

# Defining waste in South Africa: Moving beyond the age of 'waste'

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THE LEGAL DEFINITION OF WASTE CAN often be vague and dependent on factors other than the composition or possible after-use of the material. The European Court of Justice has stated that the term 'waste', in European Union legislation, implies 'discard'. In South Africa, there is currently more than one legal definition of waste. This not only complicates the classification of material as waste, but also creates confusion amongst industry and government dealing with waste management issues. This hinders the successful implementation of the waste hierarchy that aims at diverting waste away from landfill by promoting sustainable waste recycling and re-use. The aim of this paper is to provide a critical analysis of the definition of waste and the shift to waste as resource, and the implications thereof for the implementation of government policies, strategies and legislation on waste re-use and recycling. Special emphasis is placed on the South African situation where new waste legislation is currently under development.

## Introduction

The internationally accepted waste hierarchy<sup>1</sup> (Fig. 1), as first accepted into policy by the European Community in the Framework Directive of 1975,<sup>2</sup> is aimed at preventing waste where possible, re-using, recovering and recycling waste to reduce volumes, treating the waste to render it less hazardous or harmful to the environment, and disposing of unavoidable waste to landfill as a last resort. The successful implementation of the waste hierarchy largely depends on its translation into policy, strategy and legislation. However, one of the main obstacles to successful implementation appears to be the mere definition of waste and its legal interpretation by both government and industry.

Defining waste has its origins in the management of unwanted and discarded material, where waste historically was disposed without consideration for the resultant environmental consequences or the re-use or recycling potential. The management of waste, both locally and internationally, has been incorporated into environmental legislation to protect both the environment and human health from any adverse effects of waste disposal.

While there are certainly some cases where it is clear that material is waste and re-use should not be considered—for example, medical waste—resource recovery at landfill sites and waste dumps is a clear indication of the existing re-use potential of waste being disposed of. There is also a vast number of 'difficult' or 'border-line' residues and by-products (mostly industrial waste) that are not being disposed of, but are consistently and profitably re-used, both locally and internationally. Defining something as waste therefore involves treading a very thin line between 'resource' and 'waste'. In addition, the classification of a material as 'waste' has fundamentally important commercial consequences,<sup>3</sup> for instance, disposal requirements, and transportation of hazardous substances.

South African law has very strict requirements regarding the transport of waste, with companies having to go through extensive administration to effect the movement of the material, adding to the cost of transport.<sup>4</sup>

Waste is internationally defined in legislation that controls waste disposal. To promote waste re-use, there is a need for a clear definition of waste, and perhaps more importantly, clarity on when something ceases to be waste. This paper provides an overview of different legal definitions of waste adopted abroad and in South Africa. Each definition is briefly discussed, focusing on the implications of the definitions of waste to re-use and recycling.

## International definitions of waste

A review of the literature reveals an on-going international debate on the

Cleaner production	Prevention
	Minimisation
Recycling	Re-use
	Recovery/Reclamation
	Composting
Treatment	Physical
	Chemical
	Biological
Disposal	Landfill

Fig. 1. Waste management hierarchy.

definition of waste. Countries and regions where this definition is currently in the spotlight include: the European Union, Singapore, New Zealand, Taiwan, and the United States. The discussions in each of these countries are briefly highlighted in the following sections.

## European Union

The Waste Framework Directive<sup>2</sup> defines waste as 'any substance or object in the categories set out in Annex I [of the Directive] which the holder discards or intends or is required to discard'. While simple, this definition is problematic in its interpretation<sup>5,6</sup> and inconsistent in its enforcement.<sup>6</sup> There is no consensus about when material is discarded or intended to be discarded. This uncertainty in the definition of waste has even been argued to have implications for human rights.<sup>5</sup>

Within the European Union, many of the cases dealing with, or testing the definition of waste arise out of criminal prosecutions for violations of waste management regulations, where criminal liability depends on whether the substance or material concerned falls within the legal definition of waste.<sup>5,6</sup> As a result, the UK government has acknowledged the need for a full debate on the interpretation of the definition of waste, to provide industry and competent authorities with increased clarity in this regard.<sup>5</sup> The European Community's Sixth Environment Action Programme calls for 'clarification of the distinction between waste and non-waste' and this issue seems set to remain topical for some time to come.<sup>5</sup>

Industry and government need to have the same understanding as to what is waste and what is a by-product (material with the potential for re-use, whether a re-use market currently exists or not). The definition of waste should allow for responsible waste recovery, recycling and re-use without creating a threat of criminal liability in terms of waste legislation, while at the same time, not ignoring the potential environmental and human health impacts associated with these activities.

