Brazil, China, Europe, India, Indonesia and the US. CPI's Energy Finance practice is a multidisciplinary team of economists, analysts and financial and energy industry professionals focused on developing innovative finance and market solutions that accelerate the energy transition.

Agence Française de Développement

The Agence Française de Développement (AFD) supported the launch of a reflection and the realization of studies by the Climate Policy Initiative on the financial implications of the low carbon transition, especially in South Africa, without contributing to this report. The AFD is not responsible for the accuracy of the information contained in the report, as well as the conclusions expressed by CPI. The conclusions of these studies are expressed and distributed under the sole responsibility of CPI.

Disclaimer

The analysis in the report was conducted by CPI Energy Finance using publicly available information on taxes, contracts, investments and company strategies, drawing particularly on the documents listed in the "References" section of the report. The analysis has been supplemented by a stakeholder engagement process, although none of the entities other than CPI were responsible for the provision of inputs. Unless explicitly stated, the findings do not represent an endorsement by any of the institutions mentioned in the report.

The quantitative analysis set out in the report was performed in relation to scenarios devised by CPI Energy Finance with inputs from institutions such as the International Energy Agency. The findings do not constitute a forecast of the future financial performance, or financial position or risks of any entity mentioned in this report.

Foreword

South Africa must navigate the risks and benefits of a global low-carbon transition

Patrick Dlamini
Chief Executive Officer and Managing Director
Development Bank of Southern Africa

In 2017, South Africa earned R61 billion ($4.2 billion) in revenues from exporting coal. Domestic coal resources provided 91% of South African electricity, as well as a major portion of transport fuel and chemical output. More than 100,000 people are employed in the mining, electricity generation, logistics, and synthetic fuel sectors related to the extraction, development and export of this natural resource.

In early 2018, Cape Town was in the midst of an extreme drought. The city was days away from running out of water, with 4 million Capetonians subjected to severe water restrictions. The severity of the drought made news headlines across the world and brought attention to a most unwelcome consequence of a warming world.

"If people around the world, specifically South Africa, ever thought that climate change is just a fable or a fiction, we in South Africa as regards Cape Town are now seeing the real effects of climate change," President Cyril Ramaphosa warned.

South Africa faces competing pressures. On one hand, the threat of climate change to its water supply, agriculture, coast lines, and infrastructure, and on the other, the threat to the country's economy of policies in other countries that reduce demand for South Africa's carbon heavy natural resources, such as coal. The country is not alone in facing these pressures, nor are the effects and choices faced by South Africa independent of what is happening elsewhere in the world.

Internationally, policy and technology are evolving quickly. South Africa is already taking the threat of climate change seriously. The country was among the 181 signatories to the 2015 Paris accord which required countries to submit carbon mitigation plans – its aim is to peak emissions by 2025 before plateauing for ten years and then declining after 2035.

Meanwhile, new policies such as the Integrated Resource Plan for the electricity sector will take account of the cost declines that continue to make electricity from low-carbon technologies less expensive than coal in many countries around the world, including South Africa.

But for as long as South Africa depends on coal and other commodities for a large part of its exports, the impact of climate change-driven transition on the country's economy may be more dependent on the actions of our international partners than our domestic policy.

How fast will major consumers of our coal, such as India, try to reduce their emissions? What opportunities will arise in new technologies for minerals mined in South Africa? Which industries should be prioritised as long-term, sustainable sources of jobs in a more prosperous South Africa? None of the choices that we face are without risk, which is why high-quality independent research and analysis as we find in this report is so valuable in helping government policymakers, investors and industry plan for South Africa's transition pathway.

For me, one of the most striking findings from this report is that South Africa faces "transition risk" approaching R1.8 trillion ($125 billion) in present value terms if the world achieves a path consistent with the Paris targets. With much of this risk apparently due to fall on the public balance sheet, such transition risk could strain the public finances, jeopardise the sovereign credit rating and the government's ability to pursue a progressive social agenda. It would be irresponsible of us not to investigate these risks more thoroughly.

For DBSA, this report is very timely as climate change mitigation and adaptation (and the energy transition) are increasingly becoming embedded in our core strategic objectives. As well as identifying specific risks to our balance sheet and those of other large corporates, the report also identifies a series of policies that government might adopt to reduce the impact of the risk to the whole country. As one of the major funders of municipalities and state-owned enterprises, DBSA will work with government to assess these findings.

At DBSA, we believe that the low carbon transition is a major opportunity for South Africa. That's why in October 2018, we announced the Climate Finance Facility (CFF) to catalyse financing from public and private sector sources for investment in sustainable development both in South Africa and across the rest of the African continent.

As is evident from this report, the transition is upon us and will cost us dearly. We need therefore to engage in the proactive pursuit of a path that seeks to contain the costs of the transition, one focused on alleviating the plight of the most vulnerable parts of society: workers and communities directly affected.

