COMMERCIAL IN CONFIDENCE

FINAL REPORT

NSW waste regulation

Cost-benefit analysis

Prepared for
NSW Environment Protection Authority

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THE CENTRE FOR INTERNATIONAL ECONOMICS
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Executive summary

The *Protection of the Environment Operation (Waste) Regulation 2005* (the waste regulation) are due to be revoked and remade in October 2014 and will commence on 1 November 2014.

The waste regulation covers some key elements of the Governments waste avoidance and resource recovery strategy. Specifically, the regulation currently relates to:

- the waste and environment levy (the waste levy) — the waste regulation specifies the waste levy contributions payable by occupiers of a scheduled waste facility and the associated administrative arrangements
- waste tracking — the waste regulation sets out the arrangements for tracking and transporting waste
- management of special waste — the waste regulation specifies the requirements relating to the management of special wastes, such as asbestos and clinical and related waste
- prohibits the use of certain waste for growing vegetation
- waste and sustainability improvement scheme (WASIP) — the waste regulation establishes a waste and sustainability improvement incentive payment system for local councils, as well as the associated guidelines establishing waste and sustainability improvement standards to be met by local councils
- recycling of consumer packaging — the waste regulation establishes a system giving the EPA the authority to set targets for recovery of material and review of packaging design for brand owners of products
- other miscellaneous requirements including record keeping by non-waste levy paying landfill facilities.

The Environment Protection Authority (EPA) intends to remake the waste regulation. This cost benefit analysis has been completed to support preparation of a Regulatory Impact Statement (RIS) as required by the *Subordinate Legislation Act 1989*.

The proposed waste regulation

The EPA is proposing several amendments in the remade *Protection of the Environment Operation (Waste) Regulation 2014.* Key proposed amendments are summarised in table 1.

1 Proposed changes to the waste regulation

Part	Summary of changes
Proximity principle	The inclusion of a requirement that waste be disposed of within prescribed distance from where it is generated, with some exceptions.
Waste levy arrangements	Removal of exemption clause for certain scheduled waste facilities, placing a waste levy liability upfront on storage, transfer and treatment facilities. Additional requirements include record-keeping and installation of weighbridges on-site. The EPA is also proposing to lower licensing thresholds for resource recovery, waste processing (non-thermal treatment) and waste storage facilities). The proposed changes to the waste levy arrangements include record keeping requirements for some non-levy paying scheduled waste facilities.
Waste tracking	Coverage extended to include the transport of non-hazardous waste originating from the metropolitan levy area (MLA) to another state or territory.
Management of special waste	It is proposed to have a new power included in the regulation that requires monitoring of the movement of asbestos from the point of generation to the point of disposal. A new tracking system for waste tyres has also been proposed.
Prohibition against using certain waste for growing vegetation	No significant amendments.
Recycling of consumer packaging	No significant amendments.
Waste and sustainability improvement scheme (WASIP)	The WASIP program is being replaced with alternative forms of funding for Councils. As the scheme is being removed from the regulation it has not been assessed in this cost benefit analysis.
Land pollution offence	To include in the *Protection of the Environment Operations (General) Regulation 2009* a list prescribing matter that constitutes land pollution including: ▪ hazardous waste ▪ restricted solid waste ▪ >10 tonnes of asbestos waste ▪ >5 tonnes or >500 waste tyres.

Source: EPA.

For each key element of the waste regulation, the costs and benefits of the current regulation and the proposed regulation were assessed against the base case option of no regulation. An exception was Part 2 of the existing waste regulation relating to waste levy contributions for which only the costs and benefits of the proposed regulation relative to the current regulation were assessed.

Cost benefit analysis of specific components of the waste regulation

Each part of the waste regulation deals with separate issues relating to waste management and our general approach is to consider each part of the proposed regulation separately. Our key findings for each key element are discussed below supported by detailed analysis in the main part of the report.

Not all components could be assessed quantitatively. Where possible quantitative estimates of the costs and benefits are provided, alternatively a qualitative assessment of the costs and benefits is provided.

Long distance transportation of waste

The long distance transportation of waste imposes social and environmental costs from transportation. The rigorous regulatory framework in NSW incentivises the long distance movement of waste, in order to avoid the full costs of waste disposal in NSW.

The introduction of a proximity principle that requires waste to be disposed of locally has been proposed following the draft RIS. This change would require waste to be disposed of within 150 kilometres of where it was generated, with some exceptions. This amendment to the regulations would address the incentives created by the NSW regulatory framework to seek to avoid the full costs of waste disposal in NSW and particularly the waste levy.

The adoption of a proximity principle that requires waste to be disposed of locally is estimated to have substantial net benefits. We estimate that, over a 10 year period, these would be in the order of $119 to $303 million (discounted). The adoption of a proximity principle would have costs to those currently seeking to avoid the full costs of waste disposal in NSW, but benefits to the broader community through avoidance of social and environmental costs associated with long distance transportation of waste and additional Government revenue from the waste levy.

Waste levy contribution by scheduled waste facilities

The proposed amendments to the waste levy framework place a waste levy liability on storage, transfer and treatment (STT) scheduled waste facilities. Additional proposed changes that align with the amendments to the waste levy framework include lowering of license thresholds for scheduled waste facilities, record-keeping requirements and use of weighbridges on-site, and provision for the EPA to request installation of video monitoring systems at waste facilities.

The total cost to industry and government of the proposed amendments is estimated at around $25 million in present value terms over ten years (using a discount rate of 7 per cent). This has been revised up since the draft report, as better information has become available through the consultation process.

It is difficult to estimate the amount of illicit activity that occurs through STT facilities due to the secretive nature of such activities. Nevertheless, the total benefit to the community of the proposed change is estimated at $38.92 million in present value terms over ten years (using a discount rate of 7 per cent). There remains significant uncertainty around this estimate and no new information has emerged from the consultation process. The net benefit to society from the proposed amendments is estimated at $13.95 million over ten years (table 2).[1]

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1 All estimates of present value and net present value in this cost benefit analysis use a discount rate of 7 per cent.

An alternative option of requiring all waste transporters to be licensed was also assessed. Neither the costs nor the benefits of the alternative option could be quantified. The total cost will depend on the number of entities required to be licensed, the number of vehicles associated with these licences and the number of waste loads transported annually. The total benefit of the alternative option is dependent on the extent to which waste transporters, as opposed to waste facilities, are engaging in illegal handling of waste.

Given available information, the proposed amendments to the waste levy framework is the preferred option for society.

2 Estimated net benefits

	Estimate
	$ million
Benefits	
Reduced waste management costs	38.92
Cost of changes to the levy collection arrangements	
Industry	
Capital cost of weighbridge and software (50%)	1.18
Staff cost to operate weighbridge	5.48
Record keeping and reporting	0.53
Volumetric surveys	2.99
Government	
Capital cost of weighbridge and software (50%)	1.18
Administration and enforcement	3.09
Total	14.45
Cost of changes to the licensing threshold	
Industry	
Capital cost of weighbridge and software (50%)	0.98
Staff cost to operate weighbridge	4.66
Record keeping and reporting	0.21
Volumetric surveys	1.58
Licensing-related costs	0.56
Government	
Capital cost of weighbridge and software (50%)	0.98
Administration and enforcement	1.55
Total	10.63
Total costs	24.97
Net benefit/cost	**13.95**

Source: CIE estimates.

Waste tracking requirements

A qualitative assessment of the current and proposed waste tracking requirements was conducted. The current waste tracking requirements aim to minimise the potential for

adverse environmental and human health impacts associated with the movements of particular types of wastes deemed higher risk within NSW and to or from NSW. The proposed additional waste tracking requirement extends tracking to non-hazardous wastes transported interstate, although this will not require any certificate or consignment authorisations to be issued.

The primary benefit of the current waste tracking requirements is collection of accurate information on the movement of higher risk wastes, through a common and low cost system, that would arguably be collected in the absence of the waste tracking requirements by the majority of parties involved in tracking waste. This information system is valuable to both participants and the waste regulator. Removal of the requirement would increase the risk of movement of high-risk wastes. The requirements also support implementation of the NEPM for controlled waste.

The estimated ongoing annual cost to government to verify and audit the tracking requirements system is $25 000. The additional cost to industry of the current waste tracking requirements is expected to be negligible as commercial contracting arrangements between waste management parties would necessitate collection of this or similar information regardless.

Extending the system to interstate tracking of non-hazardous waste would provide information for waste regulators on the type, generator, origin, and destination of waste that is transported from NSW interstate. However in the absence of information on the cost to administer interstate tracking and the benefit of this type of information to waste regulators, it is unclear if this option provides a net benefit to society.

The preferred option, from society's perspective, is to remake the regulation as it currently stands given the waste tracking requirement is a low cost system of information flow which manages the risk of moving and storing higher risk wastes.

Management of special wastes

The current waste regulation imposes requirements on the transportation and disposal of special waste, namely asbestos waste and clinical and related waste. The EPA is proposing to extend the current regulation to include monitoring of the movement of asbestos from the point of generation to the point of disposal.

The benefit of the proposed change is reduced risk of asbestos exposure to the community. The costs of the proposed change are expected to be modest. There are existing notification requirements for licensed removalists under their obligations to WorkCover NSW and the information required by the EPA is likely to be the same (or very similar). While the EPA would may not be able to fully integrate their reporting requirements with the WorkCover system, the additional cost of reporting the same information to EPA as well as WorkCover are not likely to be significant.

There is uncertainty regarding the magnitude of the potential benefits because the proposed change does not alter the behaviour of unlicensed removalists. Given the uncertainty regarding the potential benefits, it is not clear whether the proposed change will result in a net benefit to the community. To the extent that there is some illegal dumping by licensed

removalists and associated transporters and the costs of the proposed system are minor, the proposal can be expected to deliver a net benefit to the community, albeit a small one.

EPA is also proposing to establish a waste tyre tracking system. Currently, tyres are considered 'special waste' but unlike asbestos and clinical waste, there are no specific regulations.

Several reports suggest that the illegal dumping and unsafe storage of waste tyres could impose significant costs on the community, including clean-up costs and the costs associated with tyre fires. The magnitude of these costs are not known with any certainty, but the information available suggests it could be several million dollars per year in NSW.

The EPA has proposed a tracking system to address these issues relating to waste tyres. The question is whether a waste tyre tracking system is needed in addition to:

- proposed changes to the regulation of waste tyre storage and processing facilities
- the voluntary Tyre Product Stewardship Scheme that began operation in July 2014.

Our estimates suggest that an electronic tracking system could impose compliance costs on business of around $744 000 per year. The total costs of the proposed waste tyre tracking system over ten years — including the costs to EPA of developing and administering the system — could be in the order of $5.2 million in present value terms (using a discount rate of 7 per cent).

For the benefits of the waste tyre tracking system to outweigh these costs it would need to prevent around 2500 tonnes of tyres per year from being illegally dumped, in addition to any reductions achieved through other recent measures. This is in the range of 20-30 per cent of the estimated total volume of waste tyres currently illegally dumped in NSW (although it is not clear how robust these estimates are).

Given that there are other measures to address the problems caused by waste tyres that have either been recently implemented or are likely to be implemented in the near future, it may be preferable for the EPA to wait and see whether these measures are sufficient to address the problem before imposing additional compliance costs on businesses.

Prohibition against using certain waste for growing vegetation

The current waste regulation prohibits the application of certain waste to land for the purpose of growing vegetation. No further amendments are proposed. The cost and benefit of this prohibition were qualitatively assessed against the case of no regulation.

The costs of the prohibition include:

- increased disposal costs to industry and potentially increased cost of inputs used instead of residue waste
- increased cost to apply for and comply with an exemption from the EPA
- additional administration costs to government to assess exemption applications.

The benefits of the current prohibition include:

- avoided risk of harm to the environment and human health

- avoided costs to government relating to investigations and remediation efforts from illegal incidents.

With the information available, the preferred option is to remake this component of the waste regulation as it currently stands due to the fact that the costs of the regulation are minimal, whilst the benefit, from avoided risk of harm to the environment and human health, is potentially large.

Recycling of consumer packing

The consumer packaging component of the waste regulation is the NSW component of the National Environment Protection (Used Packaging) Measure (NEPM).

The regulation effectively forces 'brand owners' with a turnover of more than $5 million to join the Australian Packaging Covenant (APC). The APC funds projects aimed at meeting its recycling targets and reducing litter. APC signatories are also required to develop action plans to increase recycling and reduce litter and report on their progress.

The compliance costs associated with APC membership for NSW businesses could be around $3.8 million per year plus membership fees of around $1.3 million (table 3). In present value terms, the cost to NSW businesses could be around $20.1 million over five years (using a discount rate of 7 per cent).

3 Compliance costs associated with APC membership

	Annual costs	Net present value over five years[a]
	$ million	$ million
Compliance costs	3.8	15.6
Membership fees	1.3	5.4
Total	**5.1**	**20.1**

[a] Using a discount rate of 7 per cent

Source: APC Annual report 2012; Hyder Consulting, 2008, National Packaging Covenant mid-term review, p. 68; The CIE.

The benefits of increased recycling includes the value of the material recovered and the avoided cost of landfill including private capital and operating costs, as well as social and environmental costs. However, there are also additional collection and processing costs.

Whether of additional recycling delivers and net benefit to the community will depend on a range of factors, such as the composition of the material recovered, market price for the recovered material, the size of the landfill the material would have been sent to and the controls in place. These are likely to vary significantly making it difficult to estimate the overall benefits.

Nevertheless, our analysis based on publicly available information suggests that on average, additional recycling could potentially deliver a net cost to the community (table 4).

4 Net benefits of diverting waste from landfill to recycling

	Landfill will best practice controls	Landfill with poor controls
	$ per tonne	$ per tonne
Benefits		
Market value of resources recovered	177	177
Avoided landfill costs (including private and external costs)	52	69
Total	***229***	***246***
Costs		
Kerbside collection	187	187
Processing at MRF	85	85
Total	***272***	***272***
Net benefit/cost	**-43**	**-26**

Source: PricewaterhouseCoopers and Wright Corporate Strategy, 2011, Attachment C: Cost benefit analysis report, Prepared for the Standing Committee on Environment and Water, The CIE.

The external social and environmental costs associated with a well-sited landfill with best practice controls are relatively small. These costs are likely to be more efficiently addressed directly, such as through better regulation of landfills or better enforcement of existing regulation.

The costs of litter on the community are difficult to measure, but could be significant. The choice to litter is made by consumers, rather than producers. The most effective way to change consumer behaviour is to provide bins and through education campaigns. These community-wide measures are likely to be most efficiently funded by government.

Land pollution offence

The EPA is proposing to include in the *Protection of the Environment Operations (General) 2009 Regulation* a list that prescribes matters that constitute land pollution.

The benefit of a list that prescribes matters that constitute land pollution is to remove the burden of proof for the regulator and provide clarity to the regulated community. This would reduce enforcement and legal costs to the government. The costs to industry and government of the proposed change are expected to be minimal. Although not quantified, it is expected this proposed change will result in a net benefit to society.

1 Background and introduction

Waste management in NSW

In 2010-11 NSW households, businesses and government generated around 17.1 million tonnes of waste. There are potentially significant environmental and social costs associated with waste disposal. These costs include private costs (such as the cost of the land), as well as environmental and social costs. These environmental and social costs could include contamination of aquifers, risks to human health and loss of amenity for those living near a landfill. Waste management is therefore a significant issue for the community.

The NSW Government has therefore put in place a range of measures aimed at reducing the amount of waste going into landfill through:

- waste avoidance — this involves reducing waste going into landfill by avoiding creating it in the first place
- resource recovery — some waste includes resources that can be used for other purposes. Resource recovery includes recycling, composting and energy generation.

As part of its overall waste avoidance and resource recovery strategy, the NSW Government has committed to meeting resource recovery targets for municipal waste, commercial and industrial waste, and construction and demolition waste.

Various policy measures are in place to meet these targets, including regulatory measures. The regulatory framework for waste is set out in:

- The *Waste Avoidance and Resource Recovery Act 2001*
- The *Protection of the Environment Operations Act 1997*
- The *Protection of the Environment Operations (Waste) Regulation 2005.*

The waste regulation

The New South Wales waste regulatory framework is set out in the *Protection of the Environment Operation Act 1997* and the *Protection of the Environment Operation (Waste) Regulation 2005* (the waste regulation). The waste regulation will be revoked and remade in October 2014. The Environment Protection Authority (EPA) is proposing to remake this regulation with several proposed amendments. It is therefore necessary for the EPA to prepare a Regulatory Impact Statement (RIS) under the *Subordinate Legislation Act 1989*.

The current waste regulation

The current waste regulation covers the following issues.

- the waste and environment levy (the waste levy) — the waste regulation specifies the waste levy contributions payable by occupiers of a scheduled waste facility and the associated administrative arrangements
- waste tracking — the waste regulation sets out the arrangements for tracking and transporting waste
- management of special waste — the waste regulation specifies the requirements relating to the management of special wastes, such as asbestos and clinical and related waste
- prohibits the use of certain waste for growing vegetation
- waste and sustainability improvement scheme (WASIP) — the waste regulation establishes a waste and sustainability improvement incentive payment system for local councils, as well as the associated guidelines establishing waste and sustainability improvement standards to be met by local councils
- recycling of consumer packaging — the waste regulation establishes a system giving the EPA the authority to set targets for recovery of material and review of packaging design for brand owners of products
- other miscellaneous requirements including record keeping by non-levy paying landfill facilities.

The proposed waste regulation

The EPA is proposing several amendments in the remade *Protection of the Environment Operation (Waste) Regulation 2014.* Key proposed amendments are summarised in table 1.1.

1.1 Proposed changes to the waste regulation

Part	Summary of changes
Proximity principle	The inclusion of a requirement that waste be disposed of within a prescribed distance fromwhere it is generated, with some exceptions.
Waste levy arrangements	Removal of exemption clause for certain scheduled waste facilities, placing a waste levy liability upfront on storage, transfer and treatment facilities. Additional requirements include record-keeping and installation of weighbridges on-site. The EPA is also proposing to lower licensing thresholds for resource recovery, waste processing (non-thermal treatment) and waste storage facilities). The proposed changes to the waste levy arrangements include record keeping requirements for non-levy paying scheduled waste facilities.
Waste tracking	Coverage extended to include the transport of non-hazardous waste originating from the metropolitan levy area (MLA) to another participating state.
Management of special waste	It is proposed to have a new power included in the regulation that requires the monitoring of the movement of asbestos and waste tyres from the point of generation to the point of disposal.
Prohibition against using certain waste for growing vegetation	No significant amendments.

Part	Summary of changes
Recycling of consumer packaging	No significant amendments.
WASIP	The WASIP program is being replaced with alternative forms of funding for Councils.
Land pollution offence	To include in the *Protection of the Environment Operations (General) Regulation 2009* a list prescribing matter that constitutes land pollution including: ▪ hazardous waste ▪ restricted solid waste ▪ >10 tonnes of asbestos waste ▪ >5 tonnes or >500 waste tyres

Source: EPA.

This project

Scope

The EPA has commissioned the CIE to prepare a cost benefit analysis to support a RIS for the proposed remake of the waste regulation. The RIS requirements under the *Subordinate Legislation Act* are shown in box 1.2.

1.2 Regulatory Impact Statement requirements

Under the *Subordinate Legislation Act*, a RIS must include the following matters:

- a statement of the objectives sought to be achieved and the reasons for them
- an identification of the alternative options by which those objectives can be achieved (whether wholly or substantially)
- an assessment of the costs and benefits of the proposed statutory rule, including the costs and benefits relating to resource allocation, administration and compliance;
- an assessment of the costs and benefits of each alternative option to the making of the statutory rule (including the option of not proceeding with any actions), including the costs and benefits relating to resource allocation, administration and compliance;
- an assessment as to which alternative option involves the greatest net benefit or the least net cost to the community; and
- a statement of the consultation program to be undertaken.

While the Subordinate Legislation Act requires the consideration of a range of options for meeting the objectives, including a 'no government action' option, our terms of reference specifically excludes consideration of the waste levy.

General approach to identifying and assessing options

Each part of the waste regulation deals with separate issues relating to waste management and our general approach is to consider each part of the proposed regulation separately. This includes:

- identifying the need for government action
- identifying the specific objectives of each part of the waste regulation
- identifying potential options for achieving the government's objectives, including non-regulatory options and a 'no government action' option.