European case law gives a legal resolve on when waste is no longer considered waste. If material can be re-used without further processing and if there is financial advantage to be gained from the re-use, the substance in question should not be regarded as waste, but as a legitimate product. The reasoning applicable to by-products should be confined to situations in which the re-use of the goods, materials or raw materials is not a mere possibility but a certainty.<sup>6</sup>

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### Singapore

The Environmental Public Health Act (EPHA)<sup>7</sup> defines waste as 'any substance which constitutes a scrap material or an effluent or other unwanted surplus substance arising from the application of any process; and any substance or article which requires to be disposed of as being broken, worn out, contaminated or otherwise spoiled, and anything which is discarded or otherwise dealt with as if it were waste shall be presumed to be waste unless the contrary is proved.' The definition of disposal facility, similar to South African legislation, also includes a recycling facility, subjecting recycling facilities to the same controls as disposal facilities.

This definition of waste therefore assumes just about everything to be waste unless the producer or generator can provide proof that it is not. By subjecting recycling facilities to waste disposal controls, they are also subject to the bureaucratic process of applying for a waste disposal facility licence. These definitions leave Singapore in the same situation as South Africa, where there is ambiguity as to what exactly is waste and where waste legislation could be seen as a burden to waste re-use and implementation of the waste hierarchy.

### New Zealand

Unlike a number of other OECD (Organisation for Economic Cooperation and Development) countries, New Zealand does not have comprehensive legislation dedicated to the management and minimization of wastes. Analysis of the waste minimization and management provisions in OECD countries indicates that legislation is required to support waste management programmes and targets.<sup>8</sup>

The New Zealand Waste Strategy<sup>8</sup> defines waste as 'any material, solid, liquid or gas that is unwanted and/or unvalued and discarded or discharged'. This definition recognizes that, in fact, 'waste' is not necessarily a useless material but rather a renewable resource.<sup>9</sup> This definition emphasizes material being unwanted and/or unvalued. Availability of economically viable markets for these materials is therefore key in interpreting this definition.

According to Boyle,<sup>10</sup> the current New Zealand legislation and policy does not provide sufficient direction and focus in the field of waste management and pollution prevention. Compared with programmes in the UK and Pennsylvania, the New Zealand waste management and pollution prevention programme is vague, lacking in direction and funding,

and fails in reducing waste production or effectively managing waste.<sup>10</sup> The broad definition of waste should be identified, at least in part, for this situation.

At the time of writing this article, the New Zealand Ministry for Environment has been developing a new Waste Minimization (Solids) Bill ([www.greens.org.nz/waste](http://www.greens.org.nz/waste)). Interestingly, the new Waste Bill does not specifically define the term 'waste', but does define certain types of waste, namely, organic waste, medical waste, and construction and demolition waste. This may be an attempt to avoid the confusion experienced internationally in legislating a too broad definition of waste.

The international experiences of a broad legal definition of waste should guide new developments on the legislation front. It is, however, also possible that a too narrow definition of waste may result in increased adverse environmental consequences.

The New Zealand approach to defining specific waste-streams with specific controls may serve the purpose of reducing the impacts of problem waste-streams, through strict controls, while supporting the re-use of other waste-streams with a high re-use potential. The added advantage of this approach is that re-use can be promoted and controlled in a specific manner to a waste-stream.

### Taiwan

The Waste Disposal Act of Taiwan,<sup>11</sup> as amended in October 2001, does not specifically define 'waste'. Instead, the act classifies waste into two broad types: general wastes and industrial wastes. Industrial wastes are further broken down into hazardous industrial waste that contains toxic or dangerous substances in a sufficient concentration or quantity to endanger human health or pollute the environment, and general industrial waste that includes materials other than hazardous industrial waste.<sup>12</sup>

According to Tsai and Chou,<sup>12</sup> industrial wastes may still possess some economic value, depending on the quality and the ready accessibility of a market for it, and should not necessarily be considered a waste. As a result, a new paradigm was established,<sup>12</sup> aiming at minimization of the generation of industrial wastes and the use of virgin resources by the manufacturing industry. This new paradigm is evident in the promulgation, by the Environmental Protection Administration (EPA) of Taiwan, of the Resource Recycling Act.<sup>13</sup>

The purpose of the Resource Recycling

Act<sup>13</sup> is to 'conserve natural resources, reduce waste, promote recycling and reuse of materials, mitigate environmental loading, and [build] a society in which resources are used in a sustainable manner'. The act defines renewable resources as 'substances that have lost their original usefulness, are economically and technologically feasible to recycle and may be recycled or reused as announced or approved by the Act.' Defining a material as a renewable resource, therefore, aims at protecting non-renewable resources through the re-use of 'waste' streams.

