



TIPS FORUM 2023

INDUSTRIAL POLICY IN AN ERA OF GLOBAL STRUCTURAL CHANGE: IMPLICATIONS FOR SOUTHERN AFRICA

HOW THE TRANSITION TO A CIRCULAR ECONOMY CAN ASSIST IN A JUST TRANSITION

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Abstract

The circular economy has been identified globally and in South Africa as a model to transition from an inherently extractive carbon-intensive economy to an economy that is locally more attuned, resilient and inclusive. Little attention has been placed on the social dimension of a Circular Economy, which is predominantly framed as a resource focused concept. This is also reflected in South Africa, where the circular economy is predominately seen as a waste management approach. However, in a country with deeply engrained and persistent inequalities the social dimension is of utmost importance. JUST2CE, is a Horizon 2020 project, that investigates and scrutinises the *just* aspect of the Circular Economy. The research question addressed in this paper is: How can the circular economy enable a just transition for South Africa? Two national co-creation workshops and semi-structured interviews were held between March and May 2023 to identify barriers and develop technological and political interventions that are required to transition to a just circular economy following an emerging transition design approach. The collected data was analysed using content analysis to identify common themes. Eighteen and eleven main coding categories were structured for the problem map and perception map respectively. Key challenges that must be considered in a transition include the country's Apartheid history and the consequences thereof today, including the continued lack of access to services and infrastructure, including energy, water, education, and technology 29 years since the first democratic election. Particularly vulnerable populations bear the burden, shaped by spatial, racial, and gender inequalities. Stakeholders hold various perceptions about a just circular economy transition. Stakeholders express concerns about a perceived lack of urgency regarding the crisis. Nevertheless, participants firmly believe that a fair transition to a clean energy (CE) system can effectively tackle societal, environmental, and economic challenges. They are optimistic that by addressing these challenges effectively, seizing opportunities, and prioritizing societal wellbeing, the desired outcomes can be achieved. Nine key areas for enabling a transition were identified. Key recommendations including the development of a comprehensive National Just Circular Economy Roadmap to build on ongoing initiatives. It is essential to develop training programs to empower future workforces aligned with the principles of a circular economy. Additionally, there is a need to re-skill individuals transitioning from traditional sectors to embrace the opportunities in the emerging circular economy industries. Based on reviewed literature the current just transition discourse in the country is driven by climate change adaptation and mitigation and has not sized the potential of the circular economy as an overarching framework yet. The just transition in South Africa strongly focuses on labour in the energy sector. Other dimensions such as environmental justice, gender, and governance need to be included.

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Katharina Gihring is an executive member of the African Circular Economy Network (ACEN) and currently coordinates and implements projects such as Horizon 2020 JUST2CE, Circular South Africa and South Africa Circular Economy Hotspot 2024. Her background is in systems thinking, Life Cycle Sustainability Assessment, ecology and environmental management. Katharina's main focus is on the circular economy and how this concept can be implemented in a just-way in the (South) African context. Her experiences reach from multidisciplinary and mix-method research, research coordination, stakeholder engagements, project management, event coordination, action plan development to educational facilitator.

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Abbreviations

CE – Circular Economy

CPI - Corruption Perception Index

GBV – Gender-based Violence

GHG – Greenhouse Gases

HIV - Human Immunodeficiency Virus

PCC – Presidential Climate Commission

SD – Sustainable development

STI - Science, Technology and Innovation

TB - Tuberculosis

1 The Circular Economy and *Just Dimension*

On a global scale, five of the seven biophysical boundaries¹ are overshoot which does not allow for a safe and just operating space for our societies (Fanning et al., 2021). On average a country overshooting one biophysical boundary leads to the achievement of one more social threshold² such as life satisfaction (Fanning et al., 2021). Thus, a trade-off between social development and environmental degradation occurs (Fanning et al., 2021), which is due to the linear economy that is inherently wasteful.

The circular economy (CE) is promoted as a way to transition from a linear economy. At the core the CE is a regenerative economic system with a fundamental principle to design out waste and pollution, keep materials at their highest value and regenerate nature (Ellen MacArthur Foundation, 2013). We argue that the CE should also regenerate humans which includes societies, communities and individuals. There are many definitions of the CE. Research institutions and the International Organisation for Standardization (ISO)³ are trying to define the CE, but these definitions might have very little use for practical implementation (Kirchherr et al., 2023). The economic benefits of a transition towards a CE have been estimated to create \$4.5 trillion (Lacy and Rutqvist, 2015). A global green economy has been estimated to create additional 24 million jobs, which could replace the 6 million jobs that will be lost due to a transition (International Labour Organization, 2018).

However, the socio-economic development opportunities have not been well understood in the CE debate and have rather been seen as a by-product of the transition (Ripa et al., 2021). Positive social impacts will not happen by merely implementing a CE. A CE transition needs to be carefully designed to decrease negative impacts on affected communities, livelihoods and society at large (European Commission, 2022). If not well designed and implemented a CE can have negative social consequences e.g., e-waste or clothing being declared as second-hand goods and dumped in the emerging economies, thus shifting negative environmental and social burdens to other countries. However sustainable development (SD) is receiving increasing attention as part of the CE debate and CE is seen as the vehicle to achieve SD (Kirchherr et al., 2023). Social equity and the just transition are also more frequently discussed in the academic literature (Kirchherr et al., 2023). These discussions need to go beyond the academic realm and also be taken up in the private and public sectors.

The labour aspect is only one part of the social dimension that needs to be considered in a transition, but will be used as an example to demonstrate the current debate. A recently published study took a deep dive into the global labour aspects of the CE and found five key findings (Circle Economy et al., 2023).

1. Most employment gains will be measured in Europe due to the first mover advantage around reprocessing and recycling.
2. The informal sector is still invisible in most policies even though 60 percent of the world population works in the informal sector, which is especially applicable to the Global South.

¹ Biophysical thresholds of the study are: CO₂ emissions, Phosphorus, Nitrogen, Land-System Change, Ecological Footprint and Material Footprint.

² Social thresholds of the study are: Life Satisfaction, Life Expectancy, Nutrition, Sanitation, Income Poverty, Access to Energy, Secondary Education, Social Support, Democratic Quality, Equality and Employment.