In general we assess each option against a counter-factual of no government action. The key exception is Part 2, which deals with the waste levy. Since removing or changing the level of the waste levy is outside the scope of this project, a 'no government action' option cannot be considered. If the waste levy is to remain, there is also a need to specify the collection arrangements. In this case, we consider the proposed changes to the waste levy collection arrangements against the counterfactual of the existing arrangements.

Where we have quantified the benefits and costs of the regulation, we have generally done so in net present value terms over a ten year period, using a discount rate of 7 per cent.

Report structure

The remainder of this report is set out as follows:

- Chapter 2 addresses the proposed amendments to the long distance transportation of waste.
- Chapter 3 addresses the proposed amendments to the collection arrangements for the waste levy
- Chapter 4 assesses the proposed regulation relating to waste tracking
- Chapter 5 assesses the proposed regulation relating to management of special wastes
- Chapter 6 assesses the proposed regulation relating to the prohibition against using certain waste for growing vegetation
- Chapter 7 assesses the proposed regulation relating to consumer packaging
- Chapter 8 assesses the proposed amendments relating to land pollution offences.

2 Long-distance movement of waste

The movement of waste over long distances imposes costs, such as environmental costs and additional transportation costs. This occurs as businesses seek to minimise their financial costs by avoiding the full disposal costs for the waste they generate (including landfill gate fees and the waste levy). From a social perspective, this activity has net costs. This is because long distance movement of waste leads to additional social resources devoted to the transport of waste, as well as additional environmental costs arising from greater transport.

This chapter sets out the magnitude of the problem arising from the long-distance movement of waste, options proposed and the costs and benefits of these options.

The problem

The long distance movement of waste imposes additional resource costs for waste transport and disposal. These costs include additional resource costs of transport, such as the operating costs of trucks and labour costs for drivers. They also include additional social and environmental costs, such as from greater accidents and pollution arising from the movement of vehicles.

The NSW Principles and Guidelines for transport appraisal categorise the social and environmental costs of transport as set out in table 2.1. All of these impacts are relevant for the longer distance transport of waste, except nature and landscape, which depends on the infrastructure in place. There are also likely to be a number of waste specific impacts of long distance transport. These could include risk of spills and contamination, resulting in environmental damage or clean-up costs.

2.1 Environmental and social impacts of additional transport

Impact	Description
Air pollution	Air pollution reflects the health impacts from additional vehicle kilometres. Air pollution costs are higher in urban areas, because of the greater population impacted.
GHG emissions	GHG emissions have global impacts in terms of costs arising from changing temperatures
Noise pollution	Noise pollution arises in the immediate vicinity of roads. Its impacts are larger in urban areas than in rural areas.
Water pollution	Water pollution includes organic waste or persistent toxicants run-off from roads generated from vehicle use: engine oil leakage and disposal, road surface, particulate matter and other air pollutants from exhaust and tyre degradation.

Impact	Description
Nature and landscape	Nature & landscape impact is driven by the infrastructure 'footprint', e.g., habitat loss, loss of natural vegetation or reduction in visual amenity as infrastructure is constructed. Key impacts in rural areas are natural impacts, whilst key impacts in urban areas are mostly amenity / visual as the urban environment is already dominated by infrastructure.
Upstream and downstream impacts	Upstream and downstream costs refer to the indirect costs of transport including energy generation, vehicle production and maintenance and infrastructure construction and maintenance.
Accident costs	Accident costs reflect the additional accidents caused by additional vehicle kilometres

Source: Transport for NSW 2013, Principles and Guidelines for Economic Appraisal of Transport Investment and Initiatives, pp 250-251.

The long distance movement of waste is made more likely by the rigorous regulatory framework for licensed landfills in NSW (including higher performance standards, record keeping and reporting requirements and application of the waste levy to encourage resource recovery). This can lead to waste being moved over long distances to minimise the disposal costs for that waste. While this leads to reduced *financial* costs for waste disposal, it leads to higher *social* costs of waste disposal.

For example, consider the following scenario.

- Waste can be disposed of outside the area to which a waste levy applies for a gate fee of $30 per tonne and transport of waste costs $110 per tonne. This means the total cost from a financial perspective is $140 per tonne.
- Alternatively, waste could be disposed of within the regulated area at a cost of $180 per tonne, comprising $100 per tonne for the waste levy and $80 per tonne for landfill disposal costs and transport.

Under this example, the financial costs would be $40 per tonne lower by disposing of waste outside the area to which the waste levy would apply.

However, the social costs are quite different. If, under this example, gate fees and transport costs are assumed to reflect underlying resource costs, then the *social cost* of disposing outside of the area where a levy would apply is $140 per tonne and the *social cost* of disposing within the area where a levy would apply is $80 per tonne. In this case, the community is made worse off by $60 per tonne from the disposal of waste outside of the area where a levy would apply. Because transport of waste has environmental and social impacts (such as air pollution and accidents), this again means that the community can be worse off from disposal at substantial distances away from where the waste is generated, even though the financial costs might be lower.

Distances travelled by waste

All waste disposal requires some amount of transportation, as locating landfills near where waste is generated can have its own social costs.

Exact information on the distance travelled is not known, although the EPA has information on a number of longer distance waste journeys. Within NSW, longer distance waste journeys include:

- The transport of waste from Sydney to Veoila's Woodlawn bioreactor outside Goulburn (which is a distance of 250 kilometres).[2]
- The transport of some waste to the Hi-quality Minda landfill (also near Goulburn) from Sydney.
- A small number of instances where waste from the Blue Mountains City LGA has been transferred to Lithgow
- A number of instances where waste has been moved from Sydney to Bathurst.

The EPA is also aware of movements of waste interstate from NSW. The EPA has limited data on this, as much of the movement is likely to be either direct haul from point of generation or through recycling facilities (which are not subject to reporting requirements on the movement of waste).

Anecdotally, movements include specific waste types (including e-waste and some trackable waste) from New South Wales to Victoria and South Australia. The Qld Department of Environment and Heritage Portfolio also indicates that for financial year 2013/14, 461 547 tonnes of waste from interstate was received by Queensland waste facilities.[3] Anecdotally, it is likely that a significant percentage of this waste emanates from metropolitan areas in New South Wales.

While all longer distance transport of waste imposes social and environmental costs, the movement of waste interstate is particularly incentivised by avoidance of the full costs of disposal of waste in NSW. This is because, for movement of waste within NSW, scheduled waste facilities are required to pay levy amounts based on where the waste was generated rather than where it is disposed.[4] In practice, recipient waste facilities within NSW may not report that waste was received from the regulated area.

Unit costs of transport

There are standard values applied to the above social and environmental costs from transport (table 2.2). These are not specific to the transport of waste, but to commercial vehicle transport in general. Estimates for general commercial vehicles are likely a lower bound for the impacts for the transport for waste. The transportation of waste may have higher externalities if vehicles used allowed for greater air pollution (such as dust) or water pollution from waste that can leak from the vehicle and then subsequently end up in waterways.

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2 Veolia website, http://www.veolia.com.au/sustainable-solutions/community-development/woodlawn-bioreactor, accessed 5 September 2014.

3 Note that this is substantial revision to anecdotal information previously available for the Draft Report, which used a figure of 130 000 tonnes of waste moving interstate.

2.2 Unit values of environmental and social impacts

Impact	Unit costs for heavy vehicles
Air pollution	Urban — $24.18 per 1000 tonne kilometres Rural — $0.24 per 1000 tonne kilometres
GHG emissions	Urban and rural — $5.38 per 1000 tonne kilometres
Noise pollution	Urban — $4.03 per 1000 tonne kilometres Rural — $0.41 per 1000 tonne kilometres
Water pollution	Urban — $3.02 per 1000 tonne kilometres Rural — $1.45 per 1000 tonne kilometres
Upstream and downstream impacts	Urban and rural — $21.53 per 1000 tonne kilometres
Accident costs	$144 959 per accident (rural, based on average of two truck types and including person cost, repair cost, incident cost and economic loss)

Source: Transport for NSW 2013, Principles and Guidelines for Economic Appraisal of Transport Investment and Initiatives, Table 48.

Total costs of long distance waste movements

As discussed above, there is limited quantitative evidence of some of the longer distance vehicle waste movements both within and outside of NSW.

Based on the limited information available on the long haul transport of waste, the environmental and social costs of long distance waste movements through New South Wales are estimated to be $5 to $8 million per year (excluding accidents, table 2.3). This is based on between 230 000 and 370 000 tonnes of waste being moved an additional 750 kilometres. Information provided by the EPA suggests that there may also be significant additional amounts of long distance intrastate movement of waste in New South Wales. However, there is not sufficient information available to estimate of the volume of such movements. The estimates provided below may therefore understate the costs associated with long distance waste movements.

2.3 Environmental and social costs of long distance waste movements

Item	Low	High
Distance beyond reasonable transport (kms)	750	750
Amount of waste transported (tonnes/year)	230 000	370 000
Tonne kilometres (000)	173 080	276 928
Environmental and social costs per 1000 tonne kilometre (rural)	$29.01	$29.01
Environmental and social costs excluding accidents ($m/year)	$5.0	$8.0

Source: The CIE.

A further social cost from long distance transport relates to accidents. These costs are borne by both the heavy vehicle and its occupant and other vehicles involved in an

accident. Crashes involving heavy trucks accounted for 20 per cent of NSW road fatalities in 2012.[5]

We estimate accident costs per year would be in the order of $0.8 to $2.4 million per year. The range of estimates depends on the low and high assumptions for the number of tonnes moved and the assumptions for the tonnes carried per truck.

- The low estimate of vehicle kilometres is based on 230 000 tonnes being moved per year with an average load per truck of 40 tonnes. It is assumed that each load travels 750 kilometres further than it would were waste managed locally and that 50 per cent of vehicles return empty.
- The high estimate of vehicle kilometres is based on 370 000 tonnes being moved per year with an average load per truck of 20 tonnes. It is assumed that each load travels 750 kilometres further than it would were waste managed locally and that 50 per cent of vehicles return empty.
- A crash rate of 0.8 heavy vehicle crashes per million kilometres travelled is applied, based on a 2010 NRMA study, with data from 2003. This crash rate is for non-urban areas.[6]
- An average cost of $144 959 is applied based on Transport for NSW Guidelines for Economic Appraisal.

2.4 Accident costs

Item	Low	High
Vehicle kilometres per year	6 490 505	20 769 615
Crashes per million vehicle kms	0.8	0.8
Number of crashes per year	5.2	16.6
Cost per crash	144 959	144 959
Total cost ($m/year)	**0.8**	**2.4**

Source: NRMA 2010, The safety needs of heavy vehicles in Australia, March; Transport for NSW 2013, Principles and Guidelines for Economic Appraisal of Transport Investment and Initiatives, Table 48; The CIE calculations.

Additional resource costs

The additional resource costs, which are privately incurred, from long distance waste movement can be estimated using vehicle operating cost and value of time assumptions. These depend on the type of truck that carries waste, with larger trucks costing less per tonne delivered.

We estimate the additional resource costs for the transport of waste over long distances could range from $12 to $34 million per year based on some assumptions regarding long haul intrastate and interstate transport of waste.

5 NSW Centre for Road Safety 2014, Heavy Truck Fatal Crash Trends and Single Vehicle Heavy Truck Crash Characteristics, January.

6 NRMA 2010, The safety needs of heavy vehicles in Australia, March.

- The low figure is based on anecdotal evidence of long haul transport of waste through New South Wales. It presumes that only 50 per cent of waste known to be delivered to Queensland from interstate was generated in New South Wales metropolitan areas and for this to be transported on a six axle truck carrying an average load of 40 tonnes.
- The high figure is also based on anecdotal evidence of long haul transport of waste through New South Wales. It presumes however that 80 per cent of waste know to be delivered to Queensland from interstate was generated in New South Wales metropolitan areas and for this to be transported using 3 axle trucks carrying an average load of 20 tonnes.
- Both the low and high figures allow for 50 per cent of trucks to return empty and driver time calculated on the basis of average speeds of 70 kilometres per hour.

These estimates are likely to somewhat understate actual resource costs because no allowance has been made for additional capital, such as new trucks, that result from this transport task. Figures provided by industry have suggested costs per tonne in the order of $90 to $110 per tonne delivered[7], compared to $53 to $91 per tonne calculated using standard operating cost assumptions.

2.5 Resource costs from long distance waste transport

Item	Low	High
Vehicle kilometres per year	6 490 505	20 769 615
Vehicle hours per year	92 721	296 709
Vehicle operating cost (cents per kilometre)	137.425	112.08
Driver and freight time cost ($/hour)	$35.15	$35.15
Total cost ($m/year)	$12.2	$33.7
Costs per tonne delivered ($/tonne)	$53	$91

Source: Transport for NSW 2013, Principles and Guidelines for Economic Appraisal of Transport Investment and Initiatives; Table 12 (for regional highways); The CIE.

Total costs of long distance transport

The total costs of long distance waste transportation are estimated to be in the order of $18 to $44 million per year (table 2.6).

2.6 Total costs of long distance waste transportation

Item	Low	High
	$m/year	$m/year
Environmental and social	5.0	8.0
Accidents	0.8	2.4
Resource costs	12.2	33.7
Total	**18.0**	**44.2**

Source: The CIE.

7 Sydney Morning Herald 2013, Queensland: Beautiful one day, NSW's tip the next, April 27.

Options and impacts

The costs of the long distance transport of waste could be mitigated through a number of options.

- Vehicles could be charged to ensure that they are appropriately accounting for their external costs — such a policy option would apply to all vehicles not just waste vehicles.
- Specific restrictions could be placed on the movement of waste. These could include:
  - restricting the management of waste to an area close to where it was generated; or
  - seeking to charge waste that is disposed of at any facility (including facilities interstate) based on where the waste was generated, to avoid incentivising the movement of waste by differential waste levies.

The long distance movement of waste is specifically incentivised by avoidance of the full waste disposal costs in New South Wales (due to the more rigorous regulatory framework regarding waste disposal in this State including the waste levy). This means that any option that seeks to address general externalities would not address the incentives specific to the transport of waste in NSW.

Within waste specific options, the NSW Government does not have direct control over the ability to charge levies in other states and territories. This option has not been considered in any detail.

The option that we therefore assess is an amendment to the waste regulations to allow for waste to be managed locally. The amendment being considered adopts a 'proximity principle' that requires waste to be disposed of within 150 kilometres of where it is generated. The exceptions to this are that movement to one of the nearest two disposal facilities is allowed (even if one or both of those facilities are outside the 150 kilometre radius), or for genuine recycling, or movement not using motor vehicles (such as by train or ship). Restricted solid waste must be taken to the nearest lawful facility.

Benefits of a proximity principle

A proximity principle would lead to the avoidance of all the costs identified from the long distance transportation of waste, where such transportation has been incentivised by avoidance of the full disposal costs for that waste in a particular region. The benefits are therefore in the order of $18 to $44 million per year, based on the resource cost calculations set out above.

An alternative way of considering this is to examine the level of the waste levy at which long distance transport of waste became financially viable. From our understanding, at a levy rate of around $80 to $90 per tonne and with very low disposal costs in some areas outside the regulated area and in neighbouring States and Territories, movement of waste from New South Wales metropolitan areas in distances over 150 km has become financially viable in certain circumstances.

In 2014/15, the waste levy is $120.90 per tonne for the Sydney Metropolitan Area and Extended Regulated Area. Applying the rule of half would suggest an average additional

cost exclusive of the waste levy for waste moved over long distances in the order of $100 per tonne. This is slightly above the resource cost estimates of $53 to $91 per tonne.

The benefits translate into the following distribution of impacts.

- Waste generators who have sought to avoid the full costs of disposal of their waste in New South Wales face higher overall costs. This reflects a reduction in the costs of transportation of waste that is more than offset by the additional levy payments that they make.
- The Government receives a benefit from the additional payment of the levy. This is then a benefit to the NSW community through the services that this is used to pay for or through allowing for less onerous taxation elsewhere.
- There are environmental and social benefits from avoided pollution and accidents (quantified) and potentially congestion (not quantified).

The pattern of benefits is quantified in table 2.7.

2.7 Pattern of benefits and costs

Item	Low	High
	$m/year	$m/year
Higher cost to waste generators	-15.7	-10.9
Additional revenue to Government	27.9	44.6
Environmental and social costs (including reduced accidents)	5.8	10.4
Total benefits	**18.0**	**44.2**

Source: The CIE.

Costs of a proximity principle

The costs of a proximity principle could include costs to Government from enforcement activities and costs where the proximity principle either (a) leads to restricted competition and hence some level of monopoly pricing in waste disposal, or (b) leads to an inefficient placement of landfills or other facilities.

These cost areas are discussed in turn.

Government enforcement costs

The Government enforcement costs for the proximity principle have not been estimated. The regulation would not *require* substantial costs to be incurred. Rather costs would reflect the identification of specific activities that breached the proximity principle and operation/investigation costs associated with this.

Costs from restrictions on competition

A restriction on competition could emerge from the application of the proximity principle because it limits spatial competition. For example, if there were four landfills to which waste could be transported of which only one was within 150 kilometres of where waste was generated, then only 2 of these landfills would be able to compete for receipt of waste.

Any restriction in competition can show up in two ways.

1 Higher prices but no change in where waste is directed — this has small costs associated with monopoly pricing. (This could also lead to suppliers becoming less efficient over time in the absence of competitive pressures.)

2 Diversion of waste to less efficient facilities — this would have larger costs and would occur if an efficient facility were not able to compete because it was outside the 150 kilometre zone and not one of the two closest facilities.

Comprehensive data on the spatial distribution of landfills is not available at present. Information previously collated by the EPA suggests that there are generally many landfills within a 150 kilometre radius circle of any given location. This, along with the allowance of disposing waste at one of the 2 closest facilities to its point of generation (even if one or 2 of those disposal facilities are outside the 150 kilometre radius) will mean that any competition impacts will likekly be small relative to the benefits of the proximity principle.

Inefficient placement of facilities

The regulations may lead to new facilities being set up in less efficient locations than would otherwise be the case. For example, a new facility established outside the Greater Sydney area would have limited access to waste generated in Sydney. This may restrict the use of some sites that are old mine sites, for example.

Any concerns about new landfill sites are not likely to be relevant, at least for Sydney, in the immediate future. The Wright Review noted "there is presently no capacity shortfall for Sydney putrescible waste disposal, and capacity is secure for more than 30 years".[8]

Net benefits of the proximity principle

Although the proximity principle will result in higher costs to waste generators (between $10.9 million and$15.7 million per year), there are likely to be substantial net benefits to the community from the introduction of the proximity principle.

- The benefits are estimated at $18 million to $44 million per year.
- Government enforcement costs cannot be readily quantified. As a conservative estimate, we allow for costs to be $1 million per year.
- Net benefits are then $119 million to $303 million in net present value terms over a 10 year period (table 2.8).

2.8 Net benefits from adopting the proximity principle

Item	Low	High
Net benefits ($m/year)	17	43
Net benefits (npv over 10 years)	119	303

Source: The CIE.

8 Wright Corporate Strategy 2009, *Public review: landfill capacity and demand,* p. 53.

3 Impacts of mechanisms for collecting the levy

The waste levy is the NSW Government's key policy instrument driving waste avoidance and resource recovery. The waste levy is a government charge for waste delivered to a disposal facility. By making waste received at landfills more expensive, the levy provides an economic incentive to reduce waste sent to landfill in NSW. The key objective of the levy is to:

> …drive waste avoidance and resource recovery by providing an economic incentive to reduce waste disposal and stimulate investment and innovation in resource recovery technologies.[9]

Evidence has emerged that some businesses have been avoiding the waste levy through illegal dumping and other unintended means. The NSW Government has therefore proposed that the remade regulation will change the levy collection mechanism to reduce illegal dumping and other unintended consequences of the waste levy. In this chapter, we assess the benefits and costs of the changes in the proposed regulation, compared to the current regulation. It is outside the scope of this study to consider whether the waste levy is set at an appropriate level, or whether there is a need for a waste levy at all.

Current regulatory arrangements

The *Protection of the Environment Operations Act 1997* (the Act) requires occupiers of certain waste facilities to pay a contribution (the waste levy) for each tonne of waste received at that facility. Schedule 1 of the Act lists the 'scheduled waste facilities' that are liable to pay the waste levy to EPA on material received at a facility that is disposed of in landfill.

Currently, the levy is only paid on waste received at landfills, including the residual waste sent to landfill by recyclers. Other scheduled waste facilities such as storage, transfer and treatment (STT) facilities are not currently liable to pay the levy to the EPA due to an exclusion provision under the Act and an exemption clause in the waste regulation:

- Section 88 of the Act excludes waste facilities that the EPA determines are used solely for re-using, recovering, recycling or processing waste.
- Clause 9 of the waste regulation provides an exemption to waste facilities that are used as waste storage, transfer and treatment.

