

Developing green trade and industry opportunities in South Africa

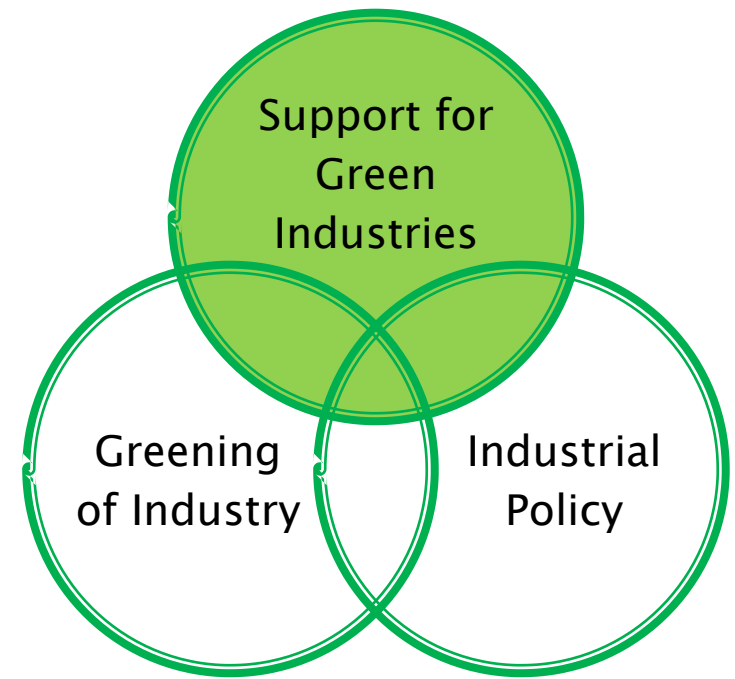
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Trade and Industrial Policy Strategies (TIPS)



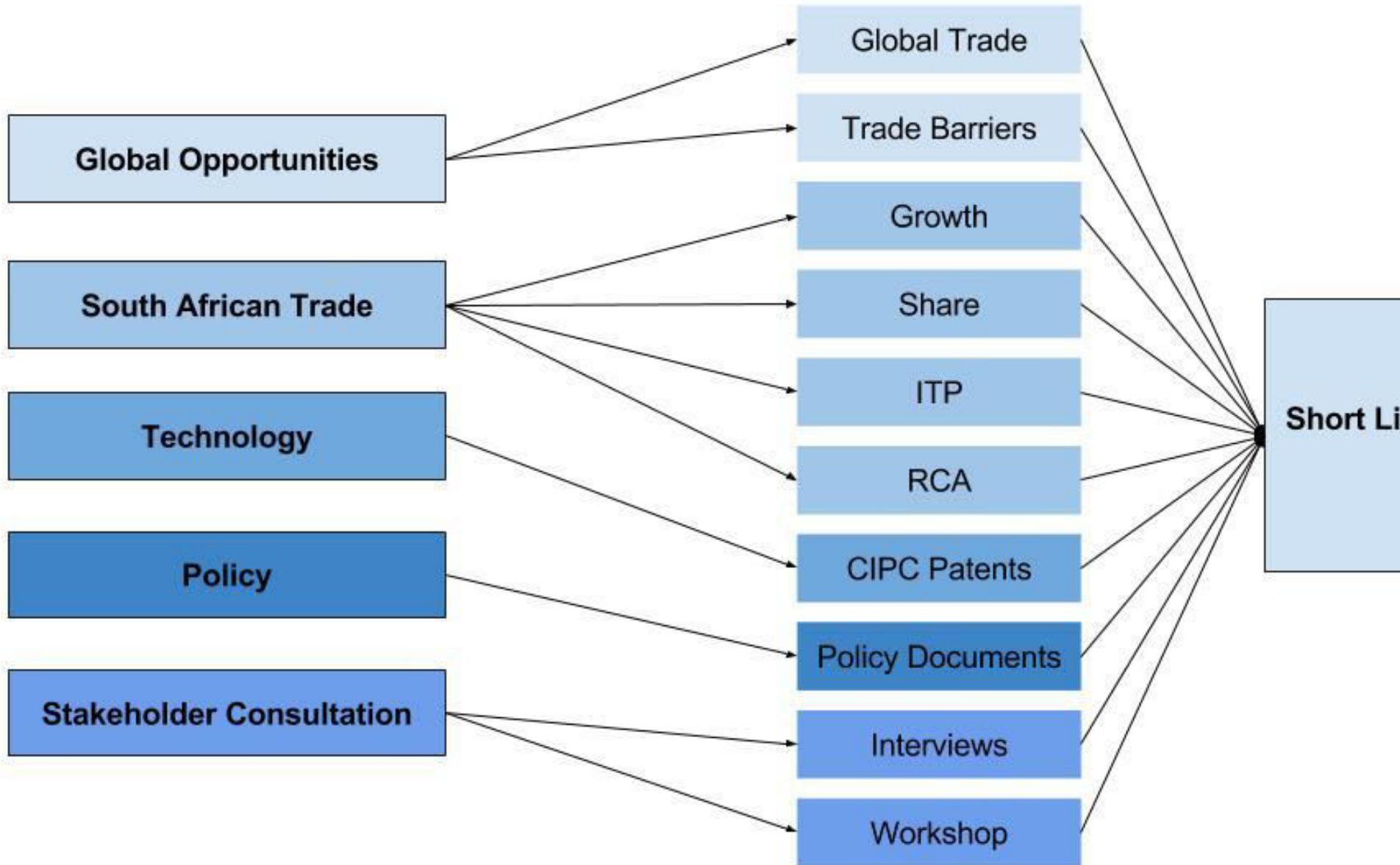
1. Introduction

- ▶ Global transition to a green economy underway, as a response to multiple crises of sustainability, including climate change
- ▶ South Africa has entered this transition and is determined to seize associated opportunities
- ▶ From a trade and industry perspective, two complementary streams, which go hand in hand:
 - development of new, green industries on the one hand, and
 - greening of existing, traditional industries on the other hand

- ▶ The transition to a sustainable development pathway is not an environmental issue but a **socio-economic challenge** which has ramification at all levels of economic development, notably trade and industrial development
 - Implications in terms of *what is produced* as well as *how it is produced*