Preface

The transition to a low carbon economy should be a just transition, one that leaves no-one behind

Rémy Rioux
CEO of Agence Française de Développement (AFD)
Chair of the International Development Finance Club (IDFC)

Ever since the world's nations committed in December 2015 at the COP21 in Paris to limit global warming to well below 2°C and to pursue the efforts towards the 1.5°C goal, the energy transition has continued to gain momentum in many parts of the economy with the help of technological shifts, reduced renewable energy costs and ambitious public policies. The development finance community in particular is leading the way, with the majority of development institutions having committed in December 2017, at the One Planet summit in Paris, to align their financial flows with the Paris agreement.

These climate objectives require widespread and unprecedented efforts as highlighted by the recent IPCC Special Report on Global Warming of 1.5°C. But it is a scenario which governments and companies should factor into their planning and strategies. Indeed, such a transition will induce economy-wide transformations; some sectors will gain while others will inevitably bear financial, economic and social difficulties. Understanding, anticipating, and managing these difficulties is a responsibility naturally incumbent upon governments as they seek to maximize social welfare and economic stability. It is also an endeavour that the financial community has recently taken onboard, since the Financial Stability Board of the G20 issued in June 2017 a series of far reaching recommendations to analyse and communicate on climate-related financial risks.

Agence Française de Développement (AFD) is a development institution committed to being 100% compatible with the Paris Agreement. We provide financing, expertise and research to assess and manage transition risks. Financial stability is key for an orderly transition to a low carbon world, but more importantly still, inclusive policy debates are needed throughout the process. How to navigate through the low carbon transition is paramount to all actors, whether they are set to lose or to gain from it. Helping these particular companies, sectors, and countries navigate the difficult transition ahead is both an economic, environmental and social imperative. The transition to a low carbon economy is only possible if it is a just transition, one that leaves no-one behind and that leverages the many economic and job opportunities that a green transition offers.

We are all countries in transition towards sustainable development. This is the message of the Sustainable Development Goals adopted in 2015 at the United Nations. How to achieve them by 2030? The International Development Finance Club, of which both AFD and DBSA are members, offers a way forward. This network of 24 national and regional development banks share a similar vision of promoting low carbon and climate resilient futures, poverty reduction, an inclusive, fair and equitable design of the globalized economy. They are the largest provider of public development finance globally, totaling more than $4 trillion in assets, with commitments above $850 billion per year, of which $220 billion in green and climate finance.

Going forward, this in-depth country case study of South Africa, carried out by Climate Policy Initiative, and commissioned by AFD, and the Advisory Finance Group of the World Bank, is an important stepping stone in this collective effort. It is aimed to contribute to the on-going energy debate in the country and to the wider discussion around climate-related policy options.

South Africa is a country with huge potential in renewable energy as well as in low carbon transition-driven export sectors. It is also a country dependent on coal resources for a significant part of its energy needs and export activity. This low-cost energy resource has played an important role in South Africa's industrial and economic growth. This competitive advantage is not however without risks. As this report shows, fossil fuel exporting countries such as South Africa have a lot to gain by considering the consequences for their national budgets, companies and workers of the world moving away from coal, and planning ahead accordingly.

My hope is that this analytical work can contribute to the ongoing conversation among policymakers in the country on how best to manage these risks and opportunities. AFD stands ready to support the South African government and its many partners in the country in this endeavour.

Executive summary

Climate Policy Initiative (CPI), with the support of Agence Française de Développement and the Advisory Finance Group of the World Bank, have examined the risks to the economy of South Africa – and its government, municipalities, companies and financial institutions – from a global economic transition to a low-carbon economy.[1]

A global low-carbon transition could reduce the demand and price for assets including carbon-intensive fossil fuels such as coal and oil. Infrastructure that supports higher carbon activities including rail, power plants or ports built around fossil fuel industries, may have to be replaced or retired early. Companies, investors and workers could be hurt by lower prices and reduced demand for certain products. Governments may face reduced revenues, for example from lower tax receipts, while their expenditure increases for financial assistance to industries and workers in transition.

"Transition risk" is widely regarded as the risk that the value of assets and income are less than expected because of climate policy and market transformations, such as the switch away from coal-fired power. However, the analysis in this report not only quantifies the downside risk of South Africa's transition, ie the negative impact on assets and revenues, but it also attempts to forecast some of the potential benefits of a transition, such as the impact of a lower global oil price that is passed through to consumers.

Trade-offs associated with a low-carbon transition are particularly acute in South Africa, a country with high levels of unemployment[2] and inequality[3] and an ambitious development agenda.[4] South Africa's exposure to coal mining as a source of export revenues, as a fuel for domestic power generation and as a key employer in certain provinces presents significant transition risk that is mirrored in many other resource exporting countries.[5] Conversely, South Africa could gain via lower oil prices, through new markets for minerals used in low-carbon technologies (eg, platinum and manganese) or through the creation of new jobs in industries that are more resilient to, or would even benefit in, a low carbon world, compared to today.[6]

This report outlines the measures that South Africa and its partners can take to reduce climate transition risk, avoid potential economy-damaging risk concentrations and in so doing, reduce the costs associated with the decarbonisation of the South African economy. More generally, this analysis can serve as a template with which to identify and evaluate the financial risk of a low-carbon transition for a variety of countries. Well managed and less concentrated risk can facilitate the transition and lower its cost in countries across the world.

