

TOWARDS A SECONDARY RESOURCES ECONOMY

Opportunities for the Circular Economy in South Africa and Africa



Prof Linda Godfrey

Manager: Waste RDI Roadmap IU
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**science
& technology**

Department:
Science and Technology
REPUBLIC OF SOUTH AFRICA

CSIR
our future through science

Shifting to a Circular Economy

LINEAR ECONOMY



TECHNICAL & BIOLOGICAL MATERIALS MIXED UP

CIRCULAR ECONOMY



“A circular economy aims to **decouple economic growth** from the **use of natural resources** and ecosystems by using those resources more **effectively**”

WITKO W. POLONOWSKI / KOPERNIKUS

PRINCIPLES OF A CIRCULAR ECONOMY

WASTE = FOOD
DIVERSITY = STRENGTH
ENERGY → RENEWABLES
PRICE = REAL COST

BIOLOGICAL MATERIAL
SAFELY ENRICHES
NATURAL SYSTEMS...



TECHNICAL MATERIALS DO NOT
COMPOST, THE PRODUCTS ARE
MADE TO BE MADE AGAIN...

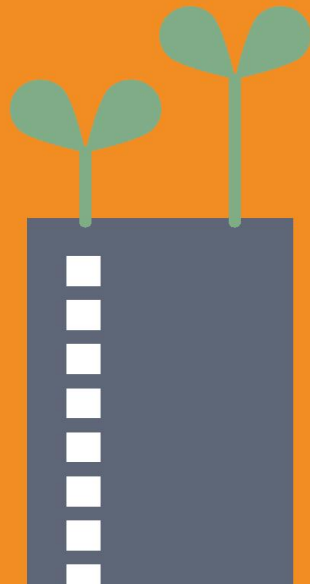




It's time to move the Circular Economy discussion beyond the waste sector

India's approach to the CE

Cities and construction



Cities and construction: liveable cities with buildings and infrastructure that meet the future needs of India's expanding population

Food and agriculture



Food and agriculture: a regenerative, restorative agricultural system that combines modern technology with traditional practices to meet India's growing food demand

Mobility and vehicle manufacturing



Mobility and vehicle manufacturing: a convenient, multimodal transport system enabled by digital technology, for resource-optimised and efficient mobility

<https://www.ellenmacarthurfoundation.org/publications/india>



Understanding the CE drivers

- The Circular Economy is a hot topic in the EU right now – driving changes in policy, innovation, etc.
- The EU **drivers** for a CE include, e.g. –
 - Lack of access to primary resources (27 critical raw materials) (*scarcity*)
 - Availability of end-use markets (specialist manufacturing) (*demand*)
 - Lack of space for waste disposal
- Is the Circular Economy **relevant** to all countries, now?

http://ec.europa.eu/growth/sectors/raw-materials/specific-interest/critical_en

Understanding the CE drivers

- For resource-rich countries with strong mining-based economies, is **resource scarcity** the driver for a CE?

South Africa -- \$2,494 billion in metal & ore reserves

Reserves composition (value):

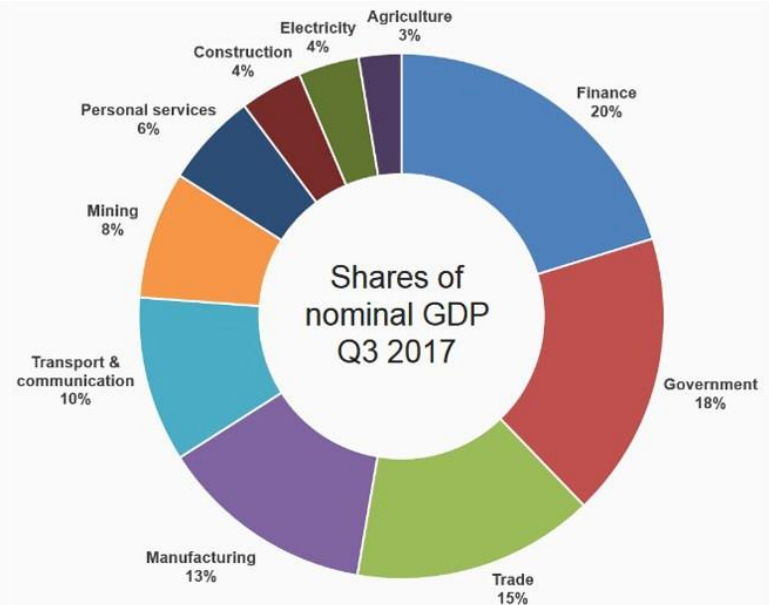
91% Platinum (PGM)

6% Gold

2% Nickel

1% Iron ore

Years of production: 184



STATS SA
STATISTICS SOUTH AFRICA



<http://www.businessinsider.com/15-resource-rich-countries-2010-4?IR=T>



The unique value proposition for SA

TOWARDS THE CIRCULAR ECONOMY

Economic and business rationale
for an accelerated transition

- No doubt the Circular Economy creates social, economic and environmental **opportunities**
- But, we need to carefully define the **unique value proposition** that the CE provides for South Africa and other African countries