1. Introduction



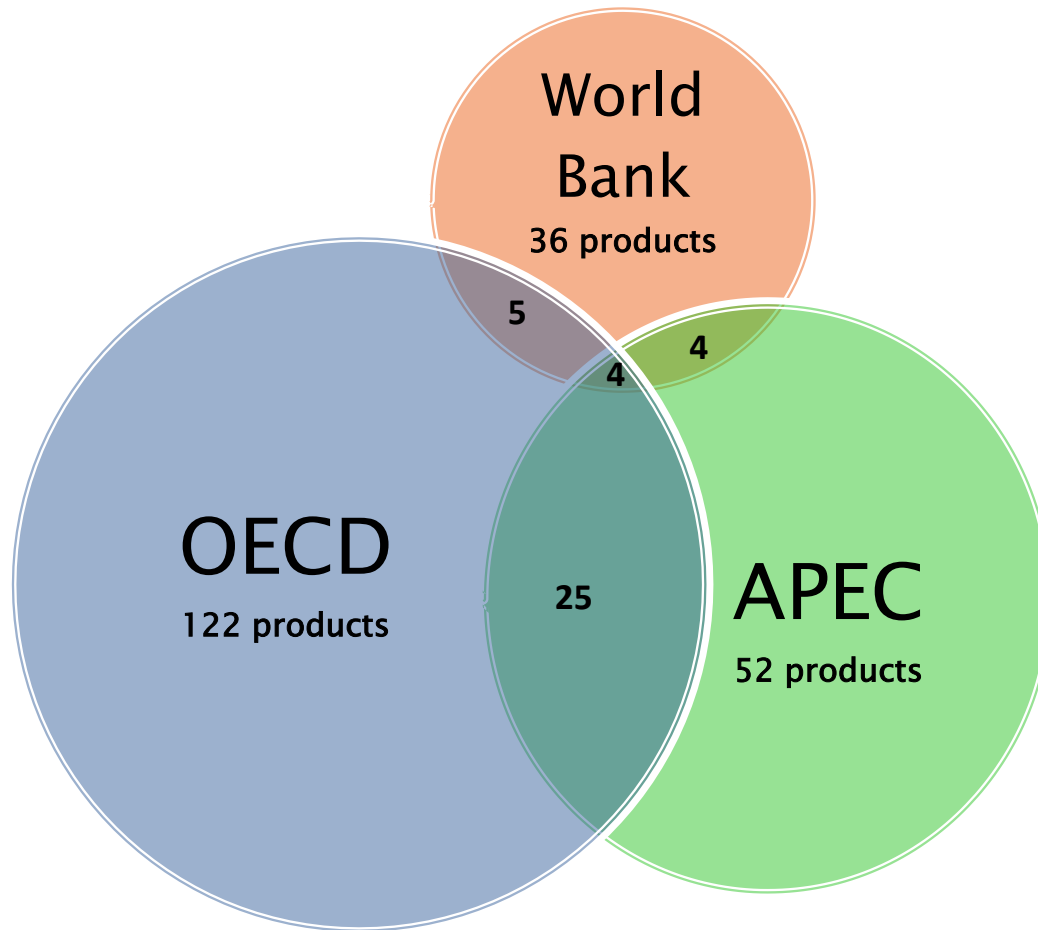
Global Opportunities

2. Global Opportunities

- ▶ No definition or agreement on what constitutes green trade and industry (or its predecessor: environmental goods and services), internationally
- ▶ Globally, many different understandings of green trade and industry
- ▶ Multiple efforts to create a comprehensive list of Green Goods
 - OECD – 122 products
 - APEC – 54 products
 - World Bank – 36 products
 - UNCTAD – includes services
 - WTO – changeable, 525 products as of 2009
- ▶ All efforts are the product of political processes
 - Focus on trade liberalisation
 - Primarily about promoting national interest
 - Debate over how green some products are

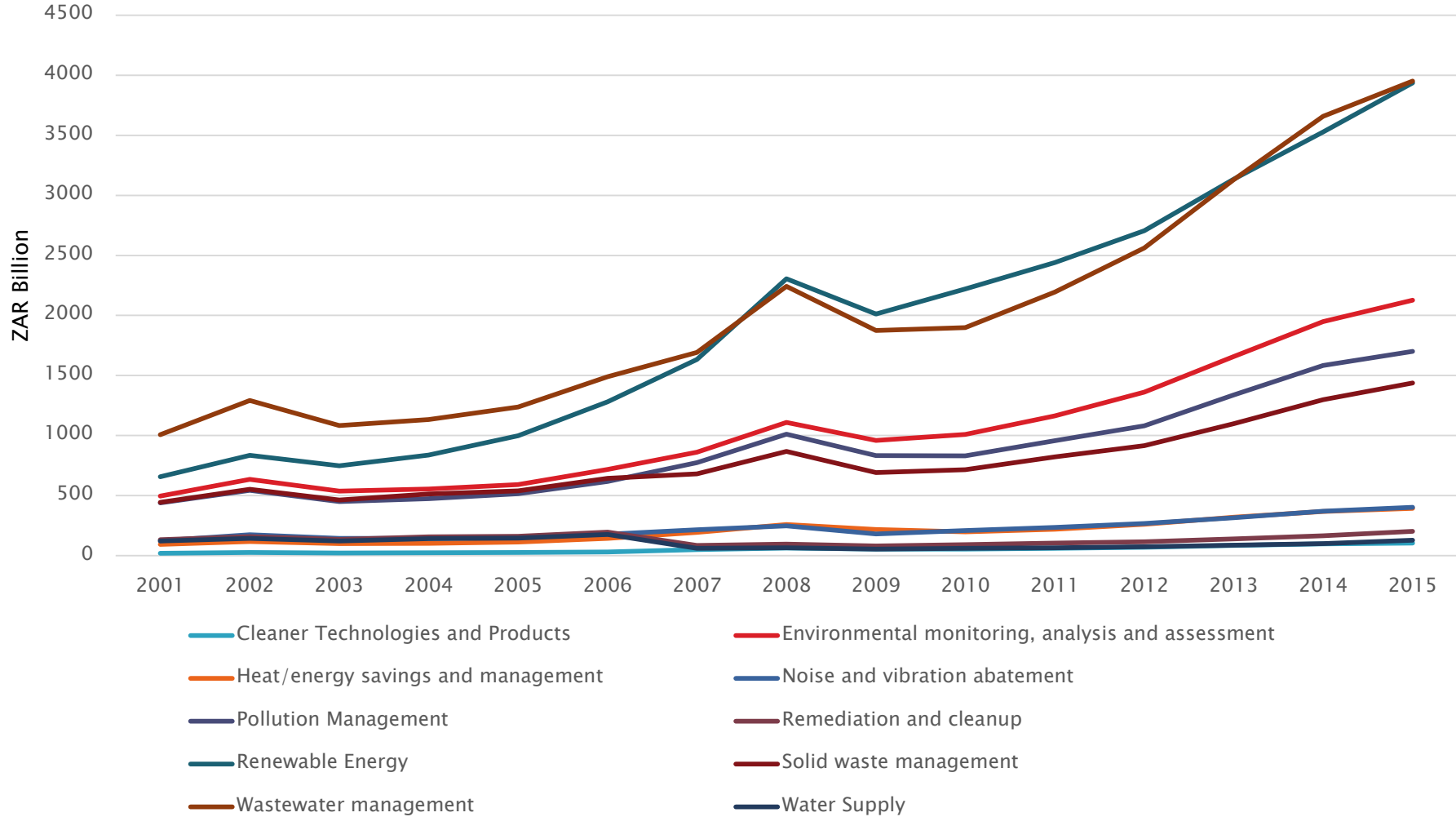
Green trade can be defined as the import and export of goods and services that are produced using green VCs with enhanced sustainability of transport, production, use, maintenance and end-of-life cycling . This entails the segment of EGS, including products for EE, RE, pollution control, water and wastewater, and organic agriculture (PAGE, 2015)