³ ISO/TC 323 Circular Economy

3. To allow a just transition to happen, re-skilling and access to capacitation will be required to allow for a workforce to transition with the new economic paradigm.
4. The CE is believed to address poverty. However, current CE practices taking place in the Global South are centered around waste, which frequently exposes workers and surrounding communities to unhealthy living and working conditions.
5. The female employment opportunities will increase in a CE, however very few studies have investigated the impacts on migrant workers and the youth.

Current research focuses on gains in job and employment opportunities, however other indicators like the type of work that is created, under which condition the work takes place, who will benefit etc need to be addressed (Circle Economy et al., 2023). The current studies focusing on labour in a CE are highly skewed toward the Global North where 84 percent of the studies were conducted (Circle Economy et al., 2023). Primary stakeholders in the transition are the formal and informal workers, especially those in the Global South (Meira et al., 2023). To make the CE just it requires an inclusive process (procedural justice) where marginalised groups and parties are included, represented and have an equal voice (Meira et al., 2023). Shifting the CE narrative to a more humancentric narrative has been discussed in previous literature where the Human Development Index (life expectancy, education and income per capita) was combined with the CE (Figure 1).

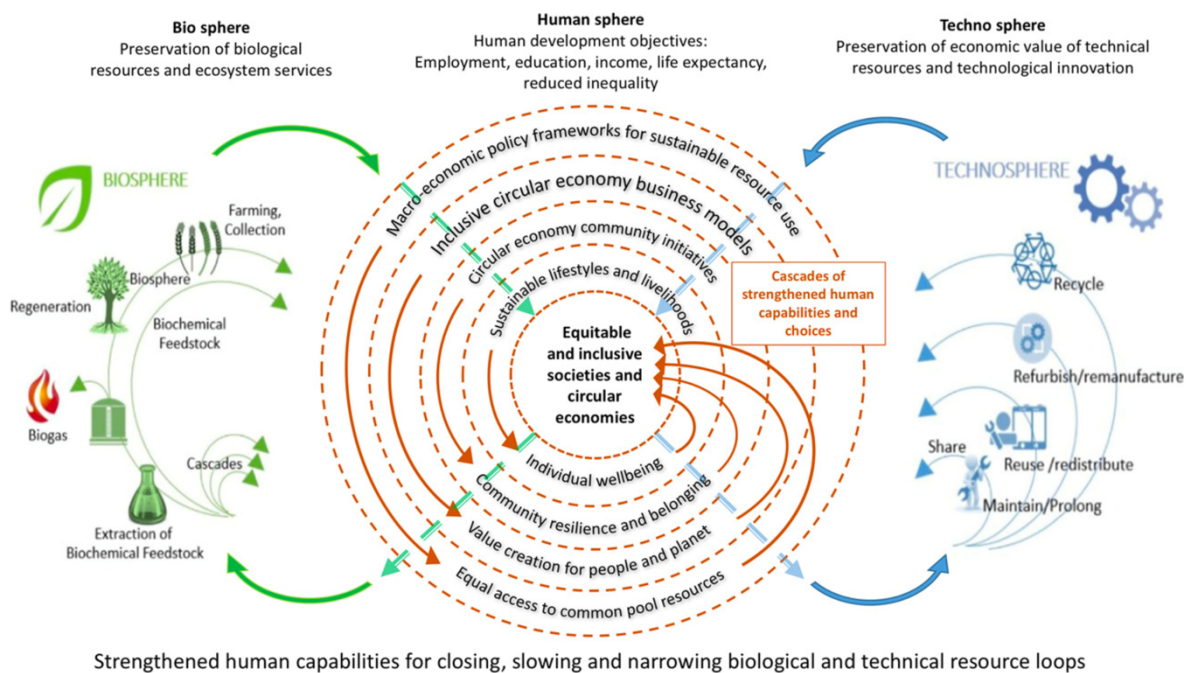


Figure 1 -Proposed framework that integrates a human centric approach into the CE. Figure by (Schröder et al., 2020).

If the CE is regenerative at its core then it should be implemented in a way where fundamental human needs are met (subsistence e.g. food and clean water, shelter; protection e.g., health and safety; affection; understanding; participation; recreation; creation; identity and freedom) (Max-Neef, 1991). This would also suggest that the CE addresses environmental justice and gender justice. This is what the Horizon2020 funded [JUST2CE](#) project aims to identify. The aim of the project is to understand, in a critical and thoughtful way, under which conditions a responsible, inclusive and socially just transition to a CE is possible and desirable, what technical, geopolitical and social factors can enable

or hamper such transformation and how these aspects can contribute to the development of transitional policy measures. The [African Circular Economy Network](#) (ACEN) is participating in the JUST2CE consortium with the focus on South Africa.

This paper combines the results of the South African JUST2CE co-creation workshops with a literature review on the CE in South Africa and the just aspect thereof. Thus, the research question was: How can the CE enable a just transition for South Africa?

1.1 The Circular Economy in South Africa

The CE term is nascent in policy discussions in South Africa, and for the first time mentioned in a white paper in 2019 by the Department of Science and Innovation (Department of Science and Technology, 2019). The CE is gaining popularity across South Africa, where policies, legislation and initiatives are being developed to promote it (e.g., Extended Producer Responsibility, SA-H2 fund, Circular Innovation South Africa, Circular South Africa etc). However, the CE is widely seen as a waste management and recycling approach in the county rather than a holistic tool that might productively break silos and connect stakeholders across communities, sectors, and government departments.

Currently, South Africa is approximately 7 percent circular (von Blottnitz et al., 2021), which is slightly lower than the global average of 7.2 percent in 2023⁴ (Circle Economy, 2023). From a resource perspective the current linear economy of South Africa is illustrated in Figure 2. The South African economy is largely extractive with little domestic stock building. Extracted resources are exported and not further processed in the country, while the required infrastructure development is not taking place (von Blottnitz et al., 2021). Fossil fuels like coal and imported oil are the main energy sources of the country (von Blottnitz et al., 2021). Circularity takes place around post-consumer packaging by the informal sector which recovers packaging for recycling, while some construction and demolition waste is also reused in informal settlements (von Blottnitz et al., 2021). Ecological cycling takes place, but industrialised agricultural and forestry practices that do not regenerate the ecosystems are of concern. These practices are reliant on e.g., heavy use of synthetic fertilizers, pesticides and heavy machinery (von Blottnitz et al., 2021).

