



OPERATION PHAKISA

CHEMICALS AND WASTE ECONOMY

LAB OUTCOMES

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Environmental Affairs
Planning, Monitoring and Evaluation

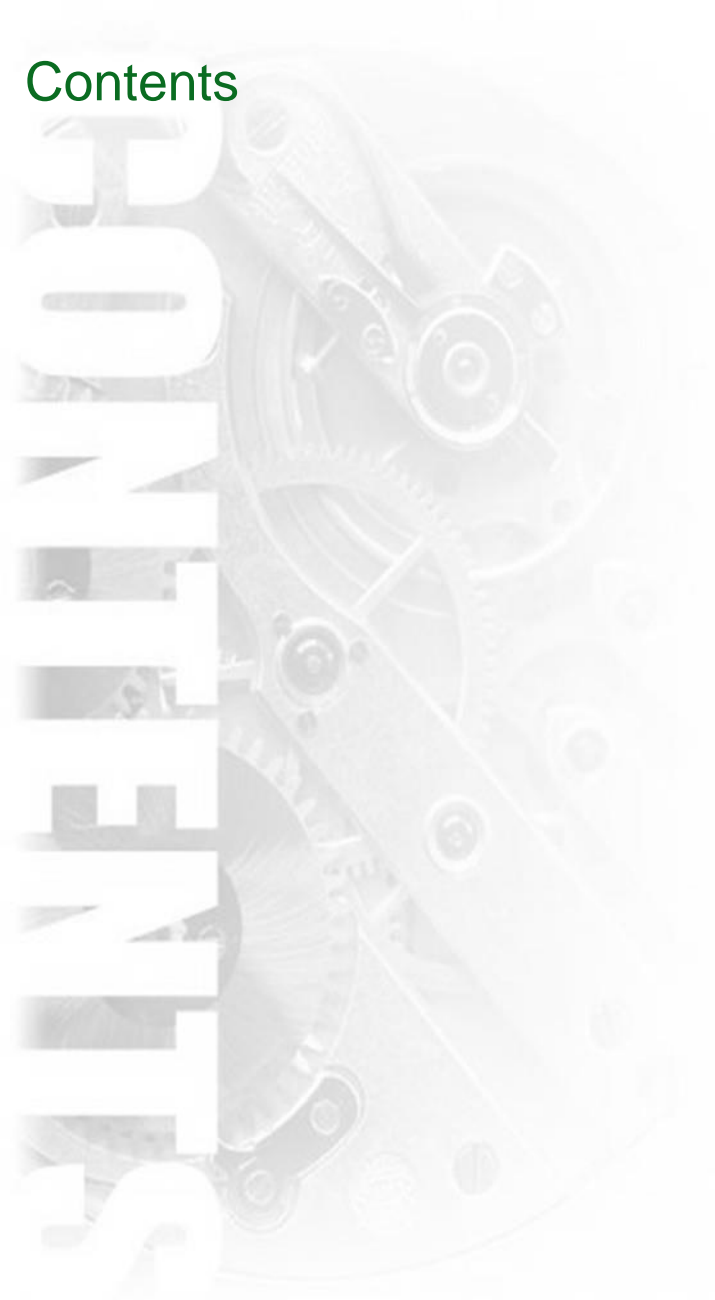




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The Phakisa addresses the opportunity to enhance South Africa's Chemicals and Waste Economy

The Chemicals and Waste sector has a critical role in the economy



South Africa has a responsibility to **protect the environment** for present and future generations through the **promotion of sustainable conservation** and **ecologically sustainable development** and use of natural resources



Despite its rich natural resources, **South Africa lacks adequate measures and/or tools for effective transformation** of its waste into goods and services for social and economic development



Government is mandated to **promote economic opportunities in the chemicals and waste sectors**



DST's 10-year Waste Research, Development and Innovation Roadmap has a goal of **growing the waste sector from 0.62% of GDP to 1-1.5% of GDP in the next 5 years** via a number of levers:

- Accelerating the waste recycling economy
- Growing the waste-to-energy economy

Lab aspiration

- **Reduce the negative environmental and health impact** of waste and risks posed by chemicals
- Increase **commercialisation of the circular economy** and create value from resources currently discarded as waste
- **Foster inclusive growth** through positioning of South Africa as a globally competitive producer of sustainable products



The Big Fast Results methodology has been harnessed to increase the contribution to GDP, and jobs created, by the chemical and waste economy

There is a huge opportunity for us to expand South Africa's chemicals and waste economy

- The 10-year Waste RD&I¹ Roadmap has set the goal of **growing the current contribution of the waste sector from 0.62% to 1-1.5% of GDP by 2023**
- The waste sector is recognised by Government as one that provides **opportunities for value recovery, beneficiation, job creation and economic development**
- Significant opportunity exists to maximise the recycling of chemicals and waste and expand the value of the chemical and waste economy, while sustainably **minimizing the environmental and health impacts** by reducing chemical and waste as early as possible in the value chain
- **Accelerating waste recycling, waste-to-energy and waste beneficiation** will be key to unlocking the possible economic opportunities in the waste sector



The Big Fast Results methodology can yield detailed plans to achieve this



Intensive **consultative** process...



...involving all relevant **stakeholders**...



...to define ambitious **targets**...



...and identify **big ideas** to reach them...



...by defining detailed **3 feet plans**...



...with **defined timelines**...



...and **committed budget**...



...and **legal** support...



...where **implementation is wholly owned** by stakeholders

Currently, 111 megatonnes of waste is generated per annum, of which 75% ends up in landfills



111 Mt of waste generated per annum



~10% annual job growth in the private waste economy



0.62% contribution to GDP¹



~110,000 formal jobs in chemical sector



60,000 – 90,000 informal waste pickers



~35,000 formal jobs in the waste economy



75% of waste disposed in landfill²

¹ In 2012 DST estimated the GDP contribution to be 0.62%, increase since then is estimated based on annual job numbers from Stats SA household surveys
² The remaining 25% are either recycled, beneficiated, including agriculture organic waste composted at source

SOURCE: 2012 National Waste Baseline, Stats SA, World Bank, DST South African Waste Sector 2012: An analysis of the formal private and public waste sector in South Africa. A National Waste RDI Roadmap for South Africa: Phase 1 Status Quo Assessment



The Chemicals and Waste Economy Phakisa aims to reduce negative impact on the environment, while growing the GDP contribution and creating jobs

Phakisa Aspiration



Reduce the **negative environmental and health impact** of waste and risks posed by chemicals

Increase **commercialisation of the circular economy** and create value from resources currently discarded as waste



Foster inclusive growth through positioning of South Africa as a globally competitive producer of sustainable products



Key objectives



- Grow the secondary resources economy by **increasing local utilization and beneficiation of waste resources by 50%-75%** through creation of an enabling regulatory environment
- Generation of **opportunities from chemical and waste resources** for the creation of jobs/ opportunities in new / existing markets specifically **through enabling SMMEs**
- Invest in R&D innovation (including IP) and infrastructure to **enhance the utilization of local waste** resources for new products, substances and services that will create jobs, and enhance the production of environmentally friendly chemicals
- **Reduce waste to landfill** by 75% of industrial waste and 50% of municipal waste through education and awareness, compliant society, application of cleaner production

Four workstreams were defined across the Chemicals and Waste economy

1 Bulk industrial waste

Maximise the **utilisation and beneficiation of bulk industrial waste**, including:

- Ash, Slag and Gypsum
- Organic waste (sewage sludge and meat production waste)



2 Municipal

Maximise **diversion of waste from landfill sites** through reuse, recycling and recovery, covering:

- Organic waste
- Construction and demolition (C&D)
- E-waste
- Packaging waste (paper, plastic and glass)



3 Product design & waste minimisation

Reduce volume of packaging and food waste ending up in landfill sites, by:

- Improving product design
- Increasing quality in production practices
- Promoting waste prevention



4 Chemicals

Reduce negative health, safety & environmental effects of harmful imported chemical products, focused on:

- Reclamation and recycling of refrigerant gas
- Lead-free paint



Our initiatives aim to directly address the aspirations

20 initiatives contribute R 11.5 bn to the GDP and create ~127 k jobs and ~4,300 SMMEs

ENVIRONMENT



WASTE

9 initiatives directly address beneficiation of waste¹



LANDFILLS

10 initiatives redirect waste from landfills



GENERATED

2 initiatives directly reduce the amount of waste generated

INDUSTRY SUPPORT



PRODUCTION

9 initiatives result in local production of goods



SMMEs

10 initiatives directly create ~4,300 SMMEs



REGULATORY

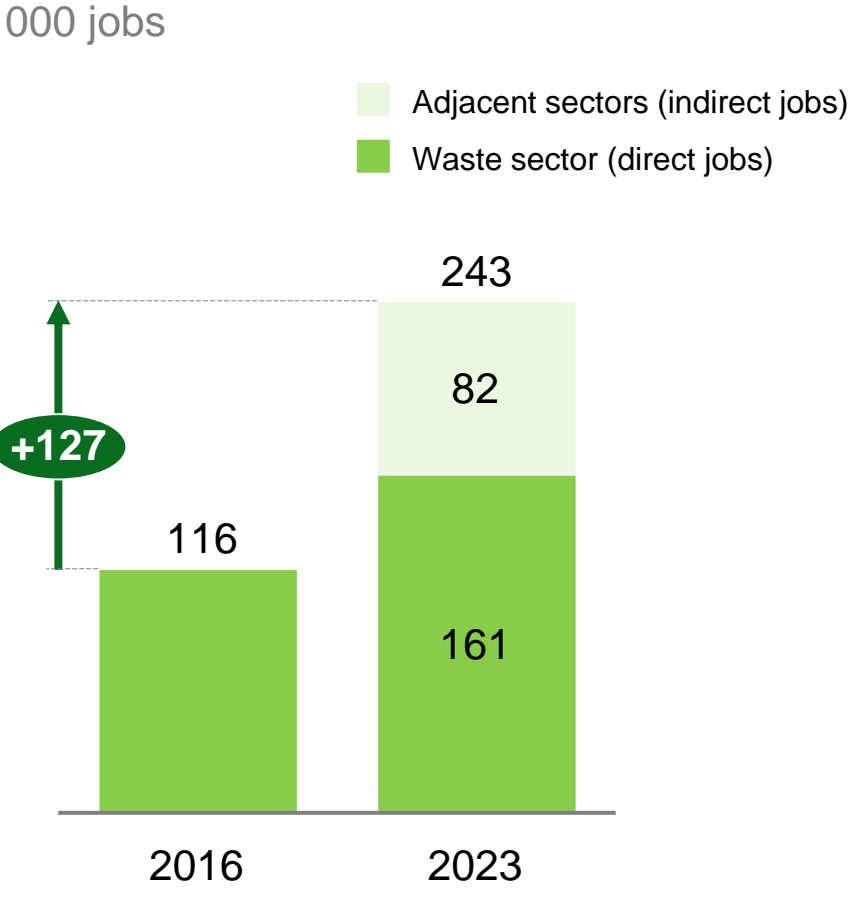
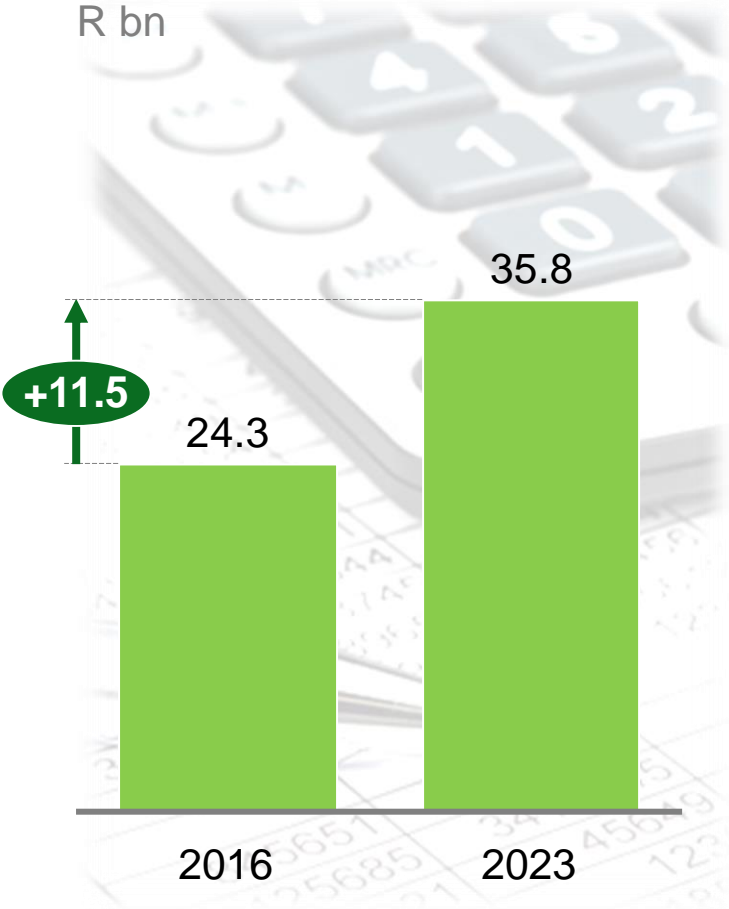
15 initiatives requesting regulatory improvements to help sector grow