The Taiwanese government has further supported this new paradigm, with the promulgation of supporting regulations aimed at promoting recycling such as the Renewable Resource Recovery Regulations,<sup>14</sup> Preferential Procurement Regulations<sup>15</sup> and the Management Regulations for the Restriction or Prohibition of the Import or Export of Renewable Resources.<sup>16</sup>

A key factor in the re-use of industrial waste in Taiwan is the Industrial Waste Exchange Information Service Centre, established by the Industrial Technology Research Institute (ITRI) with the assistance of the Taiwan EPA and the Ministry of Economic Affairs. This centre has, since 1987, actively assisted in coordinating with factories that intend to re-use industrial wastes.<sup>12</sup>

To support resource re-use/recycling, the Waste Disposal Act has incorporated financial incentives such as tax deductions for investment, accelerated depreciation, and low-interest loans. The Waste Disposal Act has therefore provided both a regulatory framework for implementation as well as an economic framework that promotes re-use. Although industrial waste re-use/recycling has benefited from this new paradigm and supporting legislation, it is not without its problems.<sup>12</sup> Key factors that stand out in the Taiwanese case is the absence of a clear definition of waste, while at the same time providing for the definition of a 'renewable resource', indicating a shift in mindset towards materials re-use and recycling.

Again, whether or not material is viewed as waste depends on the available market for it. The definition is not clear on where the distinction between waste and renewable resource should be made. The approach towards renewable resources is, however, a significant change in thinking from the historical, conservative, protection-based legal definition.

### United States

According to Lown,<sup>17</sup> the statutory definition of solid waste differs from the

regulatory definition in the United States. Congress defined solid waste as: '[A]ny garbage, refuse, sludge from a waste treatment plant, water supply treatment plant, or air pollution control facility and other discarded material, including solid, liquid, semi-solid, or contained gaseous material resulting from industrial, commercial, mining, and agricultural operations, and from community activities'.<sup>17</sup> By contrast, the Environmental Protection Agency's (EPA's) regulatory definition of 'solid waste' is 'any discarded material that is not excluded' under 40 Code of Federal Regulations [sec] 261.4(a), or by variance. If a material is discarded, it is solid waste, unless the EPA specifically removes it from the solid waste category.

The U.S. EPA approach to defining solid waste is thus to spread its regulatory authority widely, and then to remove from the solid waste category anything that it deems to be legitimately recycled, or actually needed to make a product.<sup>17</sup>

Many of the significant decisions that attempt to distinguish regulated discarded materials from non-regulated products have emanated from the U.S. Court of Appeals for the District of Columbia. The court limited the EPA's authority under the Resource Conservation and Recovery Act (RCRA) to those materials that were actually part of the 'waste disposal problem' and not those which are 'destined for beneficial reuse or recycling in a continuous process by the generating industry itself.' Thus, if a material was still part of the 'ongoing manufacturing or industrial process,' it was outside the EPA's jurisdiction.<sup>17</sup> In another court ruling, the EPA's jurisdiction was expanded to include materials recycled outside the generating facility, even if they were later sold as a product.<sup>17</sup>

It has been argued, usually by the regulated community, that environmental regulations create unnecessary impediments to creative solutions like eco-industrial developments. The RCRA regulations are often cited as the most obstructing.<sup>17</sup>

The American example once again points to the fact that defining material as waste has the consequence of subjecting that material to waste regulations. Waste regulations are primarily aimed at the protection of the environment against the possible harmful effects of waste material, if not managed properly. It is not geared towards providing an enabling legal environment for re-use or recycling of that material. Protection of the environment by applying the precautionary approach, and therefore a broad (catch-all) definition of waste, is therefore in direct conflict

