

# Biomaterials: From petro to sustainable chemicals

*Gaylor Montmasson-Clair*  
*Trade & Industrial Policy Strategies (TIPS)*

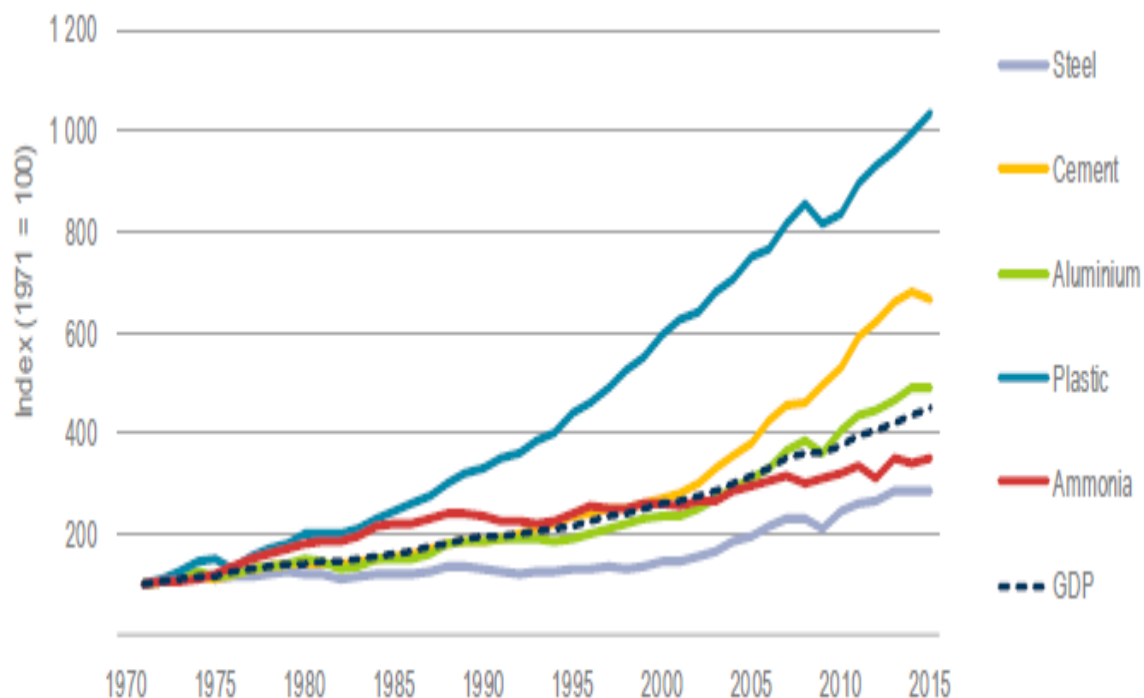


# Chemical products are essential to modern lives

## Petrochemical products are ubiquitous

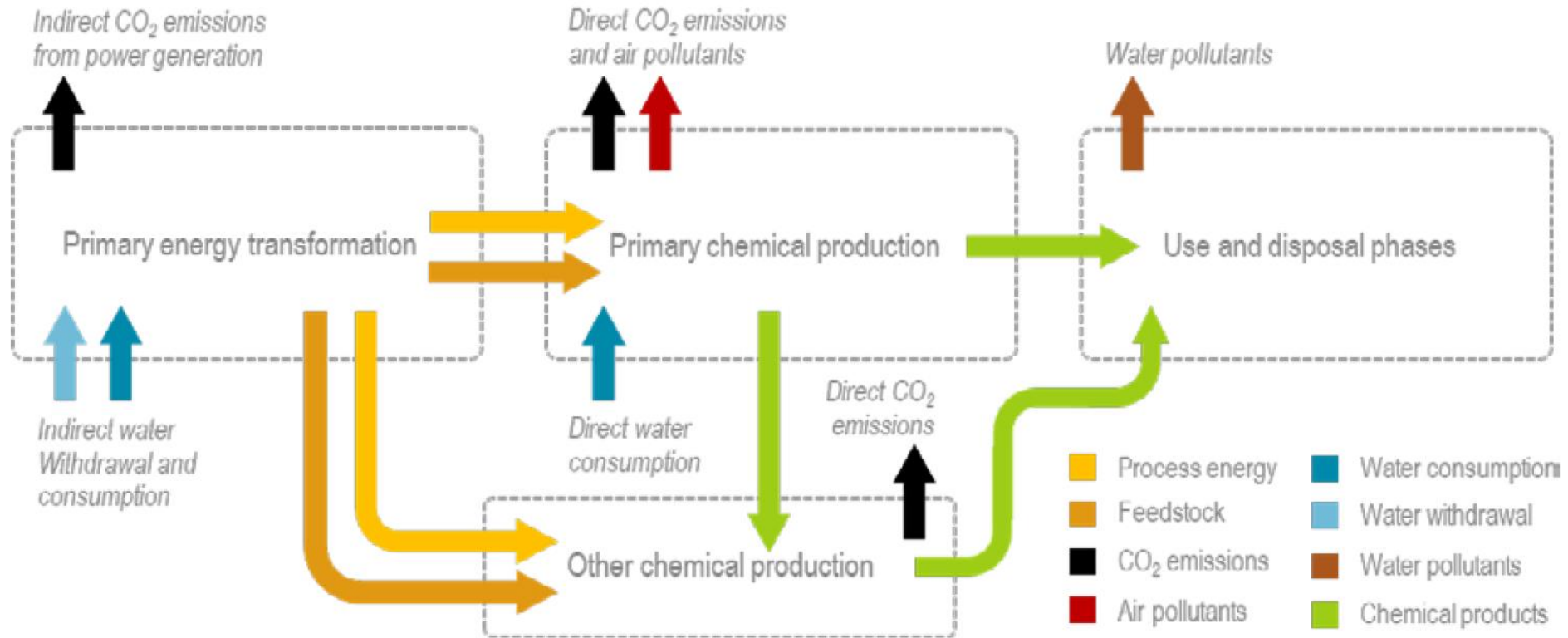
- ▶ 95% of manufactured goods rely on chemistry
- ▶ Provide consumer products
  - Plastics, fertilizer, clothing, food, health products and pharmaceuticals
  - Replacement of wood and metal
- ▶ Provide industrial inputs
  - Petrochemical industry consumes ~25% of its own products

