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Contents

<i>No.</i>		<i>Gazette No.</i>	<i>Page No.</i>
GOVERNMENT NOTICES • GOEWERMENTSKENNISGEWINGS			
Environmental Affairs, Department of/ Omgewingsake, Departement van			
904	National Environmental Management: Waste Act (59/2008): National pricing strategy for waste management	40200	4

GOVERNMENT NOTICES • GOEWERMENTSKENNISGEWINGS

DEPARTMENT OF ENVIRONMENTAL AFFAIRS

NO. 904

11 AUGUST 2016

**NATIONAL ENVIRONMENTAL MANAGEMENT: WASTE ACT, 2008
(ACT NO. 59 OF 2008)****NATIONAL PRICING STRATEGY FOR WASTE MANAGEMENT**

I, Bomo Edith Edna Molewa, Minister of Environmental Affairs, hereby publish the National Pricing Strategy for Waste Management, set out in the Schedule hereto, under section 13A of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) for implementation.



BOMO EDITH EDNA MOLEWA
MINISTER OF ENVIRONMENTAL AFFAIRS

SCHEDULE



**National Pricing Strategy
for Waste Management**

January 2016



environmental affairs

Department:
Environmental Affairs
REPUBLIC OF SOUTH AFRICA

Table of Contents

1	Executive Summary.....	1
2	Background.....	2
	2.1 Introduction.....	2
	2.2 Legislative context.....	2
	2.3 Objective and principles of a National Pricing Strategy.....	3
	2.4 Problem statement.....	4
	2.5 Approach and methodology.....	5
3	Economic instruments for implementing a NPSWM.....	6
	3.1 Upstream instruments.....	8
	3.2 Downstream instruments.....	10
	3.3 Subsidy-based instruments.....	12
4	Approach to the setting of waste management charges.....	13
	4.1 Downstream instruments.....	14
	4.1.1 Volumetric tariffs.....	14
	4.1.2 Disposal taxes.....	15
	4.2 Upstream instruments.....	16
	4.2.1 Product, material and input taxes.....	17
	4.2.1.1 Virgin material tax.....	18
	4.2.1.2 Input taxes.....	18
	4.2.1.3 Product taxes.....	19
	4.2.2 Advance recycling fees (ARFs).....	21
	4.2.3 Deposit-refund schemes.....	22
	4.2.4 EPR fees.....	22
5	Implementing economic instruments.....	23
	5.1 Downstream instruments.....	23
	5.2 Upstream instruments.....	24
	5.2.1 Government intervention.....	24
	5.2.2 Selecting the appropriate economic instrument(s).....	25
	5.3 Extended producer responsibility.....	26
	5.3.1 Approach to developing EPR schemes.....	26
	5.3.2 Identify product, product group or waste stream for EPR.....	27
	5.3.3 Design EPR scheme.....	28
	5.3.3.1 The Product Steering Committee,.....	28
	5.3.3.2 Operationalisation of the Waste Management Bureau.....	28
	5.3.3.3 Develop Product Plan.....	28
	5.3.3.4 Product Responsibility Organisations (PROs).....	29
	5.3.3.5 Develop Industry Waste Management Plan.....	29
	5.3.4 Give effect to EPR.....	30
6	Collection and disbursement of waste management charges.....	30
	6.1 Downstream charges.....	30
	6.2 Upstream charges.....	31
	6.3 Proposed EPR Scheme.....	32
7	Monitoring and Evaluation.....	33
	7.1 DEA / The Bureau.....	33
	7.2 Product Responsibility Organisations.....	33
	7.3 Product Steering Committees.....	34
8	Transitional arrangements.....	34

Annexure A. Action Plan for the Implementation of the NPSWM

*National Pricing Strategy for Waste Management***Index of Figures**

Figure 1.	Examples of economic instruments along the product-waste value chain	7
Figure 2.	Process for considering government intervention	25
Figure 3.	Approach to the collection and disbursement of downstream charges	30
Figure 4.	Approach to the collection and disbursement of Upstream charges	31
Figure 5.	Approach to the collection and disbursement of EPR charges.....	32

Index of Tables

Table 1:	Phases for developing the NPSWM	5
Table 2:	Potential economic instruments for solid waste management.....	8
Table 3:	Upstream instruments: Incentives created and typical applications	10
Table 4:	Downstream instruments: Incentives created and examples	11
Table 5:	Information relevant for selection of upstream economic instruments.....	17
Table 6:	Monitoring and evaluation responsibilities	33

List of Abbreviations

ARF	Advance Recycling Fee
CoGTA	Department of Cooperative Governance and Traditional Affairs
DEA	Department of Environmental Affairs
DRS	Deposit-Refund Scheme
EDD	Department of Economic Development
EI	Economic Instrument
ELV	End-of-life Vehicle
EPR	Extended Producer Responsibility
IDP	Integrated Development Plan
IndWMP	Industry Waste Management Plan
IWMP	Integrated Waste Management Plan
LCA	Life Cycle Analysis
MEC	Member of Executive Committee
MTEF	Medium-term Expenditure Framework
NEMA	National Environmental Management Act
NEMWA	National Environmental Management: Waste Act
NGO	Non-Governmental Organisation
NWMS	National Waste Management Strategy
NPSWM	National Pricing Strategy for Waste Management
PACSA	Packaging Council of South Africa
PAYT	Pay-as-you-throw
PETCO	PET Recycling Company
Polyco	Polyolefin Recycling Company
PRASA	Paper Recycling Association of South Africa
PRO	Product Responsibility Organisation
SARS	South African Revenue Service
TGRC	The Glass Recycling Company
<i>the dti</i>	Department of Trade and Industry
WEEE	Waste Electrical and Electronic equipment
WTP	Willingness to pay

1 Executive Summary

The National Environmental Management: Waste Act, hereafter referred to as the "Waste Act", directly allows for targeting of economic instruments to specific waste streams to serve as incentives or disincentives to encourage a change in behaviour towards the generation of waste and waste management by all sectors of society.

The National Pricing Strategy for Waste Management (NPSWM) is a legislative requirement of the National Environmental Management: Waste Amendment Act (Act No. 26 of 2014) and gives effect to the National Waste Management Strategy (NWMS). The Waste Act, as amended in section 13B, calls for an Act of Parliament to give effect to the pricing strategy, including details on 13B(b) determination of waste management charges and the review of these waste management charges from time to time. Section 13B(c) includes procedures for collection of charges through the national fiscal system.

In line with the requirements of the Waste Amendment Act, this strategy contains guiding methodologies for the setting of waste management charges, aimed at funding the re-use, recycling or recovery of waste; implementation of industry waste management plans (IndWMP) for those activities that generate specific waste streams.

The selection and use of economic instruments (EIs) must also be aligned with the "polluter pays principle" where all generators of waste (including businesses and households) are responsible for the costs of managing the waste generated. A detailed outline of how various actions emanating from this strategy will be implemented is as contained in the Action Plan (Annexure A) of this strategy document. Also contained in the Action Plan are the associated timeframes for implementation by responsible parties.

These IndWMP include not only the direct financial costs of collection, treatment and disposal of waste, but also associated negative externalities including negative health and environmental impacts. Hence, use of EPRs as stipulated within the strategy provides a mechanism for boosting the recycling economy and monitoring the effectiveness of the implementation of Industry Waste Management Plans.

2 Background

The aim of this National Pricing Strategy for Waste Management (NPSWM) is to provide the basis and guiding methodology or methodologies for setting of waste management charges in South Africa. This is through providing an enabling environment for waste recycling and contributing to the recycling economy in South Africa, through recovery, re-use and recycling of waste.

2.1 Introduction

The purpose of this section is to describe the context within which the NPSWM has been developed. This includes the legislative context that frames the development of the NPSWM, the objectives and principles of the NPSWM, the problem statement which the NPSWM aims to address, and the methodology followed in developing the NPSWM.

The NPSWM consists of seven sections as outlined below –

1. **Section 1** describes the methodology followed in developing the NPSWM, the legislative context which gave effect to the NPSWM, and the problems currently experienced within the South African waste sector which the NPSWM aims to address
2. **Section 2** provides a summary of economic instruments which can be applied as policy instruments in the management of waste, and in particular, in the implementation of the NPSWM.
3. **Section 3** outlines possible approaches in determining waste management charges, including issues for consideration by the Department of Environmental Affairs (DEA), Department of Trade and Industry (*the dti*), National Treasury and the South African Revenue Services (SARS) in the setting of charges, fees or levies.
4. **Section 4** describes mechanisms which can be applied in implementing waste management charges in South Africa, within the current legislative context.
5. **Section 5** outlines the approach to the collection and disbursement of waste management charges.
6. **Section 6** deals with monitoring and evaluation of the implementation of waste management charges.
7. **Section 7** provides for transitional arrangements during the implementation of the NPSWM

2.2 Legislative context

The NPSWM is a legislative requirement of Section 13A (1) of the National Environmental Management: Waste Amendment Act (Act No. 26 of 2014), hereafter referred to as the "Waste Amendment Act". In terms of section 13B, an Act of Parliament to give effect to the pricing strategy, including details on 13B(b) determination of waste management charges and the review of these waste management charges from time to time. Section 13B(c) includes procedures for collection through the national fiscal system. In line with the requirements of the Waste Amendment Act, this strategy contains guiding methodologies for the setting of waste management charges, aimed at funding –

National Pricing Strategy for Waste Management

- the re-use, recycling or recovery of waste, including –
 - the identification, further development and promotion of best practices
 - implementation of approved guidelines, norms and standards
 - management of the disbursements of incentives
 - monitoring of the impacts of incentives and disincentives
 - including in previously disadvantaged communities
- the implementation of industry waste management plans for those activities that generate specific waste streams, including –
 - the monitoring of the implementation and impact of industry waste management plans
- the operations of the Waste Management Bureau and the implementation of Industry Waste Management Plans (IndWMP).

The National Environmental Management: Waste Act, hereafter referred to as the "Waste Act", directly allows for the implementation of economic instruments through the following mechanisms:

- **Priority Wastes** (Section 14(1) of the NEMWA) – provides for the identification of specific waste streams to which specific management measures can be applied. This provides a mechanism for managing wastes and the targeting of economic instruments to specific waste streams.
- **Extended Producer Responsibility** (Section 18(1) and (2) of the NEMWA) – allows for the Minister to specify the financial arrangements of a waste minimisation programme in support of EPR arrangements.
- **Regulations by Minister** (Section 69(1o)) allows for the financial arrangements of waste minimisation programmes; (Section 69(1x)) requirements in respect of the funding or ensuring of a waste management activity; and (Section 69(1bb)) incentives or disincentives to encourage a change in behaviour towards the generation of waste and waste management by all sectors of society.

The NPSWM gives effect to the National Waste Management Strategy (NWMS). In particular, it addresses two policy instruments to be applied in managing waste in South Africa – *Economic instruments (Ei)* and the implementation of EIs through *Extended Producer Responsibility (EPR)* schemes.

2.3 Objective and principles of a National Pricing Strategy

The objective of the NPSWM is to implement economic instruments as part of a basket of policy instruments which will –

- Mainstream the Polluter Pays Principle
- Reduce the generation of waste
- Increase the diversion of waste away from landfill towards avoidance, minimisation, reuse, recycling and recovery
- Support the growth of a southern African (regional) secondary resources economy from waste
- Reduce the environmental impact of waste

The NPSWM is based on the following underlying Principles –

- The implementation of waste management charges is based on *sound evidence*.
- The social, environmental and economic *benefits* of implementing waste management charges *outweigh the costs* of implementation.
- Implementing waste management charges should not result in the reversal of social, environmental and economic benefits achieved through existing systems.
- The selection of waste management charges and their methods of implementation must ensure *maximum returns* to the waste management sector.

- The implementation of waste management charges is about correcting market failures and internalising externalities (to drive behavioural change), and funding the increased diversion of waste away from landfill
- *Transparency* with respect to the collection, and disbursement of charges and their use.

Finally, the NPSWM is based on the principles of environmentally-related taxation including equity, neutrality, simplicity, certainty, administrative efficiency, cost effectiveness, flexibility, stability, distributional effectiveness and a fair balance from the point of view of taxpayers between the respective burdens of direct and indirect tax.

2.4 Problem statement

South Africa is estimated to generate 108 million tonnes of waste (as at 2011), of which 98 million tonnes (or 90%) is disposed of to landfill. With a value of at least R25.2 billion per year, these secondary resources are mostly lost to the South African economy. Recycling figures vary for the different waste streams, from less than 20% for tyres, plastic and WEEE to in excess of 80% for metals and batteries. By international standards, certain waste streams generated in South Africa have achieved encouraging levels of recycling through voluntary programmes, while other waste streams are lagging behind that of other developed and developing countries. The South African Government has implemented numerous pieces of waste legislation over the past five years with the aim of reducing the impacts of waste on society and the environment, and on increasing the diversion of waste away from landfilling towards reuse, recycling and recovery. These command-and-control instruments are one of a number of possible policy instruments which can be applied in the management of waste. Economic instruments, as an alternative, have been successfully applied internationally in driving waste up the waste hierarchy, by creating a set of incentives and disincentives through pricing. Pricing of waste can offer a more cost-effective and dynamic form of regulation than the traditional command-and-control approach. The NPSWM provides a methodology and approach for the implementation of such economic instruments in South Africa.