¹ Beneficiation of waste is the creation/transformation of waste into higher value products and includes recycling initiatives



These initiatives will add ~R 11.5bn to South Africa's Waste and Chemicals sector and create ~127,000 jobs by 2023...

GDP contribution¹ | Job creation²



¹ Only direct potential (i.e. multiplier effect ignored)
² Includes direct and indirect jobs

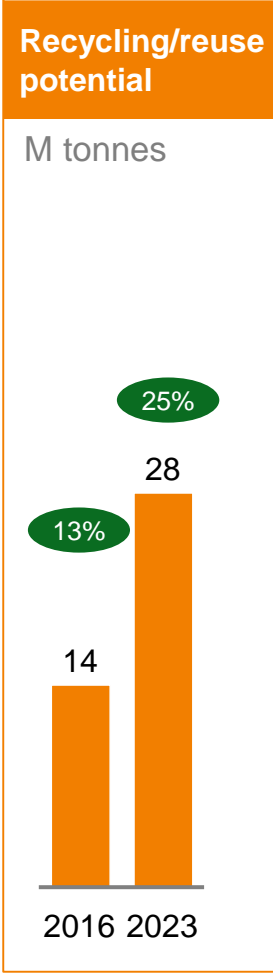
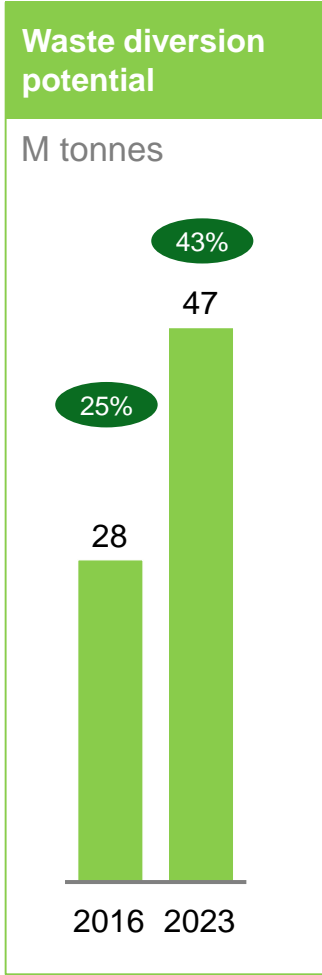
SOURCE: National Waste Baseline 2012, STATS SA household survey 2016

- ~4,300 SMMEs create ~41k of the total jobs created
- SMME development has a preliminary target of 30% women and 70% youth

... and will divert 19.74 m tonnes from landfill of which 13.55 m tonnes will be recycled

% Percentage of total waste generated

Waste stream	Total annual waste production	Total additional waste to be diverted annually	Total additional waste to be recycled/reused annually
	M tonnes	M tonnes	M tonnes
Organic waste ²	40.40	2.34	0.27
Ash	36.00	14.76	10.76
Non-recyclable waste ¹	8.85	0.12	0
C&D	5.20	1.45	1.45
Packaging/plastic waste	1.49	1.00	1.00
E-waste	0.36	0.08	0.08
Total addressed	92.30	19.74	13.55
Waste not addressed³	22.40		
TOTAL WASTE	111.00		



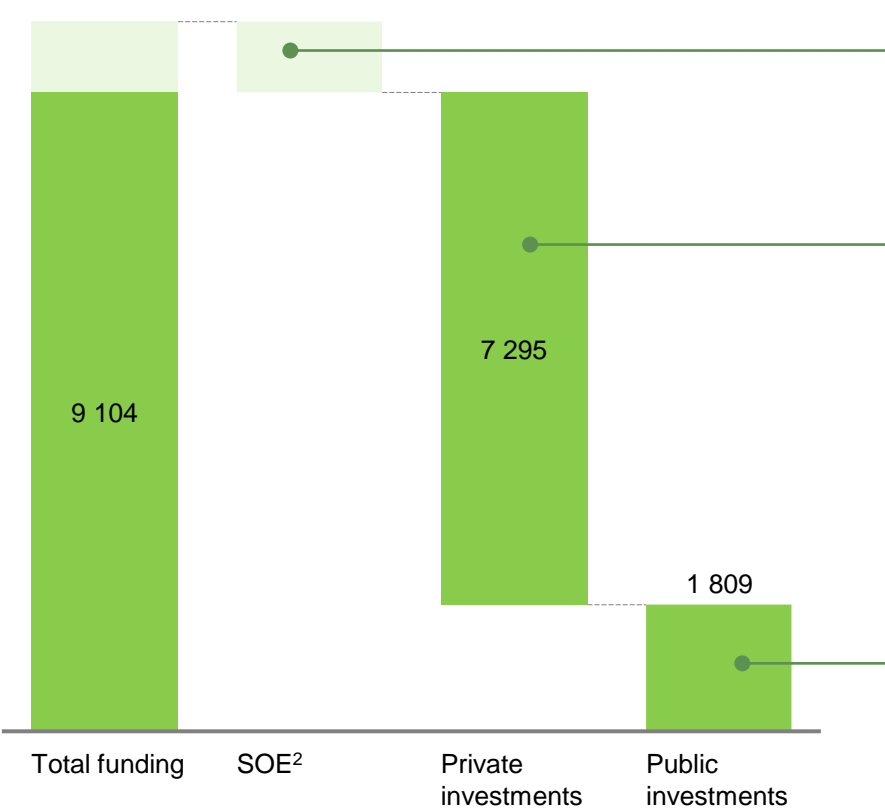
1 Includes AHP (absorbent hygiene products) and waste that would be recyclable but was contaminated due to mixing, composite materials, etc.
 2 Includes organic waste from large industrial sources, municipal waste and sewage sludge
 3 Waste not addressed includes all other waste generated in South Africa that is not being addressed by the Phakisa
 SOURCE: 2012 National Waste Baseline



To implement the identified initiatives, public investment of ZAR 1,809 M over the next 5 years will be required to unlock ZAR 7,295 M of private investment

Phakisa initiatives will require public funding to support infrastructure build-up and awareness spreading to enable private investment and SMME development

Required 5-year funding for Phakisa initiatives
ZAR million, capex and non-recovered opex



NOT EXHAUSTIVE

Major funding needs

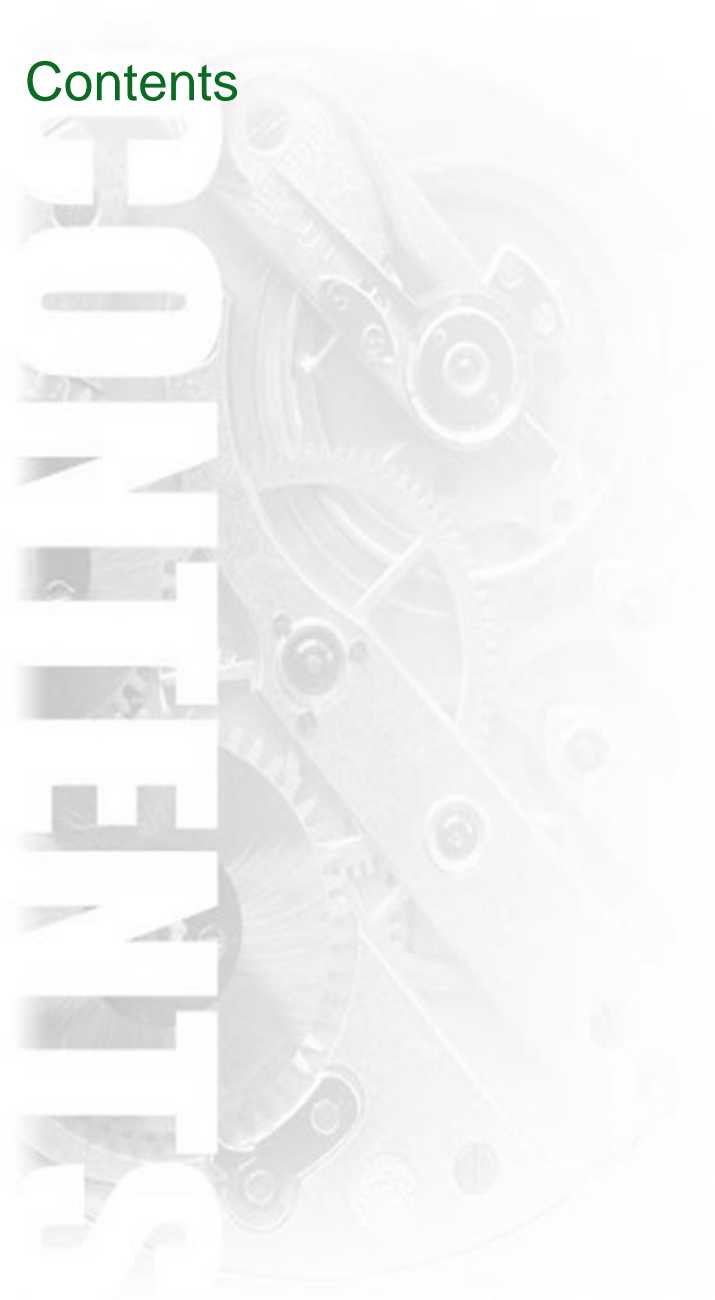
Funding need (ZAR M)