The price, applicable regulated areas and timing of payment of the waste levy is specified in the *Protection of the Environment Operations (Waste) Regulation 2005* (the waste regulation). Specifically, the regulation outlines the following:

- The regulation defines three separate areas for the purposes of the waste levy

9 KPMG, 2012, *Review of the NSW Waste and Environment Levy: Final Report*, Page 7.

  - Sydney Metropolitan Area (SMA) — specified as 38 local government areas within the Sydney metropolitan area[10]
  - Extended Regulated Area (ERA) — comprises the local government areas of Cessnock, Gosford, Hawkesbury, Kiama, Lake Macquarie, Maitland, Newcastle, Port Stephens, Shellharbour, Shoalhaven, Wingecarribee, Wollongong and Wyong.
  - Regional Regulation Area (RRA) — comprises the local government areas of Ballina, Bellingen, Blue Mountains City, Byron, Clarence Valley, Coffs Harbour City, Dungog, Gloucester, Great Lakes, Greater Taree City, Kempsey, Kyogle, Lismore City, Muswellbrook, Nambucca, Port Macquarie-Hastings, Richmond Valley, Singleton, Tweed, Upper Hunter Shire and Wollondilly.
- The value of the levy that applies in each area:
  - In the SMA, the rate specified in the 2005 waste regulation was $30.40 per tonne and has subsequently increased to $120.90 per tonne
  - In the ERA, the rate specified in the 2005 waste regulation was $23.10 per tonne and has subsequently increase to $120.90 per tonne to match the rate in the SMA
  - In the RRA, the rate specified in the 2005 waste regulation was $10.00 per tonne and has subsequently increased to $65.40 per tonne.[11]
- Clause 4A specifies that contributions by occupiers, in respect of waste other than trackable liquid waste, are to be paid within a period of 56 days after the end of each month.[12]

In 2011-12, approximately 5.6 million tonnes of waste was disposed in landfills within regulated areas, and 1.17 million tonnes of waste was disposed in landfills within regional NSW. The waste levy revenue equivalent to the total waste disposed to landfill in 2011-12 was $411 million.[13]

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10 Local government areas include Ashfield, Auburn, Bankstown, Baulkham Hills, Blacktown, Botany, Burwood, Camden, Campbelltown, Canada Bay, Canterbury, Fairfield, Holroyd, Hornsby, Hunters Hill, Hurstville, Kogarah, Ku-ring-gai, Lane Cove, Leichhardt, Liverpool, Manly, Marrickville, Mosman, North Sydney, Parramatta, Penrith, Pittwater, Randwick, Rockdale, Ryde, Strathfield, Sutherland, Sydney, Warringah, Waverley, Willoughby and Woollahra.

11 NSW EPA, *Waste and environment levy*, http://www.epa.nsw.gov.au/wr/index.htm

12 NSW Government, *Protection of the Environment Operations (Waste) Regulation 2005*. Current version as at September 2014.

13 The waste levy rate in 2011-12 was $82.20 for the SMA, $78.60 per tonne in the ERA and $31.10 per tonne for regional areas..

Unintended impacts of the current arrangements

Avenues for movement of waste originating from storage, transfer and treatment facilities

Storage, transfer and treatment (STT) facilities receive waste from 'waste generators' — from the domestic, building and construction, and commercial and industrial sectors. At the first point of the waste management supply chain, 'waste generators' will choose to manage this waste by either (chart 3.1):

- sending it directly for lawful landfill disposal
- sending it to a storage, transfer or treatment facility
- illegally dumping the waste.

For waste received at a STT facility, there are six possible avenues for the next movement of waste, two of which are intended and four which are unintended.

- Intended avenues include:
  - landfill disposal with payment of waste levy
  - recycling and sorting of waste for lawful re-use elsewhere
- Unintended avenues include:
  - stockpiling on sites not lawfully allowed to store waste, or stockpiling on sites that are subsequently abandoned
  - sending waste to a landfill site under an illegal arrangement with no payment of the waste levy
  - illegal dumping of waste
  - transporting waste an unnecessarily long distance for disposal.

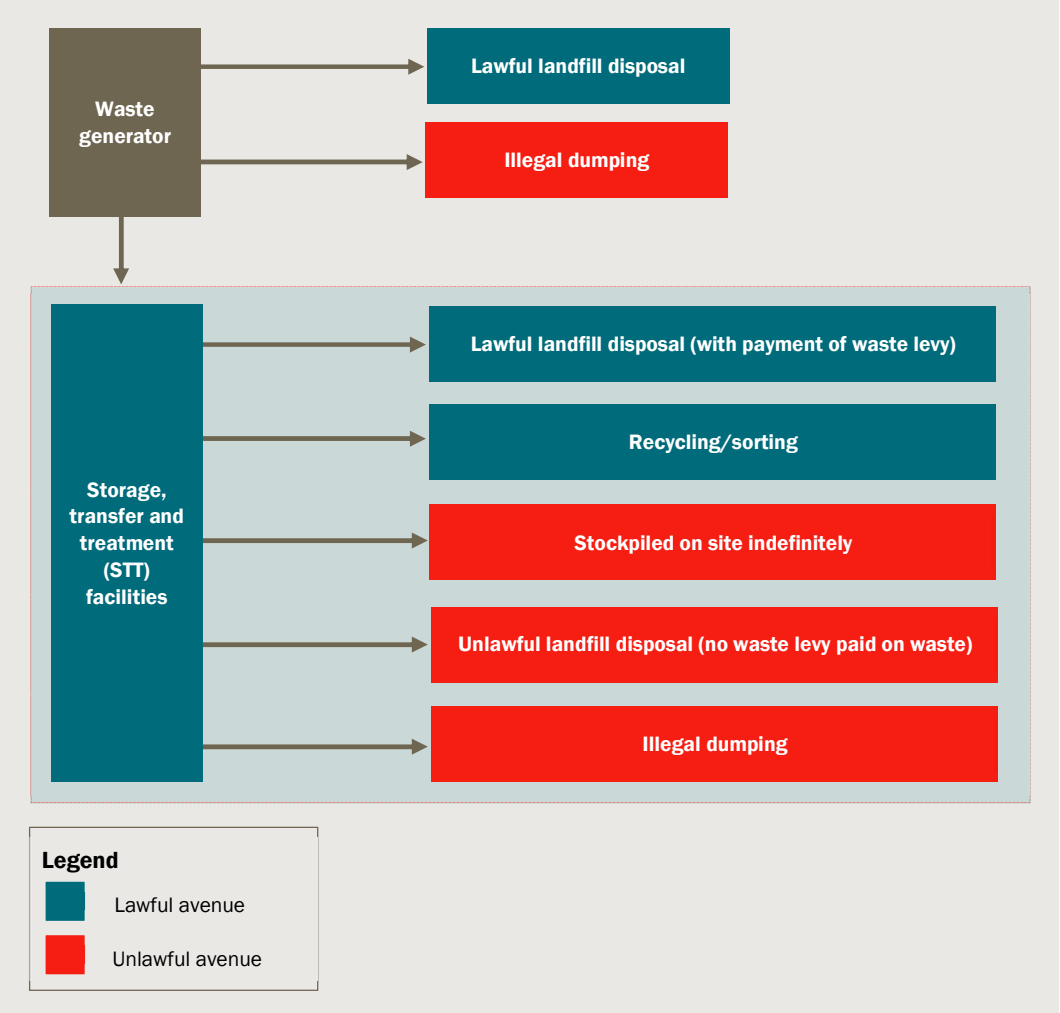
Storage, transfer and treatment facilities each play a different role in the waste management supply chain. Storage and transfer facilities play an intermediary role, receiving and distributing different waste streams. Treatment facilities differ slightly in that waste material received on site is processed or treated to varying degrees.

These types of facilities will face different incentives regarding the management of waste received at their sites. It is important to understand these incentives and how they differ for recyclable and non-recyclable/treatable waste materials.

Non-recyclable and non-treatable waste

Under the current waste regulation, the waste levy may partially increase the financial incentives for all three types of facilities (storage, transfer and treatment) to illegally dump, illegally landfill or stockpile non-recyclable/non-treatable waste. Whether or not this occurs will reflect industry's risk preferences and the risk of penalties.

3.1 Possible avenues for movement of waste under current system



Source: The CIE.

Recyclable and treatable waste

Treatment facilities are unlikely to illegally dump, illegally landfill or stockpile recyclable materials that can be processed to provide a positive financial return such as glass, plastics, paper and metals. However there may be a financial incentive to illegally handle or transport waste materials outside the regulated area that are relatively expensive to recycle and also the residual waste component.

How big is the problem of illegal handling of waste?

Waste regulators have consistently had to deal with illegal handling of waste such as illegal dumping or illegal landfilling. Illegal handling of waste can result in social and economic impacts to the community and lost revenue to the state government:

- social impacts — health and environmental impacts from illegally dumping materials (such as asbestos) and dis-amenity impacts to the local community

- economic impacts — often the community bears the cost of clean-up and lawful disposal for example, in 2004, NSW local governments estimated expenditure of $10 million a year removing and properly disposing of illegally dumped materials.[14]

As noted in the RIS for the *Protection of the Environment Operations (Waste) Regulation 2005:*

> The waste industry attracts illegal operators who work alongside a mostly compliant sector. There is substantial money to be made by operating outside the law and the levy may be one of the factors influencing decisions to dispose of waste illegally.[15]

The RIS also reported levy avoidance of between $1.4 million and $1.9 million per year during each of the three years of 2001-02 and 2003-04.

The Government estimates that each year $100 million is lost to the New South Wales Government from incidents causing significant and long-lasting environmental harm, associated clean-up costs and unpaid waste levies.[16] Estimates of the clean–up costs of illegal dumping to local councils provide an indication of the extent of illegal dumping:

- Parramatta City Council — annual cost of $800 000 to collect and dispose of illegally dumped waste[17]
- Marrickville Council — approximately $1 million spent every year to clean up illegal dumped waste[18]
- City of Canada Bay — annual cost of $135 000 to clean up illegally dumped waste.[19]

There is no conclusive information on the total amount and type of waste that is illegally dumped. A recent investigation found building and demolition (B&D) waste, soils (some potentially contaminated), asbestos waste and general household skip bin waste stockpiled or buried at facilities that were not lawfully able to receive such waste. The EPA also recently conducted investigations into illegal handling of waste by storage, transfer and treatment facilities (box 3.2).

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14 NSW EPA, *Crackdown on illegal dumping: Handbook for Local Government.* pg 8. http://www.epa.nsw.gov.au/resources/warr/200845Section1.pdf Sourced from an unpublished report commissioned by DEC in 2004 titled *Illegal Dumping in NSW.*

15 NSW Department of Environment and Conservation, 2005, *Protection of the Environment Operations (Waste) regulation 2005: Regulatory Impact Statement*. Page 37.

16 Legislative Assembly, 2013, *Protection of the Environment Operations Amendment (Illegal Waste Disposal) Bill 2013.* Second Reading., 30 May 2013.

17 Parramatta City Council, *Draft illegal dumping strategy,* http://www.parracity.nsw.gov.au/__data/assets/pdf_file/0008/69866/draft_illegal_dumping_strategy.pdf

18 Marrickville Council, *Illegal dumping,* http://www.marrickville.nsw.gov.au/services/waste/illegal_dumping.html?s=0

19 City of Canada Bay, *Illegal dumping : what a waste,* http://council.cleanaway.com.au/canadabay/illegal-dumping.aspx

3.2 EPA's investigation into illegal handling of waste

Environment Protection Authority investigations in 2013 uncovered organised illegal dumping and waste levy fraud at waste storage, transfer and treatment (STT) facilities. Illegal waste activities included:

- waste leaving STT facilities is illegally dumped on private property, in State forests and national parks
- on-site stockpiling of large volumes of waste at recycling yards that is never processed, and in some cases left stranded if the waste operator vacates the site
- waste levy evasion schemes through illegal arrangements between landfill and STT facilities, with one case amounting to approximately $18 million in unpaid waste levies.

Additional case studies of illegal dumping in NSW include:

- Case 1 — found from September 2007 to July 2008, 44 728 tonnes (including asbestos) was disposed at an unlicensed facility, and from September 2007 to October 2008, approximately 2 000 tonnes of crushed concrete (including asbestos) was disposed of at an unlicensed facility.
- Case 2 — found that from July 1999 to July 2008, 23 500 cubic metres of waste was disposed of at an unlicensed facility.
- Case 3 — over 16 months, 60 000 cubic metres of waste was disposed of at an unlicensed facility.
- Case 4 — between December 2009 and November 2010, a facility accepted thousands of tonnes of excavated material, building and demolition material and other types of waste above licence thresholds.

The recent fire at an intermediary waste and recycling facility in Chester Hil shows the potential costs associated with illegally stockpiled waste (see box 3.3). While this type of incident occurs relatively infrequently, the costs on the Government and the community more broadly can be significant.

3.3 The Chester Hill waste fire

In early 2014, a fire in illegally stockpiled waste at an intermediary waste and recycling facility in Chester Hill burned for nearly two months.

The EPA removed around 25 000 tonnes of building and demolition waste and 1.4 million litres of runoff water (from fighting the fire) from the site. The clean-up is estimated to have cost around $2.1 million and was funded by the NSW Environmental Trust. The site owner had previously gone into liquidation and the EPA had a bond of $100 000 to cover the clean-up costs.

In addition to the clean-up costs, the fire adversely affected residents in the local area. In addition to the disamenity, the smoke is likely to have contained various irritant gases resulting in a range of health issues; there were reports of vomiting, asthma, difficulty breathing and migraines from residents in the area.[20]

Information on the total volume of waste that is illegally dumped is limited. Estimates of illegal dumping clean-up costs per person vary across jurisdictions, ranging from $0.98 in South Australia, to $1.39 in New South Wales and $1.75 in Victoria. A cost benefit analysis undertaken for the South Australian waste strategy estimated the cost[21] of illegally dumped waste at $300 per tonne (in 2010 dollars).[22]

Applying the NSW cost per person estimate to the NSW population of approximately 7.3 million at June 2012, the estimated resource cost of illegal dumping across NSW is approximately $10.90 million per year.[23] A rough estimate of the volume of illegally dumped waste in NSW can be estimated by applying the cost of illegally dumped waste of $300 per tonne estimated in the South Australia CBA study[24] (equivalent to $323 in 2013 dollars). Using these estimates, implies that approximately 33 800 tonnes of waste is illegally dumped in NSW per year. This represents approximately 0.18 per cent of the total waste stream generated in NSW.

Recent investigations by the EPA into waste levy fraud by storage, transfer and treatment facilities also uncovered waste levy evasion schemes and illegal arrangements between landfill sites and STT facilities, with one case amounting to $18 million in unpaid waste levies.

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20 O'Brien, N., "Chester Hill fire costs $2 million to clean up", *Sydney Morning Herald*, 3 August 2014.

21 It is not clear from the cost benefit analysis whether this is a financial or economic cost estimate. For our purposes we use this estimate as proxy for the economic cost of illegal dumping.

22 QLD Department of Environment and Resource Management, 2010, *Regulatory Assessment Statement and Cost Benefit Analysis for a waste disposal levy proposal*. Pg. 18.

23 Cost of illegal dumping per person in NSW indexed from 2010 dollars to 2013 dollars using CPI.

24 Hyder, 2013, *Descriptions of waste technologies – C&D recycling facilities: WA Waste Authority – Strategic Waste Infrastructure Planning.*

Options to address unintended impacts

In this cost benefit analysis we consider two options to address the unintended impacts of the waste levy under the current regulatory framework.

- The first option has been proposed by the EPA with amendments to the Act and the waste regulation.
- The second option, suggested as an alternative option by industry, requires licencing of all waste transporters and keeping of records of waste transported. The two options are discussed below.

Amendments to the waste levy framework

There are two key elements of the proposed amendments to the waste levy framework:

- Changes to the waste levy collection arrangements — this change moves the collection point further up the supply chain to storage, transfer and treatment facilities to remove the incentive for illegal dumping and on-site stockpiling and create a level playing field for all stakeholders.
- Lowering of the licence threshold — this change brings more facilities that undertake resource recovery from general waste, waste processing (non-thermal treatment of general waste) and waste storage under the regulatory arrangements to deter avoidance of the proper disposal costs of waste and provide a level paying field for all facilities.

Changes to waste levy collection arrangements

Part 2 of the proposed regulation relates primarily to the waste levy framework and Part 3 relates to record keeping, measurement and monitoring at scheduled waste facilities. The associated *Protection of the Environment Operations (Waste) Amendment (Contributions) Regulation 2014* contains amendments required to give effect to the proposed new levy system.

Key changes to the waste regulation and the Act relating to these Parts are detailed below and include amendments to the waste levy framework and lowering of licensing thresholds for scheduled waste facilities.

Changes to the waste levy framework include the following:

- The *Protection of the Environment Operations Amendment (Illegal Waste Disposal) Act 2013* was passed by the Parliament in September 2013. The amendment to the Act included more stringent penalties for illegal dumping and removal of the 'exclusion provision' under the Act for facilities that EPA determines are used solely for the purposes of re-using, recovering, recycling or processing waste other than liquid waste.
- The *Protection of the Environment Operation (Waste) Regulation 2005* is due to be revoked and remade in October 2014 under the NSW Government's staged repeal program. A key change to the remade waste regulation regarding waste levy contributions is the removal of the 'exemption provision' for premises used as a waste storage facility, transfer facility or waste treatment facility and lowering of thresholds for scheduled waste facilities.

The removal of the 'exclusion provision' under the Act and the 'exemption clause' in the waste regulation mean that all scheduled waste facilities (above certain threshold limits as specified in Schedule 1 of the Act) will incur levy liability on all waste received on-site.

The changes to the Act and the remade waste regulation move the collection point for the waste levy further up the supply chain to storage, transfer and treatment facilities to remove the incentive for illegal dumping and on-site stockpiling and create a level playing field for all stakeholders. Under these changes to the waste levy framework, STT facilities will incur a waste levy liability on all waste (and other materials) entering the facility.

However, during consultation, the EPA proposed that payment of the waste levy will only be triggered when:

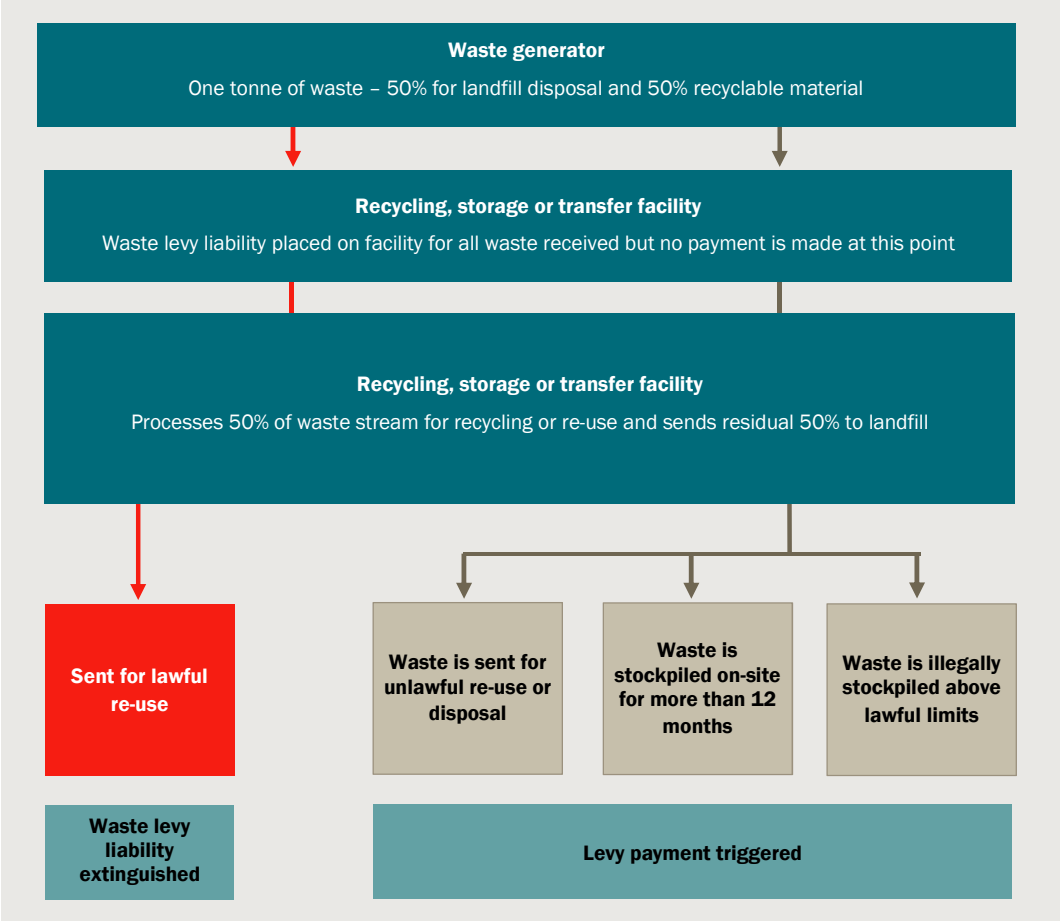
- waste is sent for disposal
- waste is stockpiled on-site for more than 12 months[25]
- waste is stockpiled on-site above lawful capacity limits.