South Africa currently has both mandatory and voluntary waste management charges in place. Mandatory environmental charges are currently levied on plastic bags, waste tyres and electric filament lamps (incandescent light bulbs), electricity generation using non-renewable or environmentally hazardous fuels (e.g. coal, gas, nuclear), motor vehicle carbon dioxide (CO₂) emissions. Voluntary charges are levied on numerous products, product groups and waste streams including, amongst others, paper and packaging (plastic, glass, metal), waste oil, waste batteries. The voluntary charges are collected and managed by product responsibility organisations (PROs) often established and/or overseen by local producers and government, in some cases. In certain instances the producers fulfil this role directly without a dedicated PRO.

The NPSWM builds on the extensive work conducted as part of the NWMS, including the Research Papers on "*Producer responsibility and consumer awareness*" and "*Macroeconomic trends, targets and economic instruments*". The NPSWM also draws heavily on the research undertaken by the CSIR, over the past seven years, on economic instruments for solid waste management in South Africa. The research conducted in 2009, in support of the NWMS, undertook to assess the feasibility of introducing EPR Programmes within the constraints of South Africa's socio-economic and policy environment, and based on the status and evaluation of international programmes, makes recommendations for its implementation in South Africa. These remain very relevant issues and these documents should be consulted when specific charges or EPR schemes are developed.

*National Pricing Strategy for Waste Management***2.5 Approach and methodology**

The development of the NPSWM has been guided by a consultative process, as required by the Waste Amendment Act. This has included consultation and scoping with government, including relevant national and provincial government departments, consultation with business, and public participation (Table 1).

Table 1: Phases for developing the NPSWM

PHASE	ACTIVITIES AND OUTPUTS
INCEPTION PHASE May 2014 - July 2015	<ul style="list-style-type: none"> Waste Amendment Act gazetted on the 2 June 2014 DEA consultation with business through the Industry Waste Management Forum and various individual meetings
BASELINE RESEARCH June - July 2014	<ul style="list-style-type: none"> Research conducted on economic instruments for inclusion under the NPSWM and the approach to the setting of waste management charges <p>Key outputs: Research paper - Economic instruments and waste management</p>
STRATEGY FORMULATION July 2014 – December 2014	<ul style="list-style-type: none"> Preparation of first draft of the NPSWM Consultation with DEA, NPSWM Steering Committee, SARS, National Treasury Consultation with Working Group 9 (Provinces) Consultation with Industry Technical Task Team <p>Key outputs: Draft NPSWM for public consultation; Stakeholder written comments</p>
CONSULTATION AND FINALISATION January 2015 – January 2016	<ul style="list-style-type: none"> Stakeholder consultation workshops in the provinces Publication of draft NPSWM for comment Extensive consultations on the NPSWM with government, industry and civil society <p>Key outputs: Stakeholder written comments, final NPSWM</p>

Consultation with government, industry and business (including the waste and recycling sectors) was critical to ensure that the NPSWM, and the mechanisms for implementation, would have the least negative impact on the sector and on business, while ensuring achievement of the above objectives.

3 Economic instruments for implementing a NPSWM

This section provides a brief summary of possible economic instruments (EIs), or waste management charges, which can be applied, as alternative policy instruments, in achieving the objectives of the Waste Act. Sections 4 and 5 provide more detail regarding the design and implementation of the instruments.

The Waste Act provides for economic instruments, and empowers the Minister, in concurrence with the Minister of Finance, to make regulations for incentives and disincentives to encourage a change in behaviour towards waste generation and management. Economic instruments are to be applied within the overall fiscal and taxation policy of government. The selection and use of EIs must also be aligned with the principles established by NEMA, including the 'Polluter Pays' Principle. According to the 'Polluter Pays' principle, all generators of waste (including businesses and households) are responsible for the costs of managing the waste generated. These include not only the direct financial costs of collection, treatment and disposal of waste, but also externalities such as health and environmental impacts.

According to the NWMS, before economic instruments can be more widely applied, the pervasive under-pricing of waste services needs to be addressed. The under-pricing of waste services creates the wrong set of incentives, undermines waste minimisation efforts, and ultimately undermines the polluter pays principle. Additional economic instruments will create distortions and be ineffective in this context.

Disposal of waste to landfill imposes significant costs on the environment and broader society, in the form of various health, social and environmental hazards. By contrast, moving up the waste management hierarchy (waste avoidance, reducing, reusing, recycling and recovery of waste) has clear benefits over final disposal to landfill. In most instances it saves natural resources and energy; leads to reduced production costs associated with using recycled as opposed to virgin materials; reduces the costs of waste management; reduces environmental impacts, demand for landfill airspace and other costs associated with landfilling; and generates income and job creation opportunities for the poor and unemployed.

However, neither the 'negative externalities' (external costs) associated with disposal of waste to landfill; nor the 'positive externalities' (external benefits) associated with moving up the waste hierarchy, are reflected in market prices along the waste value chain. As such, there is little incentive for waste generators and other role-players along the chain to move up the waste management hierarchy. Disposal to landfill is still perceived as being the 'cheapest' and therefore most attractive option for waste management in South Africa, while there are few incentives for recycling as a viable alternative. Correcting market failures through correct pricing in such a way as to 'internalise' these externalities would therefore change the relative prices of landfilling as compared to other options, thereby creating incentives for moving up the waste management hierarchy.

EIs, such as environmental taxes and subsidies (also known as Pigouvian taxes and subsidies), seek to change behaviour by changing the relative prices (and hence incentives) that individuals and businesses face. Specifically, they refer to a set of policy tools designed in such a way as to internalise externalities in market prices, in line with the Polluter Pays Principle. Ideally, the level of the Pigouvian tax or subsidy (per unit of the activity or product in question) should be set equal to the level of the external cost or benefit (per unit) (or as close to this level as possible, given the uncertainties in estimation of externalities), in order to fully internalise the externality, and to avoid possible negative consequences associated with the tax or subsidy being set at a sub-optimal level.

National Pricing Strategy for Waste Management

In the context of solid waste management, EIs provide incentives for manufacturers, consumers, recyclers and other actors along the chain to reduce waste generation and to seek alternatives to final disposal to landfill (such as reuse, recycling or recovery). To understand the range of potential economic instruments that can be used to address externalities along the waste value chain, it is useful to think of each step along the chain as involving market transactions, and of actors along the chain as having a choice to make at each stage (Figure 1). In this context, decisions made upstream in the value chain (e.g. by producers) ultimately have a significant effect on downstream waste generation and recycling. For example, when producers purchase materials to use as inputs in manufacturing, they have a choice between virgin and recycled materials. They also face choices with regard to product design (e.g. the use of recyclable versus non-recyclable materials, the use of composite materials, and the degree to which products can be easily dismantled and the components separated for recycling). Similarly, consumers can choose whether to purchase products consisting largely of virgin or recycled materials (and products that are easy to recycle versus those that are not); and how much of each type of product to purchase. They must then choose whether to re-use waste items, to separate (or return) their waste for recycling, or to have all of their waste collected for disposal to landfill. Similarly, collectors and recyclers have to make choices with regards to whether, how much, and which types of materials to collect and recycle.

These market transactions (and the choices made by the actors involved) are affected by the relative market prices of each option (in addition to other factors, such as the range of choices, infrastructure and services available to them). In order to internalise externalities in these market prices, and therefore to ensure that the various role-players along the chain make decisions which are of greatest benefit to the economy, environment, and society; a broad range of economic instruments can potentially be implemented, as and when deemed appropriate to correct the market failure, at various points (upstream or downstream) along the waste value chain (Figure 1).

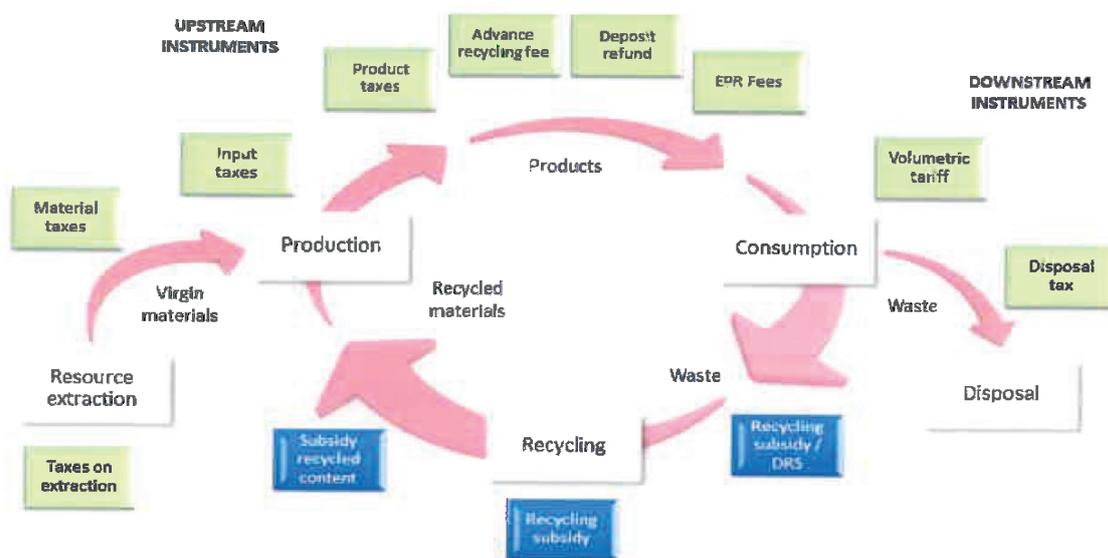


Figure 1. Examples of economic instruments along the product-waste value chain

A summary of possible economic instruments applied in the management of solid waste is provided in **Table 2**.

Table 2: Potential economic instruments for solid waste management

Category	Instrument
Downstream instruments	<ul style="list-style-type: none"> • Volumetric tariffs ("pay-as-you-throw") • Waste disposal taxes (including landfill and incineration taxes)
Upstream instruments	<ul style="list-style-type: none"> • Material and input taxes (including virgin material taxes, taxes on hazardous materials, etc.) • Product taxes • Advance recycling fees (ARFs) (also known as advance disposal fees) • Deposit-refund schemes • EPR fees
Subsidy-based instruments	<ul style="list-style-type: none"> • Recycling subsidies • Tax rebates and benefits • Capital financing

When selecting an instrument (or combination of instruments, such as a tax-subsidy combination), it is important to ensure that "double-taxation" is avoided, i.e. that externalities that have been addressed through taxation at one point along the chain are not further addressed at another point along the chain. Provided that charges are set at an appropriate level that takes external costs along the lifecycle of a particular product into account, it will not be appropriate to impose charges both upstream and downstream. Instead, a choice must usually be made as to where along the value chain a charge will be levied. This choice will often depend on whose behaviour is being targeted for intervention; that is, who has the ability to make decisions that ultimately affect outcomes with respect to waste generation and recycling. Often, for example, it is decisions made by producers (e.g. with respect to input or material use, recycled content or recyclability) that have the most significant impact on waste generation and recycling; while in other cases it may be more appropriate to target the behaviour of waste generators.

The following sub-sections briefly describe each of these instruments, focusing on the purpose of each instrument (i.e. the incentives provided), and examples of typical applications. Section 3 provides greater detail regarding the design and implementation of the instruments; focusing specifically on the first two categories of instruments (upstream and downstream instruments), and in particular on the issues to be considered in setting the level of the tax or charge in each case.

3.1 Upstream instruments

In some cases, it may not be administratively, practically, or politically feasible to implement volumetric tariffs or disposal taxes (e.g. due to the complexities associated with monitoring household waste generation; potential for resultant illegal dumping; possible negative impacts on poor households; etc.). In that case, an alternative to targeting downstream waste generation or disposal activities directly is to assess taxes based on upstream activities, such as the purchase of products that will ultimately be discarded as waste, thereby providing an incentive to waste generators to reduce their consumption of such products. Extending the Polluter Pays Principle even further upstream, taxes could be levied on environmentally significant materials or inputs (e.g. virgin materials) used in production (i.e. before products reach the consumer); so as to provide incentives for producers to reduce the use of such inputs or materials in manufacturing, and to rather use (for example) recycled materials as an alternative.

In general, product, input and material taxes aim to reduce waste generation by increasing the relative price of (and thus reducing demand for) specific products, inputs or materials, the use of which (in

National Pricing Strategy for Waste Management

production or consumption) generates waste. The intention is to make alternative (less damaging) products or inputs relatively cheaper, and therefore more attractive.