2. Global Opportunities



Source: Authors' composition

2. Global Opportunities

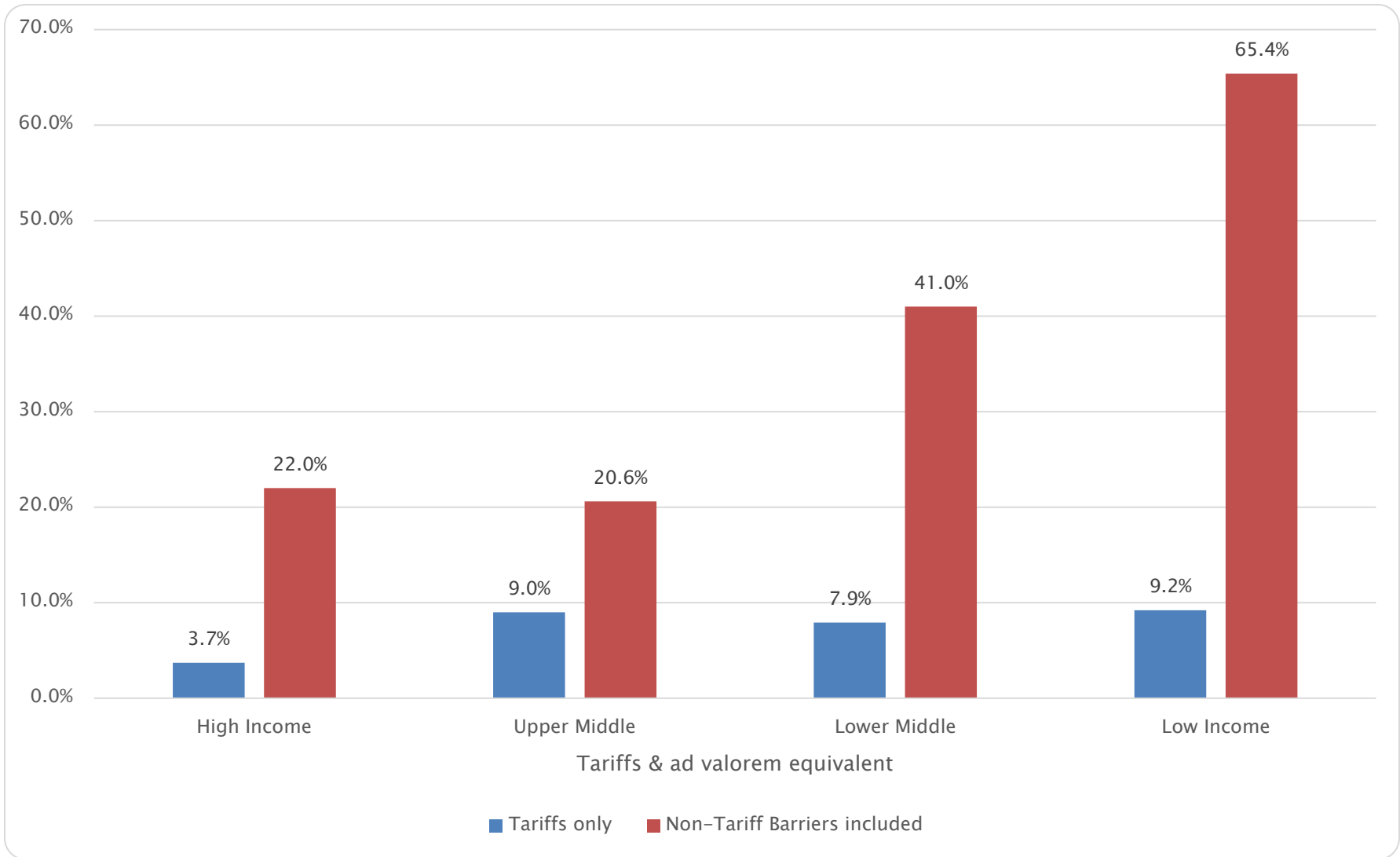


2. Global Opportunities

- ▶ Rapid growth of trade in green products, and still underdeveloped in many parts of the world.
- ▶ However: a complex market
 - Dynamic, rapidly changing technology
 - Certain products dominated by a few countries
 - Others extremely competitive environment
 - Driven by government intervention – includes local content, standards, other barriers
 - Issues of capability
 - Intellectual property crucial
- ▶ Barriers to entry of global market
 - New products but close link with existing industries
 - Large returns to R&D
 - Local Procurement programmes
 - Standards