During consultation, it was proposed that the waste levy liability would be extinguished for all waste that is transported off-site for lawful re-use or further processing (chart 3.4).

However, as a result of the consultation process, the EPA decided to remove the 'credit system' (as explained in our previous report) to simplify administration of the new levy system. The result of this is that the payment of the waste levy for waste sent offsite will now only be triggered if the waste is sent for **unlawful** disposal or re-use (rather than for any disposal). This proposed change simplifies the system, but maintains a strong deterrent for unlawful behaviour through recyclers and storage facilities.

25 The 12 month trigger for the waste levy liability will not apply for waste received that has been processed to meet the requirements of a resource recovery exemption for use (for example application to land).

3.4 Proposed framework to administer proposed changes to waste levy framework



Data source: The CIE.

Some intermediary licensed facilities will also be excluded from the requirement to pay the waste levy. This includes the following.

- Premises required to be licensed for metallurgical activities (under clause 26 of Schedule 1 of the POEO Act)
- premises required to be licensed for container reconditioning (under clause 14 of Schedule 1 of the POEO Act), composting (under clause 12 of Schedule 1 of the POEO Act), ceramic works (under clause 7 of Schedule 1 of the POEO Act) and contaminated soil treatment (clause 15 of Schedule 1 of the POEO Act) and carry out no other scheduled waste activities (other than associated storage).
- Premises required to be licensed only to receive hazardous waste, liquid waste, restricted solid waste, clinical and related waste, or any combination of them.

The objective of the proposed amendments is to reduce avenues for illegal handling of waste received at STT facilities. The upfront waste levy liability is aimed at removing the incentive to avoid paying the levy through unintended waste management avenues of illegal dumping, illegal landfilling and on-site stockpiling (chart 3.1). The proposed changes do not increase the total value of the waste levy paid by lawful facilities.

It is important to note that unlawful waste management avenues undertaken by 'waste generators' are not directly targeted through these proposed changes to the Act and the

waste regulation. However, the increased penalties (including monetary fines and possible imprisonment) for illegal waste activity in the *Protection of the Environment Operations Amendment (Illegal Waste Disposal) Act 2013* may deter illegal dumping by 'waste generators' and 'waste transporters'.

Lowering of licensing thresholds

Schedule 1 of the POEO Act sets out scheduled facilities or activities which are required to hold an environmental protection licence. Certain facilities are exempt from this requirement if their operations remain below licensing thresholds as specified in Schedule 1. The EPA is proposing to lower licensing thresholds for waste facilities that undertake resource recovery from general waste, waste processing (non-thermal treatment of general waste) and waste storage (table 3.5). The objectives of lowering of licence thresholds is to reduce the risk of harm to the environment through EPA licensing and oversight of these smaller waste facilities, deter avoidance of the proper disposal costs of waste and provide a level paying field for all facilities.

3.5 Proposed lowering of licence thresholds

Type of waste facility	Current licensing threshold	Proposed licensing threshold
Resource recovery from general waste	▪ Having on site at any time more than whichever is lesser of 2 500 tonnes or 2 500 cubic metres of waste, or ▪ processing more than 120 tonnes of waste per day or 30 000 tonnes of waste per year.	▪ In the regulated area: – having on site at any time more than whichever is lesser of 1 000 tonnes or 1 000 cubic metres of waste; or – processing more than 6 000 tonnes of waste per year ▪ In the non-regulated area: – having more than whichever is lesser of 2 500 tonnes or 2 500 cubic metres of waste; or – processing more than 12 000tonnes of waste per year
Waste processing (non-thermal treatment of general waste)	▪ Having on site at any time more than whichever is lesser of 2 500 tonnes or 2 500 cubic metres of waste, or ▪ processing more than 120 tonnes of waste per day or 30 000 tonnes of waste per year.	▪ In the regulated area: – having on site at any time more than whichever is lesser of 1 000 tonnes or 1 000 cubic metres of waste; or – processing more than 6 000 tonnes of waste per year ▪ In the non-regulated area: – having more than whichever is lesser of 2 500 tonnes or 2 500 cubic metres of waste; or – processing more than 12 000tonnes of waste per year

Type of waste facility	Current licensing threshold	Proposed licensing threshold
Waste storage	▪ Having on site at any time more than whichever is lesser of 2 500 tonnes or 2 500 cubic metres of waste, or ▪ more than 30 000 tonnes of waste is received per year from off site.	▪ In the regulated area: – having on site at any time more than whichever is lesser of 1 000 tonnes or 1 000 cubic metres of waste; or – more than 6 000 tonnes of waste is received per year from off site. ▪ In the non-regulated area: – having more than whichever is lesser of 2 500 tonnes or 2 500 cubic metres of waste; or – more than 12 000 tonnes of waste is received per year from off site.
Storage and/or processing of waste tyres	▪ 50 tonnes or 5000 tyres.	▪ 5 tonnes or 500 tyres.

Source: NSW Government, *Protection of the Environment Operations Act 1997*.as at September 2014 and NSW EPA.

Waste facilities that will be required to hold an environment protection licence due to the proposed changes to the licensing thresholds must also meet the regulatory requirements for a scheduled waste facility, including the proposed change placing a waste levy liability on STT facilities for all waste received.

Licensing of waste transporters

An alternative option to reduce avenues for illegal handling of waste, is to licence all waste transporters with requirements for record keeping and reporting of the origin and destination of all waste transported, the type of waste, the date and the vehicle registration number. This option was raised during discussions with industry.

Impact of the proposed option

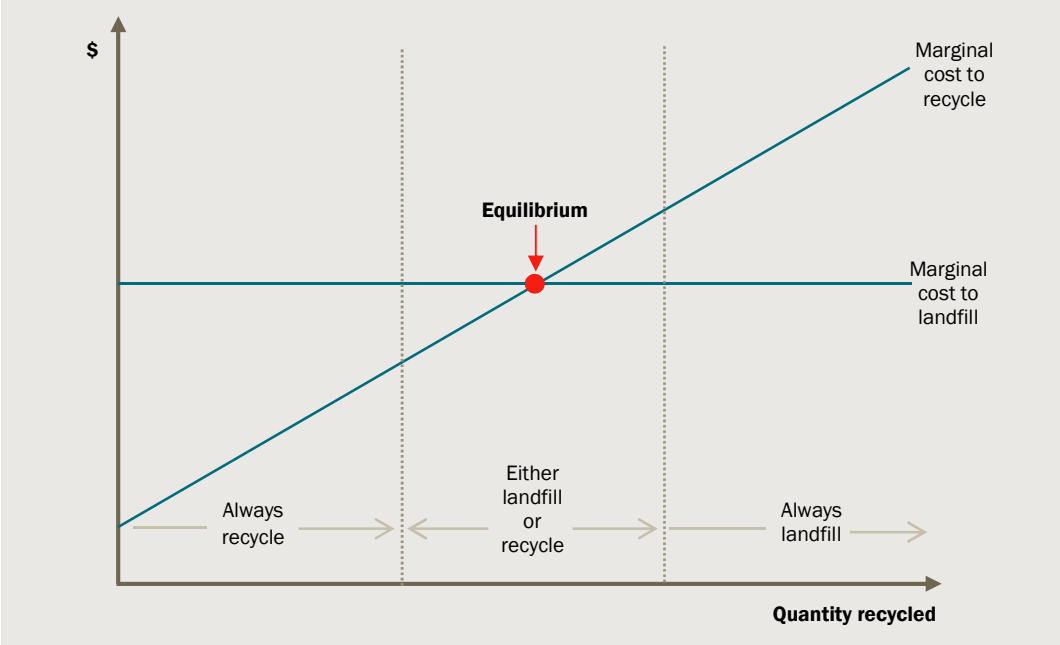
How will waste flows change under the proposed amendments?

In the absence of full details on the type of waste that is illegally dumped and stockpiled, it is difficult to ascertain whether under the proposed amendments, waste that was previously illegally handled will instead be recycled or landfilled. We can analyse the economics driving waste management decisions using a simplified demand and supply model for recycling (chart 3.6).

- Close to the **equilibrium** a facility receiving waste is indifferent between recycling and landfill as the costs are relatively equal.
- On the **left side** of the equilibrium point the cost of landfill exceeds the marginal cost of recycling, and represents materials such as paper, plastics and aluminium. For such materials facilities have a financial incentive to recycle.
- On the **right side** of the equilibrium, the marginal cost of recycling exceeds the cost of landfill, representing materials which are expensive to recycle such as tyres and mixed waste and which facilities will send for landfill disposal.

As the waste levy increases, the set of materials viable for recycling increases. We anticipate that only a limited quantity of waste materials that are cheap to recycle (i.e. far left of the equilibrium) are currently illegally handled (illegal dumping and on-site stockpiling). Instead it is most likely that these actions are carried out for waste materials that are too expensive or are marginal to recycle and that require landfill disposal. Therefore we estimate that the majority (approximately 80 per cent) of the waste stream recovered from illegal dumping, or stockpiled on-site will end up in landfill disposal.

3.6 Economic decision to recycle or landfill



Data source: The CIE.

How will resource costs of handling waste change?

The resource cost of handling waste is the cost of inputs such as labour and capital — it excludes transfer payments such as taxes and subsidies. From society's perspective the optimal waste strategy minimises the resource cost of managing the waste stream.

Given the resource cost of waste management excludes the transfer payments such as taxes and subsidies, the ranking of waste management actions in terms of resource cost may differ from the ranking of actions in terms of the total cost (including the waste levy) faced by industry. For example, the cost of illegal dumping to a waste handler is, in some cases, less than the cost of landfill disposal in NSW, however the resource cost of illegal dumping (including the environmental and social costs to society) is greater than the resource cost of legal landfill disposal.

Table 3.7 details the difference in the resource cost of illegal and unintended waste management avenues relative to two legal avenues of landfill disposal and recycling. With approximately 80 per cent of the waste stream diverted from unintended avenues to landfill disposal, the remaining 20 per cent is expected to be diverted to recycling.

3.7 Resource cost of illegal/unintended avenues relative to legal avenues

Current options	Landfill	Recycling
Illegal dumping	**Resource cost greater than legal landfill** The resource costs of illegal dumping (including environmental and social costs) are assumed greater than the costs of legal landfill.	**Resource cost greater than recycling** The resource costs of illegal dumping (including the environmental and social costs) are assumed greater than the costs of recycling.
On-site stockpiling	**Resource cost greater than legal landfill** The resource cost of on-site stockpiling of waste (including environment and social costs) is assumed greater than the costs of legal landfill due to the economies of scale at landfill sites.	**Resource cost is the same as recycling** It is expected that materials that are currently stockpiled are mixed waste materials and relatively expensive to recycle and hence the resource cost to recycle this waste is expected to be similar to the resource cost of on-site stockpiling.
Illegal landfill arrangements (with no levy)	**Resource cost is the same as legal landfill** The resource cost of landfill disposal without waste levy payment is the same as landfill disposal with the waste levy payment because payment of the waste levy is a transfer payment from industry to government.	**Resource cost likely to be less than recycling** It is expected that recyclable waste that is currently sent to landfill under illegal arrangements is relatively more expensive to recycle (e.g. mixed waste) and as such the resource cost of these illegal landfill arrangements is likely to be less than recycling.

Source: The CIE.

Costs of the proposed option

The proposed change to the Act and the waste regulation will impose costs on industry and the government. The two main elements of the proposed changes to the regulations — the changes to the waste levy collection arrangements and the lowering of the licensing threshold — are separate decisions. We therefore consider the costs associated with each of these decisions incrementally.

Cost to industry

The proposed changes to the regulation will require occupiers of scheduled waste facilities[26] to keep records on the amount and type of waste delivered, the date of the delivery and the registration of the vehicle marking the delivery. Other regulatory requirements include volumetric surveys and installation and operation of weighbridges.

The proposed change to the regulation are estimated to impose a levy liability on an 130 facilities across NSW. This includes:

- 85 intermediary facilities that are already licensed (existing intermediary licensees)
- 45 intermediary facilities that are not currently licensed but will be under the reduced thresholds (new intermediary licensees).

The estimated number of existing intermediary licensees is lower than previously estimated because some existing intermediary licensees that were included in the initial estimate are both landfills and resource recovery facilities. EPA considers it likely that

26 A scheduled waste facility means a facility that is required to be licenced under the Act. Schedule 1 of the *Protection of the Environment Operations Act 1997* (the Act) lists the scheduled activities that require a licence and include facilities involved in energy recovery from waste, resource recovery, waste disposal (application to land, thermal treatment or non-thermal treatment) and waste storage.

these facilities will not obtain new levy liability as licences may merge and/or there will be limited additional infrastructure requirements at those facilities. Further, as a result of consultation, all facilities that are licensed for metallurgical activities will be exempted from the requirement to pay the levy (whereas in the consultation draft, scrap metal processors were subject to the levy).

The proposed changes to the regulation placing a waste levy liability on facilities as material is received on site will impose costs on industry including:

- capital cost to install and operate a weighbridge at facilities that don't currently have weighbridges in place
- administration costs due to extra record keeping and reporting requirements
- potential cost to facilities if requested by the EPA to install a video monitoring system
- licence-related costs for new intermediary licensees.

It is expected that a high proportion of scheduled waste facilities will already comply, to some degree, with the additional requirements for weighbridges and record keeping as part of good business practice. Hence for the majority of facilities the proposed change is expected to impose minimal capital and administration cost.

Weighbridge-related costs

Costs to industry will differ by the type of operation, type of waste and scale of operation. For example, many large facilities already have weighbridges installed and software for data collection and record keeping.

The cost to install a weighbridge will vary by its capacity, size (single versus double deck) and material used to construct weighbridge. In addition to the capital cost for the weighbridge itself, additional costs to install a weighbridge include (but are not limited to) soil sample testing, planning approval, approach ramps, civil infrastructure (electricity and communications), piering for unstable ground material, bridge platform, stumping and traffic flow management. These cost components will vary by facility. Two estimates of the cost to install a weighbridge are:

- between $50 000 and $80 000 (or between $62 000 and $100 000 in 2013 dollars) to install (with mid-point at $81 000 in 2013 dollars) from the 2005 RIS[27]
- an industry estimate suggesting it could cost up to $150 000 to install a double weighbridge.

We take the midpoint between the two estimates ($81 000 and $150 000) to estimate the capital cost to install a weighbridge at approximately $115 500 per weighbridge. This estimate is broadly consistent with the costs provided by a weighbridge supplier. In addition, the cost of installing new weighbridge software is estimated at around $6000. Some facilities that already have a weighbridge may also be required to upgrade their software. We assume a software upgrade would cost around $3000 — half of the cost of installing new software. In some instances, there may also be additional costs for

27 NSW Department of Environment and Conservation, 2005, *Protection of the Environment Operations (Waste) regulation 2005: Regulatory Impact Statement*.

electricity connections and shelter for weighbridges (although EPA will retain an exemption power in exceptional circumstances).

The EPA estimates that around 37 of the intermediary facilities that will become liable for the waste levy under the proposed regulations do not currently have a weighbridge. This includes:

- 20 of the existing intermediary licensees (i.e. facilities that are currently licensed but do not currently incur a waste levy liability)
- 17 of the new intermediary licensees (i.e. facilities that will become liable for the waste levy due to the lowering of the licensing threshold).

These facilities will be required to install a weighbridge and the associated software. We assume that around half of the 93 additional intermediary facilities that already have a weighbridge will be required to upgrade their software.

The upfront costs associated with installing weighbridges and the associated software is estimated at around $4.6 million across NSW (table 3.8). This includes:

- an incremental cost of around $2.5 million for existing licensed facilities attributable to the changes to the waste levy collection arrangements (excluding changes to the licensing threshold); and
- an incremental cost of around $2.1 million for newly licensed facilities attributable the lowering of the licensing threshold.

The NSW Government is proposing to fund 50 per cent of this cost to industry up to a maximum of $75 000 per facility for both industry and council scheduled intermediary waste facilities that do not have a weighbridge currently installed and successfully apply for grant funding.[28] Assuming this proposal goes ahead, the up-front capital cost to industry for installation of weighbridges and related software would be $2.3 million, but could potentially be more if the Government does not provide grants to all applicants.

3.8 Additional upfront weightbridge-related costs

	Number of facilities	Capital cost	Software cost	Total cost
	No.	$'000	$'000	$'000
Change to waste levy collection arrangements				
Existing intermediary licensees requiring weighbridge	20	2 310	120	2 430
Existing intermediary licensees requiring software only	33	0	98	98
Total		***2 310***	***218***	***2 528***
Change to licensing threshold				
New intermediary licensees requiring weighbridge	17	1 964	102	2 066
New intermediary licensees requiring software only	14	0	42	42
Total		***1 964***	***144***	***2 108***
Grand total		**4 274**	**362**	**4 635**

Source: EPA, CIE estimates.

28 Information provided by NSW EPA.

In addition, there is also the ongoing staff costs associated with operating the weighbridge. These costs may be partly offset by some cost savings associated with automating manual data collection. Discussions with industry stakeholders suggest that the net additional cost associated with operating a weighbridge would be around $39 000 per year for each facility. This is based on:

- 0.6 additional FTEs required to operate the weighbridge
- an estimated cost per FTE of around $65 000 per year (including on-costs).

Across all additional facilities requiring a weighbridge, the proposed regulations impose:

- a cost of $780 000 per year (or $5.48 million in present value terms over ten years) attributable to changes in the waste levy collection arrangements; and
- a cost of $663 000 per year (or $4.61 million in present value terms over ten years) attributable to the proposed change to the licensing threshold (see table 3.9).

3.9 Ongoing staff costs for weighbridge operation

	Facilities	Annual cost per facility[a]	Total annual costs
	No.	$	$'000
Change to waste levy collection arrangements	20	39 000	780
Change to licensing threshold	17	39 000	663
Total	**37**		**1 443**

[a] Based on 0.6 FTEs at an annual cost of $65 000 per FTE (including on-costs).

Source: EPA, CIE estimates.

Administration cost to industry

Clause 13 of the current regulation requires levy paying facilities to submit a monthly report to the EPA detailing the quantity and type of waste received during the month, and clause 12 requires facilities to record certain details relating to each delivery to or transport from a facility. This requirement will extend to all scheduled facilities captured by the extension of the waste levy system.

It is expected that the majority of facilities will already be undertaking record-keeping and reporting as part of their normal business operations in order to determine gate fees and ensure that only the wastes licenced to be received are disposed of at the facility.

The software attached to modern weighbridges automatically collects information such as date of delivery, quantity and vehicle registration number.[29] A supplier of weighbridges states that weighbridge software is developed to collect the information necessary for facilities to meet government and legislation compliance requirements.[30]

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29 For example, Avery Weigh-Tronix supplies weighbridges with 'automatic number plate recognition' (ANPR) technology which improves the speed, ease and accuracy of weighbridge data collection. http://www.earthmover.com.au/new-equipment/2007/october/avery-introduces-weighbridge-number-plate-recognition

30 Mandalay http://www.mandalaytechnologies.com.au/weighbridge-software.html

Given the capabilities of this software to automatically collect the necessary information for compliance we assume that the proposed changes to the regulation will impose minimal cost for the facilities that have weighbridges installed. It is assumed that all STT facilities (with existing weighbridges or once a weighbridge is installed) will spend two days per year collating and submitting monthly reports to the EPA.

Assuming a 7.5 hour day at a cost of around $34.70 per hour (based on ABS estimates of the average hourly cash earnings for all occupations)[31], plus 30 per cent on-costs, the administration cost are estimated at around $677 per additional facility.