Specifically, **input taxes** or **material taxes** increase the costs of specific inputs or raw materials used in the production of end-products; thus encouraging producers to use fewer or alternative inputs, or to reuse or recycle waste materials; thereby decreasing waste generation, or the environmental impact thereof. For example, levies can be applied to –

- *virgin materials*, to reduce the use of these materials in production and encourage the use of recycled materials as an alternative, by increasing the price of virgin materials relative to recycled materials
- *hazardous materials*, to reduce their use in production and encourage the use of non-hazardous inputs instead, thereby changing the composition of waste so as to reduce the environmental impact of a given quantity of waste
- *packaging materials*, to discourage over-packaging (encourage lighter packaging); or
- *materials which cannot be recycled or which are difficult to recycle*, to encourage the use of recyclable as opposed to non-recyclable materials, thus increasing the likelihood of recycling and decreasing disposal to landfill.

By contrast, **product taxes** are applied to the end-product itself, based on its 'embodied' waste, thus creating incentives for consumers to reduce their purchases of waste-generating products (e.g. by reducing consumption or seeking environmentally-benign alternatives), and indirectly reducing waste generation. Specifically, product taxes can be applied to –

- products which generate a particularly *high level of waste*, or waste with a particularly high environmental impact, thereby reducing the demand for these products relative to products which generate lower levels of waste, or less environmentally-damaging waste.
- products which *cannot be recycled* as opposed to those that can, thereby increasing demand for recyclable as opposed to non-recyclable products, thus potentially increasing recycling and decreasing waste to landfill. In that way products made from 100% recycled materials could be exempted and products made partly from recycled materials could carry a reduced charge.

Advance Recycling Fees (ARF), are similar to product taxes, are implemented primarily for the purpose of raising funds to cover the costs of downstream collection and recycling activities, rather than with the aim of internalising the externalities associated with disposal.

Both product and input taxes can, in principle, reduce waste generation, reduce the environmental impact of a given quantity of waste, and encourage recycling, thereby diverting waste from landfill. However, there is need to complement tax-based instruments with command and control measures to enhance their effectiveness, with suitable alternatives (such as kerbside collection of recyclables, or conveniently located recycling infrastructure), as well as positive incentives reinforcing the use of such alternatives. For example, the incentive for illegal dumping that is created by volumetric waste collection tariffs or landfill taxes implies that such charges, on their own, will not be as effective. Similarly, product taxes on their own will encourage some reduction in waste generation, but may not encourage a significant amount of recycling.

For this reason, upstream tax-based instruments are often implemented within structured systems, such as Extended Producer Responsibility (EPR) schemes, which ensure that the supporting infrastructure and alternative systems are put in place to support the collection and reprocessing of recyclables. These EPR schemes are

Categories of waste that have been subject to product taxes include plastic bags, non-returnable containers, lubricant oils, automobile batteries. The category of non-returnable beverage containers has been the major object of product fees. Usually, the collected fees are primarily used to finance the deposit-refund systems for containers (UNEP, 2005)

National Pricing Strategy for Waste Management

usually funded by **EPR fees** paid by the producers and importers, but may also be funded by revenue generated through the collection of upstream and downstream taxes (See Section 4).

It is also often necessary for a combination of tax- and subsidy-based instruments to be considered. One such combination is a **Deposit Refund Scheme (DRS)**; although various other combinations are possible (see also Section 2.3; and Choe and Fraser 1998). Deposit-refund schemes essentially combine a product tax (the 'deposit') and a recycling subsidy ('refund'). The 'deposit' is paid upon purchase of the product, while the 'refund' is paid upon return of the used product or packaging to an authorised location, thereby creating an incentive for consumers to return the product or packaging for recycling or reuse. Deposit-refund schemes are most commonly used for beverage containers, although their use has recently been expanded to include tyres, batteries and cars (e.g. Sweden and Norway).

Table 3 summarises the incentives provided by the different types of upstream instruments available, as well as examples of the products and materials to which they are typically applied.

Table 3: Upstream instruments: Incentives created and typical applications

Instrument	Incentives created	Typical applications
Material and input taxes	Increase relative prices of virgin materials (or materials that are difficult to recycle, or that contain toxic properties) used as inputs in production; so as to provide incentives to use recycled (or recyclable, or less toxic) materials as alternatives	Virgin materials; packaging; hazardous materials
Product taxes	Levied at the point of production or final sale, in order to internalise external costs in product prices, with the aim of changing producer or consumer behaviour (reducing supply and/or demand).	Tyres and WEEE (some OECD countries), fuels, motor vehicles, batteries (particularly car batteries), packaging, and non-biodegradable plastic bags (e.g. Ireland, Italy, South Africa).
Advance recycling fees	Similar to product taxes; although main aim is to raise revenue to cover costs of recycling	Used oil (South African Rose Foundation), oil containers and oil filters (e.g. California and Western Canada), batteries (USA) and WEEE (California, China)
Deposit-refund scheme	Deposit is paid upon purchase (thereby providing similar incentive effects as product tax) and is refunded upon return of the used product or packaging for recycling or re-use, thereby providing an incentive to return recyclable or reusable items rather than throw them away	Glass and plastic beverage containers and steel beverage cans (various countries, including South Africa); batteries; tyres, fluorescent light bulbs, and cars (e.g. Sweden and Norway).
EPR Fees	EPR fees are fees paid by producers and importers (the obligated industry) to fund EPR schemes. Their main aim is to raise revenue that can drive behavioural changes of producers	EPR schemes for e.g. WEEE, tyres, paper and packaging, lighting, paint, cars, batteries, oil, medicines

3.2 Downstream instruments

Charges for waste collection services in South Africa are typically flat monthly payments, often related to property size, value, or location; but unrelated to the quantity (volume or weight) or type of waste generated. All waste generators (e.g. households) typically pay the same amount for municipal waste collection (via general taxation or municipal rates/levies) regardless of how much waste they

National Pricing Strategy for Waste Management

generate. This implies that the household does not pay per unit of waste generated or collected; i.e., the household faces zero costs at the margin for generating additional waste for disposal (usually to landfill); and thus has no incentive to reduce waste generation, or separate waste for recycling.

The solution to this problem is not simply to increase waste management charges to a higher flat rate; as in that case the waste generator still faces zero costs at the margin for generating additional waste. Instead, the solution is to charge variable rates, based on the quantity of waste collected (i.e. **volumetric tariffs** or "pay-as-you-throw" (PAYT)). Quantities should ideally be assessed based on weight; although where this is not feasible, a proxy (such as the number of standard-sized containers or bags) can be used (in which case the container or bag in question should be sufficiently small so as to ensure that there are still incentives to reduce waste generation at the margin). This will give the household an incentive to avoid higher charges by reducing waste generation or separating waste for recycling, and possibly even to alter purchasing patterns toward products with less packaging (or recyclable packaging) In other words, volumetric tariffs not only encourage recycling as an alternative to having waste collected for disposal to landfill, but they can also encourage households to reduce the amount of waste generated in the first place.

Volumetric tariffs on their own will not necessarily reflect the external costs associated with waste generation. Ideally, volumetric tariffs should consist of two components; one aimed at ensuring full financial cost recovery of services, and a second component reflecting external costs (the second component would essentially be a Pigouvian tax aimed at internalising environmental externalities). In addition, higher charges should apply to the collection of hazardous wastes, so as to stimulate a change in the composition of waste toward less hazardous forms of waste.

Alternatively, external costs can be addressed at the disposal stage through **disposal taxes**, e.g. through a tax on landfilling (over-and-above landfill tipping fees) or incineration, rather than at the collection stage. For example, the external costs of disposal to landfill (including social and environmental impacts, such as air, water and soil pollution) are not currently built into landfill tipping fees. The result is an artificially low cost of landfilling, which makes recycling and recovery unattractive alternatives. Landfill taxes reflecting these external costs would raise the costs associated with landfilling, thereby creating incentives to seek alternatives.

The incentives provided by volumetric tariffs and disposal taxes are summarised in **Table 3**, along with examples of their application.

Table 4: Downstream instruments: Incentives created and examples

Instrument	Incentives created	Examples
Volumetric tariffs	Puts a price on each unit of waste collected from waste generators (such as households), thereby providing an incentive for the household to reduce the amount of waste generated or put out for collection, and to seek alternatives such as recycling or re-use. May further seek to internalise external (social and environmental) costs, thereby providing further incentives to reduce waste generation.	Volume or weight-based waste collection charges have been used by some municipalities in the European Union, South Korea, the United States, Canada and Australia
Waste disposal taxes	Internalise the external costs of waste disposal into the disposal fees (e.g. landfill tipping fees), thereby increasing the cost of disposal relative to waste prevention, recycling and recovery, and in turn making the latter relatively more financially viable	The UK and some EU Member States levy a weight-based landfill tax on disposal to landfill, on top of the normal tipping fee (in combination with a ban on certain waste streams to landfill).

While the downstream Instruments are aimed at reducing waste generation and disposal, and changing consumer behaviour, the revenue generated through the tariffs and taxes can be used to fund activities such as landfill closure costs, pollution monitoring and control, clean-up of contaminated sites, and resource recycling and recovery activities. Revenue generated through downstream instruments, if successful in their objectives, will decrease over time as waste generation is reduced or diverted away from landfilling.

3.3 Subsidy-based instruments

Various types of subsidy-based instruments or tax incentives can also be used to encourage and support recycling activities, either in combination with one of the tax-based instruments discussed in Sections 3.1 and 3.2 (and in more detail in Section 4), or funded via the general fiscus. One such instrument is a recycling subsidy, in which government provides a payment either per unit or per kg of material recycled, or as a lump-sum grant to communities or recycling centres (e.g. as is common in the United States). Alternatively, Government could provide tax credits or rebates for recycling (or for recycling investment); whereby it provides tax relief to anyone who recycles or who invests in recycling infrastructure. In either case, funding for the instrument could be raised either via a complementary tax-based instrument, such as a product tax or advance recycling fee; or from elsewhere.

Subsidies can also be in the form of grants to provide financial incentives for the improvement of various aspects of solid waste management, including research and development. Other possible instruments include preferential tax treatment for commendable waste management practices or initiatives, and tax credits to industries using recycled materials. Various other types of tax relief, rebates and concessions can be used. Government can also extend preferential price treatment in its procurement practices to suppliers using recycled content. Finally, various forms of support can be provided to stabilise the market for recyclable materials, such as price supports for the establishment of materials banks; the guarantee of an income for a recycling plant or facility; or the institution of investment grants, accelerated depreciation, and soft loans designed to encourage private enterprises to implement resource recovery activities.

Since the focus of the NPSWM is on possible charges for implementation in the management of waste in South Africa, subsidy-based instruments are not elaborated on further in this document. However, these are all possible economic instruments which the Department of Trade and Industry (*the dti*) and National Treasury can explore to support the development of downstream recycling and recovery markets.

There is increasing evidence that a coherent combination of tax and subsidy-based instruments is far more effective than implementing any single instrument in isolation. A tax-subsidy combination has the dual benefit of ensuring a source of funding for the payment of subsidies (and an environmentally-related avenue for directing revenues received from the tax); and allowing for a coherent and complementary set of incentives to be created, whereby incentives are created to both discourage environmentally damaging behaviour (through the tax) and encourage environmentally friendly behaviour (by both providing and subsidising a viable alternative). For example:

Examples: In Argentina, waste service charges are reduced upon proof of efforts to reuse or recycle (Inter-American Development Bank 2003). The UK recycling credit scheme, introduced in 1992, created a means whereby savings in collection and disposal (landfill) costs, as a result of increased recycling, are passed on from disposal authorities to authorities or other organisations undertaking recycling activities. In China, an "Old-for-New Home Appliance Scheme" was introduced in 2009, whereby consumers were provided with a subsidy when purchasing new electronic appliances, worth 10% of the product price; provided that they sold their old electric goods to certified recycling companies (Liu 2014).

National Pricing Strategy for Waste Management

- subsidies could be provided to waste collectors and recyclers per unit of waste collected or recycled; funded by revenues generated through a waste disposal tax
- payments could be provided to waste generators per unit of waste separated for recycling; in combination with a tax per unit of waste collected for disposal to landfill
- subsidies could be provided to producers for using recycled materials; in combination with a tax on virgin materials; so as to create price differentiation in the market for inputs that favours the use of recycled materials over virgin materials
- subsidies could be provided to producers who design products for recyclability; in combination with a tax on producers who design products which are difficult to recycle
- subsidies could be applied on the purchase of products that are made from recycled materials or that are designed for recyclability; in combination with a tax on products made from virgin materials or that are not designed for recyclability; so as to create price differentiation in the market for products; favouring those products that are made from recycled materials or are designed for recyclability over those that are not

Specific combinations that have been applied in practice include an upstream combination tax/subsidy, a combined Advance Recycling Fee (ARF) and recycling subsidy, and a combined product tax and recycling subsidy (essentially a deposit refund scheme). Some of these combinations are discussed in more detail in Section 4.