⁴ The global average of circularity was 9.1% in 2018

Material flows, RSA 2017

All numbers in Sankey in Mt (1,000,000 t)

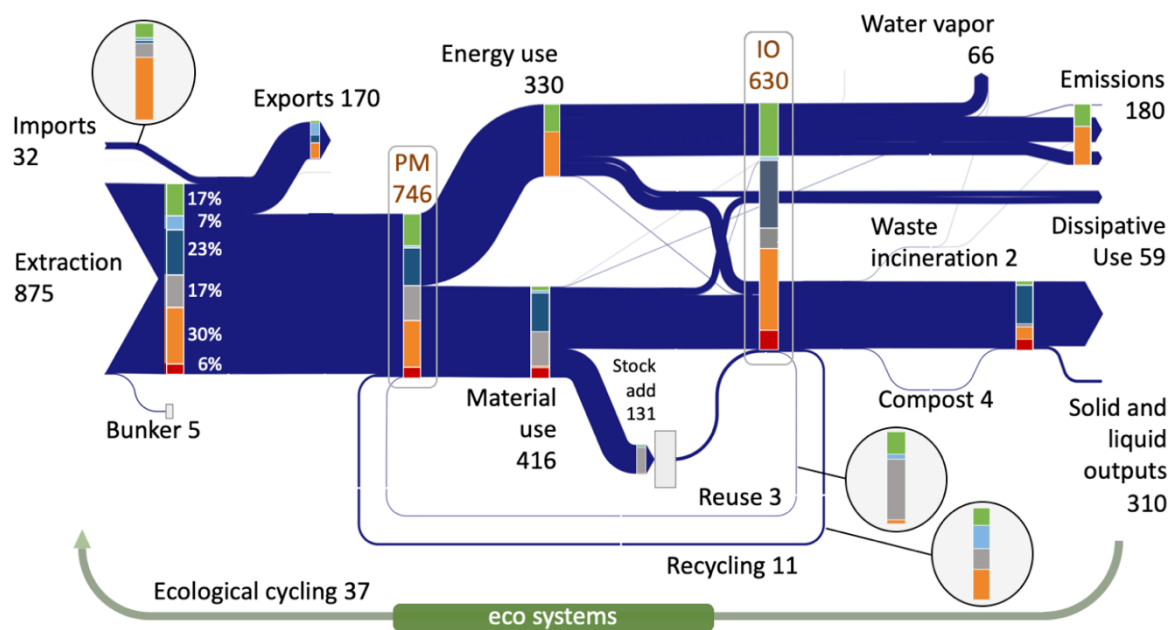


Figure 2 - The estimated materials flows in South Africa for 2017. Figure from von Blottnitz et al. (2021).

While the concept of a just transition is common in the energy sector, the social dimension of the proposed circular transition, is currently given little attention in relation to the country’s CE agenda. Bringing the discussion to the forefront is especially important in a country with one of the world’s highest Gini Indexes (67 in 2018) (The World Bank, 2022). A CE transition needs to be carefully implemented keeping in mind that the different systems and sectors are interlinked. Interventions will have impacts on other sectors or changes in policies might either enhance or slow down a transition (Nahman et al., 2021).

1.2 The Just Transition in South Africa

The development opportunities that can be enabled through a CE especially the just aspect has not been well researched and understood for South Africa, which should go beyond the simplified indicator of job creation. In South Africa, a strong focus has been put on the informal sector which drives parts of the CE in low- and middle-income countries through waste valorisation (Wright et al., 2019). Even though the informal sector and the labour dimension is absolutely crucial in a transition towards a just CE other aspects such as environmental justice, gender justice and governance must be accounted for.

Environmental injustice, is mainly driven by the exponential growth of the linear economy, with the Global South carrying most consequences (Meira et al., 2023). The current economic model leads to negative environmental and social costs especially to those countries that have little ability to address these issues (Meira et al., 2023). In a CE, exponential economic growth cannot be carried forward and a degrowth trajectory is required where an increase in current energy use and material extraction needs to be decreased (Lehmann et al., 2022). Further, to address environmental injustice international and national policies and trade agreements need to be understood in the context of systems and be developed and implemented with keeping trade partners and the social dimension in

mind. For example, the European Union has determined the critical raw minerals that are required to decarbonise (European Commission, n.d.). However, many developing countries in which these minerals are extracted do not have such a strategy in place. This makes countries vulnerable to being left behind and not adequately protecting their resources. Thus, it is necessary to apply distributional justice while transitioning to address who carries the transitioning cost and where (Meira et al., 2023). Additionally, plundering of resources and dumping of waste in the Global South needs to be addressed as well as the impacts caused by climate change and environmental destruction.

A good example is the mining sector. South Africa has 18 critical/strategic minerals which are of importance to the country's economic development, modern technologies (4th Industrial Revolution and clean energy) and industry but have limited supply left and are vulnerable to disruption (Khan et al., 2021). Even though mining is a key sector to allow for a low carbon economy by mining minerals required for manufacturing e.g., renewable technologies it also has negative environmental and social impacts. For example, mining gold contributes largely to acid mine drainage releasing toxic pollutants into downstream waters (Chetty et al., 2021), which in turn affects communities that are reliant on water catchments and rivers. As one article states 'mineral mining in southern Africa is among the most hazardous occupations in the world' (Stuckler et al., 2013, p. 1) because miners are exposed to dust particles during work.

For a **gender**⁵ just CE, values and norms need to be rethought as our current economic system values services and manufacturing of products and does not account for the low-value economy of care and reproductive work, (mostly) carried out by women. Thus, the CE can also challenge current values held by countries at large and promote value around paid and unpaid work. A "CE must aim at closing the loop between productive (i.e. valued) and reproductive (i.e. devalued) work" (Martínez Álvarez and Barca, 2021). Women spend more than double the time on domestic and care work compared to men (Poverty and Inequality Initiative, 2019). Gender plays a particular role in South Africa. Gender-based violence (GBV) is a present issue in the country because 13,000 women were victims of assault in the third quarter of 2022 (South African Police Service, 2022). It is even more disheartening that the country is called the 'rape capital of the world', where it is estimated that every three hours a woman is raped (Govender, 2023). GBV leads to direct and indirect health impacts such as unwanted pregnancies, mental illness, and the transmission of sexually transmittable infections. Consequently, women and girls are especially vulnerable to a HIV infection (Govender, 2023). Higher levels of violence is also experienced by people that belong to a sexual⁶ and gender⁷ minority group, even though the constitution of South Africa is by global comparison progressive (Müller et al., 2019). Additionally, women, especially black women are less likely to be employed, have less financial means available, and depend more on social grants and/or family support for income (Maseko, 2021). Thus, gender and racial justice needs to be well integrated into any kind of CE interventions.