## Production growth for selected bulk materials and GDP



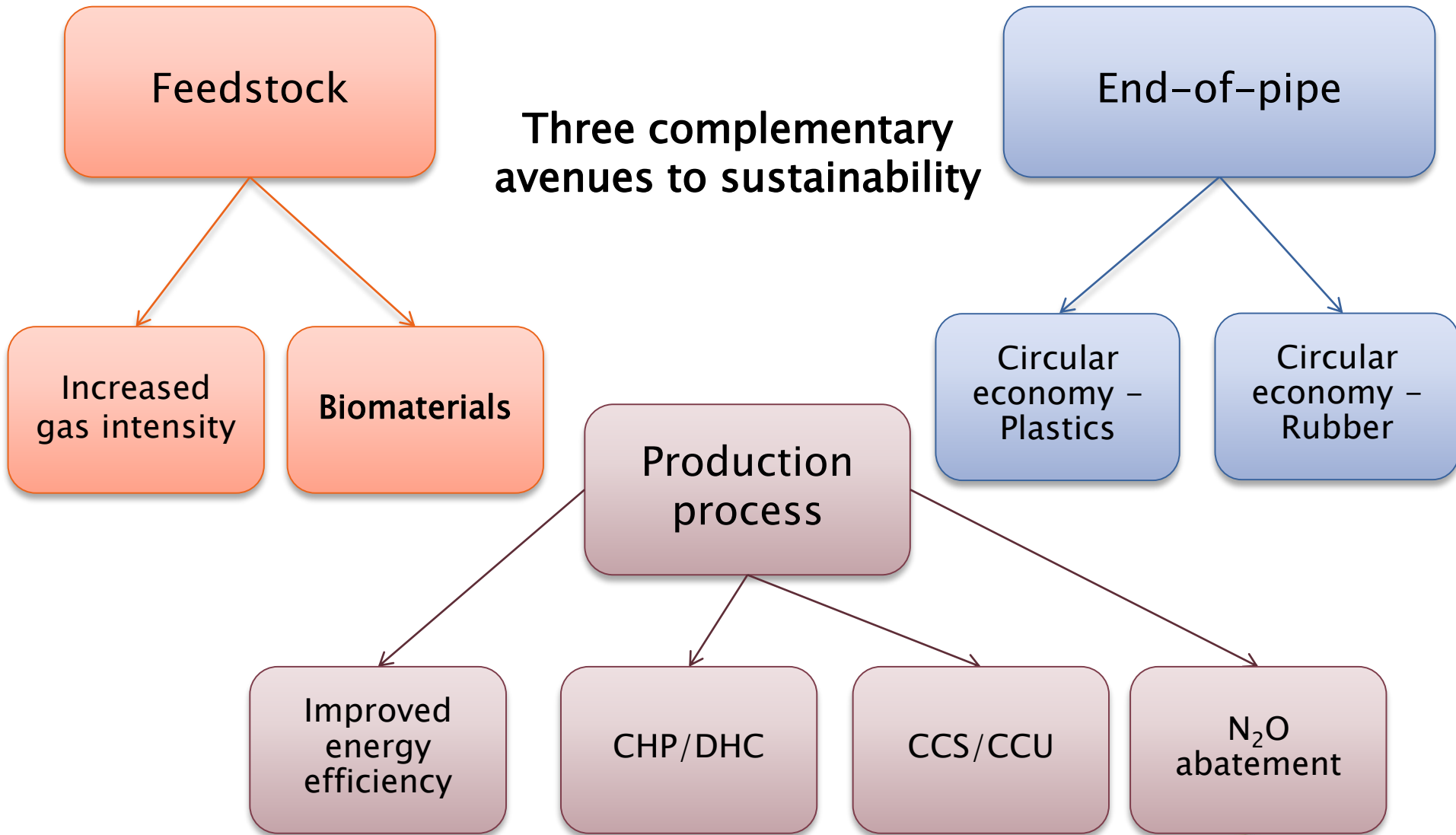
# The sustainability problems

The petrochemicals VC is unsustainable in its current form



# Options towards a sustainable future

Three complementary avenues to sustainability

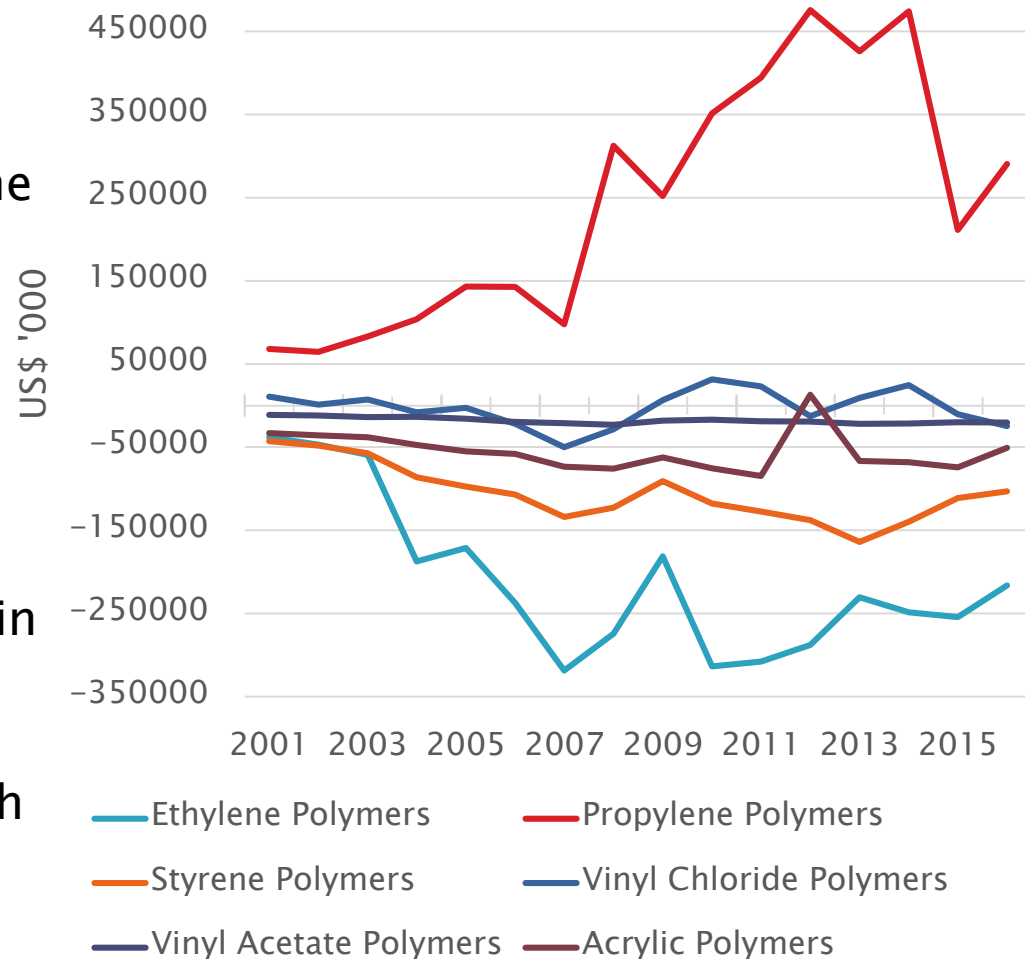


# Why biomaterials?

## Why biomaterials?

1. Large established market for plastics and composites, with the potential to drop-in new biotechnologies
2. Opportunity to close gaps in the SA plastics space
3. Long-term adjustment for plastics industry as petroleum declines
4. Localising supply to strategic industries, notably autos
5. Potential to better share value in the plastics space, through agriculture
6. Strong feedstock potential, with waste management benefits
7. Greening of plastics and other chemical products