4 Approach to the setting of waste management charges

As described in Section 3, economic instruments for waste management fall into three broad categories, namely downstream instruments (e.g. volumetric tariffs and disposal taxes), upstream instruments (such as product, material and input taxes), and subsidy-based instruments (such as tax credits and rebates). Given the focus of this document on waste management charges, this Section focuses on the first two of these categories. In particular, it focuses on considerations in the selection and design of each of these categories of instruments, with particular emphasis on considerations for the setting of charges.

Given the “*complexities and specific nature of many market failures*” (National Treasury, 2006), it is not possible or appropriate at this stage to be overly prescriptive in terms of a general methodology that can be applied in the setting of all charges, since this will need to be done on a case-by-case basis, depending on the –

- product, product group or waste stream
- environmental (waste) problem and (fiscal) objective(s) to be addressed
- intention of the instrument (e.g. to address market failures by internalising externalities to change behaviour, or generate funding for recycling initiatives)
- type of instrument that is appropriate for the case at hand (which in turn depends on the specific problem to be addressed);
- methodology or modelling approach to be used in estimating external costs (where necessary); etc.

In accordance with the views of National Treasury, “*for each environmental objective, a tailored or stylised solution is likely to be required*” (National Treasury, 2006).

4.1 Downstream instruments

Before considering the implementation of volumetric waste collection tariffs or disposal taxes, extensive consultation with stakeholders (e.g. waste generators, local municipalities) is necessary to establish both the need for such instruments, as well as to select the appropriate instrument(s). Factors to consider include:

- Existing pricing of waste services (for example, are the full financial costs of providing the services being recovered? If not, this should ideally be addressed before considering the implementation of economic instruments)
- Monitoring and enforcement capacity (does capacity exist to measure waste generation at the household level (and, if not, to monitor waste entering landfill sites); and to monitor illegal dumping? If not, can such capacity be relatively easily developed?)
- Local socio-economic conditions (e.g. the number of indigent households – what will be the likely impact of the instrument on the poor?).
- Price elasticity of demand for the service in question, relative to the intention of the instrument (e.g. if the intention is largely to change behaviour, but price elasticity of demand for the service in question is low, then a tax is not likely to be effective in achieving this objective).

Having established the need and selected an appropriate instrument; there is a need to design the instrument (including the determination of charges) in such a way as to maximise positive impacts and minimise negative impacts on the economy, society and environment; which should also involve extensive consultation with affected parties. Issues to be considered in the case of each instrument are discussed briefly below.

4.1.1 Volumetric tariffs

The aims of volumetric charging for waste collection services (pay-as-you-throw) are two-fold; firstly, to ensure that waste generators are charged per unit of waste set out for collection (ideally on a weight basis, or else per bag, or varying with bin size), thereby creating incentives for a reduction in waste generation. Secondly, having established volumetric charging, it is then possible to incorporate the external (social, environmental and health) costs associated with waste generation and disposal, in the form of a Pigouvian (environmental) tax (over-and-above tariffs reflecting full financial cost recovery). This tax rate should ideally be based on the external costs per tonne of waste generated. It is also important that downstream charges distinguish between the costs related to providing the service at each specific stage of waste management (e.g. collection, transport, transfer, and final disposal).

True volumetric tariffs or pay-as-you-throw schemes have been implemented mainly in developed countries (e.g. USA, Switzerland, South Korea, Canada and Australia). In developing countries, waste collection tariffs tend to be flat periodic payments aimed at cost recovery rather than at reducing waste generation. There are a few isolated examples from Latin America (e.g. Santiago (Chile) and Rio de Janeiro (Brazil) where user charges are related to the weight of the waste being collected. Nevertheless, only the private (financial) costs of the waste service are incorporated; external costs are not addressed (UNEP 2006).

Furthermore, the Waste Amendment Act (Section 13A) provides for waste management charges that differ in respect of *different geographic areas*, including –

- i. on the basis of socio-economic aspects within the area in question;
- ii. the physical attributes of each area; and

National Pricing Strategy for Waste Management

- iii. the demographic attributes of each area.

In this respect, volumetric tariffs could be applied differentially on the basis of income levels or some proxy thereof (e.g. property values or location); in order to ensure that the impact on indigent households is minimised. In practice, this could be applied through the use of rising step/block tariffs, free basic service levels, or rates that differ based on income levels, property value or location. To the extent that transport distances impact on the costs (and associated externalities) of providing the service, this could also be taken into account, and the realistic transport costs should be considered and measures put in place to minimise the impact on poor households. Not taking into account such costs may lead to inefficient solutions which may cost the poor household even more.

Furthermore, the Waste Amendment Act (Section 13A) provides for waste management charges that differ in respect of *different types of uses*, including –

- i. on the basis of the manner in which the waste is generated or disposed of;
- ii. whether it is re-used, recycled or recovered;
- iii. whether any previously disadvantaged group is impacted upon or derives any benefit therefrom.

As such, the charges in question (or higher charges) should apply to waste that is destined for disposal to landfill, whereas no charges (or lower charges) should apply to waste that is destined for reuse, recovery or recycling; while the opportunity for recycling to be subsidised should also be considered.

Similar considerations (i.e. varying charges by geographic areas or different types of use) apply to certain of the other economic instruments discussed in the document.

4.1.2 Disposal taxes

Where it is not feasible to monitor the quantity of waste collected from individual waste generators, an alternative is to apply the environmental tax at the disposal stage (over-and-above existing disposal fees, e.g. landfill tipping fees; provided that these fees already address the full financial costs associated with disposal). In the case of landfill taxes, the level of the tax should ideally be based on the external costs (e.g. air, water and soil pollution; health impacts and 'disamenities') per tonne of waste disposed of to landfill. These types of valuations require fairly in-depth studies and are highly site-specific. Ideally, charges should be based on valuations that have been conducted (or at least adjusted) specifically for the site in question. Nevertheless, in those cases where landfill taxes with explicit environmental objectives have been implemented (e.g. in the UK and New Zealand); the level of charges tends to be determined at the national level.

A differentiated landfill tax system is applied within the EU, depending on the waste type or landfill type. While there are usually a limited number of tax levels (1-3), more than 20 tax rates have been applied, e.g. Poland. Landfill taxes are significant, ranging from €30-70 per tonne (± R400-R1000 per tonne), however lower tax rates are typically applied to inert wastes

Example: In Estonia, revenue generated from landfill taxes is made available by Government to subsidize private sector recycling activities. Recyclers can apply for up to 50% of their costs to establish recycling facilities.

Suggested approach to the design and implementation of Disposal Taxes

- Ensure a system is in place for adequate monitoring of quantities (by weight) of waste disposed (e.g. weighbridges, accurate reporting, etc.)
- Ensure that current disposal fees take the full operational and capital costs into account (full-cost accounting) and correct if not
- Ensure adequate enforcement capacity to avoid illegal dumping
- Determine the external costs of waste (this must be done by a qualified environmental/resource economist):
 - Identify the external costs of waste not currently incorporated in existing landfill or incineration tipping fees in the area in question (environmental impacts, social impacts, health impacts etc.)
 - Value (quantify in monetary terms) the external costs per tonne of waste landfilled or incinerated, using an appropriate economic valuation technique (such as the Contingent Valuation Method, the Hedonic Pricing Method, the Benefits Transfer Method, Production Function approaches, etc.)
- Taxes should be levied per tonne of waste landfilled or incinerated, at a level reflecting external costs per tonne (over-and-above landfill or incineration tipping fees that reflect full financial cost recovery)
- Conduct extensive consultation on the level of the tax, as well as modelling of the impacts of the tax in terms of social, economic and environmental outcomes (taking into account price elasticity of demand for the service in question, among other variables). In particular, attention should be paid to potential negative unintended consequences, such as illegal dumping
- The tax should be phased in gradually, according to a schedule that is provided to the target group in advance, to ensure that impacts of the tax can be managed

4.2 Upstream instruments

As with downstream instruments, the implementation of an upstream instrument is to establish the need for such an instrument. This need must be established in consultation with stakeholders (particularly industry (including businesses across the supply chain), consumers, retailers, etc.), and must take into account –

- the characteristics of the waste stream (existing versus potential recovery rates, ease of collection, problems associated with disposal, etc.)
- the industry in question (e.g. the existence and effectiveness of existing mechanisms e.g. Extended Producer Responsibility schemes and/or other industry initiatives)
- potential impacts on businesses and consumers (for example, will the tax have a disproportionate impact on smaller businesses and/or poorer consumers).
- Price elasticity of demand for the product or input in question, relative to the intention of the instrument (e.g. if the intention is largely to change behaviour, but price elasticity of demand for the product or input is low, then a tax is not likely to be effective in achieving this objective).

Then, having established the need for such an instrument, an appropriate instrument must be selected in consultation with the relevant stakeholders; based on the intended purpose of the instrument; and on the point along the supply chain where the tax will be levied (e.g. on the purchase of inputs, the production of outputs, or sale of the finished product). In turn, the latter decision will be determined by the specific activity or behaviour targeted for intervention. The process of instrument selection can be aided by examining **Table 5**, which summarises the range of instruments available, the point along the supply chain where they would typically be levied, and the primary purpose which would generally be served by each instrument.

National Pricing Strategy for Waste Management

Table 5: Information relevant for selection of upstream economic instruments

Instrument	Charge levied on	Primary purpose
Material and input taxes	Purchase/use of specific materials or inputs in production	Reduce the use of specific inputs or materials in production, such as virgin materials (or materials that are difficult to recycle); in favour of secondary (recycled) materials, or materials that are easier to recycle. Special taxes may be levied on packaging, or on materials that contain toxic properties or that are deemed to cause pollution or create a particular hazard
Product tax	Production or point of sale	Reduce production or consumption (and therefore waste generation) of particular products or types of products, such as products that are difficult to recycle (e.g. by virtue of their composition), and encourage "design for recyclability" instead
Advance recycling fees	Production or point of sale	Raise revenues to cover recycling costs
Deposit-refund schemes	Point of sale	Encourage return of used products for recycling
EPR fees	Number of units of product put into the market	Fund the EPR schemes, typically paid to manage and implement the EPR scheme to achieve landfill diversion targets

Most instruments may be able to serve a secondary purpose, such as revenue generation to fund recycling activities, in addition to the primary purpose, which (particularly in the case of material and input taxes, as well as product taxes) would generally focus on behavioural change (e.g. reducing production or consumption of a waste-generating product). In addition, however, there are certain instruments (specifically advance recycling fees) for which the primary purpose is to raise revenues for recycling, with behavioural change as a secondary purpose.

Having established the need and selected an appropriate instrument, the next step is instrument design, including the setting of charges. Drawing on best practice from other countries, and taking into account the South African context, the following sub-sections provide more specific information on issues that need to be considered in designing each type of instrument (including considerations relating to the setting of charges).

4.2.1 Product, material and input taxes

Taxes on materials and inputs used in production essentially extend the polluter pays principle by shifting responsibility for waste generation from consumers to producers (this can be called the "producer pays principle," and is line with the principle of EPR). The rationale for extending the "polluter pays principle" is that waste generators themselves often have little control over the amount of waste (or the environmental impact of that waste) associated with the products that they purchase. Instead, such decisions often rest with producers, who can reduce waste generation by changing the inputs or materials used in their products, or by re-thinking product design. Taxes or levies on environmentally damaging materials and inputs can create incentives for producers to reconsider the materials and inputs used in production, making less damaging materials or inputs more attractive. Importantly, "to meet the criterion of economic efficiency and to conform to the producer pays principle... the size of the levy needs to be related directly to the environmental damage" (Pearce and Turner 1993:72) (see above).

Indeed, the Waste Amendment Act (Section 13) provides for waste management charges that differ on the basis of –

- a) the characteristics of the waste disposed of
- b) the volume of the waste disposed of
- c) the toxicity of the waste disposed of

- d) the nature and extent of the impact on the environment caused by the waste disposed of
- e) the extent of approved deviation from prescribed waste standards or management practices

In the case of material taxes, for example, these considerations could be incorporated through differential charging based on the toxicity, degree of hazard or environmental impact associated with different types of materials; and the ease with which the material can be recycled. In the case of product taxes, differential rates could be applied to products on the basis of the toxicity or degree of hazard of its components, its recycled content, the use of composite materials, or the ease with which the product can be dismantled and the components recycled. Further discussion regarding the basis on which charges can be differentiated is provided in the sub-sections that follow.

4.2.1.1 Virgin material tax

Ideally, a tax on the use of virgin materials in production, which aims to reduce the use of virgin materials and encourage the use of secondary (recycled) materials as an alternative, should be based on the external (social, environmental and health) costs associated with the use of the virgin material relative to the use of the secondary (recycled) substitute; taking into account costs and benefits throughout the lifecycle of the materials in question. In practical terms, these costs could be based on the damage costs associated with the extraction and processing of the virgin material input (to the extent that these are not already incorporated in prices for the virgin material, perhaps through an existing environmental levy on extraction of the material).