- Logistics investments required for export of ash TBD
- Brickmaking equipment to produce bricks from ash ~2,625
- Meat residue infrastructure (Anaerobic digesters, biorefining for protein, composting) ~1,226
- E-waste recycling centres ~1,174
- Fleet of trucks to collect waste separated at source ~894
- Construction rubble crushers, flat glass crushers and block pressing facilities ~517
- Consumer awareness ~235¹
- Material recovery facilities to provide feedstock for recycling plants ~551
- Transfer station infrastructure for separation at source ~288
- Consultant and technical support to avail legacy government e-waste ~247
- Pilot project for treatment of meat residues ~136

¹ Additional 209M to be contributed by public sector for the campaign
² Value to be determined



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The Phakisa hosted participants from business, government and social sector, averaging 95 people a day

Business

Government

Associations and social sector¹

Bulk Industrial Waste

Municipal Waste

Waste minimisation and product design

Chemicals

Phakisa had on average 95 participants each day

¹ Includes academia



In our 5 week journey we syndicated with stakeholders on the impact and feasibility of the initiatives

Targeted syndication sessions were implemented throughout the Phakisa to ensure that initiatives:

- Will have large scale impact (GDP growth, Job creation and environmental impact)
- Are practical and implementable
- Have industry and government support
- Are economically sound



Syndication Days

✓ Environmental Sustainability

✓ Job Creation

✓ Investor Day

✓ Business Day

✓ Phakisa-specific syndications (Small business, EPRs, IDC, Legislation, Awareness)

✓ Legislation Day

✓ National Treasury Sessions

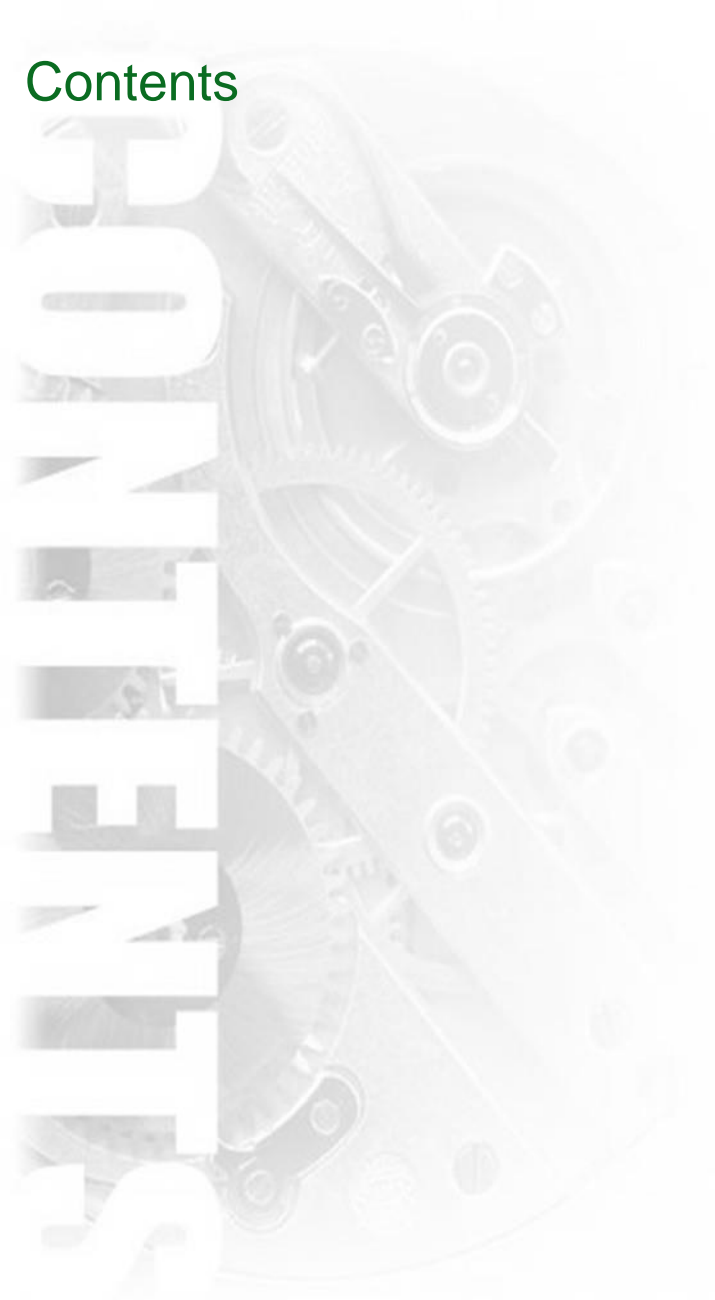
✓ SteerCo with DGs

✓ Chemicals Industry syndication

✓ SteerCo with DGs and DDG (DEA, DSBD, DPME)



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Participants identified 20 initiatives across 4 workstreams, including 2 cross-cutting initiatives

Bulk industrial waste



- 1 Increase ash uptake for alternate building materials¹
- 2 Accelerate innovation and commercialize existing R&D¹
 - Use ash as soil ameliorant
 - Use ash to treat acid mine drainage and backfill mines
- 3 Export ash and ash products¹
- 4 Zero sewage sludge to land(fill)
 - Anaerobic Diegstor Biogas to Energy
 - FBR Thermal Treatment
- 5 Towards Zero meat production waste to land(fill) by 2023

Municipal



- 6 Introduction of an E-waste levy to increase collection rate
- 7 Unlocking government ICT legacy volumes
- 8 Achieving a minimum of 50% of households separating at source by 2023
- 9 Introduction of materials recovery facilities and pelletization plants to increase plastic recycling rates
- 10 Produce building aggregates and construction inputs from rubble and glass

Product design and waste minimisation



- 11 Developing capacity through a specialised programme which upskills agri-stakeholders to minimize food loss
- 12 Consumer awareness campaign to use and consume ugly food²
- 13 Compilation/update of packaging design guidelines
- 14 Formalising the packaging industry producer responsibility plans
- 15 Establish an refuse-derived fuel plants across South Africa

Chemicals



- 16 Establish a refrigerant reclamation and reusable cylinder industry
- 17 Ban import of harmful chemicals (e.g. leaded paint/paint pigments)
- 18 Collect and dispose stockpiles of harmful substances (asbestos, mercury)

Cross-cutting initiatives

- 19 Coordinate SMME development opportunities across initiatives
- 20 Roll out national awareness campaigns

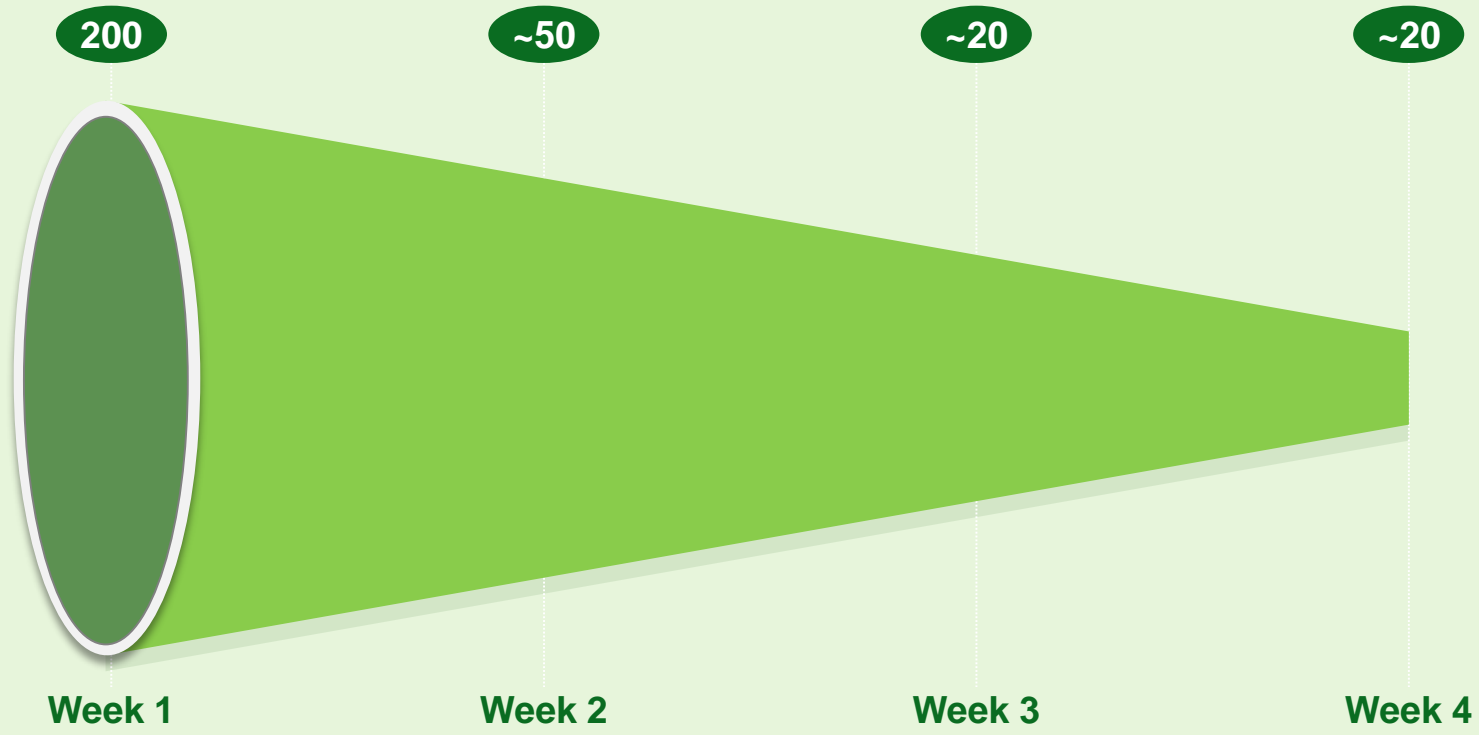


¹ The large volumes of ash produced enables both beneficiation and export
² Fruit with high calorific value, but that are physically imperfect



These 20 initiatives were prioritized from ~200 “big ideas” identified in week 1 of the Phakisa