Several significant findings emerge from the evaluation of transition risk in South Africa, which are summarised here and are explored in depth throughout the report.

Finding 1: The cumulative impact on South Africa of a global low-carbon transition over the period of our analysis (between 2013[7] and 2035) could be more than $120 billion in present value terms

South Africa faces transition risk of more than $120 billion in present value terms between 2013 and 2035.[8] The analysis shows that these risks will accumulate slowly in the coming years before accelerating in the mid-2020s. Unless the government takes action to mitigate these risks, they could jeopardise South Africa's

1 For this study we define a 'low-carbon economy' as one that is consistent with a scenario that keeps temperature rises well below 2°C above pre-industrial levels (2DS), as agreed at the 2015 Paris climate convention. Other recent studies suggest that risks to South African coal exporters could be significant even in scenarios which fall short of Paris targets

2 According to Statistics SA, the formal unemployment rate has not dipped below 20% since the end of apartheid in 1994.

3 World Bank report, Republic of South Africa Country Diagnostic, An Incomplete Transition: Overcoming the Legacy of Exclusion in South Africa (2018), South Africa remains 'the world's most unequal country'

4 South Africa's National Development Plan aims to eliminate poverty and reduce inequality by 2030. Source: https://www.gov.za/issues/national-development-plan-2030

5 What does 'peak coal' mean for international coal exporters? (DIW Berlin, Climate Strategies and IDDRI, 2018). Source: https://www.iddri.org/sites/default/files/PDF/Publications/Catalogue%20Iddri/Rapport/201809-GlobalModelingReport-Iddri-Coal_FINAL.pdf

6 Studies such as 'Green Jobs: an estimate of the direct employment potential of a greening South African economy' (IDC, DBSA and TIPS, 2011) have concluded that there is significant potential for job creation by decarbonising the South African economy. Experience in other countries indicates the potential for job creation in the wind and solar industries (https://www.seia.org/blog/solar-installer-fastest-growing-job-america)

7 We started our analysis from 2013, the year we had last analysed stranded assets in the coal sector to understand how global climate action had shifted business as usual between then and the start of the project. A more challenging question is how much key actors in South Africa have caught up with changes in policy and market conditions.

8 The figure represents downside risk from the sectors we have selected. The total is likely to be higher, given knock-on impacts of the risks on sectors that we have not studied (eg, the impact of lower employment in the coal sector on consumption in other sectors). Similarly, upside risks could also be higher, depending on the trajectory of global decarbonisation, for example, the use of platinum in hydrogen fuel cells could partially offset its declining use in diesel engines or more than offset it, depending on the relative market share of different electric vehicle technologies.

Table ES-1: Climate transition value at risk by sector

POTENTIAL TRANSITION IMPACT/RISK	DIFFERENCE IN NET PRESENT VALUE OF FUTURE CASH FLOWS BETWEEN BAU AND 2DS OVER 2018-2035 (USD BILLIONS)[9] NEGATIVE IMPACT	POSITIVE IMPACT	NET IMPACT (POSITIVE IN BRACKETS)	ISSUES
Potential impacts/risks arising from international trends outside of South African government control				
South African coal exports	83.7	-	83.7	Policy in countries such as China, India, Europe and the US, to reduce coal use to comply with a 2DS, will disproportionately affect internationally traded coal. As a result, both the volume of coal sold and its price will fall, impacting miners and export-oriented infrastructure
Global oil markets	8.3	45.5	(37.2)	Lower global oil demand will lead to lower oil prices. Provided that today's system of fuel price regulation persists, consumers will see most of the benefit, while some energy industry players – in particular, the producers of synthetic fuels – would lose out.
Global metals and minerals markets	0.5		0.5	Some risk to platinum market as demand for diesel vehicles reduces. Longer-term upside potential (not reflected) in fuel cell vehicles (platinum), batteries (manganese); potential longer-term downside from decarbonisation of the steel industry (iron ore).
Potential impacts/risks arising from domestic policy action to mitigate transition risk or contribute to global mitigation efforts				
Domestic power industry and its coal suppliers	Max 4.0bn negative impact but could be positive depending on performance of Medupi and Kusile stations		4.0	Government policy currently envisages coal generation capacity peaking in the early 2020s[10] but achieving a global 2DS could require that South Africa accelerate retirements of existing capacity and invest in cleaner sources.[11] Closure of plants before the end of their economic lives could result in a net cost to the country if the strategy is implemented in a way that negatively affects Eskom.
Domestic oil products and coal to liquids industries	27.4	-	27.4	Government is considering new fuel industry investments in upgrading existing refineries and new capacity, while there are no plans to shut the highly emitting coal-to-liquids production.[12] One of the world's largest single sources of CO2 emissions[13], Secunda would need to close in a global 2DS, although currently the cost of all replacement options would be higher than continuing to run the plant.
Other Impacts	A range of gains including adaptation ($1bn) and losses			Global efforts on carbon mitigation should reduce incremental physical climate risk and hence adaptation costs.[14] Government action to reduce national carbon emissions will impact other emissions intensive sectors, including steel and cement production, as well as other areas of the economy, including agriculture.
Total Impact	**123.9**	**46.5**	**77.4**	

9 The Rand equivalent figures, translated at the ZARUSD exchange rate of 14.47 as of the end of 2 January 2019 are South African Coal Exports: R1.2 trillion negative impact; Global Oil Markets: R120 billion negative impact and R660 billion positive impact (R540 billion); Global Metals and Minerals Markets: R7 billion; Domestic power industry and its coal suppliers: R58 billion; Domestic oil products and coal to liquids industries: R396 billion; Other: R14 billion.