Examples of virgin material taxes include those in Brazil, China, Colombia, Ecuador, Mexico, The Philippines, Tanzania, UK, Venezuela, and Vietnam (Inter-American Development Bank 2003; Bluffstone 2003). In Brazil, for example, there is a tax on the use of wood and other forest products, aimed primarily at reducing the rate of deforestation (Huber et al. 1998); while in China, the use of a wide range of energy and raw material resources are subject to a tax (initially based on volume or weight, but now based on a fixed percentage of the price), including crude oil, natural gas, coal, non-ferrous metals and salt (Jing and Huixia 2010).

4.2.1.2 Input taxes

In addition to taxes on virgin materials, taxes can be levied on various other inputs along the value chain, such as those that are difficult to recycle or reuse (e.g. those containing toxic chemicals or numerous types of materials), or that cause particular hazards upon disposal; in order to reduce the use of those materials and instead encourage the use of materials that are easier to recycle, or that are less hazardous (OECD 2001). Ideally, tax rates for these inputs should be based on the external costs per tonne of the material, either throughout its life cycle, or at specific stages of its life cycle (e.g. post-consumer), depending on the extent to which external costs throughout the life cycle are not already incorporated in prices or taxes elsewhere.

Indeed, both input and material taxes can in principle be implemented in combination with a subsidy-based instrument; thereby ensuring that revenues collected are directed towards recycling activities, and providing a set of mutually-reinforcing policy signals. An upstream combination tax/subsidy is a tax (paid by producers) which is levied on produced intermediate goods, thereby providing incentives for producers to alter their material inputs and product design; the revenues from which are then used to fund a financing mechanism to support recycling activities; i.e., a subsidy provided to collectors, recyclers, waste management firms or local government in order to incentivise recycling. The level of the tax would be set in a similar way as that described above for material and product taxes.

National Pricing Strategy for Waste Management

Example: Tanzania levies a 5% excise tax on fertilizer. The tax was largely intended to reverse the inefficiencies and perverse incentives created as a result of past subsidies, and have resulted in significant reductions in fertilizer use. However, the tax may also have resulted in a decrease in yields and a switch from intensive to extensive agriculture (Bluffstone 2003). This example highlights the need for extensive consultation and macro-economic modelling of the impacts of any proposed tax prior to implementation. Ideally, such a tax should be levied only on environmentally damaging fertilizers, and in combination with a subsidy on environmentally friendly alternatives, such as organic fertilizers.

4.2.1.3 Product taxes

Product taxes work in a similar way to input or material taxes, the main difference being that they are generally levied on a per-unit basis on the production or sale of finished products; rather than on a weight basis for materials or inputs used in the production process. They can be levied either on producers (and importers), per unit of output (thereby creating incentives to reduce overall production); or on consumers, per unit purchased (thereby creating incentives to reduce consumer demand). Typically, however, as with material and input taxes, product taxes levied on producers tend to be shifted onto consumers in the form of higher prices; such that the effect on consumer demand is similar in both cases. In either case, the overall intention is generally to remove the product from the waste stream.

UNEP finds that product taxes levied on consumers are more effective in reducing consumption than taxes levied on producers; but at the expense of a higher administrative burden. Specifically, it is found that administrative costs associated with monitoring and collecting levies from consumers is much higher as compared to levies on producers. UNEP therefore recommends that in developing countries, product taxes should generally be levied on suppliers (producers and importers) rather than consumers. Nevertheless, examples in some countries show that a tax levied on consumers, is more effective in terms of removing the product from the waste stream. It is therefore clear that this decision requires analysis of the cost-effectiveness for the specific country and industry in question.

In principle, product taxes should be set in such a way as to reflect the marginal external costs associated with the product, either throughout its lifecycle, or, more commonly, at specific stages of its life cycle (e.g. post-consumer). In practice, however, few product taxes are true Pigouvian taxes (i.e. set at an optimal level in accordance with external costs). This is largely due to the difficulties associated with assessing the downstream environmental damages of a specific product. Specifically, there may be considerable variation in the environmental impacts of the product depending on the precise nature of downstream use and disposal. The tax level would therefore typically need to be set in such a way as to reflect average external costs, taking into account typical patterns of use and disposal of that product for the country in question. For example, in the case of both the Irish plastic bag levy and the Belgian eco-tax, no attempt was made to assess marginal external costs as a basis for setting the tax at an optimum level. At the same time, however, as with any tax, it is important that due diligence and extensive consultation be conducted in the setting of the tax level, rather than setting taxes at an arbitrary level, which can often do more harm than good. In the Irish case, for example, the setting of the plastic bag levy took into account consumers' maximum willingness to pay (WTP) for plastic shopping bags. Estimates of WTP must be based on rigorous survey-based research, using an economic valuation methodology such as the Contingent Valuation Method, which requires environmental economic expertise.

On the other hand, Akullian et al. propose a methodology for assessing the externalities arising throughout the life cycle (including production, distribution and disposal) of plastic bags in the US state of Rhode Island, and show how an optimal Pigouvian tax rate can be determined based on the resulting estimate. External costs per bag are calculated, based on a review of economic valuation studies of the various damages associated with plastic bags through their life cycle (taking into

National Pricing Strategy for Waste Management

account energy use and oil consumption associated with production, as well as CO₂ emissions and other damages throughout the life cycle). A tax per bag equal to the overall external cost per bag is proposed.

In either case, in addition to economic valuation studies to determine an optimum tax level (based on external costs) or a 'second best' tax level (based on consumers' WTP); extensive consultation with the affected industry and consumers must be conducted. For example, the effectiveness of the Irish plastic bag levy can largely be attributed to it being set at a sufficiently high rate (more than six times the average maximum WTP), the intention of which was to motivate a change in behaviour. However, it should be borne in mind that this high rate was politically feasible in the Ireland case, because Ireland imports most of its plastic bags, such that the impact on job losses was minimal. However, in cases where the product in question is produced domestically to a large extent; the setting of tax rates should be based on extensive consultation with the industry in question cognisant of the potential loss of employment.

Example: A well-known example of a product tax levied on consumers is the Irish plastic bag levy, which is "explicitly aimed at changing consumer's behaviour, and fixed at an amount sufficiently high to give most consumers pause for thought, and stimulate them to avoid paying by bringing their own 'permanent' reusable shopping bags with them" (Convery et al. 2006).

Product taxes can also differentiate between products on the basis of, for example, the toxicity or degree of hazard of its components, its recycled content, the use of composite materials, or the ease with which the product can be dismantled and the components recycled. For example, in the case of WEEE, product taxes typically vary depending on the item, e.g. for mobile phones, laptops, desktops, different size TV screens, etc. In Thailand, environmental taxes are levied on motor vehicles (based on associated carbon emissions); fuel (based on lead content), air conditioners (based on energy efficiency performance), and environmentally harmful substances such as oil lubricants, pesticides, tyres and packaging (United Nations Economic and Social Commission for Asia and the Pacific, no date). Product taxes are also commonly levied on products which cause particular problems upon disposal, such as tyres (e.g. as in South Africa, Canada and Taiwan), certain types of light bulbs (e.g. Korea), and batteries (e.g. Canada, Portugal and Sweden).

Suggested approach to the design and implementation of product, material and input taxes:

- Determine the external costs of waste (this must be done by a qualified environmental/ resource economist or a specialist in life-cycle costing):
- Taxes should be levied per unit or tonne of the product or material/input purchased, at a level that reflects the external costs per unit or per tonne
- Differentiation of taxes based on for example size of the business (in the case of material/input taxes) or area (in the case of product taxes) should be considered so as to minimise the impacts on small business and poorer households
- Conduct extensive consultation on the level of the taxes, as well as modelling of the impacts of the tax in terms of social, economic and environmental outcomes (taking into account price elasticity of demand for the product or input in question, among other variables)
- Taxes should be phased in gradually, according to a schedule that is provided to the target group in advance, to ensure that impacts of the tax can be managed

Finally, product taxes are often combined with various forms of recycling subsidies, most commonly in the form of a deposit-refund scheme (see Section 3.2.5); although other combinations are also possible.

4.2.2 Advance recycling fees (ARFs)

Advance recycling fees (ARFs) are a special type of product tax that are based on the estimated costs of collection, processing and recycling; revenues from which are often used (or intended to be used) to cover the costs of recycling. Such fees “*may be visible to the consumer... as a separate line item on the bill, similar to sales tax – or they can be assessed upstream on producers and later incorporated into the product price*” (Walls 2006: 3). Like product taxes, they are generally assessed per unit of the product sold, but they can also be assessed on a weight basis.

The main distinction between ARF's and product taxes is that ARFs are intended primarily to raise revenues to cover recycling costs, with potential secondary benefits in terms of reducing demand; while product taxes are designed primarily to reduce demand by ensuring that external costs are internalised in product prices. As such, unlike in the case of product taxes, ARFs do not require economic valuation of the external costs associated with the product. Instead, the level of the ARF is determined (generally by an industry association) based on the estimated costs of collection, treatment, recycling, re-use and/or recovery of the product. In turn, the incentives provided by an ARF depend largely on what is done with the revenues.

Example: Under the Western Canada used oil program, an industry-run program, sales and imports of motor oil, as well as oil containers and fillers, are subject to an ARF, payable by the seller. Revenues from the ARF are then used to fund collection and recycling programs, via the payment of a recycling subsidy to authorized collectors, transporters, and processors for every litre of oil, every container, and every filter that is recycled or reused. The level of both the ARF and the recycling subsidy is set by a non-profit industry association operating in each province; while payment of the ARF is mandated by legislation passed in each province. The value of the return incentive varies by location, in accordance with differences in transport costs. In turn, the level of the ARF takes into account the revenues required to support the recycling programs through the payment of the return incentives (Walls 2006).

Revenues from ARFs can be used either to cover the costs of managing waste or to cover infrastructure costs, in a lump-sum fashion; or, they can be used to fund financial incentives (payments) to consumers, collectors or processors per unit or on a weight basis of material returned, collected or recycled, thus increasing the quantity of materials supplied for recycling. This combined ARF/incentive system (an ARF combined with a recycling subsidy) is essentially a type of deposit-refund scheme (see Section 3.2.5), where the ARF acts as a ‘deposit’ at the point of sale, while the payment acts as a refund that is paid upon return of the used product for recycling. Such schemes could also be designed in such a way as to create incentives for producers to design for recyclability. For example, “*lower fees or higher refunds could be paid for those products by which the waste management costs are reduced through actions such as redesigning the product for easier disassembly or with more homogenous material composition*” (OECD 2001: 43). A combined ARF/recycling subsidy is generally regarded as superior to an ARF alone, since the latter encourages source reduction, while the former encourages both source reduction and recycling.

Example: The electronic waste disposal fund in China raises funds to subsidise and promote the collection and safe disposal of WEEE (televisions, refrigerators, washing machines, air conditioners and personal computers). Producers and importers of electronic and electrical products pay a fee on each unit produced (for domestic use) or imported. Fees are declared and paid into the fund on a quarterly basis, via the tax authority, or when declaring imports via the customs authority. Defaulters face legal action, while certified recyclers who can provide proof of the WEEE they have recycled or disposed of are eligible to apply for a subsidy, which is also unit-based (Liu 2014). Fee and subsidy rates are set based on a series of consultations with experts, producers, importers and recyclers. The rates are adjusted as necessary as collection and disposal costs change, again based on extensive consultation. Importantly, the fee is set at a much lower rate than the subsidy; such that the authorities distribute and utilize the funds without surplus (i.e. no revenue is generated). The value of the subsidy is based on the basic cost of the recycling and disposal (which in turn varies for each of the five targeted types of WEEE), excluding collection costs; while the fee is typically set at between 10 and 20% of the subsidy (Liu 2014).

4.2.3 Deposit-refund schemes

Deposit-refund schemes (DRS) essentially combine a product tax (paid by the consumer upon purchasing the product) and a recycling subsidy (received by the consumer per unit returned for recycling). The intention of a deposit-refund system is to encourage the return of used products for recycling. The deposit element of a DRS is unlikely to have the same incentive effect as a product tax (i.e. to reduce demand; at least not the same extent); as consumers know that the higher costs associated with purchase can be offset upon return of the item. The purpose of the initial deposit is rather to encourage return and to finance the payment of refunds. Thereafter, the refund element comes into play, by creating an incentive to return the product.

DRS systems have been applied to a range of products, from beverage containers to batteries, tyres, fluorescent light bulbs, and end-of-life vehicles (ELVs). They can be implemented by either the private or public sector, or through some form of joint public-private partnership.

