



EU GREEN DEAL

**MAKE IT
REAL**

PARTNER EVENT
#EU GREEN WEEK
30 MAY – 5 JUNE 2022

The opportunity for a more circular South African economy

Prof. Linda Godfrey

Webinar: Inclusive circular economy
business models

1 June 2022



Embassy of Finland
Pretoria



BLACK
BUSINESS
COUNCIL

What the circular economy is not



- The biggest misconception about the circular economy is that it is about waste management
 - The circular economy is **NOT** (only) about waste
 - The circular economy is **NOT** a synonym for waste recycling
- So what is the circular economy?

What is the circular economy?

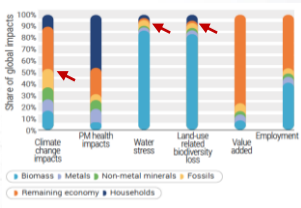
- The circular economy is about **sustainable resource management**
- It aims to **decouple** economic growth from the use of resources by using resources more effectively
- The circular economy is about **national resource-security** in support of socio-economic development – through sustainable resource utilisation



Why should South Africa adopt a circular economy?

- Over the past decade, or so, we've seen **three drivers** for a circular economy transition emerge –
 - Resource** demand and scarcity
 - Climate** mitigation
 - Economic **recovery**
 - Socio-economic **development**

- Resource extraction and processing is responsible for ~50% of **climate impacts**, 90% of **water stress**, and 90% of **biodiversity loss** due to land use (IRP, 2019)



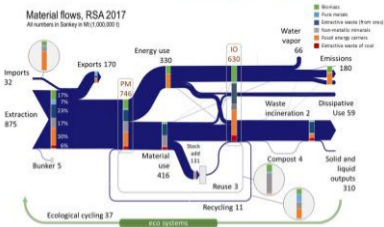
<https://www.resourcepanel.org/reports/global-resources-outlook>

How is South Africa currently faring?



Material flows, RSA 2017

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



SUMMARY OF KEY FINDINGS

Finding 1:

An economy materially dominated by export-oriented extractives

Finding 2:

An economy energetically dominated by fossil fuels, notably domestic coal supported by imported oil

Finding 3:

A sizeable footprint of bio-based activities, with some attention to ecological cycling but also with significant concerns

Finding 4:

Low rate of domestic stock building

Finding 5:

Pockets of high circularity and significant informal activity around cascade use, reuse and recycling

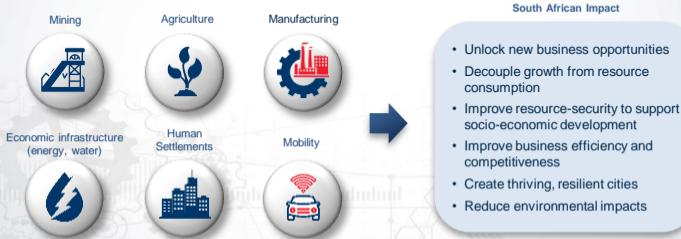
- The South African economy is estimated to be only 7% circular (most of that due to ecological cycling)

A research project funded by the Department of Science and Innovation, under the Waste 2030 Roadmap, administered by the CSIR. All deliverables from this research project will be made available at <https://wastetofuture.co.za/en/press/2024-01-04/>

Where are the circular economy opportunities for South Africa?

The opportunity for a more circular SA economy

- What are South Africa's high resource consumption, growth areas?



The opportunity for a more circular SA economy

STI4CE

SCIENCE, TECHNOLOGY & INNOVATION
FOR A CIRCULAR ECONOMY

<https://www.circulareconomy.co.za/csir/>

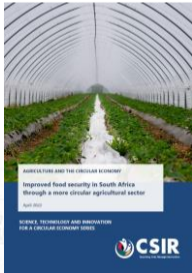
The following eight, short CSIR think pieces suggest that transitioning to a more circular economy has the potential to create value across all sectors of the South African economy – opportunities to decouple development from resource consumption and in so doing, improve local and global competitiveness of our manufacturing sector; improve food security through regenerative agriculture; create more sustainable, livable cities; improve economic development through efficient mobility systems; and decouple economic development from the demands placed on our energy and water systems, already under considerable strain in South Africa.



- 8 x short Briefing Notes or “think pieces” published in November 2021 on –
 - overview, and what the circular economy means
 - mining, agriculture, manufacturing, human settlements, mobility, energy and water

www.circulareconomy.co.za/csir/

The opportunity for a more circular SA economy



www.circulareconomy.co.za/csir

Placing the South African *mining sector* in the context of a circular economy



- The circular economy also provides new opportunities (and risks) for the mining sector. For example, as we decarbonize the economy it can rapidly increase the demand for metals, e.g., alternative energy technologies, new mobility solutions, etc.