● Number of initiatives



🔍 Focus for the week

- Big ideas/ideation
- Environment day

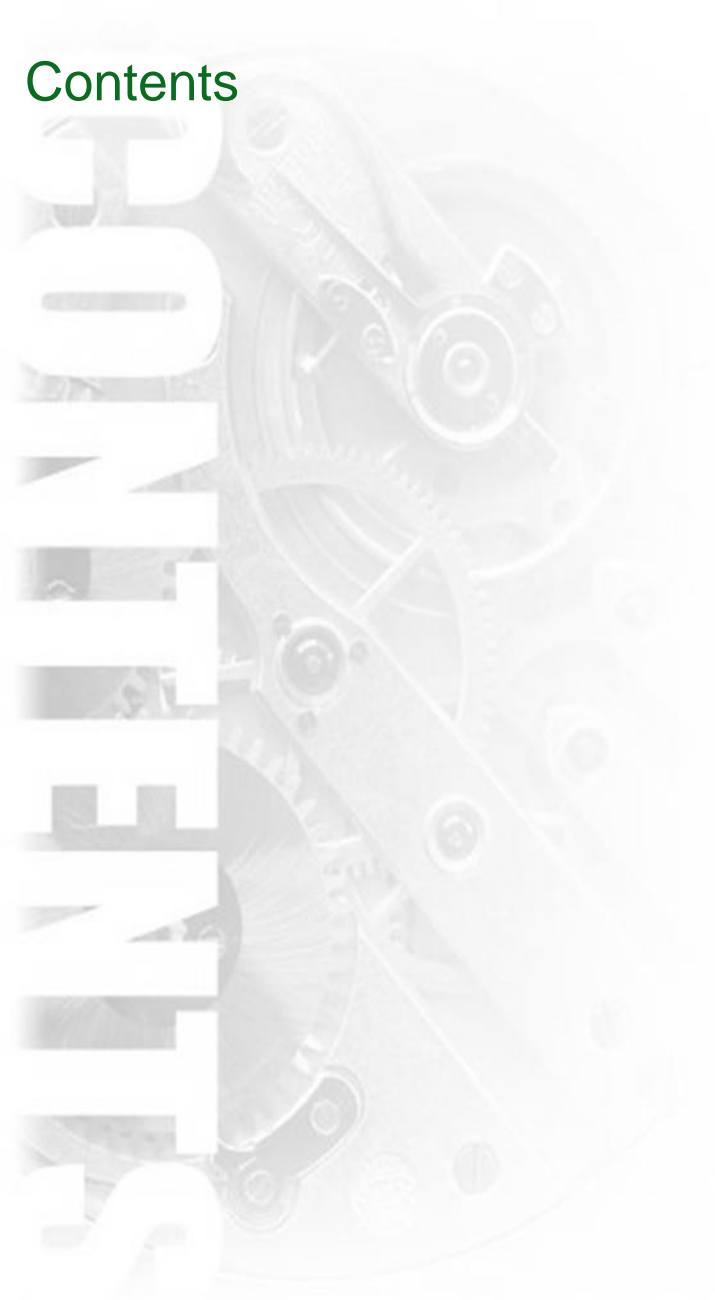
- Greatest environmental impact, jobs and GDP growth
- Job creation day and legislation day

- Budgets and business cases
- Milestones

- 3ft plans
- KPIs



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Bulk industrial waste

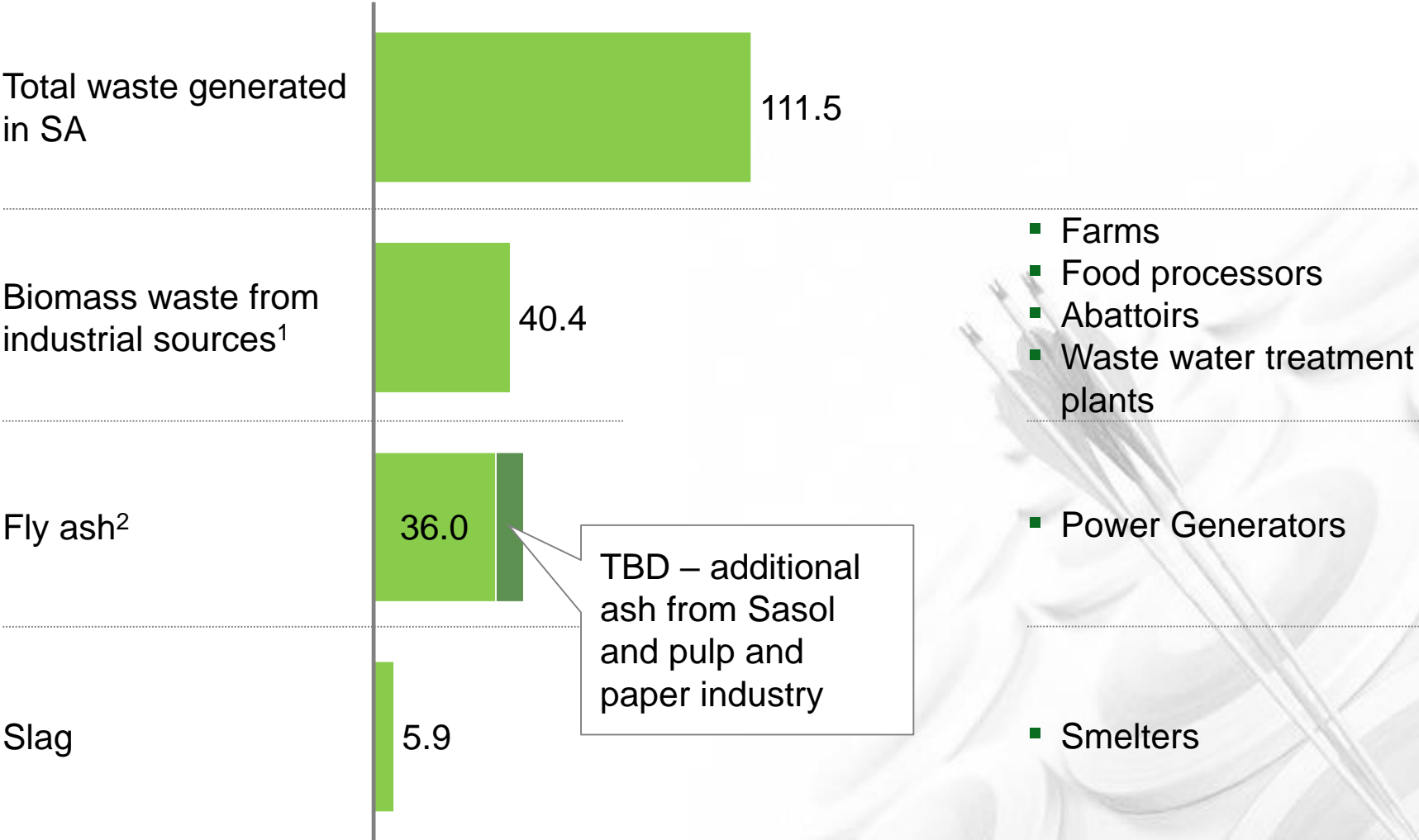


Bulk industrial waste



The industrial workstream has three main waste-streams

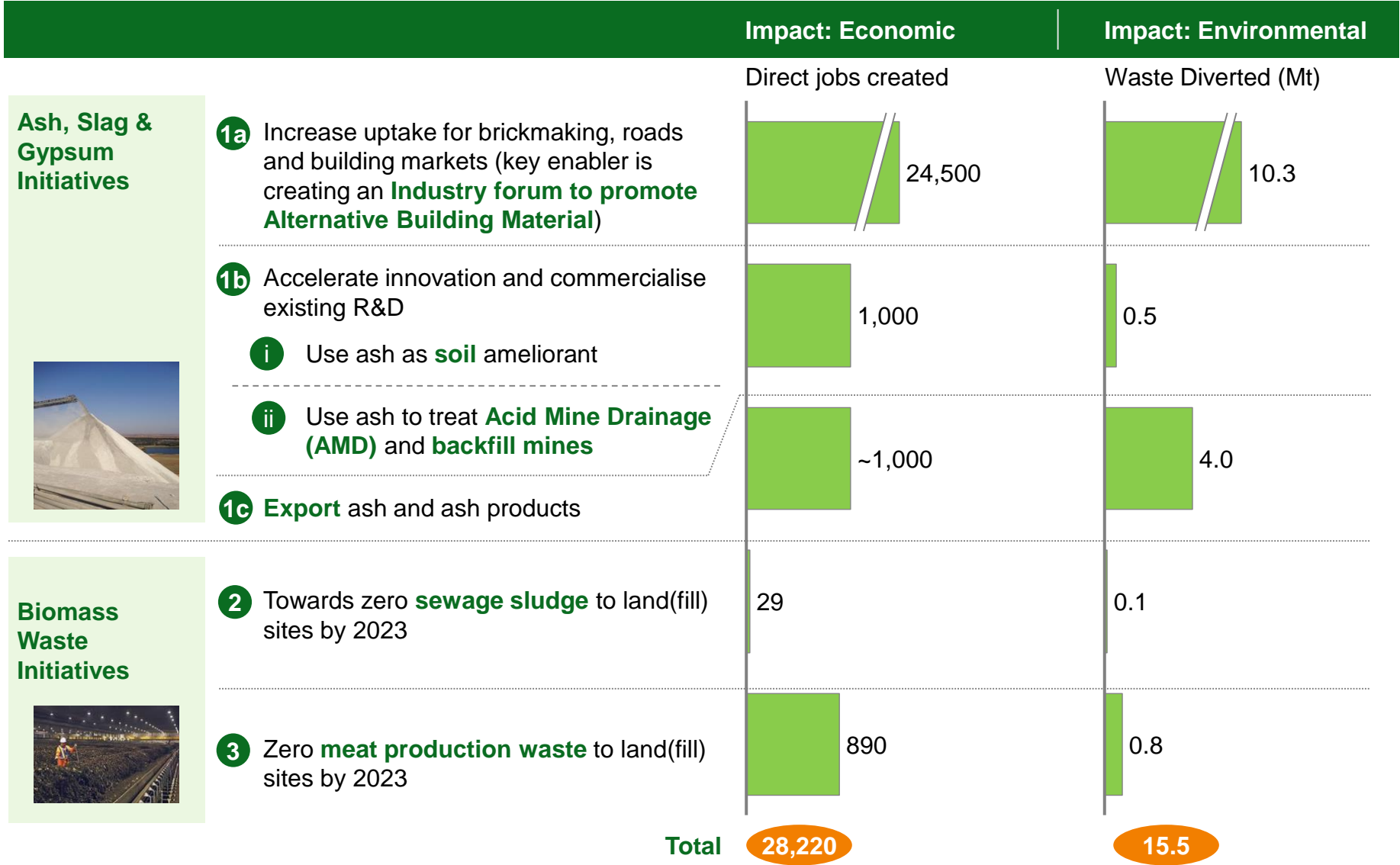
Waste streams by weight (2016), Mt | Major waste producers




¹ Including sewage sludge
² Eskom production only

SOURCE: 2012 National Waste Baseline

High impact initiatives for ash, gypsum, slag and biomass will divert 15.5Mt of waste from landfills and create ~28k direct jobs