Governance and corruption has not been addressed under the JUST2CE project, but must be mentioned in the context of South Africa and its just CE transition. There is a two-way relationship

⁵ Gender is not a synonym for women and refers to 'socio-cultural norms, identities and relations that, together, shape and sanction "feminine" and "masculine" behaviours, and which are complex and change across time and place' (European Commission Directorate-General for Research and Innovation, 2020).

⁶ In the study participants were considered a sexual minority if they did not identify as heterosexual.

⁷ In the study participants were identified as gender minority if they reported different gender identity than the gender assigned to the person at birth and those who identified as transgender women or men, gender non-conforming or other.

between corruption and good governance (United Nations Office on Drugs and Crime and Global Resource for Anti-Corruption Education and Youth Empowerment, n.d.). On one hand, if good governance is not practiced through establishing principles and structures to enforce it, corruption can occur (United Nations Office on Drugs and Crime and Global Resource for Anti-Corruption Education and Youth Empowerment, n.d.). On the other hand, good governance can be weakened and inhibited through corruption (United Nations Office on Drugs and Crime and Global Resource for Anti-Corruption Education and Youth Empowerment, n.d.). Thus, good governance and corruption have a vicious relationship with one another. When principles of transparency, accountability, and the law are violated, corruption can thrive (United Nations Office on Drugs and Crime and Global Resource for Anti-Corruption Education and Youth Empowerment, n.d.). Poor governance and corruption disable good service delivery, stagnate economic development, and can hamper democracy. South Africa scores 43 out of 100 on the corruption perception index (CPI) in 2023, where 0 means highly corrupt and 100 means clean (Transparency International, 2023). State capture a word intrinsic to South Africans is a form of corruption and occurs 'when the ruling elite and/or powerful businessmen manipulate policy formation and influence the emerging rules of the game (including laws and economic regulations) to their own advantage. The captured economy is trapped in a vicious cycle in which the policy and institutional reforms necessary to improve governance are undermined by collusion between powerful firms and state officials who extract substantial private gains from the absence of clear rule of law' (Lugon-Moulin et al., n.d.). The impacts of state capture, especially under President Zuma's years, will be long felt by the country and contribute to slow economic recovery and poor response during time of disaster (COVID-19 and Durban floods). Even worse is that the parliament is deemed to be unable to prevent another state capture from happening according to Chief Justice Zondo (Njilo, 2022). Good governance and eradication of corruption are required to allow for a just CE transition to take place.

The CE can be used as a vehicle to support the journey of decreasing corruption and enhancing good governance by creating a shared national vision which ties back to the National Development Plan 2030. A transition requires substantial investment in research, innovation, and implementation of streamlined roadmaps, masterplans and action plans. National and foreign investment needs to be mobilised which is more difficult if the country is perceived as a risk due to corruption. A CE also requires accountability and transparency not only from how materials and investments flow through the South African economy, but also how it contributes to the socio-economic development of the country. Developing and streamlining policies will be required to create an enabling environment for a CE, which requires enforcement and thus functioning governmental entities that are not in the grip of state capture. Trust in a functioning government that can deliver on its core mandate is at an all-time low in South Africa (Moosa and Hofmeyr, 2021). However, trust is required for a successful transition to a CE. This requires active participation and buy-in from the public. A shared vision of CE that is driven by the public and private sector in a transparent manner speaking to the different needs, can be used as a tool to foster trust. Technologies, which are required to enable a CE such as blockchain, can be used to create traceability in value-chains but it can also be used to make finance transaction traceable, transparent and auditable to decrease opportunities for corruption if carefully implemented (World Economic Forum and IDB, 2020). Fostering of partnerships and collaboration among the different stakeholders are key to enable a systems perspective, which can also create better accountability and transparency to foster good governance.

State functions required to enable a just transition in the energy sector have not been identified in a holistic manner which makes it difficult to allocate responsibilities and resources to the different state agencies, which work in silos (Makgetla, 2021). Further, the mandate of state agencies are expanded

often in a vague manner without increasing the entities capacity (Makgetla, 2021). Thus, government agencies are not coordinated and lack required collaboration to implement a just transition. This leads to fragmented policies, strategies and the implementation thereof (Makgetla, 2021). Further, bureaucratic processes do not allow for agility and thus hamper adaptation when circumstances change (Makgetla, 2021). These findings can also be applied to other economic sectors.

Financing the just transition is another matter that requires careful consideration. An initial investigation into financing the just transition of the energy sector in South Africa demonstrated that project's with high just transition ambitions are less likely to be funded by the current financial ecosystem (Lowitt, 2021). This requires a change in the financial ecosystems and that new mechanisms need to be developed (Lowitt, 2021). The quantity of funding availability is a challenge but more so is the appropriate allocation of the funds (Lowitt, 2021). Currently, there is a great gap of evidence on the interventions required to increase and appropriately deploy just transition funding (Lowitt, 2021).

The current just transition discourse in the country is driven by climate change adaptation and mitigation and has not seized the potential of the CE as an overarching framework yet. The energy sector is at the forefront of just transition discussion. The Presidential Climate Commission (PCC) has put forward a Just Transition framework to start coordinating initiatives as there was no clear vision, principles and interventions across key sectors (Presidential Climate Commission, 2022). Coal, automotive, agriculture, and tourism are sectors that will be strongly affected by climate change through climate change itself e.g., limited availability of resources such as water and the necessary shift of sectors e.g., from coal to renewable energy. Interventions for each sector have been put forward under the framework (Presidential Climate Commission, 2022). The framework itself is not exhaustive and concrete actions as part of a roadmap need to be developed. However, the framework speaks to aspects of a just CE where the CE is reorientated towards a humancentric concept, which fulfils fundamental human needs and a resilient future for all is created giving special attention and resources towards the most vulnerable in South Africa.