## Net South African trade in plastics polymers

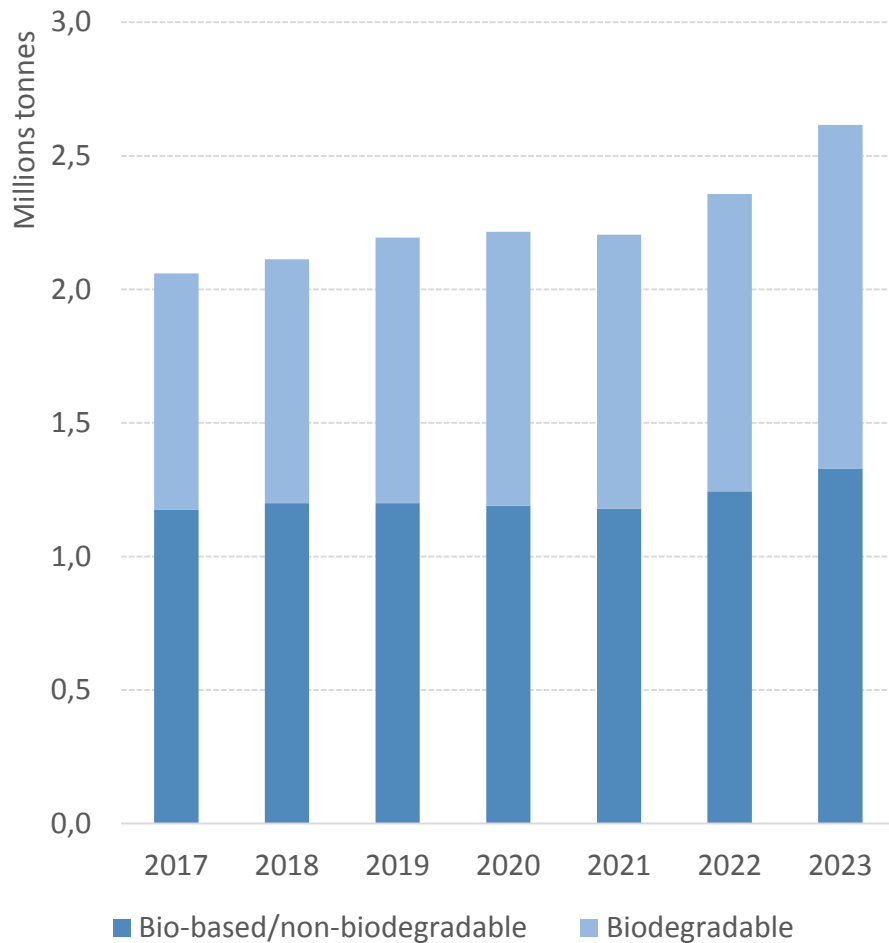


Source: TIPS, based on Trademap data

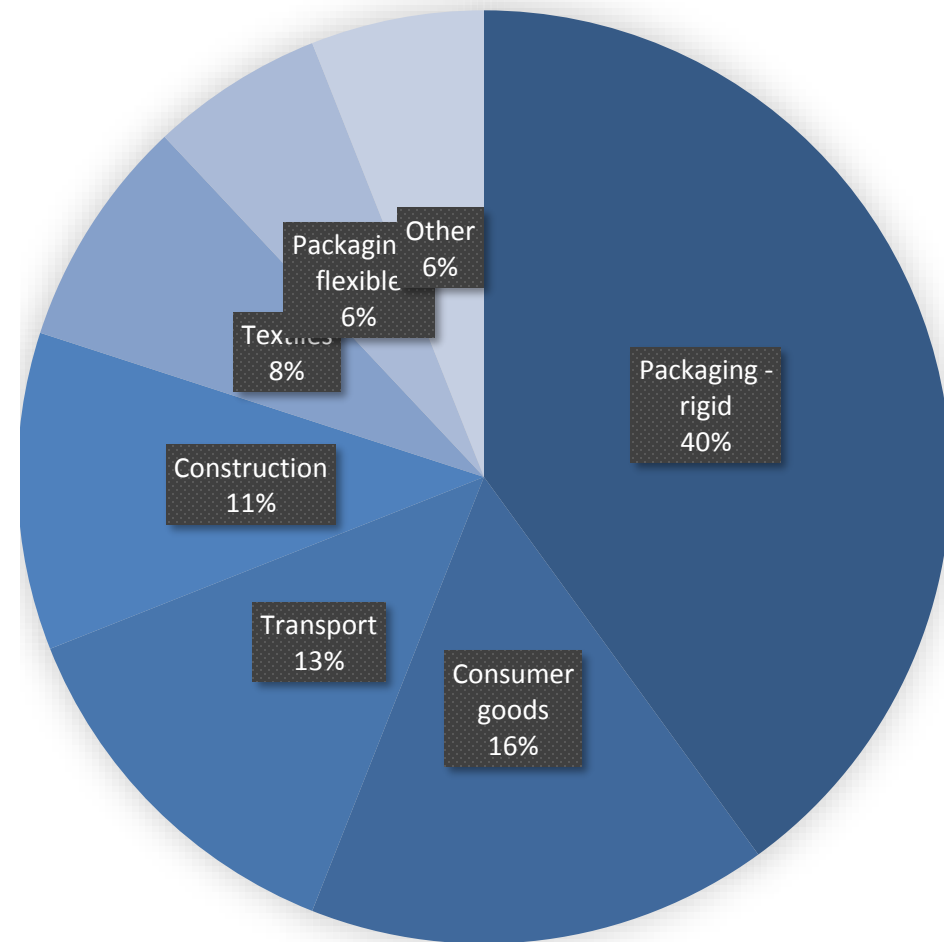


# Why biomaterials? (2)

## Global production of bioplastics



## Bioplastics production by end-use



# Key challenges

- Short-term lack of competitiveness on a cost-basis
- Identification of product gaps and niches

Competitive-  
ness

Innovation  
environment

- LT endeavour, which will required support for commercialisation, the leveraging of foreign tech and avoid dilution due to diversity of biomaterials

Feedstock

- Uncertainty on availability and access to feed stock and developing new streams

# Way forward

## Creation of a matching programme for feed stock

- ▶ Closing gaps in the availability of feed stocks, without requiring very difficult decisions on selection or pricing
- ▶ Can leverage existing industrial symbiosis programmes as well as the Bio-Atlas

## Biomaterials Centre of Excellence

- ▶ Closing the need for a biomaterials centre of excellence, or one-stop-shop, a facility where prototype, feasibility, business model development, manufacturing, testing and demonstration
- ▶ Can leverage CSIR centre and bio-refineries

## Bridge funding for biomaterials research

- ▶ Closing gaps in the broader innovation funding space through a small, dedicated funding mechanism for proven technologies
- ▶ Can leverage both public and private funding and existing channels (TIA, TIH, etc.)