10 Draft Integrated Resource Plan (Department of Energy, 2018). Downloaded from http://www.energy.gov.za/IRP/irp-update-draft-report-2018.html

11 World Energy Outlook [WEO] 2017 (International Energy Agency, 2017). Sustainable Development Scenario and impact on power sector (Annex A pg 683 for South Africa data)

12 South Africa's NDC (downloaded from https://www4.unfccc.int/sites/NDCStaging/Pages/Party.aspx?party=ZAF) includes a reference to CCS for Secunda. However, we assume that the modelling only requires this in the event of South Africa reaching the ambitious level of its targets. Sasol's recent investments in coal mining life extensions (https://www.sasol.com/media-centre/media-releases/sasol-opens-shondoni-colliery-part-r14-billion-investment-south-africa) suggests that it plans to operate the Secunda plant for at least the period covered in this study.

13 Source: https://www.iol.co.za/news/fall-in-line-on-climate-change-sasol-told-1176349

14 We estimated the benefit from higher global climate ambition (and therefore, reduced adaptation costs) in a 2DS at only $1 billion over 2018-2035. The benefit after that point rises sharply. We discuss the estimate of this potential benefit in chapter 5 of this report.

investment grade sovereign rating, which would cause further losses.

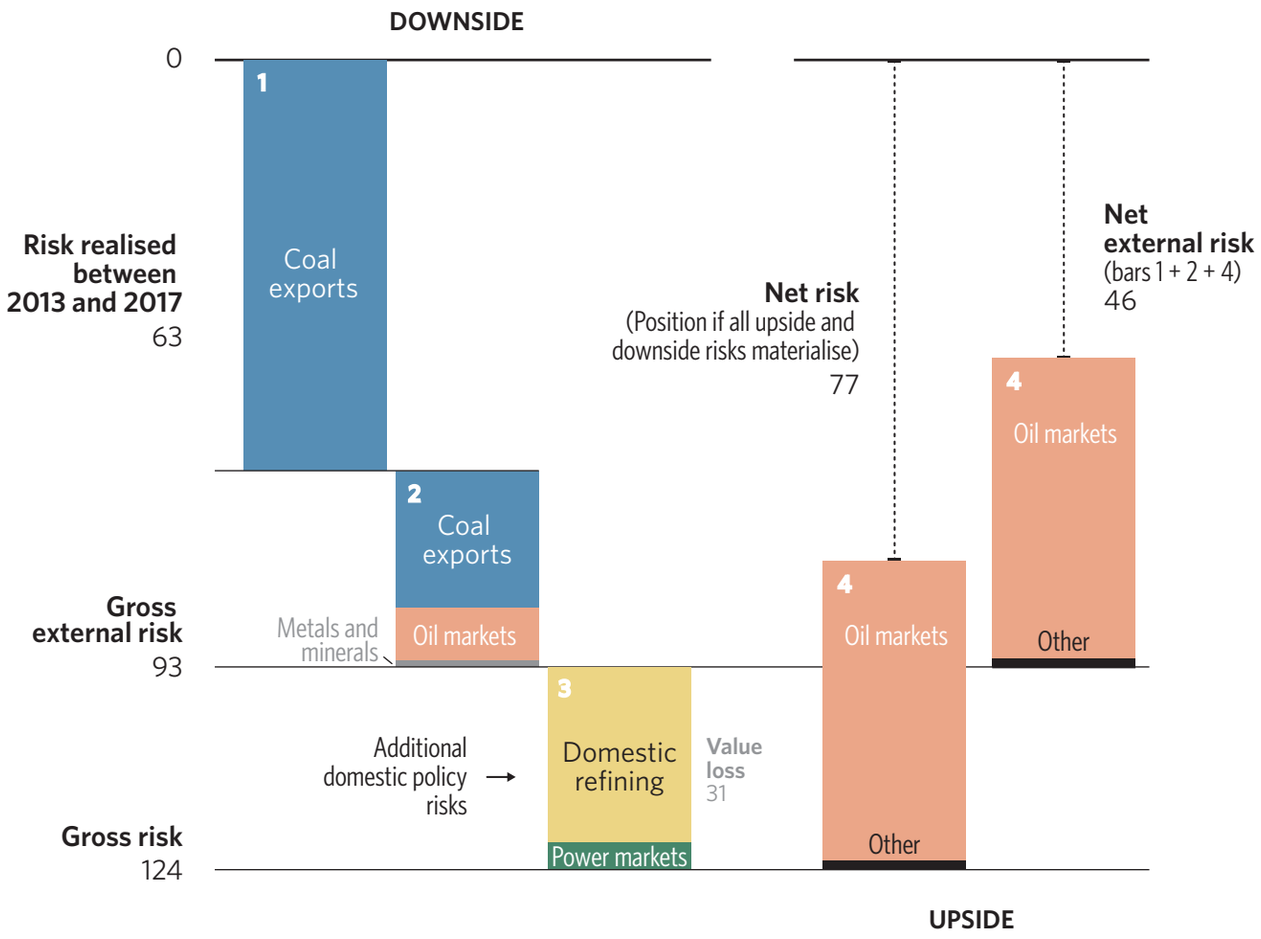
The largest share of risks come from factors that are beyond the control of South Africa itself, including changes to global coal and oil markets that will be driven by changes to global demand. Nevertheless, pro-active government responses to those risks beyond its control can help to mitigate the impact. As summarised in table ES-1, some transition risks have both potential negative and positive impacts on different parts of the economy, while other shifts in global demand could be positive for South Africa.