In addition to the 130 additional facilities that will incur a waste levy liability under the proposed regulations, certain licensed waste facilitities that will be exempt from the waste levy will also be affected by the proposed changes. For example, composters and drum reconditioners will be required to undertake record keeping similar to the current requirement for levy paying STTs. There are approximately 27 of these facilities.

The total cost of the additional administrative requirements are estimated at around $106 234 per year (or $0.75 million in present value terms over ten years using a discount rate of 7 per cent) (table 3.10). Of this:

- $75 785 per year (or $0.53 million in present value terms over ten years, using a discount rate of 7 per cent) can be attributed to the change in the waste levy collection arrangements
- $30 449 per year (or $0.21 million in present value terms over ten years, using a discount rate of 7 per cent) can be attributed to the change in the licensing threshold

3.10 Additional administration costs

	Facilities affected	Cost per facility	Cost
	No.	$ per facility	$
Costs attributable to the change in waste levy collection			
Existing intermediary licensees	85	677	57 515
Exempt facilities	27	677	18 270
Total			**75 785**
Cost attributable to changes in the licensing threshold			
New intermediary licensees	45	677	30 449
Total administration costs			**106 234**

Source: EPA, CIE estimates.

Installation of video monitoring at scheduled waste facilities

Part 3 of the proposed regulation specifies that the EPA may, by notice in writing, require the occupier of a scheduled waste facility to install an approved video monitoring system in the manner and location specified in the notice and to operate the system

31 ABS, 2013, *Employee earnings and hours, Australia, May 2012: Table 2 Full-time non-managerial adult employees.* Cat number: 63060DO003_201205. Released January 2013.

during the times specified in the notice at all times. Whether or not the EPA exercises its power under the regulation will depend on whether facilities raise concern regarding legitimate practices on-site. To date, the EPA has not required any scheduled waste facilities to install video monitoring.[32]

Some waste facilities already have video monitoring systems installed on-site. However the EPA notes that these existing systems and the information collected may not meet its regulatory requirements for compliance and enforcement. It is likely that the EPA would develop its own surveillance network (possibly an IP video surveillance system) and link all data from remote waste facilities into a centralised remote unit enabling viewing and recording by the EPA. Such a system would involve costs for both industry (installation and operation of on-site cameras) and for the EPA (video management software and IT equipment to enable viewing and recording). The cost to the EPA would be a fixed cost and dependent on how many links to remote sites (waste facilities) would be required.

This Clause is similar to Clause 16 of Part 2 of the current regulation, under which the EPA can require any levy paying facility to install a video monitoring system. Effectively, the current clause applies to levy paying landfills and incinerators in the regulated area. The key difference is that now *all* scheduled waste facilities could face a request from the EPA to install video monitoring facilities, including:

- STT scheduled waste facilities no longer exempt from a waste levy liability
- previously unscheduled STT facilities that will become scheduled waste facilities due to the proposed changes to the licensing thresholds; and
- any other scheduled waste facilities not paying the levy (including licensed facilities in the non regulated area and facilities exempted from paying the levy).

Hence, under the proposed changes to the regulation, a *minimum* of 395 additional scheduled waste facilities could be requested at any time to install video monitoring at their facilities.

Assuming the EPA covers fixed costs at their end regarding video monitoring software, facilities requested to install video monitoring would incur the cost to install and operate the on-site video surveillance cameras. The cost of these can range between $100 to $950 per camera.[33] Assuming a facility would be requested by the EPA to install two cameras the cost per facility would be approximately $1050 based on the average cost of a camera.

As noted, the proposed regulation provides the EPA with a provision to request specific scheduled waste facilities to install video monitoring. Without information on the number of facilities likely to be requested to install video monitoring, the total cost to industry of this provision is unknown. The maximum one-off capital cost to industry, if all additional STT facilities are required to install video monitoring systems is approximately $414 750.[34]

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32 Information provided by NSW EPA.

33 Install video surveillance cameras cost. http://www.fixr.com/costs/install-video-surveillance-cameras Accessed 12 September 2013.

34 While these are notionally one-off costs, the capital may need to be replaced at some point in the future.

Due to the uncertainty regarding how many facilities will be requested to install video monitoring systems, the costs and benefits of this proposed change have not been included in the final cost and benefit estimates.

Volumetric surveys

The additional facilities subject to the waste levy under the remade regulations would also be required to complete a baseline volumetric survey and then repeat it annually thereafter. The EPA estimates the cost of a survey would be around $5 000. Across the 130 additional facilities covered by the waste levy arrangements, the total cost would be around $650 000 per year, or $4.57 million in present value terms over ten years (using a discount rate of 7 per cent). Of this:

- $2.99 million can be attributed to changes in the waste levy collection arrangements (excluding the lowering of the licence threshold); and
- $1.58 million can be attributed to the lowering o f the licence threshold.

Licence-related costs

In addition to costs relating to the waste levy, new intermediary licensees will also incur a number of costs associated with the licensing requirements. Existing intermediary licensees will already incur these costs.

Annual licence fees are specified in regulation. According to the *Protection of the Environment Operations (General) Regulation 2009*, the administrative fee for most new intermediary facilities — including resource recovery facilities, waste processing (non-thermal treatment of general waste) facilities and waste storage (excluding hazardous waste, restricted solid waste, liquid waste, clinical waste, asbestos waste and waste tyres) facilities — would be based on 16 administrative fee units. The administrative fee for waste tyre storage facilities would be based on 12 administrative fee units. There are no load-based fees payable for these facilities.

In 2013, the value of an administrative fee unit was $113. Future increases in the value of an administrative fee unit specified in the regulation are broadly in line with expected inflation. The licence fees paid by new licensees will therefore remain broadly constant in real 2013 dollar terms.

The total licence fees payable by new intermediary licensees to EPA are estimated at around $77 000 per year (table 3.11) (or $539 700 in present value terms over ten years, using a discount rate of 7 per cent). These licence fees recover EPA's costs in administering the licensing regime.

3.11 Licence fees

	New licensees	Admin fee units	Value of fee unit	Licence fee per facility	Total licence fees
	No.	Units	$ (2013)	$ (2013)	$ (2013)
New intermediary licensees - waste tyres	10	12	113	1 356	13 560
New intermediary licensees - other	35	16	113	1 808	63 280
Total	**45**				**76 840**

Note: This is based on additional licensees required to pay the waste levy. There will be other waste storage/recyclers who will be licensed with lower thresholds and are not levy paying facilities. We do not have sufficient data to estimate the numbers of these facilities.
Source: Protection of the Environment Operations (General) Regulation 2009, EPA, The CIE.

In addition to the licence fees, there various other costs associated with licensing requirements. New intermediary licensees will be required to prepare:

- a licence application — this will be a one-off cost for new intermediary licensees
- an Annual Return — the costs associated with preparing an Annual Return will be incurred annually.

EPA estimates these administrative tasks would take one hour each. The total cost would therefore be around $45 (based on an hourly rate of $34.70 per hour plus on-costs of 30 per cent as explained above). Across all facilities:

- application costs would be $2030 in the first year
- the cost of preparing Annual Returns would be around $2030 per year (or around $14 258 in present value terms over ten years, using a discount rate of 7 per cent).

Cost to government

Administration and enforcement staff cost

The proposed change to the regulation will impose additional costs on the government to administer the waste levy liability applicable to recycling, storage and transfer facilities, administering new licences and additional compliance and enforcement costs under the new waste levy system.

Currently the EPA employs approximately 20 full time equivalents (FTEs) to administer, enforce compliance and audit waste levy collection from approximately 140 waste levy paying facilities. Of this, approximately 3.5 FTEs are employed to administer the waste levy from scheduled landfill facilities.

The estimate of current FTE requirements has been pro-rated to apply to the additional 130 STT facilities that will have a waste levy liability under the proposed changes. The EPA estimates that approximately 6 additional FTEs will be required to administer, enforce and audit the additional 130 scheduled waste facilities to have a waste levy liability under the proposed changes. The additional cost to government of the proposed change is approximately $660 000 per annum, applying the average annual salary of $110 000 (including on-costs). In present value terms, the total cost is around $4.64 million over ten years (using a discount rate of 7 per cent).

The administrative costs associated with new licensees is covered by the licence fees estimated above.

Installation of video monitoring at scheduled waste facilities

The total cost to government of this provision in the waste regulation is dependent on the number of facilities which the EPA requests to install video monitoring under the powers specified in the regulation.

In exchange there would be a reduction in the enforcement cost to government, as information could be automatically provided to the EPA that otherwise would need to be gathered in person through investigations.

Summary of costs

Since the draft report, the cost estimates have been revised upwards, due to changes to the proposed regulations and because better information has become available through the consultation process. The costs of the proposed changes to the regulatory framework are now estimated at around $24.97 million in present value terms over ten years (using a discount rate of 7 per cent) (table 3.12). This compares to total costs of $10.8 million estimated previously.

This total includes:

- an incremental cost of changes to the levy collection arrangements of around $14.45 million and costs associated with changes to the levy collection arrangements; and
- an incremental cost of reducing the licensing threshold of around $10.52 million.

3.12 Cost of proposed changes to the regulatory framework

	Cost
	$ million
Cost of changes to the levy collection arrangements	
Industry	
Capital cost of weighbridge and software (50%)	1.18
Staff cost to operate weighbridge	5.48
Record keeping and reporting	0.53
Volumetric surveys	2.99
Government	
Capital cost of weighbridge and software (50%)	1.18
Administration and enforcement	3.09
Total	***14.45***
Cost of changes to the licensing threshold	
Industry	
Capital cost of weighbridge and software (50%)	0.98
Staff cost to operate weighbridge	4.66

	Cost
	$ million
Record keeping and reporting	0.21
Volumetric surveys	1.58
Licence-related costs	0.56
Government	
Capital cost of weighbridge and software (50%)	0.98
Administration and enforcement	1.55
Total	***10.52***
Total costs	**24.97**

Source: CIE.

Benefits of the proposed option

Illegal dumping and illegal handling of waste can impose environmental, social and financial costs on society:

- **environmental costs** include degradation to land and biodiversity value, contamination of soil and water sources, increased risk of fire and associated damage to property and bushland.
- **social costs** include reduced aesthetic amenity of land, physical and chemical hazards from dumped items, potential health impacts (particularly from hazardous waste and asbestos) increased rodents, insects and other vermin, the cost to community to clean-up sites, block access on public land which could lead to possible delays for emergency vehicle access and potentially can attract further illegal dumping.
- **financial costs** include cost to NSW local governments to remove and properly dispose of illegally dumped materials and landfilling. There is also a financial cost imposed on the community of lower value of surrounding properties due to the decreased amenity of the area.

The proposed option aims to reduce the environment, social and financial costs to society.

Reduced resource cost of managing waste

There are resource cost savings to the community where waste is diverted from unintended avenues to lawful landfill and/or recycling. In the draft report, we estimated these benefits based on publicly available information on:

- the differential resources cost between an unintended avenue and lawful landfill or recycling
- the quantity of waste moved through unintended avenues.

Differential resource costs

Gate fees are an indicator of the resource costs associated with legal disposal. Average gate fees at different types of waste management facilities used to estimate the change in resource costs are detailed in table 3.13. Note that these are average gate fees, actual gate fees are dependent upon the type of waste and market conditions. For example, the average gate fee

at a mixed C&D waste facility can range between $36 and $121 per tonne of mixed C&D waste.[35] For this study we have used the average of $80 per tonne.

3.13 Gate fees at different types of waste management facilities ($2013)

Type of facility	Gate fee
	$ per tonne
Landfill[a]	110
Dry recyclables facility (or clean MRF)[b]	25
Alternative waste technology facilities (or dirty MRF)[b]	150
Mixed C&D waste[c]	80

Source: WME, 2005 *AWT – does it have a future in Australia? http://www.wme.com.au/categories/waste_managemt/july6_05.php;* Hyder, 2011, *Assessment of waste infrastructure and services options for the ACT;* Hyder, 2013, *Descriptions of waste technologies – C&D recycling facilities: WA Waste Authority – Strategic Waste Infrastructure Planning.*

The estimated resource cost savings from diverting waste from each of the unlawful avenues to landfill and recycling are shown in table 3.14.

3.14 Estimated resource cost savings

Diverted from	To landfill	To recycling
	$ per tonne	$ per tonne
Illegal dumping	213[a]	173[b]
On-site stockpiling	50[c]	0[d]
Illegal disposal arrangements	0[e]	50[f]

[a] Resource cost savings (including environmental and social costs) estimated based on the resource cost of illegally dumped waste equal to $323 per tonne less the average landfill gate fee of $110 per tonne (see table 3.13). [b] Resource cost savings based on a resource cost of illegal dumping of $323 per tonne, less the gate fee at an alternative waste technology facility receiving mixed recyclables is approximately $150 per tonne. [c] Given the cost of land and the potential environmental and social costs of stockpiling waste on-site, the resource cost of on-site stockpiling is expected to be greater than the resource cost of legal landfill disposal by approximately $50 per tonne. Reducing illegal stockpiling also reduces the risk of incidents like the Chester Hill fire. However, these incidents occur infrequently. We therefore have not included these potential benefits in the analysis. [d] Waste materials that are currently stockpiled are expected to be mixed waste materials and relatively expensive to recycle (if recyclable) and hence the resource cost to recycle this waste is expected to be similar to the resource cost of on-site stockpiling. [e] The resource cost of illegal landfill disposal is the same as legal landfill disposal because the waste levy is a transfer payment. [f] The average gate fees at a mixed waste recycling facility is approximately $40 per tonne greater than gate fees at landfill sites (excluding the waste levy).

Source: CIE.

Benefits estimated in the draft report

Cleaning up illegally dumped waste is generally the responsibility of local councils. In NSW, the volume of illegally dumped waste cleaned up by local councils is not reported in a consolidated or consistent way. It is therefore difficult to estimate the volume of waste dumped illegally, particularly given the illicit nature of the activity. Nevertheless, we previously estimated that the benefits of the proposed changes to the regulatory framework were around $5.5 million per year, or around $38.6 million in present value terms over ten years (using a discount rate of 7 per cent) (table 3.15).

35 Hyder, 2013, *Descriptions of waste technologies – C&D recycling facilities: WA Waste Authority – Strategic Waste Infrastructure Planning.*

3.15 Change in annual resource cost of managing waste under proposed option

Unintended action	Landfill	Recycled	Total
	$	$	$
Illegally dumped			
Tonnes by STT facilities diverted	20 266	5 067	25 333
Change in resource cost from diversion ($/tonne)	-213	-173	
Illegal on-site stockpiling			
Tonnes by STT facilities diverted	12 000	3 000	15 000
Change in resource cost from diversion ($/tonne)	-50	0	
Illegal landfill arrangements			
Tonnes by STT facilities diverted	25 210	6 303	31 513
Change in resource cost from diversion ($/tonne)	0	40	
Total change in resource cost from proposed option ($million)	**-4.9**	**-0.6**	**-5.5**

Source: CIE.

These estimates were based on the estimated resource cost savings outlined in table 3.14 and the following assumptions in relation to volumes.

- The change in the regulations would reduce illegal dumping by around 25 333 tonnes per year. Not all of the illegally dumped waste estimated above can be attributed to dumping by STT facilities; households and businesses also may illegally dump waste. It is anticipated that the illegal dumping of waste by STT facilities occurs less frequently than general illegal dumping by the community; however the volume of waste dumped are likely to be larger. We assumed 75 per cent of illegally dumped waste, is dumped by STT facilities. We also assumed that 80 per cent of this illegally dumped waste would insread go to landfill and the remaining 20 per cent would be recycled.
- There is no information available on the quantity of waste that is stockpiled on-site. We assumed that approximately 15 000 tonnes of waste per year (on average) is illegally stockpiled on-site. Due to land constraints we assumed less waste is stockpiled on-site than is currently illegally dumped or illegally landfilled. Given that around 25 000 tonnes of waste was illegally stockpiled at the Chester Hill site alone (see box 3.3), this is likely to be a relatively conservative assumption.
- Of the 31 500 tonnes of waste estimated to be illegally dumped, we assumed that 80 per cent (approximately 25 000 tonnes) will be diverted to landfill with the remaining 20 per cent diverted to recycling.

No additional evidence has emerged since the draft report was released.

Net benefits of the proposed regulations

Based on the benefits estimated previously and revised cost estimates, the proposed regulations are estimated to deliver a net benefit to the community of around $14 million in present value terms over ten years (using a discount rate of 7 per cent) (table 3.16).

3.16 Estimated net benefits of the proposed regulations

	Estimate
	$ million
Benefits	
Reduced waste management costs	38.92
Cost of changes to the levy collection arrangements	
Industry	
Capital cost of weighbridge and software (50%)	1.18
Staff cost to operate weighbridge	5.48
Record keeping and reporting	0.53
Volumetric surveys	2.99
Government	
Capital cost of weighbridge and software (50%)	1.18
Administration and enforcement	3.09
Total	**14.45**
Cost of changes to the licensing threshold	
Industry	
Capital cost of weighbridge and software (50%)	0.98
Staff cost to operate weighbridge	4.66
Record keeping and reporting	0.21
Volumetric surveys	1.58
Licensing-related costs	0.56
Government	
Capital cost of weighbridge and software (50%)	0.98
Administration and enforcement	1.55
Total	10.52
Total costs	**24.97**
Net benefit/cost	**13.95**

Source: CIE estimates.

Break-even analysis

The analysis above suggests that the community would be better off under the proposed reguations than under the current arrangements by around $13.95 million over ten years (in present value terms, using a discount rate of 7 per cent). However, limitations on the information available means there remains significant uncertainty around these estimates, particularly the benefit estimates.[36] This means that we should be cautious about drawing firm conclusions from this analysis.

[36] This is not surprising since we are dealing with illegal activities. If the perpetrators of illegal activities were known, stopping them would be a relatively simple and inexpensive exercise.

We do not have sufficient information to estimate the incremental benefits of each aspect of the proposed reform. It seems likely that the full benefits estimated above may not be realised unless both the levy collection arrangements are changed and the licensing thresholds are reduced; tightening some aspects of the regulatory framework, but not others could potentially shift illegal activity to unregulated (or more lightly regulated) parts of the industry.

Given the this uncertainty, a 'break-even' analysis may be helpful for policy makers to weigh up this decision. As the reduction in illegal dumping makes up almost 90 per cent of the estimated benefits, we estimate the reduction in the quantity of waste dumped illegally that would need to be achieved for the proposed reforms to 'break even' (i.e. for the net present value to equal zero), if all other benefits and costs were as outlined above.

The break-even analysis suggests that:

- for the the proposed change to the waste levy collection arrangements (excluding the change to the licensing threshold) to deliver a net benefit to the community, it would need to reduce the volume of waste dumped illegally by more than around 8 430 tonnes per year (table 3.17). This is around one-quarter of the total estimated above (although this estimate is also highly uncertain).
- for the change to the licensing threshold to deliver a net benefit to the community it would need to reduce illegal dumping by a further 6 900 tonnes per year or around 15 256 tonnes per year in total. This is still less than half of the total quantity of waste illegally dumped in NSW estimated above.

3.17 Break-even analysis

	Reduction in waste dumped illegally
	Tonnes per year
Change to waste levy collection arrangements (excluding change to the licensing threshold)	8 339
Change to licensing threshold	15 256

Note: Assumes that 80 per cent of waste previously dumped illegally would go to landfill and the remaining 20 per cent to recycling.
Source: CIE estimates.

To the extent that the proposed changes to the regulation could also prevent future incidents similar to the Chester Hill fire, the 'break-even' volume of illegal dumping prevented would be less than reported above.

Transfer payments under the proposed option

A transfer payment occurs when income is redistributed from one stakeholder to another, for example, a tax is a transfer payment from an individual to the government. Transfer payments neither use resources nor create output. The proposed change creates a transfer payment from industry and community to the government through the payment of the waste levy that was otherwise being avoided. Increased revenue to the state government

We assume that 80 per cent of the waste illegally dumped, illegally stockpiled, and illegally landfilled by storage, transfer and treatment facilities would be deferred to

landfill under the proposed amendments. This is equivalent to approximately 57 500 tonnes being diverted to landfill. Assuming all this occurs in the SMA or ERA, applying the current waste levy rate of $120.90, additional revenue from the waste diverted to landfill that was previously illegally handled equates to approximately $6.9 million of revenue to the state government.

The increased revenue to the state government is neither a cost nor a benefit but rather a transfer payment from industry to the government.