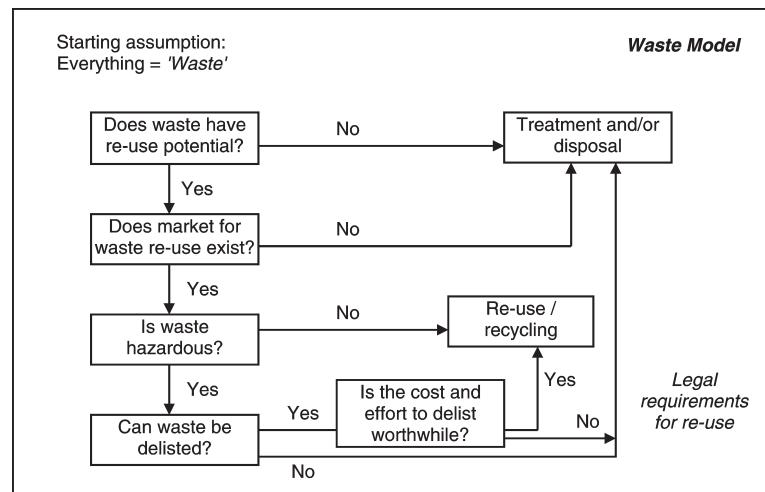


Fig. 2. Managing waste through a 'Waste Model'.

with the creation of an enabling environment for the re-use of waste material.

### South African definition of waste

There are currently at least two legal definitions of waste in South African legislation. The Environment Conservation Act (ECA)<sup>18</sup> provides for a definition of waste to be published in the form of a legal notice.<sup>19</sup> This notice defines waste in terms of its unwanted or superfluous nature. The choice of these terms to define waste reflects the thinking or approach towards waste in the 1990s, that is, one of protection. This is not surprising, as the Government notice was published under the auspices of environmental conservation. The National Water Act<sup>20</sup> also followed a similar protection-based approach by defining waste in terms of polluting potential.

This broad (all-encompassing) legal definition of waste therefore subjects waste re-use and recycling facilities in South Africa to similar controls as waste disposal sites, amongst others, the need for an operating permit. While the ECA does provide for exemptions to permits to be issued, this approach places a burden on re-use and recycling activities to obtain authorization for these initiatives that can often be a lengthy, bureaucratic process. In addition, it is not clear whether the reprocessed material should continue to be deemed a waste, or a product.

The precautionary principle, as applied in the Minimum Requirements for Waste Disposal,<sup>21,22</sup> assumes that a waste is highly hazardous and toxic until proven otherwise. The burden of proof as to whether a waste is non-hazardous lies with the generator of the waste in question, often restricting the potential exchange of the material for re-use. In applying this principle to industrial waste, all industrial

waste is considered to be hazardous and classified as such, most often purely due to the excessive volumes of waste produced. The re-use of hazardous waste is dependent upon reclassification to 'delist' it, in order to prove that the material does not pose any significant threat to the environment and human health. The delisting process is outlined in the Minimum Requirements for the Handling, Classification and Disposal of Hazardous Waste<sup>21,22</sup> and involves costly and specialized tests to be performed on both the waste and the final product, be it bricks, concrete or any other product produced by use of the material. The delisting process reclassifies the waste as non-hazardous, but the material's definition remains waste.

If, however, the material is excluded from the definition of waste, it can be re-used by the generator, or sold (exchanged) for re-use, without going through a bureaucratic process such as delisting. A proposed re-definition of waste has the potential to promote waste re-use and material exchange programs, save natural resources, reduce costs to both the generator and landfill, and protect the environment in the long-term by diverting waste away from landfill.

The broad, but very restrictive, protection-based definition of waste currently adopted by South African legislation is viewed by industry as an obstacle to the successful implementation of a waste hierarchy.<sup>4</sup> The current approach, or behaviour towards waste management and waste re-use in South Africa, driven largely by the current legal definition of waste and the associated legal requirements, is depicted in Fig. 2.