Finding 2: Much of the risk and potential impact (approximately 75%) is due to factors, policies, and events, beyond the control of the South African government, while nearly 50% has already been realised

Since CPI's last global coal analysis based on data from 2013 and the start of the work on this project in 2017, the world made significant progress in reducing green-house gas emissions, including commitments to the Paris accord. Meanwhile, the risk profile and valuation of fossil fuel energy assets have fluctuated, affected by

Figure ES-1: Sources of risk in a climate transition (2013-2035)

Billion USD (NPV to 2035)



factors including those related and unrelated to climate policy commitments. These factors include technological change (falls in the cost of wind and solar power generation and lithium ion batteries), new energy market regulation (new forms of market design which value energy system flexibility and support higher penetrations of renewables) and geopolitics – all factors beyond the control of South Africa or its government.

Future expectations for "business as usual" coal consumption, and by extension internationally traded coal volumes, have declined significantly as a result of these changes.

For South Africa, as illustrated in figure ES-1 on the previous page, the result is that by 2017 as much as $60 billion of the value that the country could have expected to earn from its coal resources based on 2013 business-as-usual (BAU) forecasts, had already been lost. That is, by 2017 nearly 60% of the transition value at risk was already factored into revised long-term forecasts for the development of the seaborne coal sector.[15] A further $29.4 billion of value (another 27% of the total) could be lost to South Africa if global coal exports and other markets adapt to a low-carbon transition consistent with keeping global temperature rises "well-below" 2C above pre-industrial levels.

Coal exports currently provide profits, royalties and tax receipts for South Africa when the revenue from selling the commodity exceeds production costs. Revenues from coal sales also pay back the sunk capital investment in mines and the rail and port infrastructure that is needed to get the coal to the market. If a global low-carbon transition prompts a fall in coal export revenues, not only might miner profits and government taxes be wiped out, there may not be sufficient cash to pay back original investments in mining and infrastructure. The debt defaults that might result could cascade through the economy.

Beyond the value at risk driven by international policy and markets, South Africa faces decisions about how it will meet its own emissions targets. While it has taken important recent steps to clarify the direction of its power sector[16], the future of oil refining and the synthetic production of fuel from coal and gas remains considerably more uncertain. Our analysis suggests that there is an additional $31.2 billion of value at risk in South Africa based upon the decisions to accelerate the retirement of these assets.[17] How these policies are financed and the level of support available from international partners will all shape the effect that South Africa's domestic low carbon transition will have on the economy and its citizens.

Finding 3: The public balance sheet in South Africa would explicitly face only 16% of the downside risk in South Africa with investors facing the rest. However, there are several channels through which business strategy, policy and financial distress may further distribute the share initially borne by investors – often as contingent liabilities to the national government

How risk is distributed through the South African economy is as important as the absolute level. Concentration of risk in one sector, industry or on one company could lead to a collapse that could send shock waves across the economy that magnify the overall impact. Alternatively, dilution of this risk among many groups, particularly foreign investors who have internationally diversified portfolios and investor bases, reduces the likelihood of sector or company collapse and broader economic contagion.

The direct or explicit distribution of risk is a function of ownership, contractual arrangements, historic and current policy, taxation and royalties, and business relationships. Companies and the national government have the greatest risk-bearing capacity. However, companies will seek to protect investors by passing risk onto the supply chain, consumers and workers.

The allocation of risk in South Africa may change once various parties react to the risk of loss in the value of their assets. Where the risk is not yet priced into listed securities, companies that are alert to climate transition risk may seek to sell them to those who are not yet considering this risk.[18] While coal mining companies will seek to recover the shortfall in export revenues by increasing sales to domestic customers such as Eskom,

15 The extent to which the impact on valuations of this shift (between 2013 and 2017 business-as-usual forecasts) have been 'priced in' or taken into account by equity investors, lenders, companies and governments varies. In practice, the extent of the incremental risk to financial assets and financial flows surveyed in this document will depend on the extent to which this shift is already incorporated.

16 Ibid. Department of Energy (2018)

17 This figure is calculated based on the costs associated with the early closure of certain power plants and the Secunda coal to liquids plant (eg, stranded asset, accelerated decommissioning costs) plus the incremental cost of replacing the products (electricity or fuels) produced by the existing assets with a "cleaner alternative". The details of this analysis are discussed in chapter 6.