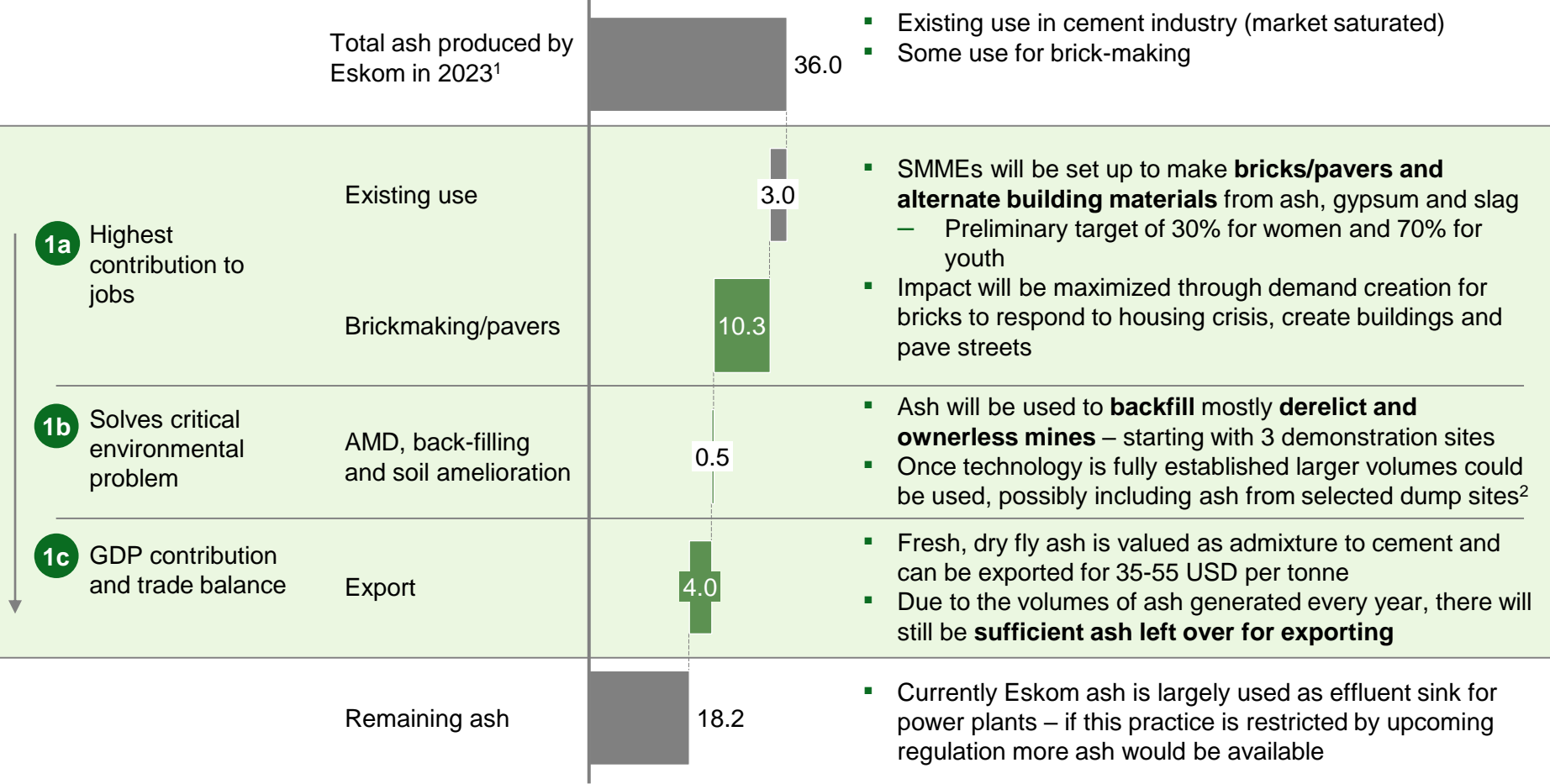


From Eskom alone there is more than enough ash to supply all local beneficiation options and export

 New uptake through Phakisa initiatives

Prioritisation by type of impact

Target use of available ash, Mt per annum **Description of use**



¹ Including ash from Medupi and Kusile
² Quality of ash differs by dump site, in particular if it was used as effluent sink



The biggest challenges for bio-waste includes access to feedstock and matching feedstock to the right technology



Abattoir waste



Food waste



Anaerobic digester



Composting plant



Agri-processing waste



Chicken feathers

VS



Biorefinery



FBR



Sewage sludge



Rendering plant



Insect farming



Biomass initiatives will focus on quick wins that will deliver the most value

Description	Initiative
<p data-bbox="58 365 362 582">Start adoption of existing technology with feedstock that is readily available</p> <ul data-bbox="408 295 1472 652" style="list-style-type: none">▪ Sewage sludge and meat production waste are readily available from well-known sources<ul data-bbox="446 389 1472 652" style="list-style-type: none">– Sewage sludge initiative focusses on technology adoption by municipalities, starting with municipalities that already have anaerobic digesters – Ekurhuleni and Tshwane– Meat production waste is provided by private companies that can enter flexible arrangements with entrepreneurs. Initial focus is on anaerobic digestion and composting.	<ul data-bbox="1547 295 1791 529" style="list-style-type: none">2 Sewage sludge3 Meat production waste
<p data-bbox="58 876 371 1086">Create a platform to inform entrepreneurs about available feedstock</p> <ul data-bbox="408 722 1472 1282" style="list-style-type: none">▪ Establishment of a platform that identifies the source (i.e. beef, chicken, pigs etc.), type (manure, blood, paunch, off-cuts etc.) and location (geospatial) of feedstock, as the facilities producing the feedstock are located across the country▪ Will answer a few key questions:<ul data-bbox="446 1002 1059 1184" style="list-style-type: none">– What feedstock is available?– Where is it located in the country?– What technology type is suitable?– What is the final product?▪ The platform will enable opportunities for easy selection and implementation of projects	<ul data-bbox="1547 722 1791 848" style="list-style-type: none">3 Meat production waste



Changes to legislation will enable acceleration of initiatives and impact

Short term

- **Section 74**
 - Application can be made for exemption from applying for WML for specific waste streams

To be clarified: If the producer can generate revenue from any of our “waste streams”, it does not fit the definition. Are these resources really waste?

“Any substance, material or object, that is unwanted, rejected, abandoned, discarded or disposed of, or that is intended or required to be discarded or disposed of, by the holder of that substance, material or object, whether or not such substance, material or object, can be reused, recycled or recovered and includes all wastes as defined in Schedule 3”

Medium to long-term (2-3 years)

- **Regulation 9**
 - Streamline and fast track process
 - Introduce timelines for processing Regulation 9 applications
- **Section 19 - Delisting**
 - Application can be made for specific waste streams to be exempted from being considered as waste based on their proven beneficial use
- **Amend and fast track Exclusion Regulations**
 - Move away from listing waste streams for exclusion to a criteria based exclusion
 - Fast track gazetting for implementation







Municipal waste



Municipal waste



The municipal waste workstream identified initiatives across 4 waste streams to maximise the diversion of waste from landfills

Theme	Initiative	Impact
E-waste 	<ol style="list-style-type: none"> 1a Introduction of an E-waste¹ levy to increase collection rate 1b Unlocking government ICT legacy volumes 	<p>ENVIRONMENTAL IMPACT</p> <ul style="list-style-type: none"> ▪ 3.7 m tonnes of waste redirected from landfill sites annually <p>JOBS</p> <ul style="list-style-type: none"> ▪ ~15,100 direct jobs ▪ ~21,200 indirect jobs <p>GDP CONTRIBUTION</p> <ul style="list-style-type: none"> ▪ R2.1 bn
Organic waste 	<ol style="list-style-type: none"> 2 Achieving a minimum of 50% of households separating at source by 2023 	
Packaging waste 	<ol style="list-style-type: none"> 3 Introduction of MRFs and pelletization plants to increase plastic recycling rates 	
Construction & demolition waste 	<ol style="list-style-type: none"> 4 Produce building aggregates and construction inputs from rubble and glass 	

¹ Electronic waste generated by consumers and businesses, including computers, cables, phones, etc.



Initiative 1a and 1b: Introduction of an E-waste levy to increase collection rate and unlocking government ICT legacy volumes

Supply generation through **increased collection**

Facilitate transformation and growth of the sector in existing recycling architecture (Tier 1 – Tier 4)

1a Collection incentive



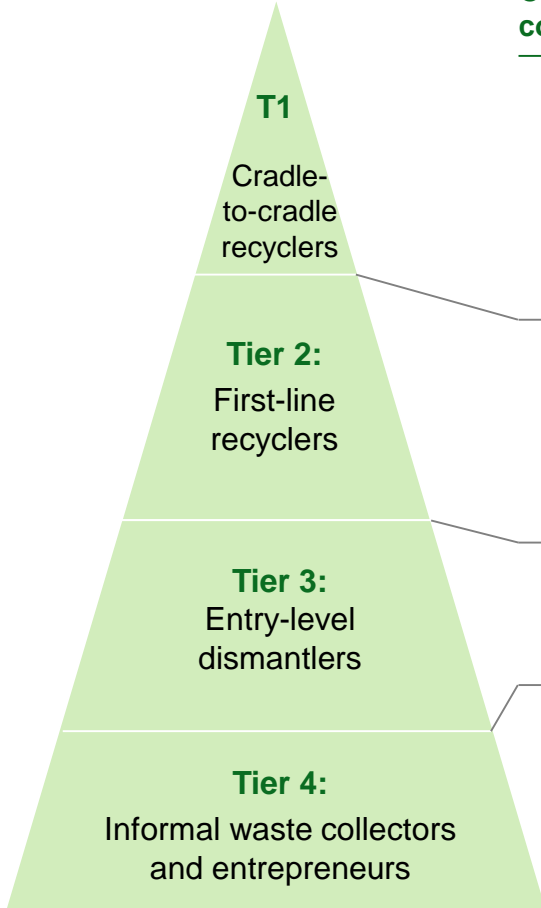
- The value of components in E-waste can be positive or negative, resulting in **illegal dumping of majority of negative or low value components**
- Introducing a **'handling fee'** per kg will incentivize collectors, and can be financed through an EPR levy¹

1b Unlock government volumes



- Adopting a government and SoE wide **E-waste asset management system** could **unlock legacy volumes** to the private sector through a process of **de-listing, data wiping and certification**
- Future stocks could be managed through a **refurbishment and re-deployment** policy