### Discussion

A common question that arises within industry is whether a material, suitable

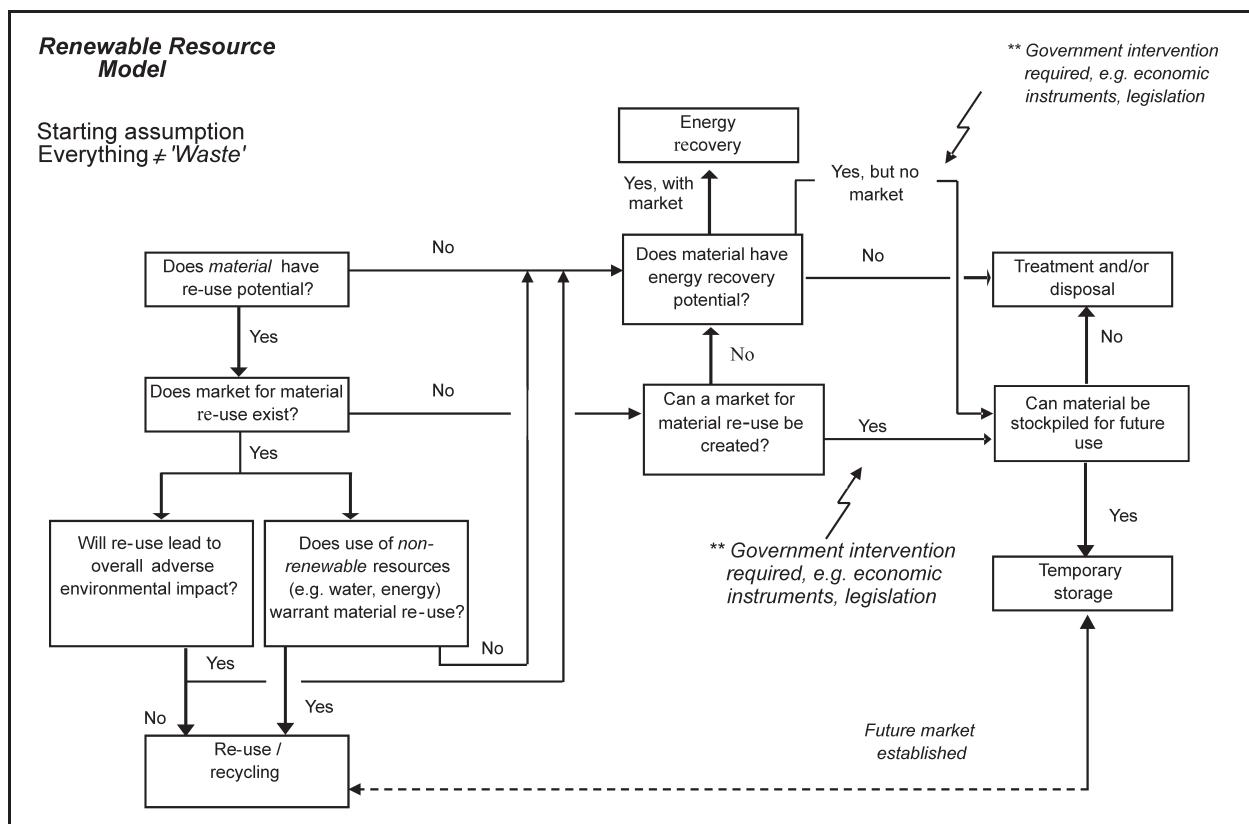


Fig. 3. Managing waste through a 'Renewable Resource Model'.

for re-use or further processing (whether a market currently exists for it or not) is waste or a by-product. In South Africa, current waste re-use and recovery is subject to waste management regulations and controls in order to regulate the full life cycle of the waste.

Internationally, a serious emerging terminological and regulatory problem is being raised by increased controversy regarding potentially recyclable waste. In most existing legal definitions, the term 'waste' includes material that is technically suitable for recovery and re-use.<sup>23</sup> By including these waste-streams in the definition of waste, the material becomes subject to the same regulations as other waste-streams that are not (or currently not) suitable for recovery.

Implementation of the waste hierarchy through reduction and recycling targets requires clarity on what can be reduced or recycled. Unclear or ambiguous waste definitions are a common phenomenon throughout the world, leading to courts of justice having to resolve waste governance issues.

Defining waste is imperative to the regulation of waste and the control of possible negative impacts of waste on the environment and human health if not properly managed. It is therefore important to define waste in a way that will support the regulation of environmental

impacts as well as support the principles of integrated waste management, as defined through the waste hierarchy. Adopting a broad, all-encompassing, definition of waste will promote environmental protection through the application of the precautionary principle, with the possibility of discouraging the implementation of the waste hierarchy, because of the bureaucratic processes involved. On the other hand, adoption of a narrow definition of waste will support implementation of the waste hierarchy, but may undermine environmental protection. Irrespective of the definition adopted, some trade-off between protection and re-use is envisaged.

The result has been a paradigm shift towards waste as resource, and a resultant change in the governance of waste from protection (Fig. 2) to re-use (Fig. 3).