18 Recent sales or planned sales by major international commodity houses (eg, Total, Anglo American and South32) to local players may reflect asymmetry of information / attention on the question of climate-related financial risks between those two groups.

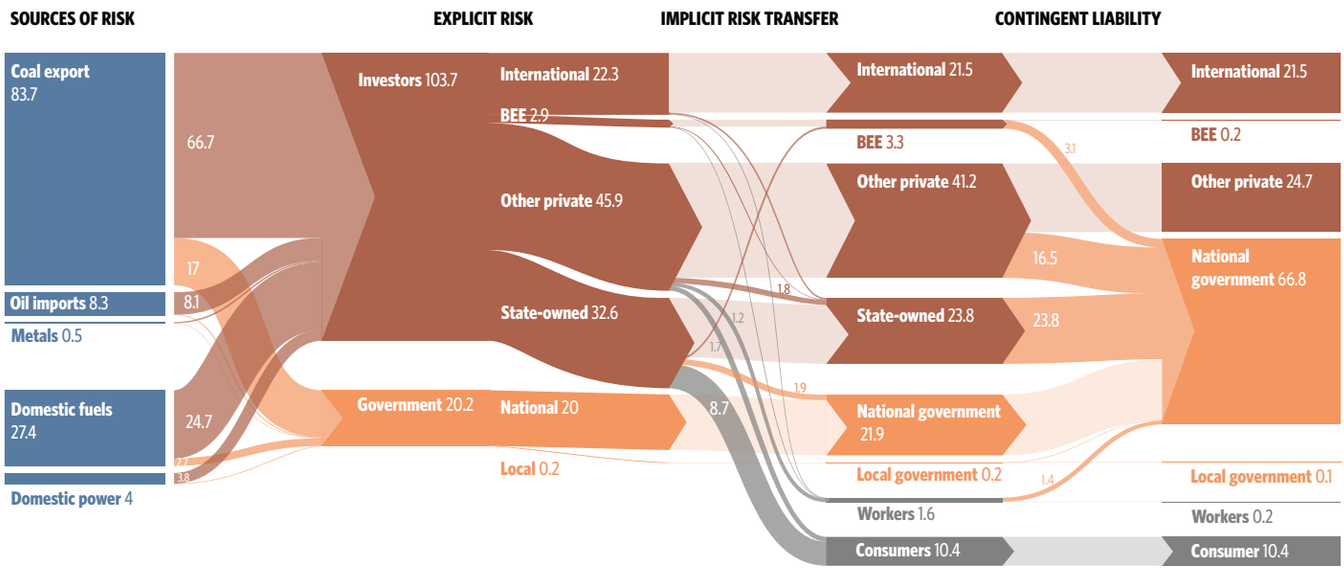
in practice, the ability to do so may be limited. Instead, workers and key counterparties such as Transnet Freight Rail will be forced to bear this risk, with investors bearing the remainder. Some mine owners may decide to close assets before the end of their economic lives. Mine closures will hit communities and workers through job losses, reduced economic activity and the loss of funding from companies for social infrastructure. Municipalities where assets are located may suffer the greatest impact, but the spread of transition risk will be broader. Lower national taxes will reduce transfers to municipalities, curtailing their ability to provide services and to pay their obligations.

As with municipalities, many companies will not have strong enough balance sheets and may appeal for government assistance. National government could find itself faced by sharply increased costs due to either bailouts or decommissioning costs following bankruptcy.

Government may find itself obliged or expected to absorb the impact of the transition in other ways. Government may support workers who lose their jobs or provide funding for unemployment benefits and retraining, or to provide finance and assistance to struggling municipalities to attract new job-creating investment. However, its capacity to provide this support could be constrained by lower tax revenues and an increase in non-performing loans and an erosion of the capital bases at state-owned financial institutions such as the Development Bank of Southern Africa (DBSA) and the Industrial Development Corporation of South Africa (IDC).

Our analysis, as summarised in figure ES-2 below, found that after these implicit transfers, the distribution of transition risk could become markedly more concentrated on national government, with the latter's share of the cumulative risk facing South Africa almost tripling from nearly 16% to more than half.

Figure ES-2: Implicit transfers of climate transition risk



Finding 4: The current South African system of incentives for new capital investment favour some existing industries that are exposed to transition risk, rather than new sectors that may create more sustainable sources of jobs and economic growth. Currently planned investment decisions could add more than $25 billion to the country's transition risk.

The South African government uses a range of incentives to attract investment in the country, including fiscal incentives, government or SOE-led procurement and access to debt and equity finance from state-owned financial institutions. However, new investments in assets such as mines, infrastructure and refineries could add to the transition risk faced by companies, investors and the government if lower future revenues under a 2DS are insufficient to cover the investment cost and losses and/or defaults ensue. Our analysis, supported by recent research from IDDRI, suggest that these investments could be avoided with limited impact on security of supply of coal[19], power or fuel.

New assets, mines and infrastructure could add to the transition risk faced by companies, investors and the government, if lower future revenues under a 2C scenario are insufficient to cover the investment cost. As shown in the table below, we identified further investments that would add more than $25bn to the risk that the South Africa could face in a global low-carbon transition.