Transformation target: **80%**



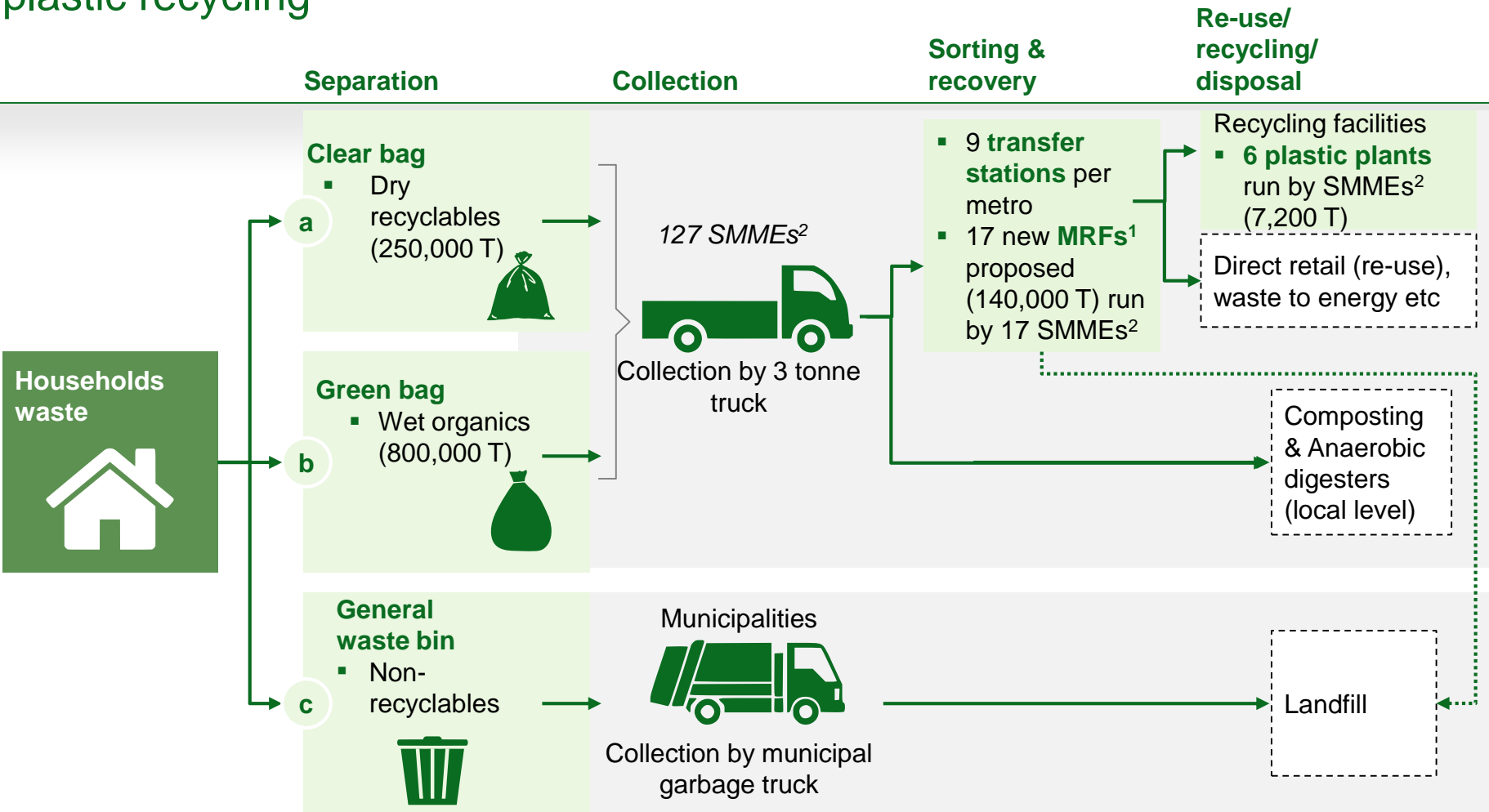
Current companies	Additional companies	Highlights
7	15	- Fast track technology uptake to enable local beneficiation of precious metals - Incubation of new black industrialists
25	50	- Incubation of new black industrialists - Enterprise support and development
600	2200	- Transport infrastructure subsidy to be introduced
~1000	2000	- Provision of tricycles with bins

¹ Extended producer responsibility requiring original equipment manufacturers to pay a fixed amount per KG upon placing product onto market
SOURCE: SAEWA, E-WASA, IESSA, RECLITE, Industry experts



Initiative 2 and 3: Separation at source and increased plastic recycling

Out of work stream scope



Enablers: Education & awareness campaigns

Incentives: Tariff re-structuring- reduced tariffs if households comply with separation system

¹ Material recovery facilities

² SMME development has a preliminary target of 30% women and 70% youth



Initiative 4: Produce building aggregates and construction inputs from rubble and glass



- Amend **green procurement policies** and tender specifications (government and private sector) to require **30% of recycled construction materials** for buildings and roads



- To be achieved through the **review** of:
 - Sector policies
 - Building and road standards
 - Regulations
 - Legislation
 - Supply chain process
 - Procurement policies and regulations

- 9 crushing plants** in metros and **44 crushing plants** in district municipalities producing:
 - G5/7/9 grade road crusher run
 - Foundation aggregate
- 19 Compressed earth bricks (CEB)** plants in metros and **44 CEB plants** in district municipalities
- 9 flat glass crusher plant in metros** for glass producing:
 - Sand blasting grit
 - Aesthetic stone flooring

Review to be conducted through **inter-departmental** and **cross-sector co-operation**



Total investment requirements for municipal waste initiatives

Waste streams diversion p.a, M tonnes, 2022/23 steady-state	Initiative name	Total investment, ZAR M	Target private funding, ZAR M	Target public funding, ZAR M	GDP contribution p.a, ZAR M
2.13	<ul style="list-style-type: none"> Achieving a minimum of 50% of households separating at source by 2023 	1,180	894	288	956
1.45	<ul style="list-style-type: none"> Produce building aggregates and construction inputs from rubble and glass 	517	509	8	437
0.13 ¹	<ul style="list-style-type: none"> Geographical expansion of MRFs and pelletization plants to increase plastic recycling rates 	690	138	551	372
0.08	<ul style="list-style-type: none"> Introduction of an E-waste levy to increase collection rate Unlocking government ICT legacy volumes 	1,420	1,174	247 ²	341

¹ Figure reports amount sorted per annum. Waste diversion is already captured in the separation at source diversion initiative

² Covers cost of running E-waste management system






Product design and waste minimization



Product design and waste minimization

An icon on a green background showing a white silhouette of a person sitting at a desk, with three gears of increasing size above their head and a bar chart to their right.

The Waste Minimisation workstream has identified food and packaging waste as largest potential sources to reduce volumes of waste produced

Theme	Initiative	Overall Impact	
Food waste 	<ol style="list-style-type: none"> 1 Conducting focused research and developing capacity amongst agro-stakeholders 2 Launching a consumer awareness campaign to use and consume 'imperfect' food 	Jobs Created	287
		Volume of food losses prevented (000 Tonnes)	245
		Value of food losses avoided (ZAR millions)	1,200
Packaging waste 	<ol style="list-style-type: none"> 3 Compile/update packaging design guidelines and establishing a national grading scheme for packaging 4 Formalising Extended Producer Responsibility (EPR) plans in the packaging industry 	Jobs Created	2,464
		Volume of waste diverted (000 Tonnes)	146
		Contribution to GDP (ZAR millions)	36
Refuse Derived Fuel (RDF) 	<ol style="list-style-type: none"> 5 Establish up to 5 Refuse Derived Fuel (RDF) plants across South Africa 	Jobs created	305
		Volume of waste Diverted (000 Tonnes)	120
		Contribution to GDP (ZAR millions)	80

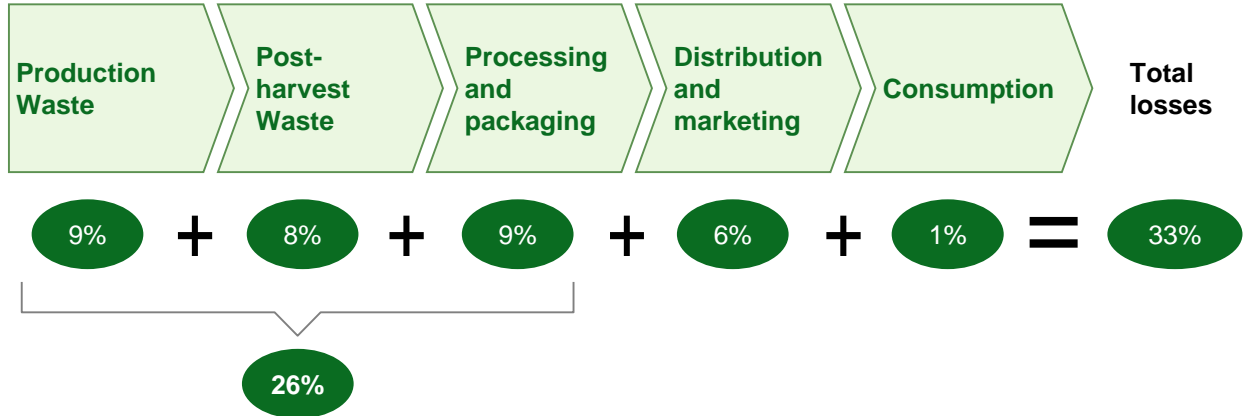


Food losses in South Africa is estimated to be ~33% of total production, of which most occurs pre-distribution

● % of total waste

Total food losses across value chain

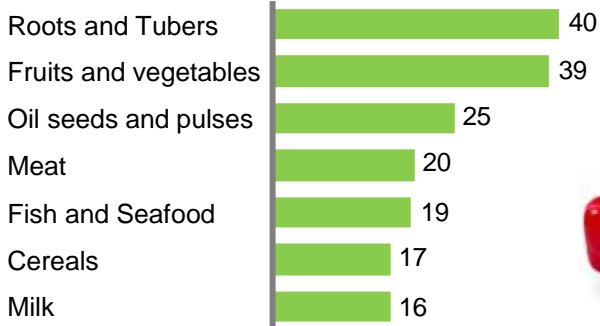
Food losses across the value chain % of total production



- Majority of food losses occurs **prior to distribution** and marketing
- Although high-level information is available, there is a **lack of research and data which identifies exactly where and why these losses are occurring**

Food Losses by food category

Percentage of production lost by food category % of total production



- Largest losses occur for
 - Roots & tubers
 - Fruit and vegetables
- For these foods, **consumer preferences for perfectly shaped produce** drives significant part of losses across the whole value chain

1 Does not include imports




Food insecurity will be reduced by upskilling and educating stakeholders across the value chain


Initiative

1


Conducting **focused research and capacity development** amongst agro-stakeholders



2 ZERO HUNGER



12 RESPONSIBLE CONSUMPTION AND PRODUCTION



- Create a specialized program which will upskill agro-stakeholders which will:
 - **Conduct targeted research** (e.g. secondary/alternative market development for ugly food and consumer incentives to increase consumption of 'imperfect' food)
 - **Testing, replicating and scaling new and existing tools** which will lead to improved production and decreased food losses
 - **Developing a national multi-purpose platform** which aggregates, consolidates and publishes agricultural and food loss data

2

Launching a **national consumer awareness drive** on food waste




- This initiative seeks to **increase the consumption of imperfect (ugly) food**
- Design, develop and launch a **national food waste awareness campaign**
 - The campaign will include TV, Social Media and other marketing aimed at influencing consumer behaviour