## Reinforcing support to pilot biorefineries

- ▶ Currently, state-led, notably by DST and the CSIR
- ▶ Plan for 5 bio-refineries: forestry, sugar, algae, non-food crop plant oils and microbial biorefineries based in rural areas



# Way forward (2)

## Task team to lead on industry partnerships

- ▶ Striking industry partnerships between government, millers, farmers, workers, communities and academia

## Leverage existing industrial policy

- ▶ SEZ, eco-industrial parks, agri-parks, Black Industrialist Programme
- ▶ Develop standards

## Facilitating regional development and cross-border movement of feed stock

- ▶ Ensuring rapid processing for feedstock to remain viable for use
- ▶ Development of regional biorefineries

## Support to clusters of platform chemicals

- ▶ Address the extreme diversity in biomaterials, preventing the risks of diluting interventions
- ▶ Selection of a few clusters based on chemical composition would enable better policy, and easier identification of linkages among biomaterials technologies

## Promoting the green premium

- ▶ Overcoming the lack of cost competitiveness in the short term

## Awareness and skills development

- ▶ Breaking path dependency and developing competencies for new technologies

# Trade & Industrial Policy Strategies

Supporting policy development  
through research and dialogue

[www.tips.org.za](http://www.tips.org.za)

Gaylor Montmasson-Clair  
Senior Economist: Sustainable Growth

[gaylor@tips.org.za](mailto:gaylor@tips.org.za)

+27 12 433 9340