Globally, 55 percent of the current Greenhouse Gas (GHG) emissions can be addressed by implementing renewable energy and other measures to create energy efficiency. However, the other 45 percent of GHG emissions can be tackled in the way goods are produced and land is managed⁸ (Ellen MacArthur Foundation, 2019). Thus, the CE is a way of addressing the current challenges in a systematic way without focusing only on the energy sector, but also on other key sectors. Driving a CE for South Africa will allow to integrate a just transition in a context that is deeply shaped by inequalities and specific socio-economic and geographic challenges.

2 Method

As part of the Horizon2020 JUST2CE project, national co-creation workshops were held in different countries with the aim to create a number of scenarios to implement a transition to a just CE and reflect on potential policy actions that could be implemented to achieve them. The South African workshops took place in Cape Town (14/03/2023) and in Johannesburg (30/03/23), where a multitude of different stakeholders from the public and private sector were represented (Figure 3). The

⁸ The study only investigated the following key areas of cement, aluminium, steel, plastics and food for CE interventions (Ellen MacArthur Foundation, 2019). The CE can be applied across other key areas as well.

roundtable discussions were structured according to an adapted emerging transition design approach by Irwin (2018).



Figure 3 – Workshop participants discussing during the Johannesburg workshop.

2.1 Workshops and Interviews

The roundtable discussion consisted of three separate rounds, with a total duration of approximately three hours. Firstly, a problem map was created identifying barriers on the political, economic, sociological, and technological dimension to a just transition (What challenges do we face to achieve a just circular economy in South Africa?). Secondly, fears/concerns, hopes/desires, and assumptions of the stakeholders about a just transition, also in relation to the barriers identified earlier, were mapped out (How do we understand a just circular economy transition in South Africa?). Lastly, the stakeholders were encouraged to engage in backcasting for an ideal South Africa in 2050 where a just CE has been achieved by developing a transition pathways to reach this (What are required political and technological interventions to achieve a just CE in 2050 in South Africa?). Projects and goals to achieve a just CE by 2050 were identified, mostly focusing on political and technological projects, initiatives, and policies while the social dimension was always considered. Additionally, to the workshops, eight semi-structured interviews were conducted. The interviews followed the same steps as the workshop.

2.2 Coding

The data was transcribed, analysed, and a relational content analysis with a deductive approach was conducted, with categories being added and revisited throughout the coding process. For the problem map 18 main coding categories were structured. For mapping stakeholders' perceptions 11 main coding categories were created. The codes were divided into 1st to 4th tier codes, with the 1st tier codes being the main codes. Second to 4th tier codes were marked with coloured circles to demonstrate in

which category (social, economic, political and technological for the problem map and hopes/desires, fears/concerns, and assumptions for the perception map). On the problem and perception map, some of the codes used were identical. Moreover, aspects that were mentioned particularly often during the workshops and interviews are marked in grey. The knowledge and insights generated during the backcasting exercise were used to develop nine key categories focusing on interventions, projects, and policy recommendations to transition to a just CE.

3 Outcome of the Workshops

The outcomes of the workshops have been structured according to the three workshops steps. All results presented are opinions of stakeholders which took part in the workshops and interviews.

3.1 Problem Map

There are various challenges that must be accounted for and overcome in a transition to a more just society and CE (Figure 4).

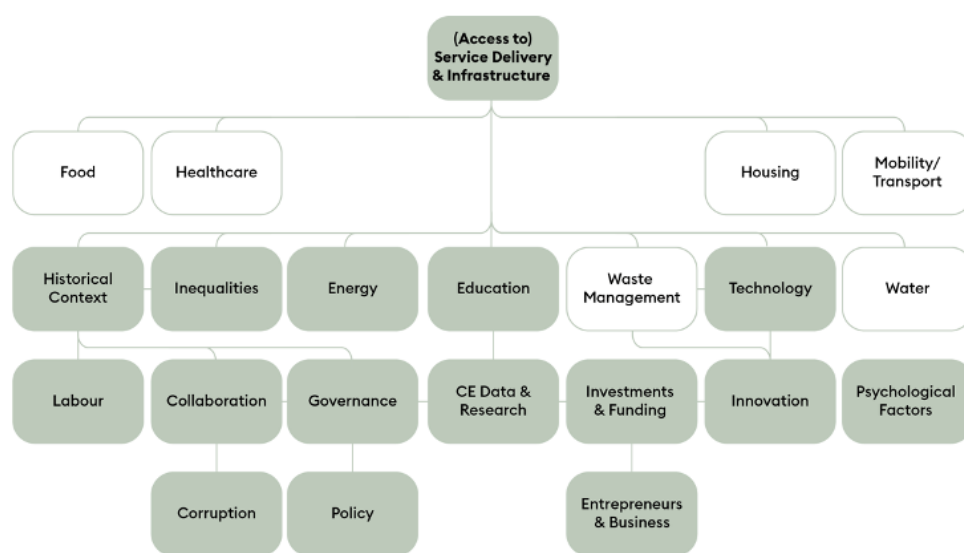


Figure 4 -The 18 coding categories for the problem map.

The lingering effects of SA’s **Apartheid** history continue to cast a shadow on the nation today. Significant structural issues and disparities in outdated infrastructure and **services and access** to it are a consequence of Apartheid still present today. Particularly vulnerable populations bear the burden, shaped by **spatial, racial, and gender inequalities**. The combination of inadequate **infrastructure** within a divided nation, creates unequal access to, **education; housing; transportation; energy; water; food; health care; waste management; and technology**. This not only hinders individuals in accessing opportunities to improve their livelihoods and quality of life, but also has detrimental environmental effects. For example, loadshedding impacts the life and businesses of many negatively, while also leading to water supply issues and contamination thereof. **Unemployment**, particularly among the young generation, is a pressing issue in South Africa, with many engaging in the informal sector, leading to many cross-cutting issues. However, unemployed people can be regarded as an “untapped resource [...] that actually need to be an activated part of the economy”. Economic empowerment, particularly of the vulnerable, is inevitable in a just transition. Occupational segregation between genders, race, unequal pay, and lack of compensation for household and care

work creates disparities in the labour market. Women have a greater lack of access to education, and societal expectations to be caretakers. This creates barriers to access opportunities in the labour market. Empowering women in the labour market can address issues around GBV, create greater access to opportunities and resources and ultimately a more inclusive and equal society.