Growth ≠ Opportunity

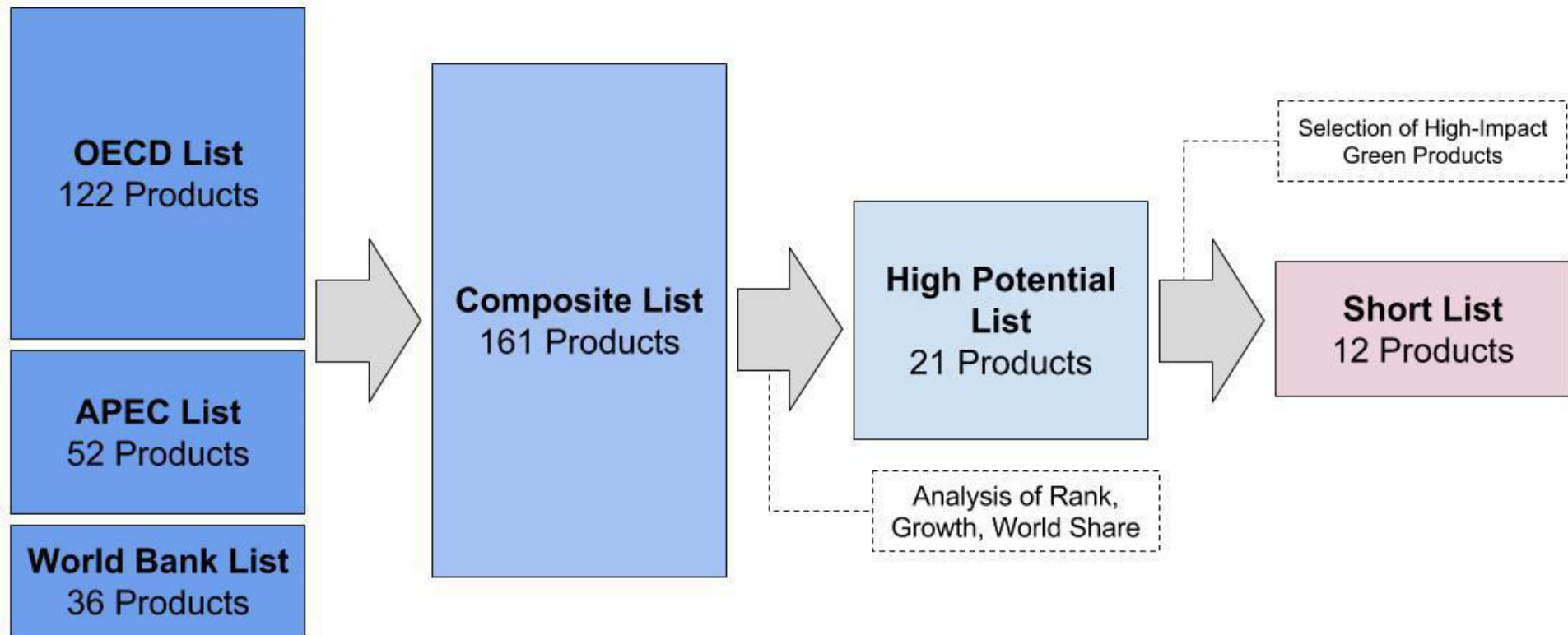
2. Global Opportunities



Source: de Melo, J & Vijil, M. 2014. "Barriers to Trade in Environmental Goods and Services: How Important are they? How much progress at reducing them?" Fondazione Eni Enrico Mattei

South African Trade

3. South African Trade



3. South African Trade

Trade in Green Goods, Short List	RCA	Share	Growth	Rank
Catalytic Converters	17.3	11.20%	1.00%	1
Lead products (often for waste storage)	6.4	3.80%	9.60%	6
Fuel Cells	4.7	2.80%	-1.80%	4
Sewage treatment equipment	4	2.60%	7.50%	10
Pumps for liquids	3.9	2.30%	8.20%	2
Recycling Equipment	2.8	1.60%	11.00%	8
AC generator for renewable energy	1.5	0.80%	7.90%	9
Tanks for sewage treatment	1.4	0.90%	9.60%	3
Cleaner paints and varnishes	1.3	0.80%	12.00%	5
Parts for incinerators	1.2	0.70%	14.90%	7
Incinerators	1	0.60%	27.80%	12
Biomass boilers	0.8	0.50%	37.40%	11

Metrics of South Africa's exports of select green goods



3. South African Trade

Trade in Green Goods, Short List	Medium-Term Growth, 1991 – 2015	Short-Term Growth, 2010 – 2015
Steam Turbines	272 491%	-78%
PV Semiconductors	2087%	241%
Waste handling equipment	296%	71%
Recycling Equipment	281%	198%
Wind turbine generators	239 557%	50 757%
Wind turbine generator parts	12 358%	2 276%
Wastewater Screens/strainers	432%	101%
Wind turbine gearing	351%	74%
Steam Turbine Parts	2 346%	8%
Filtration/Purification System Parts	695%	119%
Monitoring/Regulating Equipment (Manostats)	220%	68%
Monitoring/Regulating Equipment (Other)	140%	7%

Growth in South Africa's import of select green goods



3. South African Trade

▶ Stylised Results

- Focus on components that leverage off pre-existing industries
 - Gearing, glass, basic electronics, etc.
- Big ticket items not clearly viable yet
- Regional markets not major driver yet (according to ITP analysis)
- Bright spots: incinerators, biomass boilers (albeit from low base)
- Only **major** export advantage is in catalytic convertors

▶ Results of Green Trade Analysis

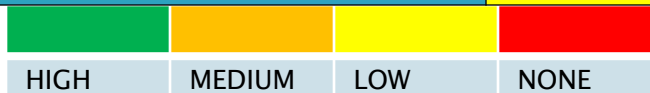
- Scale of trade still quite low (except for catalytic convertors)
- Categories for 'green trade' cover a large number of products
- **Can only get a rough picture**