The Taiwanese legal definition of industrial waste is an example where industrial waste may not necessarily be classified as waste if it still possesses some economic value. The classification, however, depends on the quality of the material and the availability and accessibility of potential markets for its re-use.<sup>12</sup> Bainbridge<sup>6</sup> noted that 'to stay within the law and maintain profitability, many businesses abandon strategies for realizing commercial value from their production and consumption residues and, instead, send these for

disposal by incineration or landfill, with the result that virgin materials are bought and used in their place.'

Internationally, a typical approach to promote waste recovery through legislation is directed at specific waste-streams, as opposed to using a broad legal framework. This is evident through the numerous waste-type specific acts which have been promulgated internationally, for example, the Electronic Waste Recycling Act, Beverage Container Recycling Act, Computer Recycling Act, and Cell Phone Recycling Act. Strong government regulation of all recycling activities can, however, be a problem. If waste re-use and recycling involves many procedures or bureaucratic obstacles, the likelihood of re-use will typically come down to (1) economics and (2) return on effort.

Reclaimed and recycled material needs to be controlled, to limit the risks to the environment, and to ensure that principles such as the 'polluter-pays-principle' continues to apply, irrespective of the after-use. The concept of extended producer responsibility provides one way of addressing this problem. A good example of extended producer responsibility is where producers of certain waste-streams are obliged to take a product back (such as for electronic waste). However, there are limits to this approach in terms of waste-streams to which it can be applied,

as well as the extent to which it is applied (such as, when the producer is released of responsibility). An argument can be made that the initial producer of the waste remains responsible for the waste until it is reworked into a secondary product, and that the producer of the secondary item then becomes the producer with extended responsibility. Although there is merit in the application of this approach, it can be applied irrespective of the definition of waste by linking it to pollution potential.

In certain cases, this concept may act as a disincentive for re-use and recycling, especially in the South African situation, where small, medium and micro enterprises with limited capital resources are the likely sector to become involved in recycling and re-use initiatives. It also needs to be recognized that reclamation and recycling is to a large degree dependent on fluctuations in the market and availability and cost of technology. In the absence of economic incentives, there is thus always the potential that certain material will be disposed of, irrespective of their potential to be re-used, or by the definition of waste.

Southern African definitions of waste are similar to the EU's. The current EU debate on the definition of waste is therefore as relevant to the South African context as to the EU itself. South Africa, however, has the advantage that the policy principles implemented in Europe since 1975 are only now being translated into South African legislation.

## Conclusions

The waste management hierarchy has been developed to improve the management of waste and reduce associated impacts through prevention, minimization and re-use. In order to ensure coherence in the implementation of the hierarchy, however, a clear definition of waste is essential. The waste hierarchy has not, however, been accompanied by a single definition of waste, and every country adopting the hierarchical approach has adopted their own definition of waste. The widespread adoption of the waste hierarchy is indicative of the magnitude of the waste problem, the desire to reduce the generation of waste, and increase re-use and recycling.

The debate on the definition of waste is far from concluded. It is clear, however, that broad definitions of waste create a minefield of regulatory requirements and

bureaucratic processes that need to be put in place in order to manage waste successfully. This approach allows for legislative control over all aspects of the waste hierarchy but it may act as disincentives to its implementation.

The approach to viewing material as a renewable resource rather than waste may provide an alternative solution to promoting waste re-use. Regulation of resource use, extended to renewable resources, will favour re-use and recycling initiatives as well as give due regard to virgin resource conservation. It may even lead to the replacement of the waste hierarchy with a resource-based hierarchy. Such a resource hierarchy would typically focus on minimization of the use of virgin resources, followed by waste minimization, and renewable resource re-use, recycling and energy recovery. This should be considered in conjunction with the protection of environmental and human health, to ensure least impact through waste recycling and re-use. Protection of the environment against the effects of waste is a high priority, especially in developing countries, where the poor enforcement of waste legislation has resulted in impacts on both the environment and human health.

There is thus a definite need in South Africa to reconsider the retention of a broad definition of waste in the new Waste Bill. A shift in focus away from waste towards renewable resource use and recovery will not only assist in implementing the waste management hierarchy, but it will also bring South Africa one step closer to the ultimate goal of reducing waste to landfill. It will further enable industry to engage more actively in industrial ecology initiatives that are more focused on sustainable development through waste and energy exchange and cooperation, than waste management as such.

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