The lack of education in general, and education regarding circularity and sustainability was identified as a barrier to a just transition. This lacking knowledge, particularly within academia, politics, and businesses hinders the integration of CE practices in behaviour, decisions, actions, and policies. Education as the 1st tier code with the sub-codes are presented as an example in Figure 5.

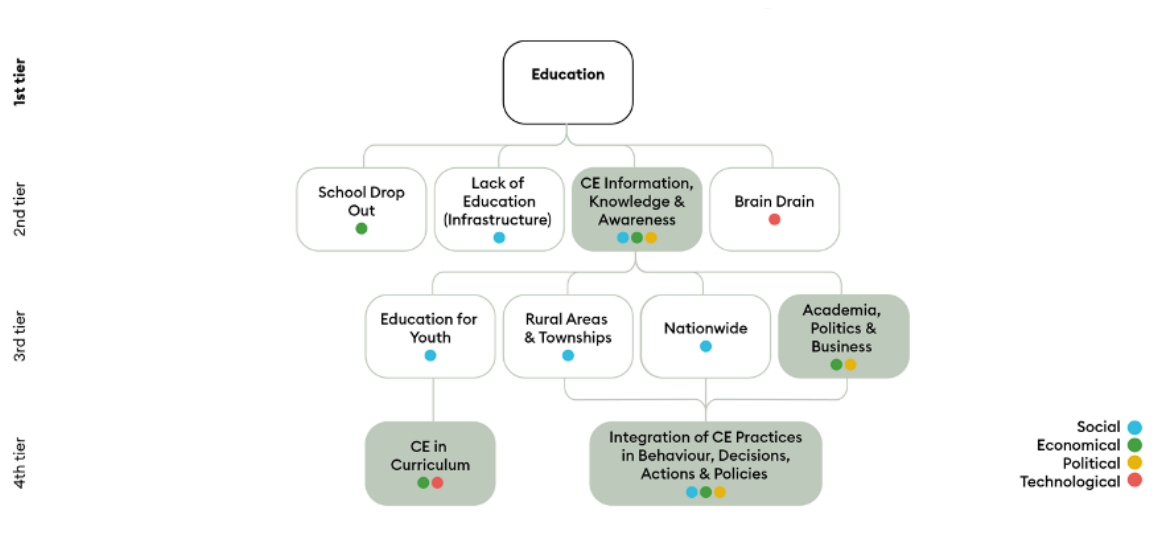


Figure 5 - Education is one of the 18 codes that were coded for based on the workshop results for the problem map.

Inequalities are perpetuated across generations and a lack of **social cohesion, trust, and safety** within society only enhance these issues. These issues create a difficult playing field for a just CE transition. Stakeholders worry that inadequate **knowledge, data, and awareness about CE** concepts and practices across the nation, but particularly within politics and businesses, hinder informed decision-making to foster CE practices. They worry that this lack of knowledge also hinders **funding and investment** into CE **innovations**, restraining CE practices uptake. This is further hindered by current lacking **CE policies** and ineffective implementation of existing policies; lack of **collaboration** between government departments and sectors; and **short-term planning**. A lack of **funding and investment** also hinders local CE **technology** development and the adaptation of technology from other countries. Market obstacles, such as lock-in effects, an unstable South African economy, and lack of economic incentives hinder the uptake of CE businesses practices across South Africa. Lastly, adjusting **beliefs, values, norms, and values** is a long and **difficult** process, but required for systems change. Fear of an unknown future, lack of interest in a CE, and lack of will to change, while idealising materialism, consumerism, and growth with much social value being placed on ownerships creates a barrier to a CE (Figure 6). If aiming to transition to a just CE these barriers must be overcome. This must be done through a systems approach and accounting for the consequences that changes in one area have on another.

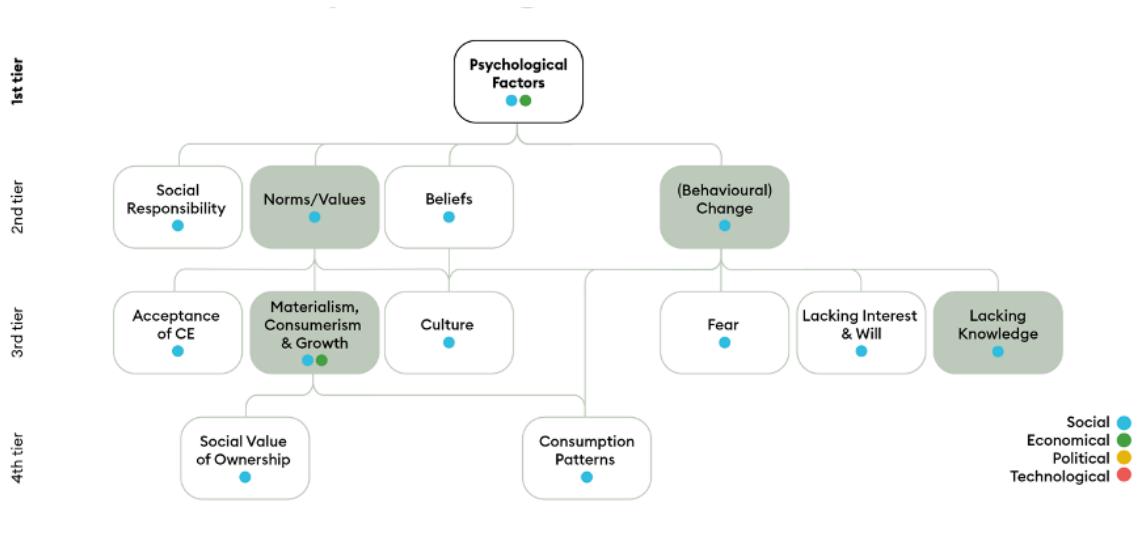


Figure 6 – Psychological Factors is one of the 18 codes that were coded for based on the workshop results for the problem map.

3.2 Perception Map

Stakeholders hold various fears and concerns about a just CE transition. These go hand in hand with hopes, desires, and assumptions that were identified around a just CE transition to overcome these concerns (Figure 7).