Impact from food waste initiatives

Jobs Created

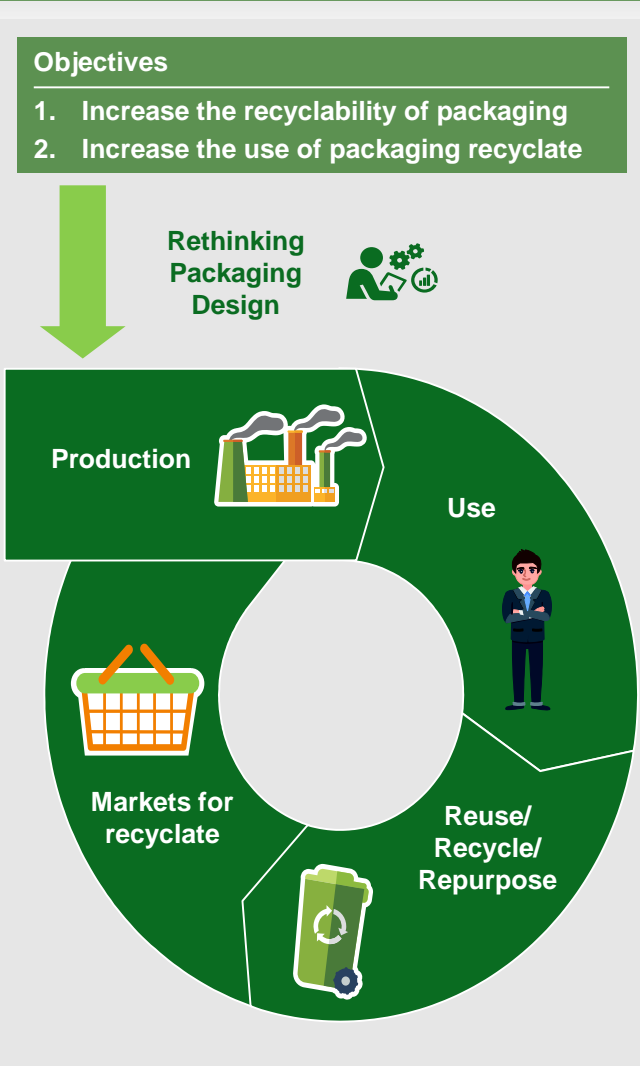
- Direct jobs 30
- Indirect jobs 257

Environmental & Economic

- Volume of food losses avoided (000's Tonnes) 245
- Value of food losses avoided (ZAR billion) 1.2

Recycling of packaging will be increased by rethinking design and formalising the Extended Producer Responsibility (EPR) mechanisms

Impact from packaging waste initiatives



Initiative

3

Develop **national packaging design guidelines** and green grading/certification scheme

Green grading/ Certification Scheme

- Level A
- Level B
- Level C

- Develop **packaging guidelines** with the intention of evolving these into **Norms and Standards** by 2022
- To accelerate adoption of guidelines and increase collaboration between recyclers, designers and brand-owners, a **packaging certification scheme** will be launched

4

Implementing a successful **packaging industry EPR mechanism**

- Publishing a section 18 or 28 notice that will
- Identify the **products** to which the EPR applies
 - Specify the **EPR measures** required for each product
 - Identify the **category of persons** who must implement the EPR
 - Include a **regulatory tool/ mechanism** to deal with “free riders”.

Jobs Created	
▪ Direct jobs	616
▪ Indirect jobs	1,848
Environmental & Economic	
▪ Volume of packaging waste diverted from landfill (000's Tonnes)	146
▪ Contribution to GDP (ZAR millions)	36



Establishing a Refuse Derived Fuel (RDF) plant with the intention of building four more by 2023

Context: the problem

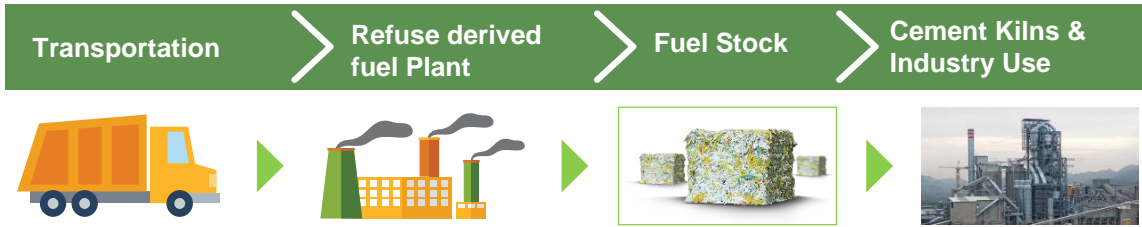


- South Africa's landfills are rapidly running out of space with **98m tonnes of waste being deposited every year**

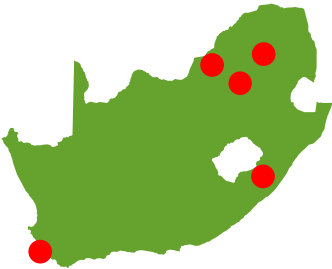


- 1.4bn diapers** are sold per year resulting in approx. 280 000 tonnes of Absorbent Hygiene Product (AHP) waste arising nationally
- It takes **200 – 500 years** for a diaper to decompose¹

Proposal



- RDF plants** will process high Calorific Value Municipal Solid Waste (MSW), including Absorbent Hygiene Products (AHP).
- Additional **revenues generated from gate fees** from brand owner contracts for excess preconsumer AHP waste and RDF sales to industry e.g. Cement Kilns
- Plants will be located based on **analysis of waste streams** in different Material Recovery Facilities (MRFs) and landfill sites



Impact: Jobs

Direct jobs	105
Indirect jobs	200

Environmental and Economic

Waste diverted (000 Tonnes)	120
GDP value (ZAR million)	80

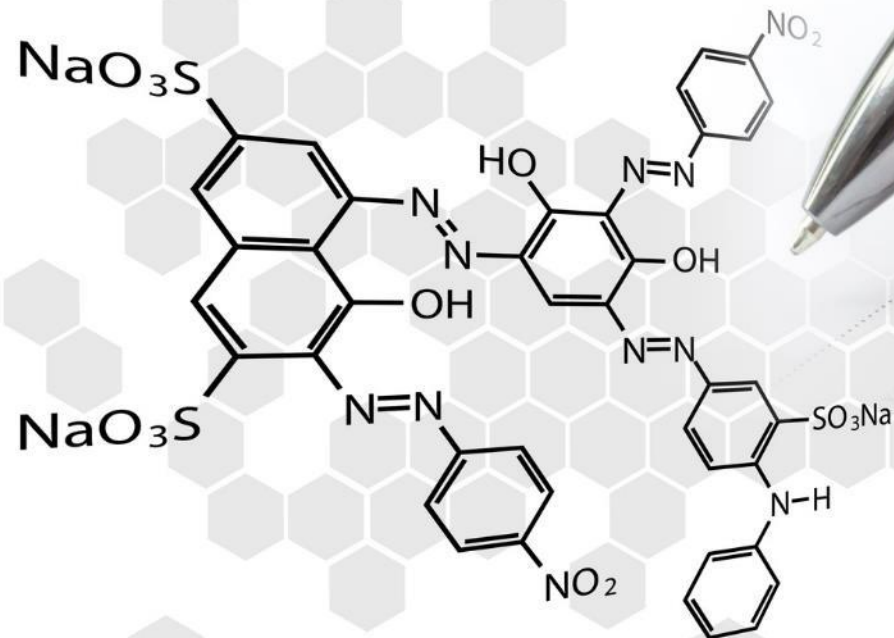
Funding requirement (ZAR Million)

Total investment		260
Private Funding	81%	210
Public Seed Funding (Waste Bureau)	19%	50

¹ BBC (2015)



Chemicals



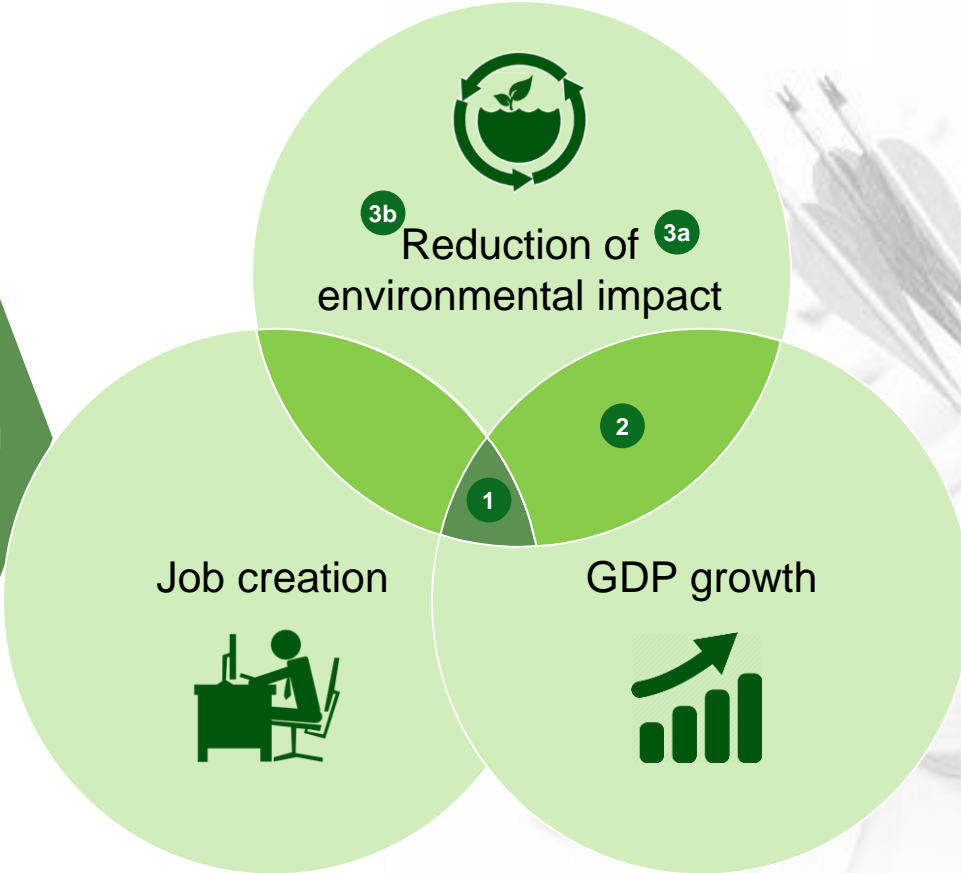
Chemicals



The Chemicals workstream identified initiatives across 3 broad areas which mitigate against negative environmental impact

APPROACH

- Consider initiatives across the chemicals value chain
- Prioritise initiatives based on economic and environmental impact
- Rank initiatives based on feasibility within and alignment with Phakisa objectives



List of initiatives

Harmful chemical imports


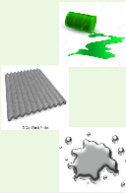
- 1 Establish refrigerant gas reclamation and recycling industry
- 2 Promote safe South African lead free paints and paint pigments

Dangerous chemical stockpiles

- 3a Strategy for treatment and disposal of Asbestos stockpiles
- 3b Strategy for treatment and disposal of Mercury stockpiles