Alternative regulatory option

An alternative option to reduce avenues for illegal handling of waste is to licence all waste transporters and require record keeping and reporting of the origin and destination of all waste transported, the type of waste, the date and the vehicle registration number.

A similar system was previously in place in NSW prior to 2007, requiring waste transporters of hazardous, industrial and Groups A, B and C liquid waste to hold a waste transport licence. Transporters of general solid waste were not required to hold a licence.

A licence applies to an entity rather than an individual vehicle. As such, there is no correlation between the number of licensed waste transporters and the number of vehicles used to transport waste. It is not known how many vehicles are currently used in NSW to transport waste, nor how many licences would need to be issued to cover this sector.

Costs of the alternative option

The alternative option imposes record keeping and administration costs on industry. These include the administration fee for a licence and the cost to record information on the type of waste, origin, destination and date of transport for each load transported. The total cost to industry is dependent on the number of additional entities required to be licensed, the number of vehicles associated with these licences and the number of waste loads transported each year.

The alternative option also imposes costs to government associated with the administration cost of licensing and the compliance and enforcement cost to ensure general compliance with licence conditions.

In the absence of information on the potential number of licensees, vehicles and number of waste loads transported each year it is not possible to quantify the costs to industry or government.

Benefits of the alternative option

Requiring all waste transporters to be licensed and to maintain records on waste movements would:

- provide information to the EPA on the quantity and type of material transported outside the regulated area

- reduce any existing incentive that unlicensed waste transporters have to illegally dump material either from the point of origin (transporting from the waste generator) or from an intermediary facility such as a storage, transfer or treatment facility.

However the alternative option may not alter the incentives that storage, transfer and treatment facilities may currently face to illegally dump waste materials or stockpile material on-site, or develop illegal arrangements with landfill sites to dispose of material without payment of the waste levy if they can rely on unlicensed waste transporters.

In the absence of information on the current culprits of illegal dumping and on-site stockpiling it is not possible to estimate the benefits of the alternative option. The benefits of this option are potentially large if the majority of illegal handling of waste is conducted by waste transporters. Conversely, the benefits will be lower if the transporters play a minimal role in illegal handling of waste activities.

Summary of costs and benefits

The costs and benefits of the alternative option could not be quantified. The total cost to industry and government is dependent on the number of additional entities required to be licensed, the number of vehicles associated with these licences and the number of waste loads transported annually. The total benefit of the alternative option is dependent on the extent to which waste transporters, as opposed to waste facilities, are engaging in illegal handling of waste.

Conclusion

Illegal handling of waste is currently being undertaken by waste managers along the supply chain from generation to disposal/re-use, including storage, transfer and treatment facilities. The EPA is proposing to minimise the quantity of waste that is illegally handled along the supply chain by placing a waste levy liability on STT facilities for all waste received on-site. The EPA is also proposing to reduce the licensing threshold.

These changes will impose some additional costs on both industry an the government. Nevertheless, our estimates suggest that they could deliver a net benefit to the community of around $14 million in present value terms over ten years (using a discount rate of 7 per cent).

There is significant uncertainty around our estimates of the benefits and costs of this proposal, making it difficult to draw firm conclusions on whether the NSW Government should pursue these reforms. This uncertainty is not surprising given that we are dealing with an illegal activity; if the perpretrators of illegal activities were known, it would be relatively cheap and easy to stop it.

- Our estimates suggest that the proposed changes to the waste levy collection arrangements should deliver a net benefit to the community if it reduces illegal dumping by around one-quarter, compared to the current level (or less if it also prevents future incidents similar to the Chester Hill fire).

- For both the changes to the waste levy collection arrangements and the reduction in the licensing threshold to deliver a net benefit to the community, they would need to reduce illegal dumping by around 45 per cent from the current level (or less if it also prevents future incidents similar to the Chester Hill fire).

Both measures may be required to reduce illegal dumping significantly because tightening regulation on one segment of the market, may simply shift illegal activities into another unregulated (or more lightly regulated) segment of the market.

Requiring small operators to install a weighbridge could potentially make some commercially unviable. The impact of this would seem to depend on what role each small operators is currently playing.

- If a small operators is performing useful niche functions (such as providing locational advantages and competition to the large operators) and can no longer afford to operate, then the impact of the regulations could be to reduce competition leading to higher prices and worse outcomes for the community.
- On the other hand, if a small operator is able to compete, only because it is able to reduce costs by engaging in illegal dumping, then removing these operators from the market may have some community benefit.

4 Waste tracking requirements

Objective of the waste tracking requirements

Part 3 of the current waste regulation has the objective of minimising the potential for adverse environmental and human health impacts associated with the *movement* of certain waste within and to or from NSW. In the 2005 RIS of the waste regulation, the case for amending the then existing regulation to modify tracking provisions to those now contained in Part 3 was made on the grounds that 'confusion arises from obligations being split between licence conditions and the regulation and because different systems operate between NSW and other jurisdictions. In addition the 1996 waste regulation has been amended a number of times and is not well structured. Quarterly reporting of the movement of HIGA wastes has poor compliance and is not delivering information value.'[37]

Specific objectives underpinning the introduction of the tracking provisions were:

- to ensure that trackable wastes reach licensed or approved facilities for treatment, recycling, reprocessing, storage and or safe disposal;
- to minimise environmental and human health impacts from the movement of trackable wastes to the air, marine, estuarine, freshwater and land environments
- to gather comprehensive information on the movement of controlled wastes to improve compliance and enable regulatory agencies and emergency services to deal effectively with spills and incidents in transit
- to introduce one model for transporting trackable wastes in NSW and interstate to help industry understand and comply with tracking requirements
- to facilitate the adoption of on-line waste tracking
- to implement the NEPM on Movement of Controlled Waste Between States and Territories.'[38]

The tracking requirement, in principle, enables waste substances which carry an elevated risk (in comparison to 'unscheduled' waste) to public health or the environment during either transportation or subsequent legal storage, disposal or reprocessing to be better managed. It is designed to ensure that these wastes are properly identified, transported and otherwise handled in ways which are consistent with environmentally sound practices for the management of these wastes.

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37 NSW Department of Environment and Conservation, 2005, *Protection of the Environment Operations (Waste) regulation 2005: Regulatory Impact Statement*. Page 10.

38 NSW Department of Environment and Conservation, 2005, *Protection of the Environment Operations (Waste) regulation 2005: Regulatory Impact Statement*. Page 12.

Implementing the National Environment Protection Measure (NEPM) on interstate movements of controlled wastes requires the consistent recognition and movement management by all participating states and territories of these potentially harmful wastes across jurisdictional borders.

Main features of trackable waste

Types of wastes that are designated as trackable

Only movements of selected wastes are covered by the tracking requirements. However, *any* transportation of these wastes is covered, not just movements to landfills. Part 3 of the current waste regulation (*Waste tracking requirements*) stipulates the documentation and record keeping requirements for the consignment, transportation, receiving and subsequent use, storage or relocation of received waste for all waste substances listed in Schedule 1 of the waste regulation. These listed substances (66 in all) include various metallic wastes (including cadmium, antimony , mercury, lead), clinical wastes, a wide variety of chemical wastes, and wastes from specific named processes (operations involving the use of cyanides, production of biocides, organic solvents, production of resins etc). They reflect the wastes designated as Category 1 and 2 wastes in the Act. These wastes may be of a solid or liquid character. The wastes must be assigned a waste code based on the type of waste.

Who are the participants?

The tracking requirements involve the participation of waste generators, those who authorise movement of these wastes, those who transport them and those who receive them, either for treatment, processing, recycling or final disposal.

The obligations imposed by the tracking requirement cover several parties formally identified — the *occupier* of waste facilities, the *consignors* of waste, the *transporters* and the *receivers* and the *approving body*.

Important distinctions apply in establishing the responsibilities of each of the participants in the waste tracking arrangements. Because the definition of 'waste facility' – as distinct from *scheduled* (licensed) waste facility - contained in the Act covers any facility that simply *stores* waste, the occupier of a waste facility will typically include all producers, processors and recyclers of specified wastes who store the waste however temporarily, as well as receivers of waste for disposal. The tracking requirements of the waste regulation apply to waste facilities and activities, whether licensed or not, provided that the waste is of the higher risk types nominated in the Act and named in the waste regulation.

However, all waste that is classified as trackable waste under the Act may only be transported by transporters who are also licensed under the Act, unless the loads are below 200kg or 2 tonnes for tyres.

Tracking obligations for Schedule 1 waste movement

Unlike the exemptions from record keeping that accompany the levy exemptions for resource recovery and recycling facilities, these facilities, as well as landfills are required to participate in detailed record keeping and document exchange when seeking to *move* waste classified as belonging to the higher risk Schedule 1. In other words, all waste facilities are subject to this requirement under the existing waste regulation.

For the waste categories specified in Schedule 1 the tracking requirement places an obligation on three types of participants before waste can be moved. They do so irrespective of whether a levy is payable.

Consignor and consignment authorisation

To move waste from a waste facility an identified *consignor* must have a *consignment authorisation* and a *transport certificate* which has also been given to the transporter of the waste. The consignor may be the occupier of the waste facility or an authorised agent. The EPA-approved authorised agent may be a licensed transporter or an EPA-approved receiver of the waste.

The consignment authorisation is itself issued by the EPA or the *receiver* of the waste. Consignment authorisations specify information on waste characteristics and volumes, as well as the details of consigners and receivers. They must be retained for at least 4 years by both the authorised agent and the receiver of waste who issued the authorisation. The consignor must also retain completed transport certificates for 4 years. The consignor, as authorised agent of the occupier from which waste covered by these transport certificates was transported, must retain a list of these premises.

Transporter and the Transport Certificate

The transporter has a responsibility to ensure that there is a valid consignment authorisation and must hold a transport certificate obtained by the consignor .The transport certificate which can be generated on-line is the waste documentation that moves with the waste load at all times. It contains information about the waste, the consignor, the transporter and the receiving facility. The transporter must keep these certificates as records for at least 4 years.

Interstate movements

Trackable waste that is transported interstate is included under Clause 18 (2). This provision of the regulation enables the consistent application of nationally agreed protocols for tracking interstate movement of higher risk waste under the NEPM designated as controllable wastes. There are mutual recognition provisions for licensed interstate transportation of these waste types under NEPM.

Waste Receiver

The receiver, who may also have issued the consignment authorisation, is required to ensure that there is a valid consignment authorisation and an accompanying transport certificate with the waste. The receiver must be legally able to receive this waste type

While not obliged to accept waste that is unaccompanied by a transport certificate or which a consignment authorisation has been issued, a receiver *licensed* to accept the type of waste in question can do so provided the EPA is subsequently notified. The receiver must keep consignment authorisations and transport certificates for at least 4 years.

Other provisions of the Act with relevance to tracking

Occupiers of facilities which are originators of waste may or may not require an environment protection licence, depending whether or not they are classified as a *scheduled* activity under Schedule 1 of the POEO Act (not to be confused with Schedule 1 of the waste regulation). Similarly, receivers of the higher risk waste that is transported under the provisions of the regulation may or may not be licensed facilities –that is, *scheduled* waste facilities. However, most (including resource recovery processing and recycling premises) will be required to be licensed for those activities under the POEO Act.

While the tracking requirement is specifically designed to help manage the risks associated with waste movement and disposal, there are other more general provisions in the Act itself designed to address one of the key targets of the regulation – illegal dumping. Section 143 of the Act requires waste to be transported to a place that can lawfully accept it. The owner (ie originator or generator) of the waste and the transporter are each guilty of an offence when waste is transported to a place that cannot lawfully be used as a waste facility.

Licensees must complete Annual Returns for their licences.

Record keeping requirements imposed by the Act itself

Quite apart from the monitoring and record keeping requirements explicitly imposed by the regulation, there are some which must be fulfilled by premises and activities required to be licensed under the Act itself. These vary with the nature of the activity and its potential pollution impact. For instance, the EPA generally imposes conditions on landfill (waste disposal – application to land) licenses requiring licensees to submit certain reports such as Landfill Environment Management Plans (LEMPs) and monitoring results. Conditions imposed on waste processing or storage facilities, for example, could limit the height of stockpiles, require monitoring of pollutants or ensure that operating procedures are environmentally acceptable. In some cases, conditions are imposed on waste facility licences to develop and implement a pollution reduction program (PRP) to reduce the environmental impact of activity over time. Almost all waste facility licences limit the types of waste that may be *received* at the premises.

A condition (L3) that limits the specific types of waste that can be received at the premises. The wording of this condition is as follows:

> The licensee must not cause, permit or allow any waste to be received at the premises, except the wastes expressly referred to in the column titled "Waste" and meeting the definition, if any, in the column titled "Description" in the table below.
>
> Any waste received at the premises must only be used for the activities referred to in relation to that waste in the column titled "Activity" in the table.
>
> Any waste received at the premises is subject to those limits or conditions, if any, referred to in relation to that waste contained in the column titled "Other Limits" in the table below.
>
> This condition does not limit any other conditions in this licence.

Trackability requirements imposed by licensing conditions contained in the Act no longer apply

Importantly, licensing requirements imposed on scheduled facilities by the Act itself do not address movement of waste between premises. Prior to 2005 amendments to the regulation, trackability provisions were not separately dealt with by the regulation. Instead, tracking requirements were imposed as part of the licensing framework covered in the Act itself. In the review that was conducted as part of the 2005 RIS process it was stated that should the regulation and its tracking provisions be allowed to lapse … 'the waste tracking provisions in relation to HIGA and controlled wastes would continue to apply.'[39]

The inadequacy of those pre-existing provisions was a principal reason for the explicit measures contained in the current regulation.

This (albeit inadequate) residual tracking capability that existed prior to the 2005 changes would no longer apply if the current regulation provisions on tracking were removed. The 2005 reforms of the regulation were targeted to remove confusion and ambiguity under the treatment of trackability provisions which existed under both the licensing provisions of the Act and the obligations of the regulation. As a consequence, with the unification of these provisions in the regulation, repeal or lapsing of the regulation would leave no fall back regulatory structure for implementing tracking of the higher risk wastes.

Record keeping required by other parts of the waste regulation

Part 2 Clause 12 of the current waste regulation specifies a series of record keeping and monitoring obligations imposed on occupiers of scheduled waste facilities. They are required to keep records of all waste types and amounts received, stockpiled and used. However, these requirements currently only apply to *levy-paying* facilities. Part 2 Clause 9 exempts licensed recovery, processing and recycling facilities from the levy. The existing

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39 NSW Department of Environment and Conservation, 2005, *Protection of the Environment Operations (Waste) Regulation 2005.*
http://www.environment.nsw.gov.au/resources/waste/poeowasteris2005.pdf

Clause 12 (9) has also allowed the EPA to exempt all resource recovery, processing and recycling facilities from the record keeping requirements imposed on levy paying facilities currently only landfills.

Whilst the record keeping specified includes waste type and transport vehicle identification requirements, it does not directly cover either the source of wastes or the transportation history of its movements to the receiving facility. The requirements in Part 2 Clause 12 (4) do however cover the composition and destination of any load on-shipped from a *scheduled* facility that is not exempted from the record keeping. Importantly, because Part 2 is dealing with levy collections Part 2 Clause 12 (4) does not cover initial movements of waste from the waste generator.

Furthermore, the record-keeping requirements of Part 2 do not extend to *unlicensed* facilities which have been brought under the tracking requirements as a critical addition through the 2005 amendments to the regulation.

If the regulation was repealed except for the provisions in the existing Part 2 which are required to enable existing levy contribution collection, this aspect of record keeping would be retained. And if the scope of the levy collections was enlarged to cover recycling and recovery facilities these requirements on composition and on-shipment would presumably extend to all in-scope facilities. They apply to general waste as well as Category 1 and 2 wastes that make up the now trackable components. However, these provisions in Part 2 do not in themselves provide any 'higher level' record keeping on the initial movement of these higher risk wastes. They do not distinguish these wastes as a separate category. And under the current scope of the regulation there is exemption for most facilities other than levy-paying landfills.

What the requirement does in practice

The tracking requirement sets up a framework of information gathering and record keeping that is more extensive than those for waste types outside its scope. It does so through two main instruments – the consignment authorisation and the transport certificate and the obligations for their completion and recording placed on originators, transporters and receivers of these higher risk types.

Compliance success

The EPA has advised that audits of the waste tracking system have shown minimal non-compliance and no failures to track waste effectively when required. It has advised that many specialist operators of waste transport services find the documentation requirements imposed by this part of the regulation to be nothing more than those required as good business practice and voluntarily impose them on all waste types that they handle.

A review of court prosecutions instigated by the EPA's Waste Operations Section since 2005 indicates that one prosecution has been pursued for the unlawful disposal of trackable waste under Schedule 1 Part 1 of the waste regulation since 2005. The

prosecution was for a breach of Section 143 of the Act, rather than a breach of waste tracking requirements under the waste regulation.

The incremental compliance benefits generated by the introduction of the tracking requirement into the regulation can only be properly established by a comparison of the pre 2005 and post 2005 incidents involving Schedule 1 wastes. However accurate information comparing pre and post incidents is not available.

Incentive- compatibility of the requirement

It is arguable that for the majority of commercially driven participants in the movement of higher risk wastes between premises, the existing on-line tracking requirements of consignment authorisation and transport certification confer a net benefit in helping to underpin the commercial transactions between the parties involved. Invoicing systems and meeting of contractual obligations require assurance that loads being shipped and received and treated are moving as expected and are of the composition expected. Without the information flow contained in the on-line tracking system there may be incremental costs imposed on transactors experiencing increased uncertainty about the composition and riskiness of loads shipped and received.

Waste generators have an interest in ensuring that the waste they are shipping is reaching those with whom they have contractual arrangements. (Those standing to benefit from illegal disposal obviously do not have this incentive since no contractual obligations are at stake). While required use of a licensed transporter of trackable waste categories provides some comfort to those dispatching and receiving trackable waste, this does not provide the level of risk reduction offered by the tracking requirement suite of measures. Larger (other than one man) transport operators have profitability and risk management incentives compatible with knowing that their vehicles are moving waste loads as contracted.

According to the EPA in the latest year, 2011-12, there were 77 receivers of trackable waste within the State. Of these 5 were landfills. For that year, there were 353 licensed and unlicensed landfills across the State that reported they were receiving waste for disposal.

The combined tracked waste volumes for 2011-12 (movements into and within the State) were 260 920 tonnes, with 64 000 tonnes transported out of NSW. This compares with 6 630 000 tonnes of total waste disposed. Trackable waste therefore represents around 5 per cent by volume of total waste recorded as disposed.

Cost to government and industry

The current cost of verifying and auditing the tracking requirements system (largely online) information is operated at an ongoing annual cost to government estimated at $25 000. For participants, there is the cost of having the waste product tested and coded for purposes of completion of consignment authorisation and transport certification. For most waste generators who produce loads of trackable waste on a repetitive basis this is a one-off cost. There is also likely to be a comparable cost that would be incurred in the

absence of a trackablility requirement. Ordinary commercial contracting requirements between waste generators and receivers would necessitate information of this kind be provided. Transfer stations, re-processors etc. require similar information. Once done, the testing and coding exercise is likely to impose negligible incremental costs on waste generators and receivers engaged in repeated transactions. Furthermore, as discussed above, the levy contribution requirements impose their own record keeping requirements on waste characteristics.

Benefits of the tracking requirement

The 2005 RIS review observed that, 'as the tracking system is embedded in the licence conditions for licensed waste facilities, activities and transporters, these requirements would remain in place if the current provisions relating to waste tracking were repealed and not remade.'[40] However, the inadequacy of relying on those provisions in the licences was a primary reason for their removal and replacement with the explicit tracking requirements of the amended regulation.

Because small loads of wastes, including trackable wastes, do not have to be transported by a *licensed* transporter, there may be an incentive for some waste generators seeking to avoid levy costs on small loads to deal with unlicensed transporters and ignore the tracking requirements by mutual consent. This would however be a source of illegal dumping risk with or without the tracking requirement. It becomes an elevated risk for larger loads if the tracking requirement is removed. These loads would continue to be classified as trackable waste for licensing purposes under the Act but would no longer be subject to the consignment authorisation and transport certificate obligations of the regulation.