In theory, the deposit element of a DRS should be set so as to incorporate *“the commercial costs of the container (or specific product), plus the environmental costs associated with the disposal or with littering. Refunds should equal the avoided environmental costs plus the scrap value of the container”* (OECD 2001: 42). In practice, however, DRS systems tend to be initiated by industry rather than by government; in which case the deposit element is generally used to cover recycling costs, rather than to internalise the environmental costs associated with disposal of the product. In that case, the level of the deposit will be set only in such a way as to cover recycling costs, including the costs associated with the issuing of refunds. For beverage containers, the value of the deposit and refund is generally based both on volume and on the material from which the container is made. A stronger incentive for returning the product can be created by ensuring that the refund is set at a sufficiently high level (or when the deposit is set at a higher percentage of the product price); or if the deposit-refund scheme is implemented in combination with an instrument such as volumetric waste collection tariffs. Ideally, the refund should equal the deposit to ensure that consumers end up no worse off than before; although in some systems only some fraction of the deposit is returned, with the remainder used to finance the system.

4.2.4 EPR fees

Extended Producer Responsibility (EPR) fees are implemented in the context of an Extended Producer Responsibility (EPR) scheme. EPR fees are levied on obligated industries (typically producers and importers) per product unit, weight, or market share. The main purpose of EPR fees (and hence the basis for their calculation) is to provide funding to cover the costs of establishing and

National Pricing Strategy for Waste Management

implementing systems for collection, sorting and other treatment required prior to the sale of materials to recyclers; or the provision of incentives, subsidies, infrastructure and/or information to consumers, collectors and/or processors; so as to increase the supply of recyclables.

EPR fees are differentiated not only according to the weight or unit of the material, but also according to the type of material. EPR fees in practice do not differentiate completely between the actual costs for collection of the specific materials, and cross subsidisation between the different materials types is observed. The level of the fees is ultimately determined by the market.

Some EPR schemes include mechanisms that lower the fees for eco-designed products or penalize (through higher EPR fees) difficult to recycle products. This ensures that EPR fees also reflect recyclability in order to drive eco-design or design for recycling.

As with material and input taxes, EPR fees are often passed on by producers to consumers in the form of higher product prices, essentially incorporating externalities associated with production into the product price. This would in turn create incentives for consumers to reduce their demand for products containing large volumes of packaging. The impact of passing these costs on to consumers, particularly in the case of packaging and packaging waste, which is likely to directly influence food prices, must be assessed.

Taxes on materials and EPR fees are not mutually exclusive, although such combinations should be designed in an integrated way so as to avoid 'double taxation' (See *example box*).

5 Implementing economic instruments

This section briefly outlines the implementation of economic instruments within these management systems, with an emphasis on EPR. As noted in Section 3, upstream economic instruments are often implemented within a 'management system', such as an Extended Producer Responsibility (EPR) scheme. This is to ensure that the supporting infrastructure and alternative systems are put in place to support the separation, transportation, recycling and recovery of recyclables, so as to maximise the impact of the charge (i.e. more than simply revenue collection).

5.1 Downstream instruments

Downstream instruments (volumetric tariffs and disposal taxes) are typically implemented as a tax in line with the overall fiscal and taxation policy of government. They are either implemented by municipalities (in the case of volumetric tariffs) or national government (in the case of disposal taxes). While they may be implemented in conjunction with upstream instruments, as a direct tax they are typically implemented directly by National Treasury without the need for a broader municipal implementation framework.

However, current research suggests that South African municipalities do not yet have the systems and infrastructure in place to implement downstream instruments such as volumetric tariffs ("pay-as-

Example: Bulgaria has both a tax on packaging material, as well as a system of EPR fees. Bulgaria gives producers and importers two options – pay a product tax to the authorities or pay an EPR fee to the PRO. The state levies a tax per tonne of packaging material due by producers and importers. Companies that achieve specified recycling and recovery targets individually, or producers and importers of packaged goods who sign a contract with a PRO; are exempt from the tax. The tax can be seen as a penalty imposed on companies for non-achievement of recycling and recovery targets for packaging waste. The taxes are set at a relatively high level, in some cases comparable to or representing a significant percentage of the value of the material itself. The rationale for the relatively high level of the tax is to encourage the use of less packaging. By contrast, the EPR fees are significantly lower than the packaging taxes (Institute for European Environmental Policy 2009; Doychinov and Whiteman 2012; Kjær et al. 2012).

you-throw”) and waste disposal taxes (including landfill and incineration taxes). In the case of waste disposal, differential tipping fees (varying by quantity and by waste type) are currently applied at most (if not all) private waste disposal facilities and some municipal waste disposal facilities. However, volumetric tariffs levied on the waste generators themselves, e.g. households, is still some way off from implementation. In order to have an effective system, municipalities ensure that they have financial and administrative systems in place before implementing volumetric tariffs on waste generators, such as correct billing and cost recovery systems.

Similarly, the implementation of waste disposal taxes, require that the basics in waste management be achieved, before levying charges on waste disposal, e.g. correct waste information collection, weighing of waste at disposal facilities. National Treasury notes that disposal taxes may lead to perverse incentives and tax avoidance. As has been adopted elsewhere, government may opt to implement waste disposal taxes on permitted landfills, or on metropolitan municipalities and private waste disposal facilities, however this may have the unintended consequence of driving increased waste disposal to outlying small municipal landfills, which if not designed and operated correctly could have greater environmental and social impacts.

5.2 Upstream instruments

Upstream instruments, including product, material and input taxes; advance recycling fees (ARFs); and deposit-refund schemes may be implemented by national government in the absence of a management system, as in the case of South Africa’s Plastic Bag levy.

5.2.1 Government intervention

Guidance on the intervention and the level of involvement by government, in the design and implementation of EIs, is outlined in National Treasury’s Environmental Fiscal Reform Policy (Figure 2). Figure 2 highlights that the implementation of EIs should be based on a clear environmental objective (i.e. the nature of the market failure) and the EI must be well targeted to that objective. This ensures that the most appropriate EI is applied to addressing the environmental problem.

National Pricing Strategy for Waste Management

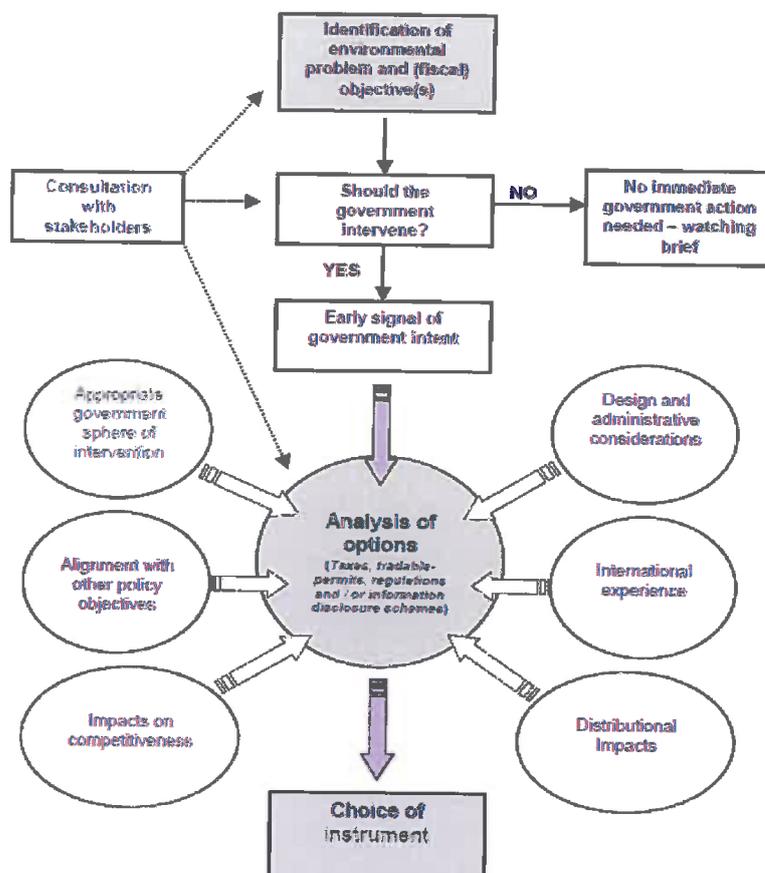


Figure 2. Process for considering government intervention

5.2.2 Selecting the appropriate economic instrument(s)

The NWMS points out that "Before implementing the EIs a process of evaluation of the appropriateness of the instruments needs to take place. The process for the development of the Industry Waste Management Plan must take into consideration the potential socio-economic impacts of the charges on consumers, producers and retailers.

There is also a need for Government to fully understand the implications of implementing waste management charges in a system where under-pricing of waste disposal still exists due to the lack of full-cost accounting in the setting of waste collection and disposal tariffs. This includes external social and environmental costs.

According to the National Treasury's Environmental Fiscal Reform Policy, the following criteria for assessing environmentally-related taxes should be applied –

- Environmental effectiveness
- Tax revenue
- Support for the tax
- Legislative aspects
- Technical and administrative issues
- Competitiveness effects
- Distributional impacts

- Adjoining policy areas

The following factors should also be applied in selecting EIs (NWMS Research Paper) –

- Balancing environmental and economic gains
- Differentiation of economic instruments by location

The NWMS Research Paper suggests that the following be in place within the South African waste sector, before implementing EIs –

- Financial sustainability of the waste management system
- Full cost accounting and pricing of solid waste services
- Evaluation of the full social and environmental costs
- Establishment of administrative mechanisms
- Specific consideration of selected instruments

5.3 Extended producer responsibility

Economic instruments are often implemented within an Extended Producer Responsibility (EPR) scheme. Since it is the intention of DEA to implement such EPR schemes in South Africa, the implementation of upstream instruments is discussed in the context of EPR.

EPR is defined by the OECD as an “*environmental policy approach in which a producer’s responsibility for a product is extended to the post-consumer stage of a product’s life cycle*” (OECD, 2001). The ultimate goal of EPR is sustainable development through environmentally responsible product development and product recovery. In other words, producers of goods have a responsibility to safely manage those products after the end of useful life, in accordance with the country’s waste management policies, which for South Africa, includes waste prevention, minimisation, reuse, recycling, recovery and treatment with disposal to landfill as a last resort.

The intentions of EPR schemes are to relieve municipalities of some of the financial burden of waste management, and to provide incentives to producers to reduce resources, use more secondary materials, and implement product design changes to reduce waste. In this way, EPR shifts the responsibility for waste management away from government to industry, obliging producers and importers to internalise waste management costs in their product prices and ensuring the safe handling of their products post end-of-life.

EPR schemes are typically funded through the implementation of various economic instruments, levied either directly by the obligated industry, or by government.

5.3.1 Approach to developing EPR schemes

The requirements for the development and implementation of EPR schemes in South Africa are provided in terms of Section 18 of the Waste Act.

The review of international literature and discussions with international experts in EPR shows that there is no single model of EPR which has been universally adopted. EPR schemes differ in their design and implementation across different countries and different products. EPR schemes are customised to the socio-economic environment of the country and the intentions of the EPR scheme. Implementing EPR schemes in South Africa must therefore draw on what has been implemented internationally and customised to suite South African conditions and needs.

Since EPR schemes differ in their design due to the unique characteristics and properties of a product, product category or waste stream, the various sectors must develop the plan whilst

National Pricing Strategy for Waste Management

considering the uniqueness of the sector. The approach is guided by the Waste Act, NWMS (Figure 3) and the Waste Amendment Act, as well as international best practice. All Industry Waste Management Plans must comply with the provisions contained in the Notice published in terms of section 28 of the NEMWA.

5.3.2 Identify product, product group or waste stream for EPR

It is the Minister's prerogative to declare the application of EPR to a product, group of products or waste stream. The declaration must be done in consultation with the Minister of Trade and Industry by notice in the government gazette. The Minister must also consult the Minister of Finance regarding any financial arrangements for an EPR programme. This is especially pertinent where the EPR programme is likely to require changes to product design, or impact significantly on the economy or economic sectors.

The following evaluation criteria are proposed, which includes products identified in the NWMS as possible candidates for EPR schemes –

1. **Risk of harm** - Products with toxic constituents that may become a problem at the end of life (i.e. potential for environmental and social impact). Examples include: batteries, electronics, used oil, pharmaceuticals, paint and paint products (latex oil-based paints and thinners), pesticides, radioactive materials, products containing mercury and cadmium including thermometers, thermostats, electrical switches (including automotive), and fluorescent lamps.
2. **Large products** – that are not easily and conveniently thrown out as waste. Examples include: appliances (e.g. fridges, TVs, computers), furniture, carpets, building materials, tyres, end-of-life vehicles, propane tanks and gas canisters.
3. **Complex products** – Products with multiple material types that make them difficult to recover in traditional recycling systems. Examples include: packaging, electronics, and vehicles.

Additional criteria to be used in the prioritisation of waste streams includes –

4. **Voluntary measures insufficient** – where participation rates or waste diversion from landfill remain low for voluntary EPR schemes
5. **Current waste stream recycling/recovery low** – where the diversion of specific waste streams from landfill is low, as benchmarked against developing and developed countries (e.g. % recycling). The reasons for low recycling/recovery rates of specific waste streams need to be understood, and the opportunities that EPR schemes may provide, evaluated.