If this sum was instead invested in industries or assets that are more resilient to transition risk, or benefit from a low carbon transition, it could spur a more sustainable source of jobs and economic growth.

Table ES-2: Future investments that could increase transition risk above the level in our analysis

ASSET	SIZE OF INVESTMENT (USD BILLION)	STAGE OF INVESTMENT
Rail lines – Expansion of Mpumulanga – Richards Bay line to 97.5 mtpa	0.6[20]	Planning
Rail lines – Waterberg expansion to 24 mtpa	0.1[21]	Planning
Rail lines – International links (Swazilink, Botswana link)	0.4[22]	Pre-feasibility studies
Coal IPPs (Thabametsi and Khanyisa)	2.8[23]	In financing discussions
Coal mines – Limpopo	1.4[24]	Range: from construction to feasibility
Coal mines – Mpumulanga	0.5[25]	Range: from construction to feasibility
New oil refinery	10.0[26]	Procurement being designed
EMSEZ industrial zone (Limpopo)	10.0[27]	Planning
Total potential investments	**25.8**	

Source: Transnet, University of Cape Town, Wood Mackenzie and CPI analysis

19 Ibid DIW Berlin et al (2018)

20 We have estimated this from Transnet disclosures on historic investment in exoanding the capacity of the line whose capacity currently stands at 81 mtpa. The actual figure could be higher or lower depending on the results of planning and feasibility studies

21 We estimated this figure based on disclosures on total project cost and percentage completion from Transnet's Annual Financial Statements 2017 (Annexure B to the Report of the Directors). Downloaded from: https://www.transnet.net/InvestorRelations/AR2017/Transnet%20AFS%202017.pdf

22 CPI estimates of Transnet's potential share of equity in Swazilink and the extension of the Waterberg line to Botswana, assuming the assets are mostly debt-funded.

23 Rand estimates taken from 'An assessment of new coal plants in South Africa's energy future: the cost, emissions and supply security implications of the coal IPP programme'. (Ireland G, Burton J, 2018)

24 Cost estimates taken from Wood Mackenzie database of coal assets and projects. CPI analysis suggests that new mining assets in Limpopo commissioned after 2023 (and therefore, with investment decisions taken in the next few years) would deliver a negative NPV in our 2DS.

25 Cost estimates taken from Wood Mackenzie database of coal assets and projects. CPI analysis suggests that new mining assets in Mpumulanga commissioned after 2023 (and therefore, with investment decisions taken in the next few years) would deliver a negative NPV in our 2DS

26 Source: https://www.reuters.com/article/us-safrica-refinery/south-africa-eyes-brics-partners-to-build-new-10-billion-refinery-idUSKBN1DL108

27 Source: https://www.thesouthafrican.com/china-south-africa-limpopo-coal-concern/

Finding 5: The South African government can still mitigate much of this risk, provided that it plans in advance to develop the fiscal, financial and policy tools required to shift transition risk away from parties without the capacity to bear it and to capture transition-related upside

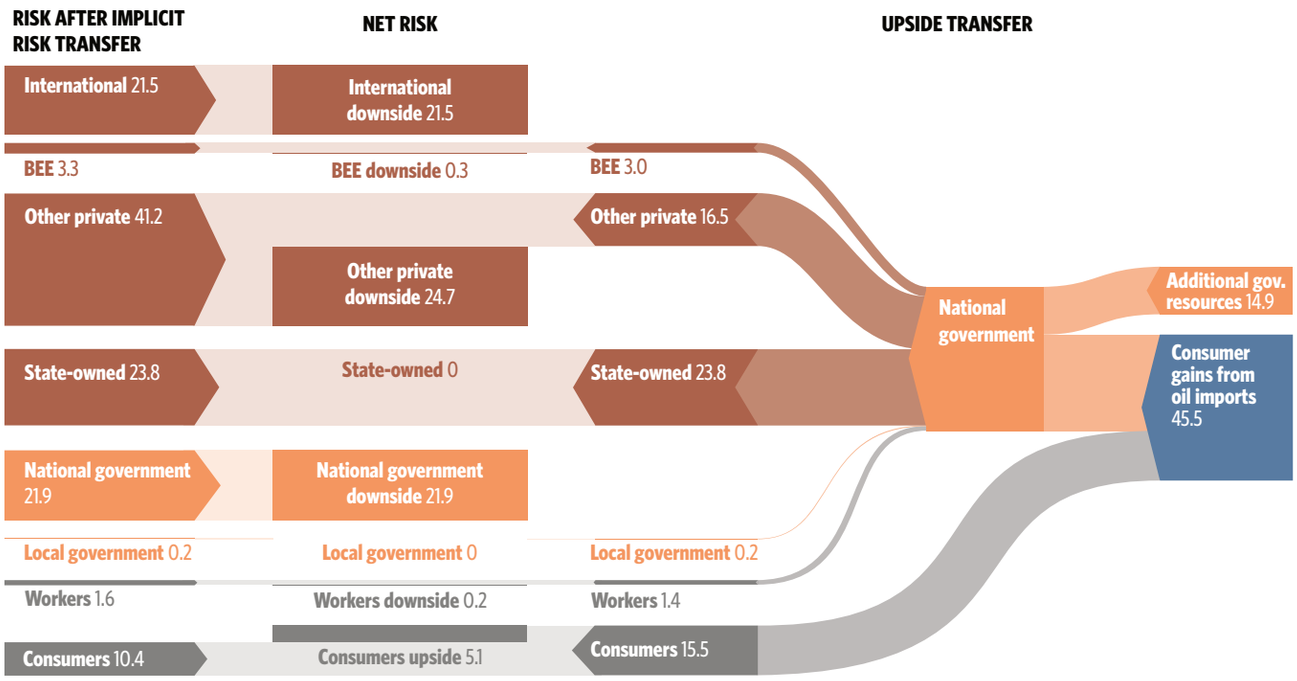
The timing of government action to mitigate transition risk will be critical, especially given the country's limited fiscal space after recent downgrades left the country close to losing its investment grade sovereign credit rating[28], the fast-deteriorating financial position of Eskom and resulting deterioration in the reliability of the electricity supply. Close power plants and fuel production assets too fast and the cost of generating or procuring replacement power and fuel could limit the government's ability to spend on social programmes and have a significantly negative impact on the workers and their communities. Act too slowly and continue to provide finance to new infrastructure predicated on a rise in future coal exports and the country could suffer a rise in debt downgrades and defaults when the expected export demand does not materialise.