Circular Economy _{SA}



The unique value proposition for SA

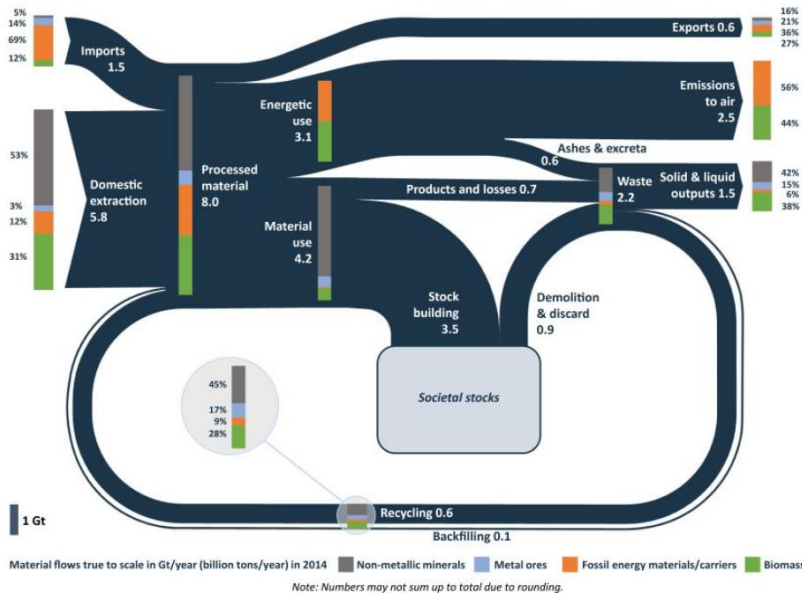
- What is South Africa's unique CE value proposition?

“In 2016, South Africa exported \$69.1 bn and imported \$73.7 bn, resulting in a negative trade balance of \$4.57 bn”

<https://atlas.media.mit.edu/en/profile/country/zaf/>

- Creating **job opportunities** in new economic sectors?
- Strengthening SA's **manufacturing** economy (local beneficiation)?
- Reducing **dependence** on resource imports?
- Positioning SA for a **post-mining** economy?

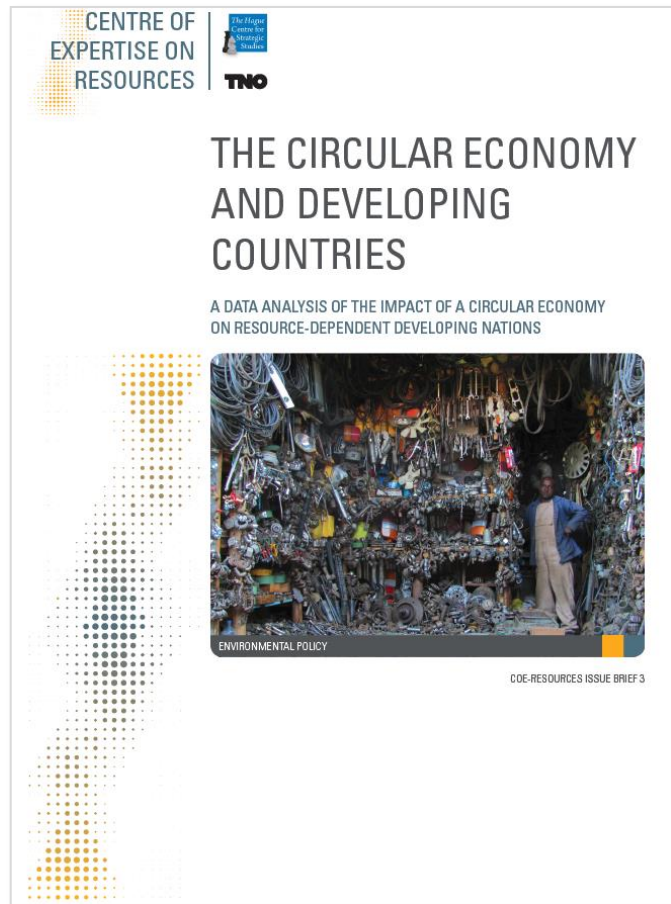
The unique value proposition for SA



Flow of materials through EU28 economy (Sankey diagram)
<http://ec.europa.eu/eurostat/web/circular-economy/material-flow-diagram>

- To understand Circular Economy_{SA} we need to understand our current and future **resource needs** (primary and secondary)
 - South Africa's material flows
 - Opportunity areas (sectors) for sustainable resource management
- DST, CSIR, GreenCape in discussion with key international CE partner

The CE risks to South Africa



- Understanding the **impacts** to South Africa of other countries adopting a Circular Economy
- South African CRM **exports** to the EU were valued at €6.5 billion in 2014 (2.1% of GDP)
- The EU moving to a Circular Economy could threaten €8.4 billion in mineral exports (or **2.7% of GDP**) for South Africa

https://hcss.nl/sites/default/files/files/reports/CEO_The%20Circular%20Economy.pdf

Questions to be answered

- In domesticating CE_{SA} , we need a better understanding of the –
 - South Africa's current and future **resource needs** (material flows)
 - **Constraints** of future resource scarcity on the SA economy, i.e. what resources would SA need in a post-mining landscape, to structure our CE around?
 - **Control** SA has on product design, i.e. how much control do we have in designing waste out of the system? What % of products consumed in SA are imported (*limited control*) versus locally manufactured (*control*)?
 - **Impact** of reduced (or changing) consumption on SA's economy (and possibly reduced primary resource consumption)
 - **Integration** of all actors, including a large **informal sector** (already active) into a circular economy



The Circular Economy is currently being driven from an **environmental agenda** but needs to be elevated to a broader **economic agenda**

Contact details

- **Prof Linda Godfrey**
Manager: Waste RDI Roadmap IU
E-mail: LGodfrey@csir.co.za
- **Dr Henry Roman**
Director: Environmental Services and Technologies
E-mail: henry.roman@dst.gov.za
- **Ms Magamase Mange**
Deputy Director: Environmental Technologies
E-mail: magamase.mange@dst.gov.za

www.wasteroadmap.co.za