Policy and Technology

4. Policy and Technology

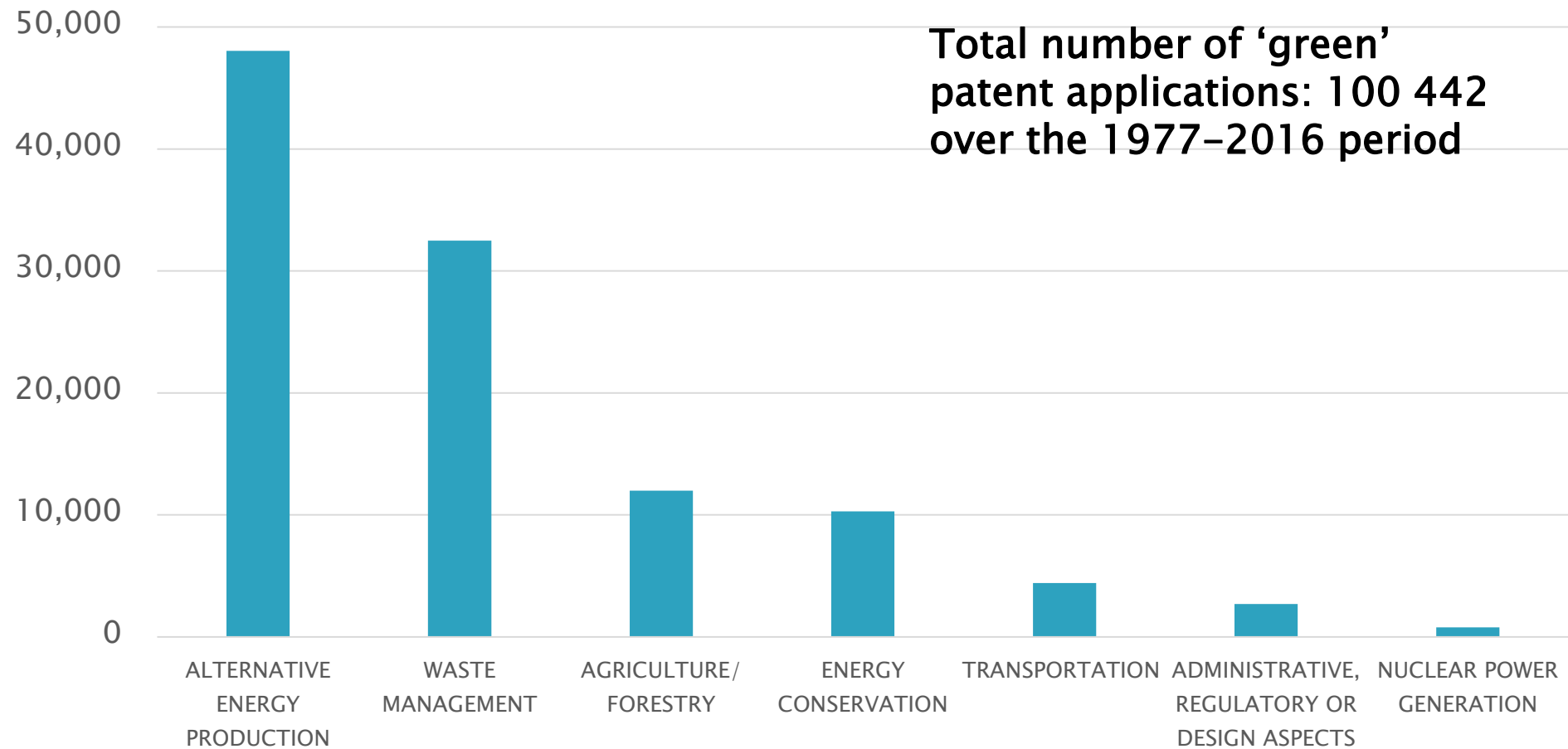
	Document	Promotion of green industries / technologies	Promotion of green import substitution industrialisation	Promotion of green export potential
National	National Development Plan	Green	Yellow	Yellow
	Ten Year Innovation Plan	Green	Green	Green
	New Growth Path	Green	Green	Yellow
	Medium-term Strategic Framework 2014 – 2019	Green	Green	Yellow
	Industrial Policy Action Plans (IPAP)	Green	Green	Green
	National Export Strategy (summary of research findings)	Green	Red	Yellow
	The National Exporter Development Programme (NEDP)	Green	Yellow	Yellow
National (green related)	The National Strategy for Sustainable Development and Action Plan	Green	Yellow	Red
	Green Economy Accord	Green	Green	Yellow
	National Climate Change Response Whitepaper	Green	Green	Yellow
National (sectoral)	Integrated Resource Plan 2010 – 2030	Green	Green	Red
	The Energy Security Master Plan – Liquid fuels	Yellow	Green	Red
	Draft Position Paper on the South African Biofuels Regulatory Framework	Yellow	Green	Red
	Sector strategy: wind and solar	Green	Green	Green
	National Transport Master Plan	Yellow	Red	Red
	Green Transport Strategy (draft)	Green	Green	Yellow
	National Climate Change Response Strategy for the Water Sector	Red	Red	Red
	National Waste Management Strategy	Yellow	Yellow	Yellow
	National Biodiversity Strategy and Action Plan	Red	Red	Red
	Integrated Growth and Development Plan (IGDP) - Agriculture, Forestry, and Fisheries	Green	Yellow	Yellow
Agricultural Policy Action Plan	Yellow	Green	Yellow	

Source: Authors' composition



4. Policy and Technology

South African patents, based on IPC Green Inventory classification (1977–2016)