By first incorporating transition risk assessment into the planning of government, state owned enterprises and state owned financial institutions, policymakers will be better informed when developing long-term emissions abatement strategies for key emitting sectors, such as coal mining, synthetic fuel production and cement making. They will also be better prepared to make the most of the benefits that a global low carbon transition could bring, particularly a net benefit of more than $40 billion from lower oil prices.

Lower oil prices could dampen the effect of falling coal exports on the balance of payments. A more proactive policy could use the benefit of lower oil prices to offset risks from other sectors. For example, national government might choose to increase taxes on oil products[29], diluting the benefit to consumers but reducing its own risk. Additional fuel tax revenues could be redistributed to parties struggling to bear the negative effects of the transition and/or retained to offset any pressure on the sovereign credit rating, as illustrated in figure ES-3 below.

These recommendations are set out in table ES-3 on the next page.

Figure ES-3: Taxing the gains from a lower oil price could halve transition risk to the public balance sheet



28 We explain the significance of the sovereign rating in box 2, chapter 3.3. In chapter 7 we discuss the potential impact of transition risk on that rating

29 This would likely require an alternative design to the current planned carbon tax, as discussed in chapter 5

Table ES-3: Key recommendations for the South African government

RECOMMENDATIONS	KEY ACTIONS
1. Take stock of the rapidly changing market for South African commodity exports and adapt development and financing plans accordingly.	Adopt a consistent approach to transition risk across South African government and public enterprises Develop fiscal and financial tools to manage risk Consider capturing oil price windfall to offset and manage risks Consider publishing government transition risk analysis
2. Avoid or delay new investments that could add to South African climate transition risk exposure, shift capital allocation to sectors more resilient to transition risk or benefiting from the transition.	Reconsider new investments that could add another $25.8 billion to transition Projects for reconsideration include planned IPPs, coal export rail and port infrastructure, and a new oil refinery Introduce climate transition risk assessments for access to public sector procurements and finance from state-owned banks Prioritise incentives for investment in sectors which are resilient to or benefit from the global transition (eg, renewable energy, EVs, batteries, fuel cells and related minerals, including platinum and manganese).
3. Make risk allocation explicit to reduce unmanaged risks and improve the efficiency of managing those risks.	Clarify responsibility for $38 billion of climate transition risk where the bearer of the risk is currently unclear or not explicit Develop and publish credible plans for managing these unallocated risks
4. Manage the timing and speed of climate mitigation actions and commitments to avoid compounding shocks to the economy.	Develop long term plans to manage the acceleration of transition risks in the early to mid-2020s Initiate scenario planning for early retirement of at-risk assets, including Eskom power plants and Transnet rail lines Develop R&D plans to create new technological options, for emissions abatement (eg, including CCS for Secunda, electric vehicles in the transport sector).
5. Plan for transitions to manage risk to vulnerable parts of the South African economy, such as workers and some investors.	Establish a transparent planning process for at-risk sectors, with earmarked transition funds and a gradual phase out Involve all interested groups in planning, including companies, trade unions, local governments, and the financial sector
6. Shift some risks from that national public balance sheet to other parties, possibly including sub-national governments, to increase risk bearing capacity.	Explore allocation of risks and revenues, particularly between different government levels, to maximise risk capacity Continue with proposed restructuring of Eskom with the aim of putting its finances on a more sustainable footing and hence manage material contingent liability to national government
7. Work with international development finance institutions and other international financiers to address items 4, 5, and 6 within the international context.	Work with international partners to balance global and South African risks and opportunities Seek assistance with financing solutions, underwriting, technical assistance, and potential carbon trades to leverage South African mitigation options

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