The consequences of removal of this part of the regulation would be to restore the level of risks of movement of higher risk wastes closer to that which existed prior to the 2005 amendments. It is clear from consideration of the residual provisions on record keeping contained in the existing Part 2 of the regulation that these do not provide information flows on waste movement comparable to those provided by

- The combined obligations on the participants created by the consignment authorisations and transport certificates
- The on-line implementation of the system

The first of these ensures that the level of detail on waste characteristics and movement is sufficient to manage the risks of moving and storing higher risk waste. The online facility underpins the cost effectiveness of the system. The on-line facility also helps to neutralise concerns that smaller participants could be disadvantaged by the fixed administration costs imposed by the tracking requirements. Importantly the combination of the two provides a readily accessed record of movements on an ongoing basis, in contrast to the information retrieval that would be feasible if only those parts of the regulation required

40 NSW Department of Environment and Conservation, 2005, *Protection of the Environment Operations (Waste) regulation 2005: Regulatory Impact Statement*. Page 9.

for levy contribution collection were retained. This information system is valuable to both participants and the waste regulator.

Benefit of centralised information collection

The tracking requirement is arguably only formalising into a regulatory requirement what would make commercial sense for the majority of contracting parties involved in tracking waste movement. And it can also be viewed as a low cost system of information flow because it applies uniformly to *all* participants in the movement of higher risk wastes. There is no assurance that a common system used by all who currently benefit would emerge should the regulation be revoked. It would require extensive negotiated agreement between parties. There would likely be fragmentary information flows from any resulting system in comparison to the comprehensive documentation under the current unified on-line system.

From a public benefit point of view the reduced cost of maintaining the current tracking system is very small (an estimated $25000). Whatever costs were incurred in setting up the system are sunk and would not be recoverable with its abandonment. If there were an ongoing demand for the on-line service by operators requiring it on a voluntary basis they could be charged for the service.

The costs of removing the tracking requirement would be both public and private. The private costs would be the loss of comprehensive information flows as described. The public costs would be from the prospects of having to manage increased illegal dumping activity from those who currently have no incentive to participate in the tracking system.

The current tracking requirements apply to some 72 receivers of higher risk waste, other than landfill operators. There a significant numbers of recyclers and waste processors among these who, to the extent that the tracking requirement reinforces collection of accurate information, gather information on type of load and mixture that is likely to be part of good business practice.

The tracking requirements support implementation of the NEPM

Division 8 of Part 3 of the existing waste regulation is a means of implementing the NEPM. The wastes which appear in List 1 of Schedule A to the NEPM have corresponding codes and, in similar fashion to the code-based tracking of intrastate movement under the regulation, base tracking requirements around these codes. The implementation of NEPM requires compatible tracking systems across states – compatibility which is supplied on NSW behalf by the current tracking system. Licences are required for transporters to move these wastes between jurisdictions and these licences are mutually recognised. Approved transport certificates are required to move with the controlled wastes.

Removal of the existing tracking requirement in the regulation, and the provision for interstate tracking, would be accompanied by the need to replace the NEPM –based facilitation of interstate movements involving NSW with another system, possibly

involving bi-lateral agreements with other jurisdictions. This is likely to be an administratively complex and more costly set of arrangements.

Alternative regulation

Increasing the scope to include general waste

Part 3 of the existing waste regulation is confined to the wastes identified in Schedule 1. Provided that this list and the characterisation and coding of wastes is sufficiently comprehensive it is unlikely that there would be increased environmental and human health risk management from extending coverage of the tracking requirement to other waste types. There would also be potential accompanying inefficiencies. Facilities receiving trackable waste generally require prior notification before they will accept a load of waste, this is often not the case for general waste. Consignment authorisations are an integral component of prior notification. Requiring consignment authorisations for general waste would increase costs for arguably little environmental benefit.

Increasing the scope to interstate tracking

The extension of the tracking system to include coverage of non-controllable (i.e. non-hazardous) wastes from designated areas (e.g. the movement of currently non-trackable building and construction waste from the Metropolitan Levy Area) to interstate destinations would provide a new source of information for waste regulators on the volumes of waste which is currently bypassing the NSW regulatory system. These movements are occurring potentially at significant environmental and congestion costs because of the transport involved. As discussed in chapter 2, anecdotally it appears that more than 400 000 tonnes of waste is transported interstate per year.

Once measured through tracking requirement, improved accuracy of volumes transported interstate would allow an appraisal of the waste diversion incentives created by the differential disposal costs. This is less relevant than it was for the draft RIS and CBA because the introduction of the proximity principle is likely to manage these incentives. The interstate tracking system will not require any certificate or consignment authorisations to be issued, which will help to minimise costs.

Satellite tracking

Another option the NSW Government could consider is to require the owner of a vehicle used for transporting waste to install and operate an approved vehicle tracking device. If a request is made by the EPA the person would be required to fit any vehicle owned by that person that is used for the purposes of transporting waste with an approved device that is capable of automatically recording routes travelled (for example, a GPS unit). It is the responsibility of the relevant transporter to ensure the approved vehicle tracking device in the vehicle is operating.

The total number of vehicles currently involved in transporting waste in NSW is not known. Further a change to the regulation would not necessarily require all vehicles to install a GPS tracking unit, rather installation is would only be required at the EPA's

request. Hence, at this stage it is not possible to estimate the number of vehicles that would be required to install a GPS tracking unit under this option.

The cost of installing GPS tracking units could potentially be borne by either industry or government, depending on the arrangements determined by the government should this option be pursued. The cost to purchase and install a GPS tracking unit is likely to range between $250 and $750 per unit.[41]

The government would also incur a setup cost to install software or a centralised database to store the collected information in addition to annual ongoing costs to maintain and/or host the system. The software setup cost to government would likely be in a range between $0 and $30 000 with an annual ongoing cost of $300 to $24 000 per year (depending on the number of devices).[42] The range in cost is due to the availability of different systems regarding the frequency of information collected and how information is stored and accessed.

Such a change would provide information to the EPA on the movement of waste through key points along the waste management supply chain. This information is likely to reduce EPA's compliance and enforcement costs. Currently the EPA requires 9.5 FTEs for compliance and enforcement of waste management activities.[43] However, the extent to which the EPA's compliance and enforcement task would reduce due to additional information sourced through satellite tracking is unknown and is dependent on the number of GPS tracking units installed and the extent to which waste transporters are involved in non-compliant waste management activities.

The net benefit of this option has not been quantified.

Conclusion

The waste tracking requirement is a low cost system of information flow to manage the risks of moving and storing higher risk wastes. This information system is valuable to both participants and the waste regulator. Removal of the requirement would increase the risk of movement of high-risk wastes.

Extending the system to interstate tracking of non-hazardous waste would provide information for waste regulators. However in the absence of information on the cost to administer interstate tracking, it is unclear if this option provides a net benefit to society.

A possible option of amending the regulations to allow EPA to request waste transporters to install GPS tracking units in vehicles used to transport waste was considered. However, the costs and benefits of this option could not be estimated.

With available information, the preferred option, from society's perspective, is to remake the regulation as it currently stands.

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41 Based on quotes received by NSW EPA from providers of GPS tracking units.

42 Based on quotes received by NSW EPA from providers of GPS tracking units.

43 Information provided by NSW EPA.

5 Management of special wastes

The waste regulation currently includes provisions for the management of 'special waste'. Part 4 of the *Protection of the Environment Operations (Waste) Regulation 2005* deals with special waste relating to 'asbestos waste' and 'clinical and related' waste. The regulation imposes requirements on the *transportation* and *disposal* of special waste.[44] Some refinements are proposed to the regulation relating to the management of asbestos waste. For clinical and related waste there are no changes to the existing regulation considered.

Clinical and related waste

Changes in infection control and advances in technology have resulted in the increased use of disposable clinical products, which have increased waste treatment/disposal volumes. Clinical and related waste has been pre-classified as a 'special waste'. This allows the EPA to set more stringent and specific requirements for the management at the generation site, collection and transport, and disposal of the waste to minimise the risk to the environment and human health. The definition of 'clinical and related waste' under the *Protection of the Environment Operations Act 1997* includes clinical waste; cytotoxic waste; pharmaceutical, drug or medicine waste; and sharps waste.[45]

Clinical and related waste is generated from a number of sources such as hospitals and medical centres, as well as from home based health care (visits from healthcare professionals and self-administered healthcare). It is also generated in non-clinical settings in public places such as pubs and clubs.

Risks posed by the waste stream

This waste stream has the potential to cause injury, infection or offence. The most significant risk associated with clinical waste, however, is the potential transmission of a blood borne virus from a needle stick injury.[46] The major blood-borne pathogens of concern are the human immunodeficiency virus (HIV), hepatitis C virus (HCV) and hepatitis B virus (HBV). In some settings, other infections may be relevant, for example

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44 There are also regulations relating to asbestos in the environment such as planning certificates under section 149 of the *Environmental Planning and Assessment Act 1979* that can be enacted on contaminated properties. These certificates may, for example, restrict the use of the land, given the presence of contaminated waste.

45 http://www.epa.nsw.gov.au/waste/clinicalwaste.htm

46 NSW EPA (2008), *Evaluation of Amendments to the Protection of the Environment Operations (Waste) Regulation 2005 – Special Wastes*, p5.

Treponema pallidum and human T-cell lymphoma virus (HTLV-1) are endemic in some populations in remote Australia.

According to the Medical Technology Association of Australia, 'needlestick and sharps injuries (NSIs) are one of the most common causes of physical pathological and psychological hazards for many healthcare workers'. These incidences are mainly associated with health care workers, with 18 000 health care workers reporting incidences each year.[47]

Estimating the risk of needle-stick injury is difficult, given the introduction of safe handling and disposal methods and introduction of 'safety-engineered devices' (SEDs). The incidence rate observed today would be expected to be higher without these safe handling and disposal practices.

The current incidence rate depends on the type of needle that is used:

- Butterfly needles (winged infusion) and intravenous catheters carry a high risk[48]
- Newer items with safety devises fitted have been adopted.[49] Compared with conventional devices, SEDs have been shown to reduce the risk of NSIs by 22 per cent to 100 per cent.[50] The Medical Technology Association of Australia found that implementation of SEDs can reduce injuries by over 80 per cent and, in conjunction with training and guidelines, can reduce injuries by over 90 per cent.[51]

The WGO guidelines suggest the general risks from accidental exposure to key pathogens from a needle-stick injury are around 5 to 40 per cent for HBV, 3 per cent to 10 per cent for HCV and 0.2 to 0.5 per cent for HIV.[52] The Centre for Disease Control and Protection (CDC) in Atlanta suggest that the rate of risk for exposure to HBV-infected blood may be between 6 and 30 per cent for an unvaccinated person, while a vaccinated

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47 Medical Technology Association of Australia, 2013. 'Value of Technology: Needlestick and Sharps Injuries and Safety-Engineered Medical Devices', April 2013, http://www.allianceforsharpssafety.org/wp-content/uploads/2013/05/VOT-Needlestick-and-Sharpscopytosend1.pdf.

48 Ibid.

49 Bowden, F. 2001. 'Needle-stick injuries in primary care', Australian Prescriber, http://www.australianprescriber.com/magazine/24/4/98/100/#t1

50 Tosini, W., Ciotti, C., Goyer, F., Lolom, I., L'He´riteau, F., Abiteboul, D., Pellissier, G., and Bouvet, E. 2010. 'Needlestick Injury Rates According to Different Types of Safety-Engineered Devices: Results of a French Multicenter Study', *Infection control and hospital epidemiology,* April 2010, vol. 31, no. 4.

51 Australian Healthcare and Hospitals Association (AHHA), 2013. 'Parliament debates sharps and needlestick injuries'. http://ahha.asn.au/news/parliament-debates-sharps-and-needlestick-injuries

52 World Gastroenterology Organisation (WGO), undated. *WGO Practice Guideline: Needle Stick Injury and Accidental Exposure to Blood'*, http://www.worldgastroenterology.org/assets/downloads/en/pdf/guidelines/16_needlestick_en.pdf.

person is virtually at no risk.[53] Based on the limited available studies, the CDC estimate there is a small risk of approximately 1.8 per cent for contracting HCV after accidental exposure to HCV-infected blood, and 0.3 per cent risk of contracting HIV after exposure to HIV-infected blood. The MTAA (2013) suggests that in Australia, the risk of infection *after exposure* to HCV-infected blood may be as high as 10 per cent, depending on the RNA positive status.

There is a low level of risk of contraction, particularly where a person has been vaccinated for HBV. A study undertaken at the Melbourne's Royal Children's Hospital of the 50 children that had been exposed to community needle-stick injuries over 32 months found none had contracted HIV, HVB or HVC indicating that while the risk is not zero it is very small. Similarly, studies found that from 53 community-acquired needle stick injuries, outside of the health care industry, none of the children had contracted a blood-borne infection up to six months following the incident.[54]

Costs

As discussed above, the risk of infection through a needle stick injury is most significant for hepatitis B virus, when the exposed is not vaccinated, and to a lesser extent the hepatitis C virus. For cases where the needle-stick injury results in infection, there are costs associated with morbidity and mortality. However, there are also costs which apply in all cases. The most significant of these is likely to be the psychological costs for the injured person and their families. Table 5.1 presents a list of direct and indirect costs associated with needle-stick injuries.

5.1 Direct and indirect costs associated with needle-stick injuries

Direct costs	Indirect costs
Blood sampling	Time loss due to anxiety and distress
Urgent testing	Lost productivity/lost time from work
Vaccinations	
Health care visits	
Post-exposure prophylaxis	
Counselling for injured staff	
Follow-up tests	
Long-term treatment (including lifetime treatment for healthcare workers who have seroconverted)	

Source: Adapted from MTAA, 2013.

53 Centre for Disease Control and Prevention, 2013. 'Frequently Asked Questions - Bloodborne Pathogens — Occupational Exposure' http://www.cdc.gov/OralHealth/infectioncontrol/faq/bloodborne_exposures.htm

54 Fiona Robbé Landscape Architects, 2006, *A Sandpit for Folley Park, Glebe,* Prepared for the City of Sydney Council, http://www.kidsafensw.org/imagesDB/wysiwyg/ASandpitforFoleyPark_1.pdf

Initial testing

A blood test is required immediately after injury, and further blood samples to test for HBV, HCV and HIV are collected after 1, 3, 6 and 12 months (WGO guidelines). Counselling is required in all cases, especially for the injured person.

Management is based on finding out whether there is a risk of HBV, HCV or HIV. Depending on the serological analysis of the sample, steps must be taken to limit infection risks from the identified virus. Post Exposure Prophylaxis (PEP) is recommended in most cases where there is accidental exposure to blood.

The CIE understands that the estimated cost of a single NSI treatment in the United States ranges between $500 to $4000 (US dollars). This does not include the costs for treating long term morbidity or psychological costs which are expected to be significant. Due to the high number of cases each year, the estimated burden of disease is significant.

Morbidity and mortality costs

The cost of treating cases of serious blood-borne pathogens is, according to the American Medical Association, reported to be as high as US $1 million. Similarly, a study from the United Kingdom suggests that while initial testing and treatment may be approximately €3500, the longer term costs of treatment of Hepatitis C or HIV may exceed €0.7 million.[55] It is unclear whether such costs include transfers associated with litigation and these numbers appear to represent the upper bounds. As such, while the probability of blood-borne virus transmission is relatively low in a person that has been vaccinated, the cost associated with a needle-stick injury resulting in infection are high.

Studies estimate the average lifetime medical costs for a newly-infected HIV patient in Australia are approximately $173 000.[56] Treatment costs may represent just a share of all costs, suggesting that this estimate is at the lower bounds.

Furthermore, the psychological effects of blood-borne transmissions are significant. In one study, 60 per cent of nurses reported elevated fear of needles following an incident and almost half reported greater levels of anxiety.[57]

Current regulation

In order to manage this risk there are a number of measures that regulate the way in which the waste is collected, transported and disposed. The regulatory framework for

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55 Medical Technology Association of Australia, 2013. 'Value of Technology: Needlestick and Sharps Injuries and Safety-Engineered Medical Devices', April 2013, http://www.allianceforsharpssafety.org/wp-content/uploads/2013/05/VOT-Needlestick-and-Sharpscopytosend1.pdf.

56 Ibid.

57 Saia, M. Hofmann, F., Sharman, J., Abiteboul, D., Campins, M., Burkowitz, J., Choe, Y. and Kavanagh, S. 2010. 'Needlestick injuries: Incidence and cost in the United States, United Kingdom, Germany, France, Italy, and Spain', *Biomedical International* (2010) 1: 41-49, http://www.bmijournal.org/index.php/bmi/article/viewFile/20/14

clinical and related waste is described in section 43 or the *Protection of the Environment Operations (Waste) Regulation 2005* and includes the elements described in Box 5.2.

5.2 Main elements of the regulation of clinical and related waste

- Generation site:
  - a waste management plan is required to be developed and kept updated,
  - a designated person responsible for the implementation and ongoing monitoring of the plan,
- Collection:
  - appropriate separation and packaging of sharps and clinical wastes is required
- Transportation:
  - in rigid, leak proof containers
  - in a vehicle that does not have a waste compaction system, securely locking the vehicle when unattended.
- Disposal:
  - for waste generated inside the regulated area it must be disposed of in a waste facility that is licensed to receive the waste,
  - for waste generated outside the regulated area it can be disposed of in an unlicensed waste facility so long as it is operated by a local authority that is located outside the regulated area and less than 40 kilograms at a time.

No regulation compared to current regulation option

This section considers the impact of the removal of the provisions in the regulation relating to 'clinical and related waste'. The main impacts of removing these provisions include the potential to:

- increase the risk of transmitting an infectious disease, particularly from needle stick injuries, and the implications of this (eg mortality, ongoing costs of managing the health effects);
- reduce the costs at all stages of the waste management cycle by no longer requiring the waste to be managed in a manner prescribed by the regulation.

A significant number of the elements of the regulation relating to the generation site, collection and transportation of the waste are based on the *NSW Health: Waste Management Guidelines for Health Care Facilities (August 1998)*. The regulation makes it mandatory to adopt the guidelines.

If the health service providers covered by the NSW Health Guidelines change their practices in the absence of the mandatory requirements then this could have implications for increasing the risk of transmitting an infectious disease as well as reducing their operational costs.

However, in our view it is likely that these health service providers have already changed their practices and this 'embedded' behaviour would not change if the waste regulation were removed. NSW Health, for example, had previously estimated that 90 per cent of health professionals who use sharps in homes, already dispose of them in accordance with the regulation.[58] In this instance removing these requirements from the regulation would have minimal impact on the risk of transmitting an infectious disease or the operational costs of the waste management cycle. This is particularly likely to be the case given that over the past 5 years existing health service providers have already incurred some of the fixed costs (eg appropriate sharps containers) associated with the regulation. Therefore, there is no reduction in fixed costs by changing their waste management practices. There are also some variable costs associated with complying with the regulation such as transporting the sharps containers to disposal sites. However, given the high level of compliance to the Guidelines even before the regulation was introduced would suggest that the cost savings to health service providers by changing their waste management practices are unlikely to be significant.

An important area also covered by the regulation relates to the management of the waste generated in public places. In a previous Schedule 1 Analysis of the 2005 Regulation, health authorities estimated that 50 per cent of such premises, predominantly in inner city areas, already have sharps waste bins/disposal procedures in place. For example, McDonalds has sharps waste bins in most of its inner city and other high risk stores, but not those in outer suburbs or country centres.[59] Given the mandatory requirements for the management of sharps waste which have been in place for the past 5 years that sharps waste bins and procedures would be in place in all public places.

Irrespective of the requirements of the regulation, the threat of litigation arising from the risk of exposure to sharps waste would also act as a significant incentive for local councils or private premises to appropriately collect this waste stream. This would also suggest that these entities are unlikely to significantly change their management of the sharps waste.

A further aspect that would be impacted by the removal of the regulation relates to the disposal of this waste at licensed waste facilities. The NSW Health Guidelines do not specify the disposal site. This is purely the result of the regulation. Therefore, one potential option is for the health service providers to dispose of the clinical and related waste stream in unlicensed waste facilities. This would depend in part on the cost differential of disposing their waste in licensed compared to unlicensed facilities. This would also apply to collectors of this waste stream from public places. There is no information currently available to determine the extent to which health service providers and other entities would choose to dispose of their waste in currently unlicensed waste facilities in the absence of the regulation.

Our analysis would suggest that there are strong incentives for health service providers and the 'managers' of waste from public spaces to maintain the current practices imposed

58 NSW EPA (2008), Amendments to the Protection of the Environment Operations (Waste) Regulation 2005 - Special Wastes, Schedule 1 Analysis, p8

59 NSW EPA (2008), *Evaluation of Amendments to the Protection of the Environment Operations (Waste) Regulation 2005 – Special Wastes*, p5.

by the regulation. The exception to this is likely to be in the disposal of waste where it is less clear whether there would be an increase in the disposal at unlicensed facilities.