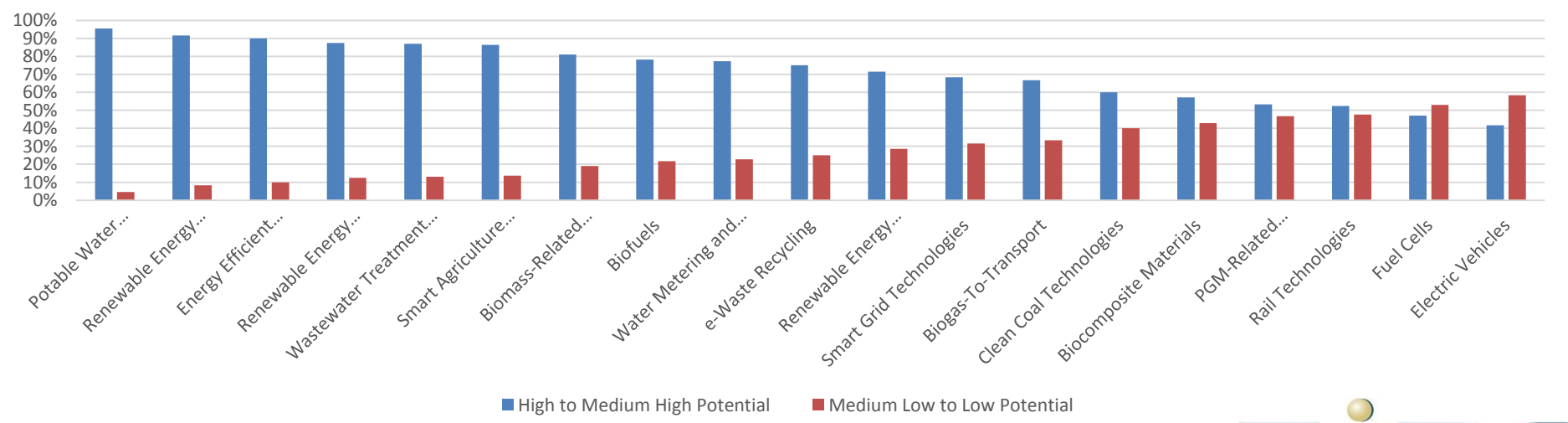
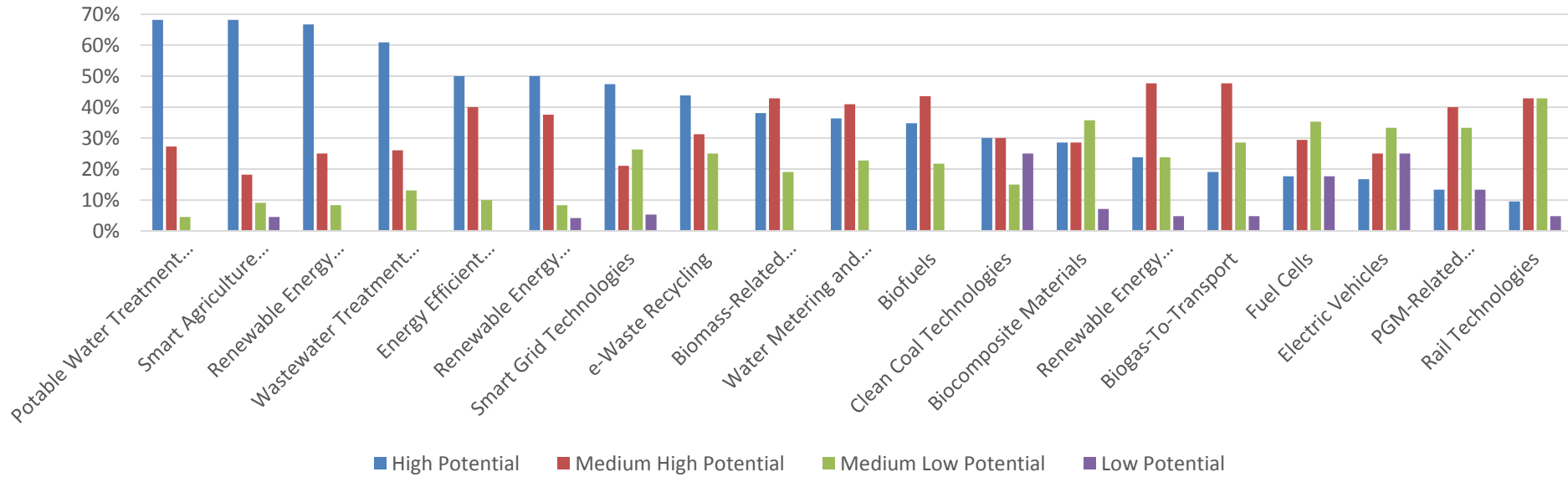


Source: Authors' composition, based on data from CIPC

Note: the data includes both granted and pending patents; the sum of the categories is larger than the total number of patents due to numerous patents featuring in more than one category

Stakeholder Engagement

5. Stakeholder Engagement



Source: Authors' calculations, based on snap survey organised at TIPS on 22 November 2016, n=26



High Potential Sectors

5. High Potential Sectors

1) Embedded Generation Technologies

- ▶ Substantial growth of renewable energy globally and in South Africa, **but** manufacturing led by China, US and EU
- ▶ Missed opportunities from the manufacturing perspective
 - Significant imports (REIPPPP)
 - Uncertainty driving existing manufacturers to close (SMA and DCD) or struggle (Jinko, Kestrel)
- ▶ **Still some opportunities**
 - Smart meters and monitoring systems
 - Battery and energy storage technologies (Solar Turtle concept, link to fuel cells and vanadium-based batteries?)
 - Local innovations to be leveraged (ex: thin-film panel technology)

5. High Potential Sectors

2) Water-related technologies

SA is water-stressed and faces ongoing water-related challenges

- Aging and lacking infrastructure, lack of access, drought and sea-level rise vulnerability, inadequate policy framework, etc.)
- Increased focus on water management (War on Leaks campaign)
- ▶ **Metering and Conservation:** Metering systems and smart water meters, Conservation technologies (leak protection, leak detection, leak solution), Water-efficient products (toilets, etc.)
- ▶ **Treatment, recycling and reuse:** Water treatment (decentralised wastewater treatment, water pumps), Water membranes and filtration systems, desalination technologies. AMD technologies?
- ▶ **Smart agriculture technologies:** Precision/conservation agriculture (GIS-based), drip irrigation, control systems and water distribution monitoring (digital water management, e.g. through smart phones)

5. High Potential Sectors

3) The biogas-to-transport value chain

- ▶ Significant ISI opportunity to replace petroleum with biogas
- ▶ Significant sources of feedstock, and experience from a growing number of sites in SA
- ▶ Potential to leverage a shift of government fleet to biogas, as well as BRTs and taxis
- ▶ Potential to attract gas equipment manufacturer (conversion kits, cylinders, refuelling stations, etc.)