The identification of products to be included within an EPR scheme may be very specific. For example, the E-Cycle Washington program which is an EPR scheme for WEEE, targets four specific products (computers, monitors, laptops and televisions) and does not include all product categories.

A risk-based evaluation will establish if a product, group of products or waste stream is suitable for EPR and its consequences. This may include an assessment of legal and administrative difficulties, such as the potential impact on waste avoidance, economic implications (including job creation), potential for contravention of competition requirements, enforcement and the potential for illegal activities. The risk-based evaluation will draw on scientific information and take into account the country's obligations with respect to any applicable international agreements.

5.3.3 Design EPR scheme

5.3.3.1 The Product Steering Committee,

To be convened by DEA, should consist of representatives of National Government (DEA, the dti, National Treasury), industry (producers, retailers, recyclers), the PRO (if applicable) and consumer and environmental non-governmental organisations (NGOs). The rationale for the establishment of a Steering Committee is to ensure transparency and consultation in design, to increase understanding of the targets and their purpose, and to ensure ongoing communication in implementation.

5.3.3.2 Operationalisation of the Waste Management Bureau

The NEM: Waste Amendment Act, 2014 established the Waste Management Bureau. The Bureau however still needs to be operationalised. The Waste Management Bureau to ensure transparency and consultation in design, to increase understanding of the targets and their purpose, and to ensure ongoing communication in implementation of the Strategy.

5.3.3.3 Develop Product Plan

The Industry may develop a Product Plan and implementation programmes for each waste stream. The Product Plan is the framework which outlines the high-level design of the EPR scheme. It should be developed by the respective industry in consultation with government.

Factors to be considered in the drafting of the Product Plan include, amongst others –

- *Clear description of the problem* (nature and extent) to be addressed through EPR, to ensure that the correct product(s), economic instruments, targets and scheme structure are selected.
- *Product, product groups or wastes* to be included in the scheme – a phased approach may be implemented as more product, product groups or waste streams are added over time
- *Financial arrangements*, including –
 - The most appropriate *economic instruments* to be applied within the EPR scheme to best achieve the objectives
 - What the EPR scheme *will fund*, e.g. partial or full contribution to product collection/take-back and recycling
 - Whether the waste management charges are likely to affect adjoining policy areas, including competition law
- *Institutional arrangements*, including –
 - The necessity for a *Product Responsibility Organisation (PRO)* and if so, their roles and responsibilities
 - On *whom* the charge is to be levied and where in the product/waste value chain the economic instrument will be most appropriately applied
 - Level of *government involvement* (in the collection of charges, operation of the EPR scheme, and in the monitoring of the EPR performance)
- *Targets* – clearly defined phased targets for waste diversion from landfill (including specific recycling and recovery targets) (there should be a clear economic justification for the proposed targets)
- The *legal nature* of the EPR scheme, whether voluntary or mandatory

The chosen framework for implementing the EPR scheme (to achieve the objectives of the Product Plan), must ensure least cost to society, industry and government, including operational costs for collection, administrative costs and compliance costs.

5.3.3.4 Product Responsibility Organisations (PROs)

PROs typically fulfil the following functions on behalf of the obligated industry –

- financing the collection and recycling of the product at the end of its life and redistributing the corresponding financial amounts
- managing the corresponding data (quantities of product put into the market, waste generated and collection and recycling/recovery)
- organising and/or supervising these activities

The PRO, together with the obligated industry(s) should assist in the –

- Co-development of the Product Plan,
- Calculation of the fee structure and price list (usually by product, that reflects the costs for each of the products to be collected and recycled)
- Development of the IndWMP. The PRO is typically also the custodian of the sector IndWMP, which will detail how the PRO will fulfil its objectives.

In accordance with Section 28(6) of the Waste Act, the sector IndWMP may be developed by the PRO on behalf of the obligated producers and importers.

5.3.3.5 Develop Industry Waste Management Plan

Sections 28-34 of the Waste Act provide for the development of IndWMPs, including the contents of the IndWMP. The IndWMP should serve as a business plan, detailing how the objectives of the EPR scheme.

In addition to the content required under Section 30 of the Waste Act, the IndWMP must outline –

- how the objectives of the Product Plan will be achieved
- the *roles and responsibilities* of various role players, including –
 - the role of municipalities in the EPR scheme (e.g. full role, joint role, no role)
 - the role of the formal and informal sectors
- the *costs* to achieve the objectives of the Product Plan
- the *corresponding charges* to be levied on products to generate the funds required to cover EPR costs. This will include the detailed breakdown of costs per (i) product category, (ii) geographic area, etc.
- the *research and development* required to support improved collection, sorting, recycling and recovery efficiencies and reduce costs

In the case of mandatory EPR schemes, the IndWMP must also address any requirements as Gazetted in terms of Section 18 of the Waste Act.

In accordance with Section 34 of the Waste Act, the IndWMP should be reviewed at intervals specified in the approval. However, the IndWMP should be continuously assessed by the PRO to ensure that it remains relevant to achieving the objectives of the plan.

International Practises on the PRO:

- The PRO must be registered and operate as a Non-profit Company.
- While multiple PROs per Industry Waste Management Plan may be considered, the preference is for a single PRO which unites the sector under a single plan, ensuring a unified approach, reduced administrative costs, and economies of scale.
- In accordance with international best practice, PRO administrative costs (of managing the EPR scheme) should be <5-10% of total revenue. Administrative costs of 3-5% are being achieved by PROs.
- PROs and their employees must have no vested interest in any waste reuse, recycling, recovery or disposal businesses (so as to avoid conflict of interest).

5.3.4 Give effect to EPR

The NWMS notes that indWMPs may include either voluntary or mandatory extended producer responsibility schemes for particular waste streams whereby producers, importers or retailers take responsibility for the waste generated by their products beyond point-of-sale and choose the most effective way of meeting their responsibilities.

The Waste Act provides for the declaration of mandatory extended producer responsibility schemes whereby the Minister prescribes how a waste stream should be managed and the required funding mechanism to do so.

Extended producer responsibility, and compliance with an IndWMP, may also be enforced where a waste has been prioritised by the Minister.

It is important to note that the state is not obliged to fund EPR initiatives, and that the primary obligation for funding rests with producers, importers, retailers and consumers along the value chain. Financial arrangements will need to be tailored to individual EPR schemes, and the key challenge will be to establish who along the value chain bears what portion of the costs.

6 Collection and disbursement of waste management charges

Section 13B of the Waste Amendment Act requires an Act of Parliament, to give effect to necessary elements of the NPSWM, as contemplated in section 13A. The Act is to include detail on the setting and imposition of waste management charges; procedures for collection of charges; and procedures for the allocation and use of generated funds. This is of particular relevance to the implementation of disposal taxes, and input, material or product taxes, levied by national government.

Section 13B of the Waste Amendment Act makes specific reference to the allocation of funds for the work of the Bureau (monitoring and evaluation), and the implementation of approved industry waste management plans for specific waste streams (e.g. through EPR schemes).

6.1 Downstream charges

Figure 3 provides a summary of the collection and disbursement of downstream charges, collected either by the municipality or by National Treasury via SARS.

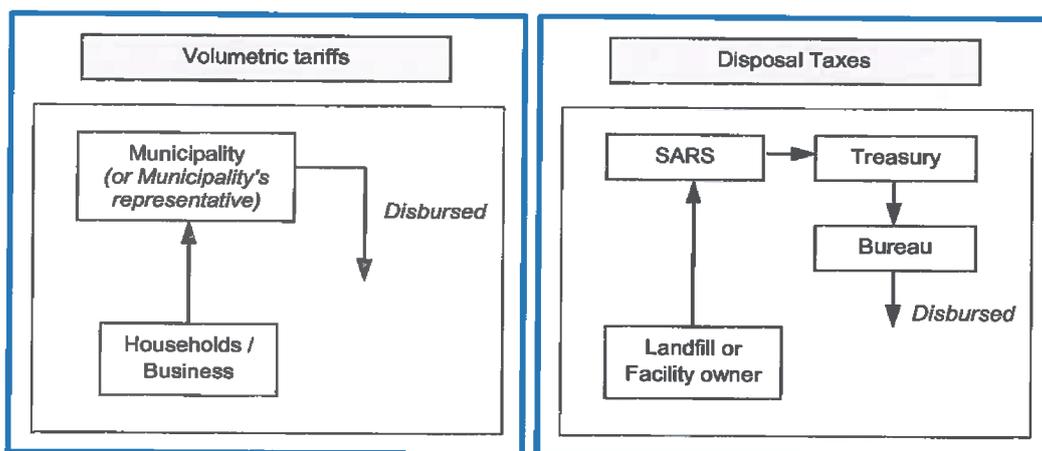


Figure 3. Approach to the collection and disbursement of downstream charges

National Pricing Strategy for Waste Management

The disbursement of funds collected through downstream charges should be informed by –

- Integrated Waste Management Plan (IWMP) and Integrated Development Plan (IDP) – in the case of Municipality collected charges (e.g. volumetric tariffs)
- DEA and the Bureau's Strategic Plans – in the case of National Government charges (e.g. disposal taxes)

In the case of government collected charges, there are different (although not necessarily mutually exclusive) uses to which revenues could be put. These include the following;

- i. Revenues accrue to the fiscus and are allocated to priority spending needs through the normal budgetary process as approved by Cabinet; and/or
- ii. Revenues accrue to the fiscus but there is some form of agreement that spending on environmental programmes may be increased through on-budget channels. However National Treasury is not in a position to earmark funding.

Ring-fencing (hard earmarking) is not advocated by National Treasury, however, soft earmarking provides for revenue generated through waste management charges to be redirected back into achieving the objectives of the NPSWM.

6.2 Upstream charges

Figure 4 provides a summary of the collection and disbursement of upstream charges in the form of product, material and input taxes, resulting in their collection through the fiscus (SARS and National Treasury) (*left-hand panel*) or of deposit-refund systems (*right hand panel*).

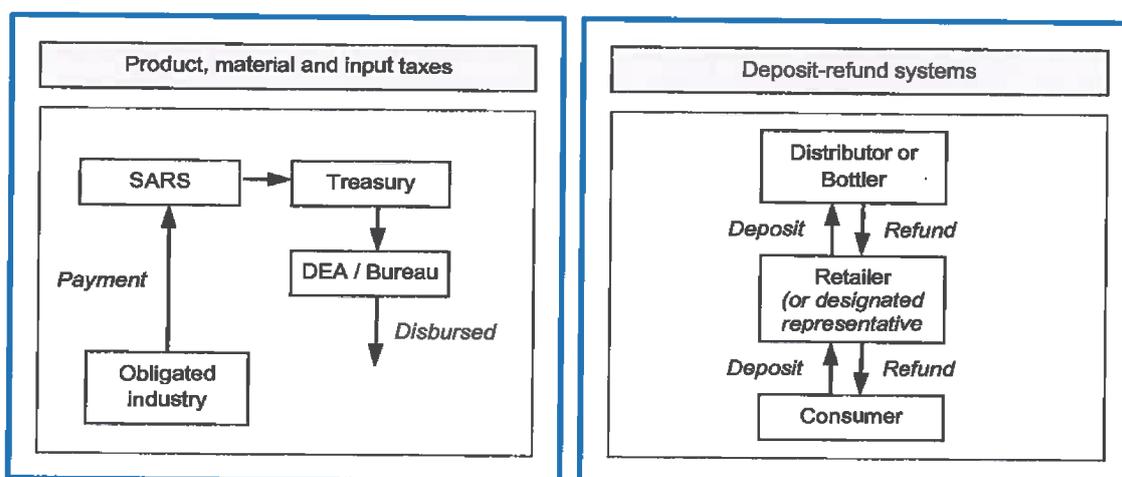


Figure 4. Approach to the collection and disbursement of Upstream charges

In the case of national government collected waste management charges, the Bureau must annually, prepare business plans. The business plans must be submitted to National Treasury for approval and inclusion in the Medium-Term Expenditure Framework (MTEF). The business plans will be submitted as motivation to National Treasury for funding of waste management activities, via the Bureau.

Currently the Customs and Excise Act provides the legislative framework to collect revenue for the Plastic Bag levy, incandescent light bulbs, motor vehicle CO₂ emissions tax and also electricity generation using non-renewable or environmentally hazardous fuels (coal, gas, nuclear). It is

envisaged that the same Act can be utilised to collect revenue for the disposal taxes and the material, input, product taxes, ARF and EPR taxes as provided for in the Amendment Act.

SARS will collect the revenue through charges or levies and transfer the revenue to the National Treasury who are responsible for all financial disbursements to Government Departments. The National Treasury will then transfer the requested and approved finances for the funding of waste management activities, to the Bureau.