Overview of the impact of the 3 proposed chemicals workstream initiatives

Theme	Initiative	Reason for prioritisation
<p>Harmful chemical imports</p> 	<ol style="list-style-type: none"> 1 Establish refrigerant gas reclamation and recycling industry 2 Promote safe South African lead free paints and paint pigments 	<ul style="list-style-type: none"> ▪ Immediate action recommended due to dual economic and environmental impact
<p>Dangerous chemical stockpiles</p> 	<ol style="list-style-type: none"> 3a Strategy for treatment and disposal of Asbestos stockpiles 3b Strategy for treatment and disposal of Mercury stockpiles 	<ul style="list-style-type: none"> ▪ Action recommended as soon as funding is confirmed ▪ Detailed plans exist and there is high environmental and health hazard

1 GWP: Global Warming Potential



The Phakisa focused on the reduction of harmful chemical imports into South Africa, and developed initiatives 1 and 2 to 3ft level

Initiative

Environmental rational for ban

Economic openings for local capture

1

Establish refrigerant gas reclamation and recycling industry



- Establish refrigerant gas reclamation and recycling industry by:
 - **Training and formalizing 2000** informal refrigerant technicians
 - **Creating 5 SMMEs** to reclaim 3000 Tonnes of refrigerants
 - **Phasing out disposable refrigerant cylinders** imports by 2023



2

Promote safe South African lead free paints and paint pigments



- Promote safe South African lead free paints and paint pigments by:
 - **Banning imports** of leaded pigments and leaded paints by 2018
 - **Phasing out local production** of leaded paint and paint pigments by 2020
 - **Enforcing compliance** at borders, local manufacturers and retail stores



Impact from initiatives

Jobs impact

- Direct jobs formalized **2,000**
- Indirect jobs created **1,000**

Environmental & Economic

- Number of waste cylinder diverted from landfill site (000's) **225**
- GWP¹ tonnes of ozone depleting gas emissions stopped (000's) **114**
- GDP contribution from initiatives (ZAR million) **540**

1 GWP: Global Warming Potential



Prioritised initiatives to be funded through multiple sources

Initiative name	Total funding required ZAR m	Private/donor funding, ZAR m	Public funding, ZAR m	Possible funding sources
1 Establish refrigerant gas reclamation and recycling industry	123	50	73	<ul style="list-style-type: none"> UNIDO¹ equipment grant SEFA² loans DSBD³ small business grants NSF⁴ training grants IDC⁵ Basic and Specialty chemicals grant theDTI⁶ SMME funding grant
2 Promote safe South African lead free paints and paint pigments	7	0	7	<ul style="list-style-type: none"> KEMI⁷ donor grant GIZ⁸ donor grant
3a Strategy for treatment and disposal of Asbestos stockpiles	Next steps <ul style="list-style-type: none"> Development of funding proposals based on existing pilots/ project plans Cross cutting financing support for Phakisa will organize engagements with international donors and local sources on funding of waste related activities This will be used to also communicate funding need for disposal of stockpiles 			
3b Strategy for treatment and disposal of mercury stockpiles				

1 United Nations Industrial Development Organization 2. Small Enterprise Finance Agency 3. Department of Small Business Development 4. National Skills Fund 5. Industrial Development Corporation 6. Department of Trade and Industry 7. Swedish Chemicals Agency 8. Deutsche Gesellschaft für Internationale Zusammenarbeit 9. Funding required to be confirmed

SOURCE : A-Gas, Afrox, theDTI, SAPMA, DEA



A number of legislative and inter-departmental issues need to be resolved for successful implementation of the proposed initiatives

New regulations required

- Regulation to phase out imports of disposable refrigerant cylinders by 2023
- Regulation to ban dumping of disposable cylinders at landfill sites
- Regulation to ban importation of leaded paints and paint pigments by 2018
- Regulation on phase out of local production of leaded paints by 2020

MOU's and regulatory amendments needed

- MOU between DEA, DOL, SARS and BMA on management of disposable cylinder imports
- MOU between DEA and DTI on phase out of local production of leaded paint and paint pigments
- Amendment to Department of Health Regulation permitting import and production of leaded paints with lead content below 600ppm
- Amendment of Department of Trade and Industry incentive schemes to enable local manufacturers change to lead-free paint production processes
- Amendment SANS 10147 (Pressurised Equipment Regulations) to include ban on disposable cylinders



Cross-cutting initiatives



Cross-cutting initiatives



A nationwide awareness campaign is required to support growth of the chemicals and waste economy

	Topics for awareness campaign	Support provided
Consumer behaviour	<ul style="list-style-type: none"> Consumer drive to “eat ugly fruit”¹ Consumer awareness on e-waste Consumer drive to separate waste at source Overall awareness about safe disposal of waste 	<ul style="list-style-type: none"> Joint platform to enhance reach and deliver individual messages, e.g. <ul style="list-style-type: none"> Common “look and feel” of campaigns Single information platform with more news Integrated plan for communication with media Measuring of reach of individual campaigns by used channel to improve overall targeting for next campaign Shared procurement of services
Industry Practices	<ul style="list-style-type: none"> Use of harmful chemicals in paint Update of packaging design guidelines to increase recyclability of packaging Building aggregates and construction inputs from rubble and glass 	

¹ Fruit with high calorific value but that are physically imperfect



The coordination of SMME development across Phakisa initiatives will support the development of 4,300 SMMEs, creating ~41k jobs

Context

- SMMEs are expected to be a driving force in South Africa's social and economic stability
- **NDP aims to create 11 million new jobs by 2030, 90% of which will come from the SMME sector**
- **40% of all businesses** in South Africa are SMMEs
- **GDP contribution of the sector was estimated between 30-36% in 2016**
- The Chemicals & Waste Phakisa expects to **create ~4,300 new SMMEs, contributing ~41,300 new jobs, between 2017-2023**
 - Preliminary target of 30% women and 70% youth

Proposal

- I** Build a **library of all financial & non-financial support available to SMMEs** and publish bi-annually
- II** Request allocation of a portion of the R1.5 billion fund being negotiated by National Treasury for DSBD
- III** Sign **transversal agreement** between SMME-related govt. departments to motivate for:
 - **ring-fencing of funds** for the chemical & waste sector
 - **batch adjudication** of Phakisa initiative funding applications
- IV** Provide **legal and regulatory guidance** and support in completing applications to all initiatives
- V** **Attract entrepreneurs to the opportunities identified by Phakisa** by advertising opportunities through collectives & chambers. Special emphasis on attraction of **women, youth and black entrepreneurs**

Impact

- Enabler of:
 - ~4,300 new SMMEs created by the Phakisa, which will unlock ~41,300 new jobs opportunities
 - the chemical & waste sector, more broadly

Funding requirement

- Funding required for dedicated resource to lead initiative
- Will be sourced through DEA delivery unity budget or seconded from partner organizations such as SEDA, SEFA, DSBD



The initiatives create ~4,300 SMMEs contributing ~41,300 jobs

Number of SMMEs in category
(Average number of jobs per SMME)

Cooperative modality can be explored for these companies

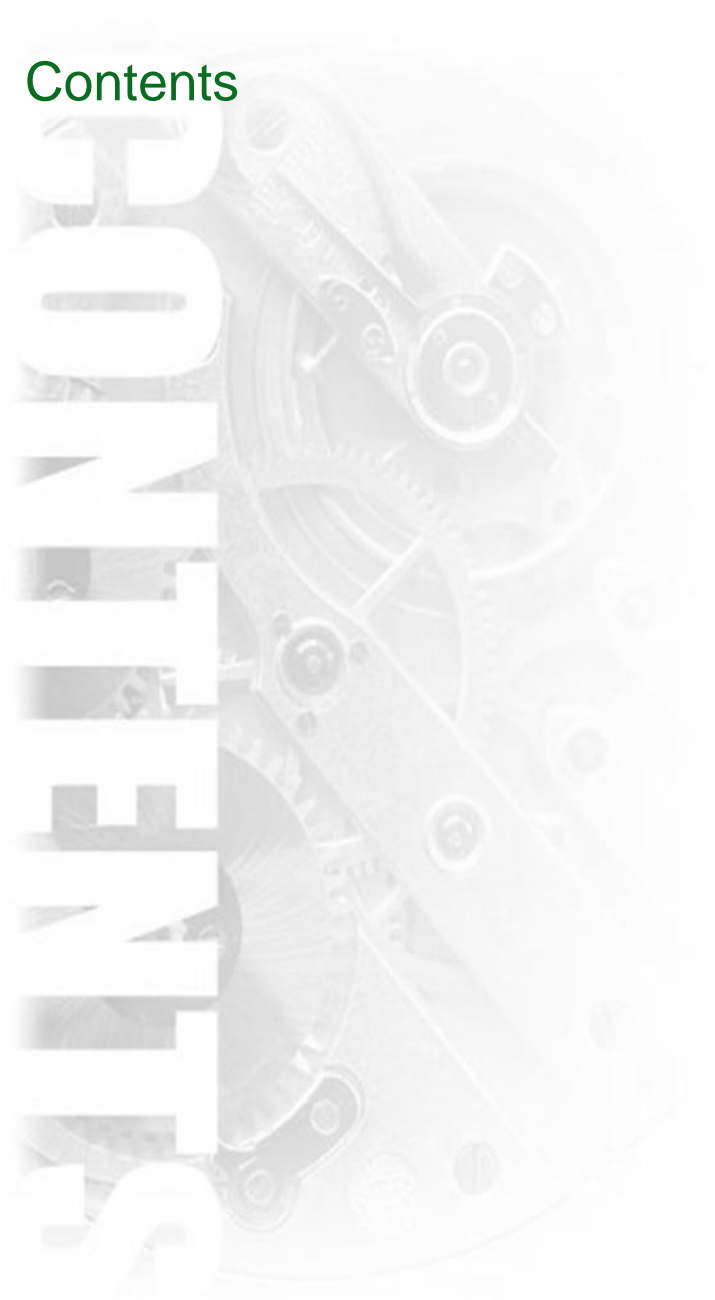
Size (employees)	Industrial waste				Municipal waste		Plastics	Construction & Demolition	Chemical	Minimization & product design	Total
	Bricks	Abattoir	AMD ¹ & backfill	Sewage sludge	E-waste	Collections			Refrigerant	RDF	
Medium business (51 – 100)							23 (80)				23 (1,840)
Small business (21 – 50)		40 (22)	25 (40)							5 (21)	113 (3,235)
Very small business (5 – 20)	1,750 (14)			4 (7)	2,283 (5)						4,035 (35,645)
Micro-enterprise (<5)								125 (4)	5 (4)		132 (543)
Total SMMEs	1,750	40	25	4	2,283	43	23	125	5	5	4,260
(Number of jobs)	(24,500)	(890)	(1,000)	(29)	(11,120)	(1,240)	(1,840)	(519)	(20)	(105)	(41,234)

¹ Acid Mine Drainage

Numbers reflect the average size of SMMEs in an initiative and not the distribution of SMMEs within that initiative
There are an additional 3,677 jobs created by the Phakisa outside of SMMEs

SMME development has a preliminary target of 30% women and 70% youth

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Thank you!