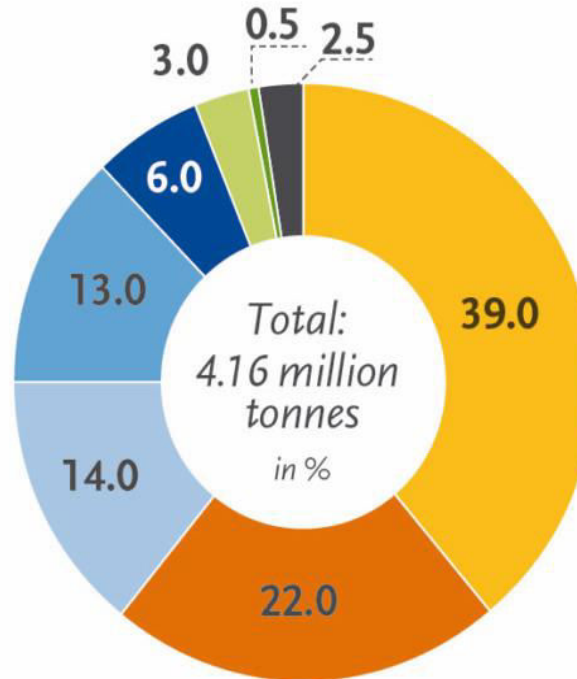
4) Development of sustainable, composite materials

- ▶ Global rise in new, innovative and more sustainable materials in numerous industries, substituting chemicals with natural inputs
- ▶ Biomaterials, including bioceramics, biopolymers/bioplastics and bio-metals, drug delivery systems, nano-enabled biomaterials, regenerative tissue engineering, stem cells, medical devices, biomechanics

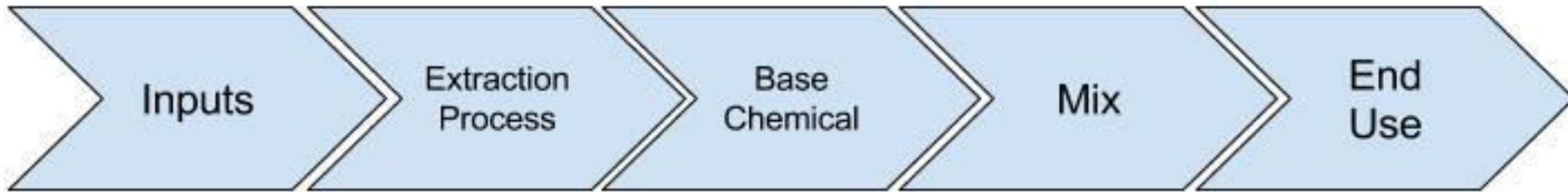
Case Studies

6. Case Studies

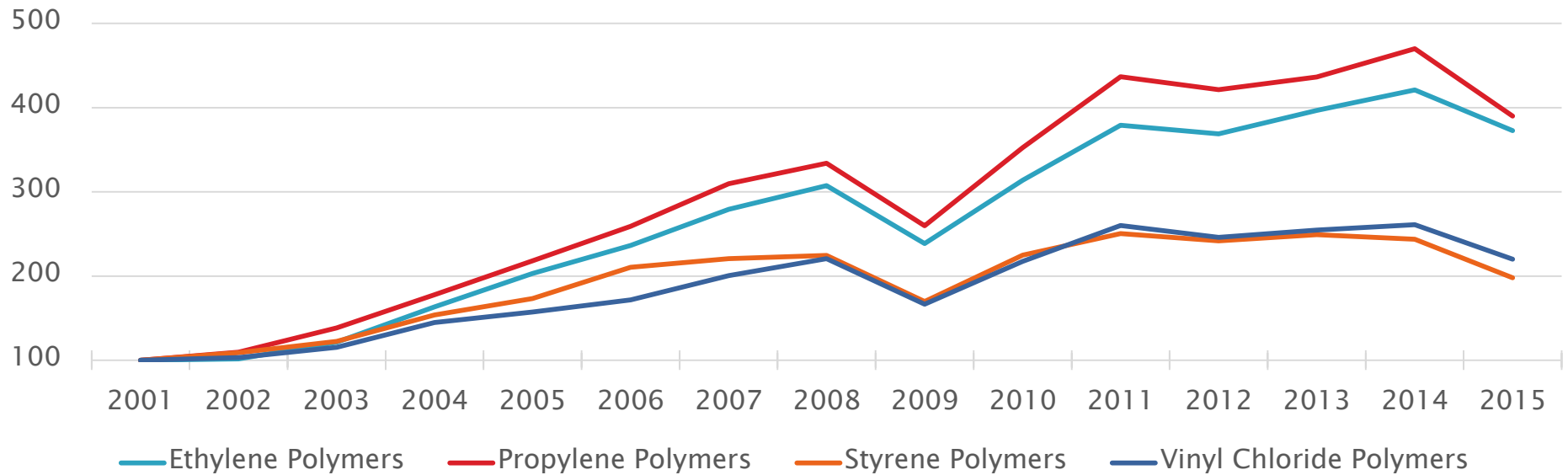
- ▶ More a category/ production process than a specific product
- ▶ Global market for biopolymers expected to grow from 1.4 million tonnes in 2015 to 6.2 million tonnes in 2019
- ▶ Number of commitments by firms and countries



- Packaging (flexible & rigid)
- Consumer goods
- Automotive & transport
- Building & construction
- Textiles
- Agriculture & horticulture
- Electrics & electronics
- Others