6.3 Proposed EPR Scheme

In the case of EPR schemes, the collection and disbursement of funds will depend on whether charges are collected as an EPR fee (by industry) (*left panel*) or a 'tax' (by government) (*right panel*) (**Figure 5**). According to section 13B of the Waste Act, a money Bill must be tabled in Parliament within 3 months of the publication of the Pricing Strategy. However, it is also possible to collect levies through the Customs and Excise Act, 1964. This is the same mechanism that is being used for certain environmental products.

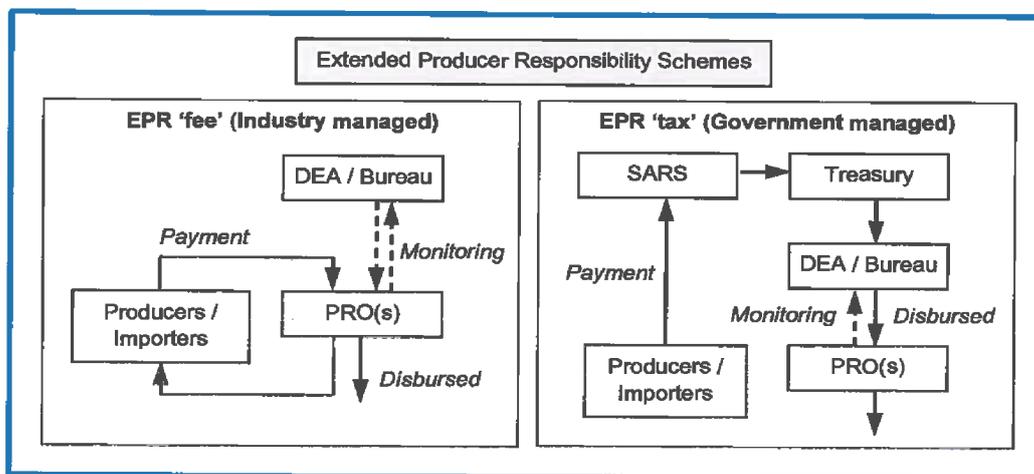


Figure 5. Approach to the collection and disbursement of EPR charges

Existing voluntary initiatives that are effecting EPR schemes will continue to follow the Industry Managed Model as depicted in figure 5. The Government managed Model as depicted in figure 5 will be followed for all plans that the Minister or MEC calls for in terms of section 28 of the NEMWA.

The disbursement of funds collected through EPR fees should be informed by –

- Industry Waste Management Plan(s) – in the case of industry collected EPR fees
- DEA and the Bureau's Strategic Plans and IndWMP(s) – in the case of National Government collected EPR taxes.

For certain products, product groups or waste streams, the Department may wish to consider EPR schemes in combination with a product tax, to allow producers and importers to use the voluntary (and paying the associated EPR fee) or mandatorily pay the product tax (See Section 4.2.4). In terms of section 17 (6) of the Waste Act, all existing Industry Waste Management Plans must align with this strategy and the within 6 months of the publication of this strategy and the relevant revenue collection system.

7 Monitoring and Evaluation

The monitoring and evaluation of economic instruments implemented within the waste sector will be conducted by various stakeholders, depending on the waste management charge(s) being implemented.

Table 6: Monitoring and evaluation responsibilities

Category	Instrument	Monitoring and evaluation functions
Downstream instruments	<ul style="list-style-type: none"> • Volumetric tariffs ("pay-as-you-throw") • Waste disposal taxes (including landfill and incineration taxes) 	<ul style="list-style-type: none"> • Municipalities • DEA/Bureau • National Treasury
Upstream instruments	<ul style="list-style-type: none"> • Material and input taxes (including virgin material taxes, taxes on hazardous materials, etc.) • Product taxes • Advance recycling fees (ARFs) • Deposit-refund schemes • EPR Fees 	<ul style="list-style-type: none"> • Obligated industries • Product responsibility organisation (PRO) • DEA/Bureau • Product Steering Committee • SARS / National Treasury
Subsidy-based instruments	<ul style="list-style-type: none"> • Recycling subsidies • Tax rebates and benefits • Capital financing 	<ul style="list-style-type: none"> • <i>the dti</i> • National Treasury • DEA/Bureau

The role of government and the private sector will differ depending on the economic instrument to be implemented, the approach to implementation, and the legal status, e.g. voluntary or mandatory. In all instances, the Bureau, as given effect through the Waste Amendment Act, will be instrumental in monitoring and evaluating the implementation of waste management charges and the broader implementation and management frameworks, e.g. EPR schemes.

7.1 DEA / The Bureau

The roles and responsibilities of the Bureau are outlined in Sections 34D and 34E of the Waste Amendment Act.

One of the primary functions of the Bureau is to review and approve, and to conduct monitoring and evaluation of IndWMPs. The IndWMPs will be drafted by each waste sector and submitted to the Bureau for approval. Any existing IndWMP must be aligned to the Waste Act, including any amendments, and the NPSWM.

In terms of the NEM: Waste Amendment Act, 2014, the Bureau is responsible for the direct monitoring and evaluation of –

- systems for the implementation of *volumetric tariffs* by municipalities
- the national implementation of *disposal taxes*
- all EPR schemes (and the implementation of IndWMPs)
- the impact of incentives and disincentives

7.2 Product Responsibility Organisations

In the case of EPR schemes, the first line of monitoring and evaluation is the PRO and the associated obligated industries (e.g. producers and importers). Accurate financial records must be kept by the PRO which are subject to independent, annual auditing. Amongst others, the PRO must report on the

requirements of the Product Plan and IndWMP, including tonnages of waste diverted from landfill and the revenue collected and dispersed.

All Extended Producer Responsibility (EPR) schemes should be established as not for profit organisations and have industry and, where appropriate, government representation on their board of Directors.

7.3 Product Steering Committees

Engagement with stakeholders in the design and implementation of EPR schemes has been shown to be effective in maintaining transparency, achieving objectives and in reducing costs.

The Department through the Waste Bureau or Industry stakeholders may facilitate the establishment of a Product Steering Committee in order to ensure transparency in the implementation of each EPR scheme, through regular monitoring and evaluation. The Steering Committee should consist of representatives of National Government, industry (producers, retailers, recyclers), the PRO consumer and environmental non-governmental organisations (NGOs).

8 Transitional arrangements

In the case of EPR schemes, Section 17 of the Waste Amendment Act provides the detail with respect to the transitional arrangements for any existing IndWMPs which may be affected should a waste stream be prioritised by Government; be prioritised for the implementation of waste management charges; or be identified for the implementation on EPR schemes.

If a waste stream has not been prioritised by the Minister for the implementation of a waste charge, and should voluntary EPR schemes (with associated PRO fees) be operating for that waste stream, then these voluntary systems should continue operating to ensure minimal disruption to current waste management activities. These voluntary EPR schemes may however be 'influenced' by DEA, through prioritisation of the waste stream for development of the IndWMPs, the approval and implementation of the relevant IndWMPs (e.g. requiring greater support of EPR schemes to municipalities, setting of recycling targets, monitoring and evaluation by government, etc.).

This strategy will be reviewed after a period of 5 years. The government managed EPR scheme is being proposed and there is provision made for the existing EPR schemes to be aligned to the Pricing Strategy. This transition does not change the operations of the PRO, but more align the funding model with what is contained in the Act and the monitoring to be done by the Waste Management Bureau.

In line with the NEMWA, the strategy also indicated various and relevant role-players for performing certain actions in order to achieve our recycling economy, through the use of the EPR. These role-players and their actions are indicated in the Action Plan (Annexure A) of this strategy document. Also contained in the Action Plan are the associated timeframes for implementation by responsible parties. The further details of the implementation of this strategy are as contained in the Action Plan (Annexure A) of this strategy document.

National Pricing Strategy for Waste Management

Annexure A. Action Plan for the Implementation of the NPSWM

Action	Responsibility	Time-frame
Action 1: Under-pricing of waste services is corrected (Full cost accounting and pricing of solid waste service)		
Tariff setting		
<ul style="list-style-type: none"> o Municipalities to be supported in implementing correct tariff setting and pricing for waste management services which takes into account the full costs of waste management). This must go beyond support through guidelines, to actual assistance to the municipalities o All municipalities are charging for waste management services (collection and disposal) by 2017 o All municipal charges for waste management services (collection, transportation, recycling/recovery, disposal) are based on full-cost accounting by 2018 	CoGTA, DEA, Municipalities	2015/17 2016/17 2017/18
Financial systems set-up		
<ul style="list-style-type: none"> o All municipalities to reach a stage where they have financial and administrative systems in place successfully recovering the costs for waste management services (collection and disposal) 	CoGTA, DEA, Municipalities, National Treasury	2016/17
Action 1: Administrative mechanisms		
1.1 Operationalisation of the Bureau	DEA	2016/17
1.2 Establishment of monitoring and evaluation systems within the Bureau	DEA	2016/17
1.3 Development of the Policy for the Waste Management Bureau	DEA	2015/16
1.4 Facilitation of the development of industry waste management plans	DEA, WB and Industry	Ongoing
Action 2: Implementation of Upstream Instruments		
2.1 Development of the Policy for the Waste Management Bureau and the PRO	DEA, National Treasury	2016/17
2.2 Development of system for the transfer of funds from National Treasury to DEA / Waste Management Bureau	DEA, National Treasury	2016/17
2.3 Establishment of a system for SARS collection of levies/charges from producers and importers	DEA, National Treasury, SARS and Industry	2015/16
2.4 Evaluate the effectiveness of the South African plastic bag levy and its future relevance in light of a possible Paper and Packaging EPR scheme	DEA, National Treasury	2016/17
2.5 Further research into implementing or extending the upstream instruments to correct under-pricing (commitment under the NWMS)	DEA, National Treasury	Ongoing

National Pricing Strategy for Waste Management

Action	Responsibility	Time-frame
2.6 Establishment of the IndWMP Forum	DEA, WB	2014/15
Action 3: Implementation of EPR schemes		
3.1 Prioritisation of the Waste Streams from the list of waste streams and EPR schemes (without any order of preference)	DEA, WB	On annual basis
3.2 Identification of products, product groups or waste streams for the implementation of EPR schemes	DEA, the dti, National Treasury	Ongoing
3.3 Development of system for the transfer of funds from SARS to National Treasury	DEA, National Treasury	2016/17
3.4 Develop Product Plans/Programmes for identified products, product groups or waste stream(s), which should be informed by an analysis of the full social, environmental and economic costs and benefits of implementing	DEA, WB and Industry	Ongoing
3.5 Develop Industry Waste Management Plan(s) in response to Minister's call for the IndWMP	Industry, PRO	Ongoing
3.6 Development of the tariff codes for the waste streams during the period when the IndWMPs are invited	DEA, WB, SARS	Ongoing
3.7 Approval of Industry Waste Management Plan(s)	DEA	Ongoing
3.8 Implementation of the approved Industry Waste Management Plan	PRO, Industry	Ongoing
3.9 Reporting on the implementation of the approved Industry Waste Management Plan	PRO	As specified
3.10 Review of Product Plan(s) every 5 years	WB	5-yearly
3.11 Review of Industry Waste Management Plan(s) at intervals as specified in the approval	DEA, WB	As specified
3.12 Monitoring and evaluation of EPR scheme(s)	EA, WB	Ongoing
3.13 Develop a set of guidelines to assist with the development of EPR programmes (commitment under the NWMS)	DEA, Industry	2016/17
3.14 Assess the effectiveness of current voluntary EPR schemes and the potential social, environmental and economic costs and benefits (and associated impacts) of converting voluntary to mandatory schemes	DEA, WB	Ongoing
Action 4: Implementation of Downstream Instruments		
4.1 Assess the readiness of municipalities to implement volumetric tariffs	DEA, CoGTA, SALGA	2016/18
4.2 Assess the readiness of municipalities to implement waste disposal taxes	DEA, CoGTA, SALGA	2016/18
4.3 Further research into implementing or extending the downstream instruments once under-pricing has been corrected (commitment under the NWMS)	DEA, National Treasury	Ongoing

National Pricing Strategy for Waste Management

Action	Responsibility	Time-frame
Action 5: Under-pricing of waste services is corrected (Full cost accounting and pricing of solid waste service)		
5.1 Tariff setting <ul style="list-style-type: none"> o Municipalities to be supported in implementing correct tariff setting and pricing for waste management services which takes into account the full costs of waste management). This must go beyond support through guidelines, to actual assistance to the municipalities o All municipalities are charging for waste management services (collection and disposal) by 2016 o All municipal charges for waste management services (collection, transportation, recycling/recovery, disposal) are based on full-cost accounting by 2018 	CoGTA, DEA, WB, SALGA Municipalities Municipalities	Ongoing 2016/18 2017/19
Financial systems set-up <ul style="list-style-type: none"> o Assessment of other systems and benchmarking with other system local and internationally o All municipalities have financial and administrative systems in place successfully recovering the costs for waste management services (collection and disposal) 	Municipalities, CoGTA, DEA Municipalities	2016/18 2017/19

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