Design out waste, e.g.,

- Redesign mining processes and value chains to be more resource efficient



Keep materials in use, e.g.,

- Reduce, reuse and recycle various waste streams (including end-of-life equipment), minerals leasing



Regenerate natural systems, e.g.,

- Renewable energy, restoring mining landscapes

Supporting food security and economic development through *circular agriculture*



Design out waste, e.g.,

- Precision farming (improved resource efficiency); peri-urban / urban farming (closer food production & consumption); the **sharing economy**



Keep materials in use, e.g.,

- Returning nutrients to the agricultural system; biorefinery; value-add of waste products



Regenerate natural systems, e.g.,

- **Regenerative agriculture**, crop rotation; intercropping; reduced or zero till

Supporting the development of a more competitive *manufacturing sector* through a more circular economy



Design out waste, e.g.,

- **Redesign** manufacturing processes and products to improve resource efficiency, additive manufacturing, **sharing economy** business models



Keep materials in use, e.g.,

- **Remanufacture, refurbish, repair** and recycle materials and products across value chains



Regenerate natural systems, e.g.,

- Transition to green energy (solar, wind, hydrogen) and decouple resource utilization

Creating resilient, inclusive, thriving *human settlements* through a more circular economy



Design out waste, e.g.,

- Green, energy-efficient buildings, more compact cities, pedestrian-friendly neighbourhoods



Keep materials in use, e.g.,

- Circular construction value chains, circular organics, waste management



Regenerate natural systems, e.g.,

- Urban agriculture, renewable energy, green roofs, green open spaces

Facilitating sustainable economic development through *circular mobility*



Design out waste, e.g.,

- Shared and multi-modal mobility; increased use of zero-emission mobility; encouraging remote and flexible working



Keep materials in use, e.g.,

- Scaling up vehicle **remanufacturing**; recycling; vehicle and infrastructure design for circularity



Regenerate natural systems, e.g.,

- Mobility systems based on renewable energy; climate resilient transport infrastructure

Decoupling South Africa's development from *water* demand through a more circular economy



Design out waste, e.g.,

- Reducing water use and wastewater generation, improved water use efficiency, better water use practices



Keep materials in use, e.g.,

- Reuse and recycling of wastewater (return flows), reclamation and recovery of resources from water-based waste



Regenerate natural systems, e.g.,

- Improving water flow and quality through the restoration of land by controlling invasive alien plants (IAP), rehabilitating and protecting wetlands and riparian systems

Decoupling South Africa's development from *energy* demand through a more circular economy

Design out waste, e.g.,

- Energy efficiency (demand management), waste and emissions prevention, reducing materials-use in manufacturing energy technologies, increasing energy technology lifespans

Keep materials in use, e.g.,

- Waste gas and heat valorisation; carbon capture use and storage (CCUS); repair and recycling of energy technologies (repurposing), waste-to-energy; fly-ash to building materials

Regenerate natural systems, e.g.,

- Renewable energy (RE), green hydrogen



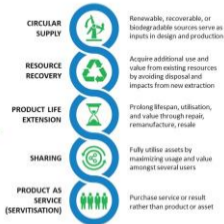
Business opportunities

Three Principles of Circularity

-  DESIGN OUT WASTE AND POLLUTION
-  KEEP PRODUCTS AND MATERIALS IN USE
-  REGENERATE NATURAL SYSTEMS



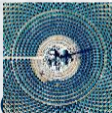
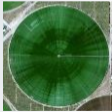
Five Business Models of Circularity



- There is a **strong economic and business case** to be made for a circular economy
- A number of large companies have already made commitments to, e.g.
 - circular design, circular supply chains, resource efficiency, alternative delivery methods
- Opportunity for “**disruptors**” and for small businesses

Adapted from the Ellen MacArthur Foundation, Australian Circular Economy Hub and the Circular Innovation Council

Concluding thoughts



- The circular economy is not about waste management but about **sustainable resource management**
- The circular economy calls for **disruption** and **innovation**
- The circular economy requires a **change in mindset** about how we view and use resources
- Transitioning South Africa to a more circular economy creates opportunities for **new businesses** and **new business models**
- And provides us with an opportunity to address major **social challenges** facing the country

Thank you

Prof Linda Godfrey

Manager | STI for a Circular Economy| DSI

Principal Scientist | Waste & Circular Economy| CSIR

Extraordinary Professor | North-West University

Email: LGodfrey@csir.co.za

Web: www.wasteroadmap.co.za and www.circulareconomy.co.za/csir



[@Prof_LGodfrey](https://twitter.com/Prof_LGodfrey)



[prof-linda-godfrey-4656616](https://www.linkedin.com/in/prof-linda-godfrey-4656616)