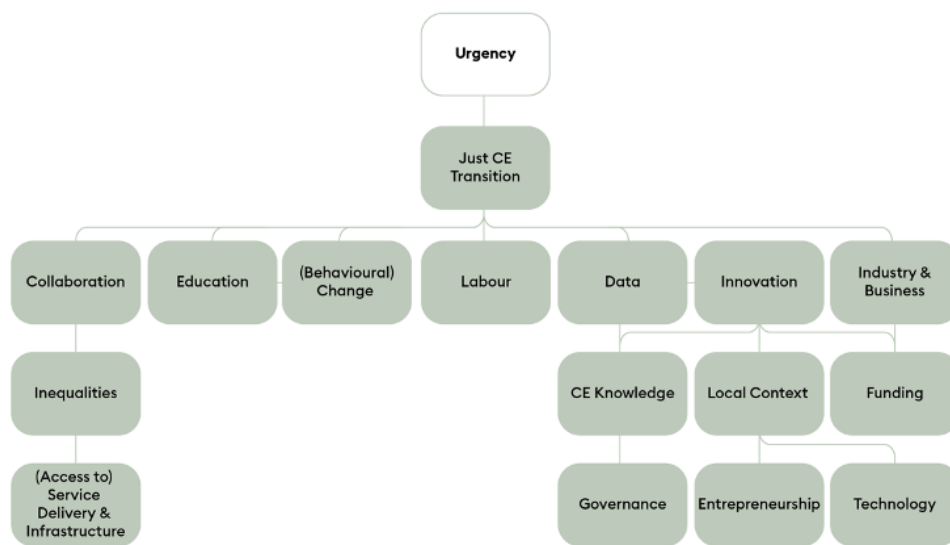


Figure 7 - The 11 coding categories for the problem map.

Stakeholders are afraid that there is a lack of understanding the urgency of the crisis, whilst there is also “no choice but to switch to a more sustainable economy to have a liveable world for the next generations”. Thus, stakeholders hope that existing pressure creates an opportunity to transition. Stakeholders are concerned that despite a CE transition aiming to be just, inequalities; the lack of access to services and resources; crime; and violence will persist. However, a transition was viewed as an opportunity to tackle these issues and enhance the quality of life for all. Moreover, it is feared that individualism, silo thinking, and a lack of social cohesion will hinder a just transition. Stakeholders hope that a just transition will focus on inclusivity, participation of all, the empowerment of communities, and collaboration across and within sectors. This will aid to create a common vision for a just transition.

The present lack of understanding of a CE, data, funding, lock-in effects on the market and profit-oriented industries are concerning in a transition. Current profit-oriented industries create a lack of affordability and accessibility to circular products and services. Stakeholders hope that increasing education (around a CE), data, innovation, and pilot projects can help to overcome this current barrier. This would ultimately make a CE more affordable, accessible while it must account for the local context. Increased knowledge around a CE, data, and education particularly to inform decision makers is hoped to increase evidence-based policy making, prioritisation of a CE and lead to more accountability in politics, ultimately eradicating barriers to a transition (Figure 8).

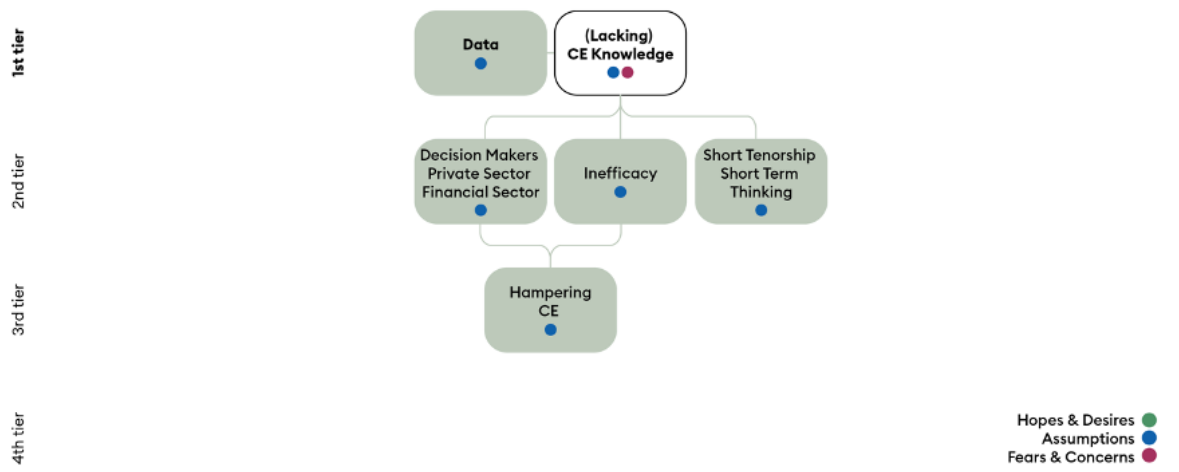


Figure 8 - Knowledge is one of the 11 codes that were coded for based on the workshop results for the perception map.

Stakeholders are convinced that a just CE transition will address societal, environmental, and economic challenges if these are addressed effectively, opportunities are utilised, and societal wellbeing is regarded as the ultimate priority.

To overcome the identified barriers and challenges nine key areas were identified that are particularly important to be addressed within a just CE transition. The nine key areas were:

1. Governance
2. Education and capacitation
3. Awareness and engagement
4. Research
5. Roadmaps, strategies and policies
6. Economic Sectors and new business models
7. Communities and municipalities
8. Partnerships and collaborations
9. Standardisation and accreditation

Stakeholders emphasised that the socio-geographic context must be accounted for where circularity is integrated into existing structures. It was highlighted that collaboration between and within sectors, while taking a system approach is of utmost importance to foster a just CE transition.

4 Way Forward

Globally the CE discussion has been very resource focused (Kirchherr et al., 2023, 2017), however a slow but gradual shift is observed where the social and environmental impacts are not just viewed as a by-product of implementing a CE but require conscious inclusion in any type of transformation of the current economy (Circle Economy et al., 2023; Circle Economy and Goldschmeding Foundation, 2022; Nahman et al., 2021; Schröder et al., 2020).