6. Case Studies

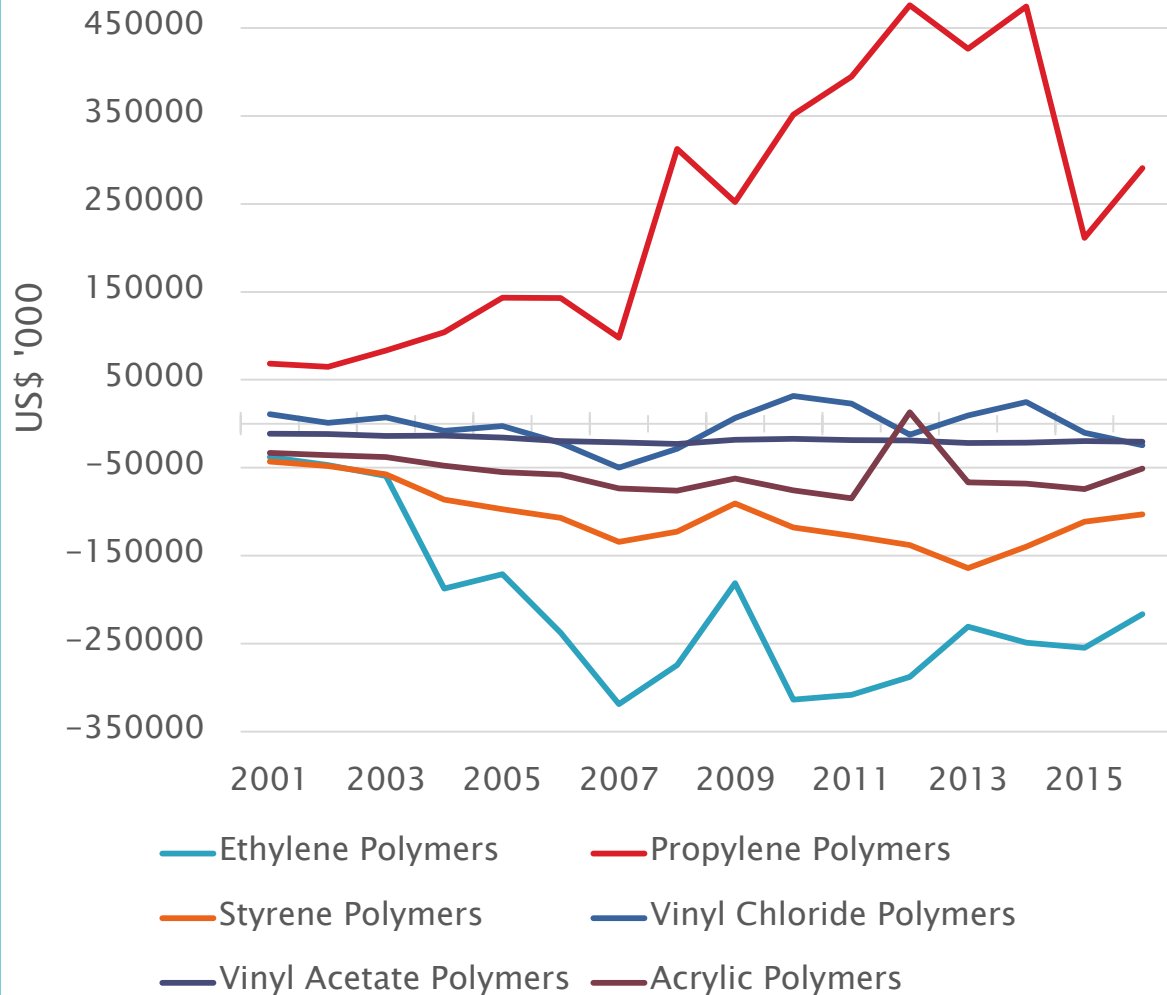


- ▶ Biopolymers/bioplastics among the highest potential for South Africa
- ▶ Broad range of product categories
- ▶ Universal usage
- ▶ Complementarity with existing industry

Traded Polymers	Ethylene Polymers	Propylene Polymers	Styrene Polymers	Vinyl Chloride Polymers
Processed Polymers	Polyethylene	Polypropylene	Polystyrene	Polyvinyl chloride
Applications	Auto components Appliances Packaging Furniture textiles	Rigid and flexible packaging Industrial & construction films Roto Moulded products tanks	Packaging	Pipes Bottles Packaging Film Flooring cable Sheathing Moulded products

6. Case Studies

- ▶ South Africa's plastics sector is valued at ZAR 50.4 billion in 2013 and employs approximately 60 000 people
- ▶ Majority of the industry (53%) is concentrated in the packaging sector
- ▶ Remainder is divided between a wide range of other applications (construction, automotive, electrical, etc.).



6. Case Studies

Little established manufacturing capacity, so focus is on 3 components of the VC

Inputs

- ▶ Concerns around availability of supply (as discussed in biogas)
- ▶ Doubts over whether biocomposites alone could create adequate supply
- ▶ Which feedstock: technology vs availability?

Technology

- ▶ CSIR Centre for Biocomposites
- ▶ Nelson Mandela Bay Composites Cluster
- ▶ A range of university projects
- ▶ Foreign firms own most leading technologies

Productive complementarity

- ▶ Few specialist biocomposite firms
- ▶ Large plastics firms expanding
- ▶ Still dominated by foreign chemicals companies

Client and partnerships	Initiatives
Airbus	Interior panels for airplanes
BIRN	International Biocomposites Network
Bombardier	Interior panels for train carriages
Chemcity	Biocomposites for construction industry
De Gama, Frame, Brits Textiles	Natural fibre composites
Experico	Packaging
IDC	Sisal fibre production
Sustainable Fibre Solutions	Kenaf processing
The House of Hemp and Hemporium	Establishment of hemp industry
University of Delaware	Biopolymers for housing
Volkswagen	Parcel tray
Woolworths and suppliers	Characterisation



Conclusion

Conclusion

- ▶ **Read the Report**
- ▶ **The growth of green industries doesn't automatically mean export opportunities**
 - Substantial trade barriers
 - Technological barriers
 - Need to be selective in which industries are supported for export
 - Many opportunities in the less glamorous areas
- ▶ **Import substitution remains important**
- ▶ **Rapidly developing space requires policy stability**
 - Proven ability of policy to drive development
 - But needs to follow through as the space changes
- ▶ **Technology pipeline needs to be strengthened**
 - Familiar problems of bringing technology to market

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