4.1 Recommendations

The workshops demonstrated that the CE as a concept is present in the South African context, however understood to different degrees and frequently still seen as a waste minimisation or recycling exercise. The CE can be viewed as a development opportunity to create alternative work opportunities for the country, but further discussion on how some of the most critical social-economic issues are addressed by the concept have been neglected which have been further unpacked in this paper. Four of the nine key areas have been summarised as recommendations below. In depth recommendations can be found in the workshop report which will be published in the [JUST2CE e-library](#).

4.1.1 Developing a National Circular Economy Roadmap

The South African government should develop a comprehensive National Just Circular Economy Roadmap that outlines the country's vision, goals, and roadmap for transitioning to a just CE. Key aims of the roadmap would be to enable a CE for the country which also realises fundamental human needs for the people of South Africa. The roadmap should involve multi-stakeholder engagement, including government agencies, businesses, civil society organisations, and academia, to ensure a participatory and inclusive approach. The roadmap must build on ongoing initiatives such as the forthcoming Science, Technology and Innovation (STI) led cross-sectoral Circular Economy Roadmap, A Framework for a Just Transition in South Africa, National Development Plan 2030, Operation Phakisa, Eco-Industrial Parks Programme, Circular Innovation South Africa and Circular South Africa.

4.1.2 Employment creation, education and skills development

Review and rethink the curriculum (NQF Level 1 to 10) to integrate just CE in all curricula including vocational training. New training and tertiary degrees need to be developed to capacitate future workforces that are geared towards a CE. Design skills development programs to support the transition of workers from traditional sectors to new CE sectors. Teachers need to be educated on critical and systems thinking. Prioritize investments in areas with high unemployment rates and promote entrepreneurship and small and medium-sized enterprises in CE sectors. Develop and capacitate government officials to integrate CE into strategies, policies, tenders etc.

4.1.3 Research

Conduct large cross-sectored quantitative and qualitative study which identifies sectoral and cross sectorial CE interaction opportunities, based on a mapping exercise of ongoing initiatives and existing resources. Collect and create accessible databases that contribute to a just CE acceleration to measure 'true' circularity of all products and services to inform evidence-based decisions/strategies. This would require developing social, environmental and economic indicators, which are applicable to South Africa. Data could be used for example in material passports. Research on CE driven public procurement to identify the opportunities to drive the CE through public procurement was recommended.

4.1.4 Governance

Corruption is a massive barrier to drive socio-economic development and the just CE transition in South Africa. The aim is to address, decrease, and as far as possible eradicate corruption. The issue of corruption can be tackled by supporting anti-corruption initiatives, enhancing transparency, and building trust between civil society and the government. Clear and reliable policy can foster an enabling environment for CE initiatives. Policies can be a tool to increase incentives, subsidies, and mitigate risks when implementing CE projects and initiatives.

4.2 Discussion and Conclusion

This research identified five constraining and four enabling factors for a just CE transition. A just CE transition may be challenging to implement due to deeply engrained systemic inequalities and structural challenges that are present in SA. Economic and political considerations, resource limitations, lacking data and information, and resistance to change are aspects that must be particularly accounted for when designing a just CE transition.

Factors that were identified as enabling for a just CE transition were transparent and accountable political will and leadership, stakeholder engagement and collaboration, education and awareness around CE, and enhanced innovation and technology to foster uptakes of circular products and services.

To realistically drive a systems shift as is required for a just CE transition, there must be a balance between the urgency to drive change and preventing too high expectations of immediate change, accounting for practical realities and the feasibility of implementation on the ground. To do so, prioritisation, considering trade-offs and long-term planning is essential. The allocation of natural, financial, and human resources as well as the socio-economic and geographic context must be considered.

From the reviewed literature it is apparent that the current just transition discussions in South Africa are strongly focuses on the formal labour dimension in the energy sector including mining for coal. However, the CE has not been appreciated as a vehicle to deliver on a just transition. It is apparent that the CE is not inherently going to deliver on a just transition if interventions are not holistically designed (Circle Economy and Goldschmeding Foundation, 2022). We propose to broaden the focus in two ways. Firstly, the focus of a just CE transition also requires to include gender justice, environmental justice and good governance besides the labour dimension. Some topics like governance and restorative justice which speaks already to environmental justice have been discussed in the ongoing just transition debate (Lowitt, 2021). We acknowledge that race has not been discussed in this paper but needs to be included, due to the 'racialised nature of inequality in South Africa' (Maseko, 2021, pg. 11). Secondly, the focus needs to go beyond the energy sector and requires to include other resource intensive sectors such as water (like energy is cross-cutting), agriculture, manufacturing, mobility and human settlements as well as mining including other critical and strategic minerals besides coal. As previously alluded to a transition will impact workers of sectors which will transition towards a CE, however other impacted stakeholders along the different supply chains as well as communities need to be considered too.

A just transition to a CE in South Africa requires a comprehensive and collaborative effort from all stakeholders. It also requires collaborative and inclusive leadership to foster co-development of power, agency and directionality to lead individual and collective transformation (Sewchurran et al., 2023). The current CE ecosystems is rather small and fragmented in South Africa. South Africa's

government and also the private sector have not started coordinating CE initiatives, even though a truly just CE transition will require intense coordination and participation of affected people and society at large. A quadruple helix approach, where government, private sector, academia, and civil society join forces around a just CE transition can be used to create inclusivity and participation. For example, governmental departments would require close collaboration which can be fostered through a task force. Government and other relevant South African stakeholders need to engage on an international stage around CE policies and international trade agreements. The current policy landscape around the CE is driven by the Global North and gaps in research of how a transition will affect the Global South put workers and other stakeholders at risk of an unfair transition (Circle Economy et al., 2023; Circle Economy and Goldschmeding Foundation, 2022; Meira et al., 2023).

A transition is a gradual process and does not happen overnight. However, going forward mechanisms and tools such as evidence-based policies, strategies, re- and upskilling programmes and financial tools need to be developed and implemented to enable a just CE. These mechanisms and tools require streamlining and adaptation over time as well as sector and geographic specific implementation. A CE requires an entire system shift and has strong overlaps with how the just transition has been framed in the South Africa an context. However, a CE goes a bit further and also takes environmental impacts and all other economic sectors into account. Thus, the CE can enable a just transition if appropriately designed and implemented. By no means are the above recommendations and discussions comprehensive but rather lay the foundation to continue the research and further the debate on how the CE can enable a just transition.

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