This would suggest, that the overall impact of the removal of the provisions in the regulation relating to clinical and related waste would depend on the extent to which current disposal practices are changed. While any changes would result in lower operational costs, it is not clear how this would change the risks of transmitting an infectious disease.

As noted earlier, there is a risk of transmitting infectious diseases particularly via accidental needle stick injuries. The extent of this risk at is not known with certainty, although the cost to society is large even where a needle stick injury doesn't result in transmitting an infectious disease.

In the absence of robust data it is not possible to quantify the potential impacts of removing the regulation. Nevertheless, by maintaining the existing regulation, the Government has implicitly accepted that there is a high cost to society of transmitting infectious diseases, even though the probability of transmitting diseases via the clinical waste stream is likely to be low. Further, as appears to be the case, the operational costs to health service providers and other entities of abiding by the provisions in the regulation appears to be relatively low. This would suggest that the potential benefits of maintaining the regulation are likely to outweigh the costs of implementing these measures.

Asbestos waste

Asbestos fibres are hazardous and can cause mesothelioma, lung cancer and asbestosis when inhaled (even in small quantities). The fibres can be released into the air when asbestos products are incorrectly handled, stored or transported for disposal. A broad regulatory framework has evolved over the past decade to improve practices relating to the handling, storage, transportation and disposal of asbestos materials.

Current regulation

The regulation of asbestos is typically divided into two components relating to the management of asbestos *in the workplace* and in the *environment* (as a pollutant and public health risk).

Asbestos in the Workplace

The *handling and storage* of asbestos waste at worksites is regulated solely by WorkCover NSW under the current provisions of the *Work Health and Safety Regulation 2011*.[60] In this instance, the 'worksite' could include, for example, the place where an asbestos removalist is working (i.e. on demolition sites).

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60 New work health and safety (WHS) laws commenced in NSW on 1 January 2012. The WHS laws replaced the occupational health and safety (OHS) laws in NSW.

New work health and safety (WHS) laws commenced on 1 January 2012. Under the new WHS laws asbestos removal work continues to be licensed. A licence for friable asbestos *removal* work is now a 'Class A' asbestos removal licence and a licence for bonded asbestos removal work is now a 'Class B' asbestos removal work licence under the *Work Health and Safety Regulation 2011*. Existing asbestos removal work licences will be converted to the equivalent asbestos removal licence class on renewal. Asbestos licences will be valid for 5 years.[61]

Under the WHS laws, *removal* of bonded asbestos materials of less than 10 square metres can be undertaken by an unlicensed person.[62] If workers, other than licensed removalists, are likely to be required to undertake work involving asbestos, employers must provide appropriate training in the identification and safe handling of asbestos.

Current Work Health and Safety regulations require workplaces to maintain an Asbestos Register detailing the location of all asbestos on site.[63]

Asbestos in the environment

The storage, transport and disposal of asbestos once it leaves a domestic premise or worksite is governed by the EPA and local councils under Part 4 the *Protection of the Environment Operations (Waste) Regulation 2005.* These revised regulatory requirements for managing asbestos waste were made under the *Protection of the Environment Operations Amendment (Schedule Activities and Waste) Regulation 2008*. The amendments introduced the following requirements.

- Waste must be stored on the premises in an environmentally safe manner.
- Bonded asbestos material must be securely packaged at all times.
- Friable asbestos material must be kept in a sealed container.
- Asbestos-contaminated soils must be wetted down.
- All asbestos waste must be transported in a covered, leak-proof vehicle.
- Asbestos waste must be disposed of at a landfill site that can lawfully receive this waste.
- It is illegal to dispose of asbestos waste in domestic garbage bins.
- It is also illegal to re-use, recycle or illegally dump asbestos products.[64]

Schedule 1 of the POEO Act generally requires waste disposal facilities that receive asbestos to be licensed.[65] Transporters of friable asbestos waste materials are *not* required

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61 Work Cover NSW http://www.workcover.nsw.gov.au/licensing/Licencesandcertificates/Asbestoslicensing/Pages/default.aspx

62 Section 487 of the *NSW Work Health and Safety Regulation 2011.*

63 No such requirement applies for private dwellings and there is no requirement for a purchaser or occupier of a residence in NSW to be informed where asbestos may be in a building.

64 http://www.epa.nsw.gov.au/waste/asbestos/

to be licensed under the POEO Act. Any transporters of asbestos waste must package the waste in accordance with the requirements of the Dangerous Goods Code (as implemented through the POEO Amendment Regulation 2008).

Other general provisions of the Act also apply such as the imposition of the waste levy to any asbestos received at a licensed waste disposal facility and penalties for illegal dumping.

The regulation does not allow the use, reuse or sale of any asbestos product.

Proposed changes compared to current regulation

The proposed changes to the waste regulation build on earlier reforms in 2005 and 2008 to improve the regulation of asbestos waste. The goals of these earlier reforms were to help protect the broader community from infection and health risks associated with clinical and asbestos waste.

The current reforms proposed to asbestos waste management seek to refine the earlier reforms by introducing a mechanism to better track the movement of asbestos waste with the aim of reducing illegal dumping of asbestos waste. Specifically, the proposed regulation introduces a requirement that any transporter and recipient of at least 80 Kg of asbestos waste to automatically provide information to EPA on the movement of the waste. This will impose additional record-keeping and reporting requirements on transporters and facilities which receive asbestos waste. Given that there are existing record-keeping and reporting requirements on these businesses, the additional costs are expected to be modest.

These changes place the onus on the *licensed* asbestos removalist at the generation site and the licensed facility that receives asbestos waste to separately log information in electronic form that will enable the EPA to track the waste. The goal is to reduce the incidence of illegal dumping of asbestos waste. While a reduction in illegal dumping of asbestos waste results in improved amenity value and a reduction in potential pollution of the environment, it is also aimed at reducing the risk posed to human health.

How big is the 'problem'?

Illegal dumping of asbestos waste has the potential to increase the exposure of the community to asbestos which increases the risk to the community of contracting asbestos related diseases. Even small levels of asbestos exposure can result in asbestos related diseases. Therefore, any small increases in the community's exposure to asbestos waste has the potential to significantly increase the risk to the community.

65 Clause 139(f) of Schedule 1 enables unlicensed regional landfills that receive less than 5 000 tonnes per year (and were in existence prior to 2008) to receive asbestos waste for disposal.

Extent of illegal dumping

The scale of illegal dumping of asbestos waste, however, is not well understood. There are a number of high profile incidents of illegal dumping that have been reported in the mainstream media:

- In 2012, 80 tonnes of asbestos material was dumped near homes in Sydney's South-West. The clean-up cost was reported to be $30,000 [66]
- In 2013, 100 kilograms of asbestos was left near a childcare centre at Belmore and there was another reported dumping incident at Bondi.[67]
- In 2013, 10 tonnes of asbestos contaminated building waste had been illegally dumped at a property in East Kurrajong.[68]

There were also incidents reported of Telstra contractors exposing workers and the public to asbestos during the rollout of the National Broadband Network.

While there are a number of high profile cases, there are no studies available that seek to estimate the scale of illegal dumping of asbestos currently occurring. However, the grants issued to local council's from the Environmental Trust for asbestos clean-up provide some indication of the potential problem.

Table 5.3 provides data on the grants provided to different councils over the past few years. This includes the council's costs (which may include the engagement of a contractor) of cleaning up and disposing the material at a landfill.

In total over the period 2009-2012 there were 139 applications for funding to clean-up asbestos that had been illegally dumped, 73 per cent of the requests came from Blacktown, Fairfield and Liverpool Councils. These figures provide a minimum known number of illegal dumping incidents. The extent of illegal dumping incidents beyond these known cases is unclear.

The average size of the grants was between $2000 to $3000 per incident. This includes the costs of engaging a contractor, having the material tested for the presence of asbestos, and the transport and tipping fee. The amount of material dumped in each instance will vary. For example, one dumping incident may include mixed waste from a demolition site with some asbestos fragments throughout; another may be more than 10 square metres of wrapped sheet asbestos.

The data provided by the EPA (summarised in the table 5.3) does not systematically indicate the quantity of asbestos being cleaned up. However, one example in Clarence Valley Council indicates that the cost to clean up one tonne of asbestos waste in December 2011 was $3195. This would imply between 16 to 44 tonnes of asbestos waste was dumped (and cleaned up) in each year between 2009-2012, an average of around

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66 http://www.abc.net.au/news/2013-04-04/asbestos-waste-dumper-gets-suspended-sentence/4609380

67 http://www.dailytelegraph.com.au/news/nsw/asbestos-dumpers-to-face-two-years-jail-as-sydney-mayors-ramp-up-the-hunt/story-fni0cx12-1226668424613

68 http://www.bigrigs.com.au/news/truck-driver-charged-over-illegal-asbestos-dumping/1897356/

30 tonnes per annum. Around 60 per cent of the dumping incidents included less than one tonne of asbestos waste.

In 2012-13, a reported 471 000 tonnes of asbestos waste was disposed in licensed landfills in the regulated and regional areas.[69] This suggests that a large amount of asbestos waste is already being legally disposed of in landfills. Despite this, even a small exposure to asbestos can result in asbestos related diseases.

5.3 Number of asbestos clean-up incidents receiving Environmental Trust grants

Name of offsetting account	2009	2010	2011	2012
BANKSTOWN CITY COUNCIL				1
BLACKTOWN CITY COUNCIL	15	4	4	4
CABONNE COUNCIL		1		
CLARENCE VALLEY COUNCIL				1
EUROBODALLA SHIRE COUNCIL		1		
FAIRFIELD CITY COUNCIL	7	10	3	2
FORESTS NSW	1	1		
HAWKESBURY CITY COUNCIL	1		5	2
HURSTVILLE CITY COUNCIL			1	
LAND & PROPERTY MANAGEMENT AUTHORIT			1	
LANE COVE COUNCIL			1	
LIVERPOOL CITY COUNCIL	9	27	11	6
OFFICE OF ENVIRONMENT AND HERITAGE	2	2	2	2
P & D ENVIROTECH PTY LTD		1		
PENRITH CITY COUNCIL		1		
RYDE CITY COUNCIL		1		
STRATHFIELD MUNICIPAL COUNCIL		2	6	
WILLOUGHBY CITY COUNCIL		1		
Total	**35**	**52**	**34**	**18**

Source: Environment Protection Authority, email 5 August 2013.

Exposure of the community

It is difficult to assess the risk posed to the community from the illegal dumping activities, as the extent of illegal dumping is not known with certainty. Nevertheless, the financial burden placed on the community (i.e. the taxpayer) can be extrapolated from the data above. The risk arises where there is some contact (i.e. inhaled asbestos fibres) between the dumped waste and the community. The extent to which the waste is dumped close to communities and places where the community visits (e.g. parkland) increases the risk of exposure. It would also depend on the type of asbestos (friable or non-friable) being

69 Information provided by NSW EPA.

illegally dumped and whether it is packaged in some way so as to limit the release of asbestos fibres.

Given that councils are actively identifying illegal dumping and cleaning up the problem, this suggests that there is less likely to be long term exposure to the communities in these areas. Illegal dumping in areas that are visible or frequently visited by the community are already being identified and the asbestos removed. Nevertheless, while the probability of contracting an asbestos-related illness from illegally dumped asbestos may be low, the cost to the community should this occur are high.

Potential benefits of proposed changes

The benefits of the proposed changes to the waste regulation arise from these changes lowering the risk of asbestos exposure to the community. This is expected to arise from a reduction in the quantity of illegal asbestos waste that is dumped in the environment where there is a chance of exposure to the community.

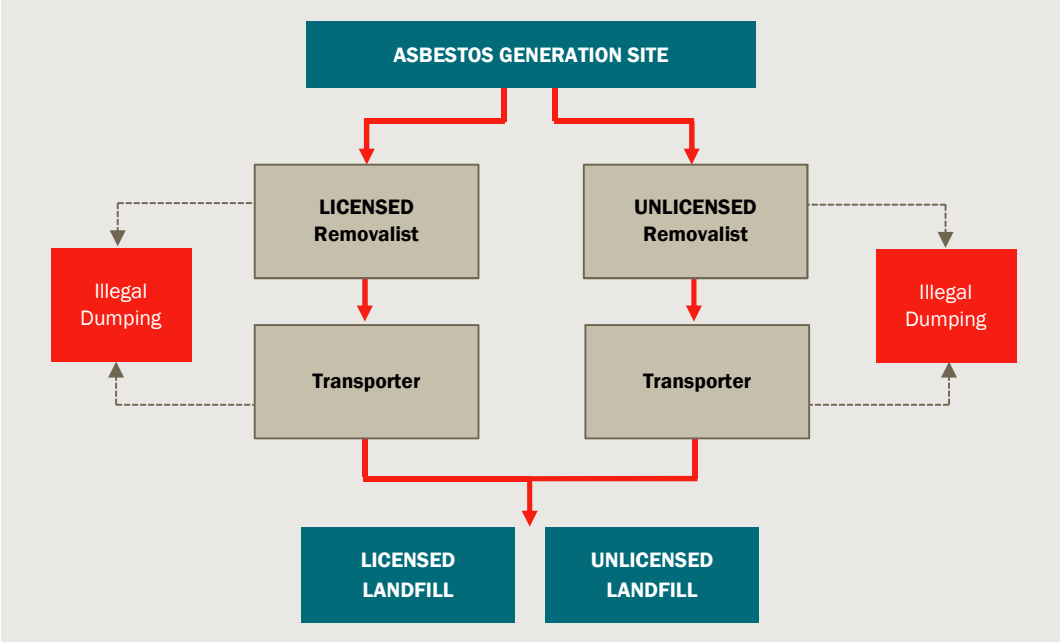
The proposed tracking system will enable the EPA to monitor whether the same quantities of asbestos are being reported at generation and disposal points. The EPA will therefore be able to identify discrepancies between the asbestos waste generated and subsequently disposed that suggest the waste has been illegally dumped by the transporter.

Chart 5.4 illustrates the different pathways whereby illegal dumping could occur. That is, it could be dumped by removalists (licensed or unlicenced including households) or transporters contracted by the removalist. Some proportion of asbestos waste is also likely to be intentionally (or unintentionally) disposed of in unlicensed landfills.

For the purposes of our analysis, the key distinction in chart 5.4 is that the proposed policy changes will need to be implemented through *licensed* removalists and *licensed* landfills.[70] The proposed introduction of the notification requirements in the waste regulation will likely only change the behaviour of the *licensed* removalists and *licensed* landfills. Unlicensed operators are already operating outside of the regulatory framework and are therefore unlikely to comply with the tracking requirements. To the extent that illegal dumping of asbestos waste arises from unlicensed removalists and their associated transporters, then the proposed changes may not have a significant direct impact on illegal dumping.

70 There are currently around 595 licenced removalists of non-friable asbestos waste and 52 licenced to remove friable waste. Between 36 40 landfills within the regulated area currently report receipt of asbestos material and 26-30 in the regional areas.

5.4 Pathways to illegal dumping



Data source: CIE

There is no data that allows us to estimate the proportion of illegal asbestos dumping that is undertaken through the different pathways.[71] However, based on anecdotal evidence it would appear that most of the illegal dumping is relatively small quantities and is being undertaken by unlicensed removalists and associated transporters. This is consistent with media reports of transporters that are unmarked – licensed removalists and their associated transporters commonly use their trucks to advertise their asbestos removal business.

Further, WorkCover NSW currently already requires a licenced person to provide a clearance certification for a site and undertakes random spot audits on removalists, including requesting information such as tipping receipts to be provided as evidence of quantity disposed. This provides a further disincentive for licensed removalists and associated transporters to undertake illegal dumping.

Given this we would anticipate that the potential benefits arising from the proposal to monitor asbestos waste removal via notifications by licensed operators are likely to be small. The quantum of illegal asbestos dumping by licensed operators is likely to be small, particularly in light of the existing regulatory regimes. Nevertheless, the proposed changes does provide an additional disincentive to illegally dump asbestos.

71 We understand that WorkCover NSW requires licensed removalists to notify WorkCover NSW of the location, type and quantity of asbestos being removed. This information was not available to us but it could provide further indication of the quantity of asbestos removed by licensed contractors and being disposed of at licensed landfills.

Potential costs of proposed changes

We anticipate that the costs of the new proposal are likely to be modest, so long as duplication with existing regulatory frameworks can be kept to a minimum. There are already notification requirements for licensed removalists under their obligations to WorkCover NSW. WorkCover NSW currently gathers information such as the address of the removal site, the date of removal, the quantity and type of asbestos removed. We understand that WorkCover NSW currently provides weekly notification information to the EPA.[72] WorkCover currently does not provide information to the EPA on the quantity of waste removed at the site but this information is already collected and could be readily provided to the EPA.[73] The additional cost of providing this information that is already provided to WorkCover to EPA as well is likely to be small.

On the disposal side the licensed landfill already collects information on the quantity of asbestos waste being disposed by the operator. Additional information would also be required to be collected such as the generation site of the material (e.g. a form from the licensed removalist may already provide this information) which may increase the time spent at the weighbridge gate per vehicle resulting in queuing and time costs to businesses.

There is also likely to be some additional effort by the EPA in collating and cross-checking information from the licensed removalists and landfills to identify any discrepancies. Currently WorkCover NSW receives notifications each year from licensed removalists. Automated spreadsheets could be readily established to collate and compare information.

Therefore, while there is some uncertainty regarding the size of the costs, given the existing systems already in place, we do not anticipate significant additional information will be required.

Conclusions

There are a range of mechanisms already in place in the existing waste regulation and the Work Health and Safety regulation that seem to manage the removal, storage, transport and disposal of asbestos waste. The proposed changes to the waste regulation seek to gather information at the removal site and disposal points in order to identify any illegal dumping of asbestos waste that may be occurring along the way.

The quantity of asbestos illegally dumped in NSW is not known but estimates suggest a minimum quantity in the order of 30 tonnes per annum. The risk posed to the community from illegal asbestos dumping is also not well understood.

The proposed changes may only be effective in relation to licensed removalists and licensed landfills. Both already have reporting obligations to WorkCover NSW and EPA. Therefore, any additional administrative costs of the proposal are likely to be modest. For

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72 Currently sent by WorkCover NSW to environmentnsw@nsw.gov.au

73 There may need to be some caution interpreting the data. We understand the licensed removalist may notify of this information on submission of a quote. There may be several operators that are quoting on the same job.

licensed removalists, the information required by the EPA under the proposal is likely to be similar to their existing obligations to WorkCover NSW. While EPA would may not be able to fully integrate their reporting requirements with the WorkCover system, the additional cost of reporting the same information to EPA as well as WorkCover are not likely to be significant.

However, the potential benefits of the proposal are not clear. While there is no detailed information on who is undertaking the illegal dumping of asbestos, anecdotal evidence and stakeholder views suggest that it more likely to be within the unlicensed sector, including unlicensed removalists (including households). The proposal will likely only have a significant bearing on any illegal activity being undertaken by licensed removalists and associated transporters. To this extent it is unlikely that the proposal will significantly reduce illegal dumping.

Given the uncertainty regarding the potential benefits, it is not clear whether the proposed changes will result in net benefits to the community. To the extent that there is some illegal dumping by licenced removalists and associated transporters and the costs of the proposed system are minor, the proposal can be expected to deliver a net benefit to the community, albeit a small one.

No regulation compared to current regulation

An alternative option is the removal of the provisions of the regulation related to the management of asbestos waste. In the absence of the regulation, however, there are no changes to the requirements relating to the handling and storage of asbestos waste at worksites imposed under the current provisions of the *Work Health and Safety Regulation 2011.* The main impact, therefore, would arise from the removal of the requirements relating to the storage, transport and disposal of asbestos once it leaves a domestic premise or worksite.[74]

These changes could be expected to reduce the operational costs of asbestos management through a number of avenues:

- a reduction in the packaging material required for asbestos waste during transportation and the labour time to package the materials;
- a reduction in the tipping fees and transportation costs of licensed waste facilities compared to unlicensed waste facilities.

In its assessment of the amendments to the 2005 Regulation, the NSW EPA previously estimated that the cost of transporting friable asbestos waste was around $1.07 million dollars per annum (in 2008 dollars), based on the industry transporting asbestos waste in drums or lined skips. The costs would be closer to $4 million per annum if the waste was instead required to be transported in 25 kilogram bags.

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74 We have assumed that the removal of the Regulation will have limited impact on illegal dumping. The penalties for illegal dumping are specified in the legislation and more stringent penalties for illegal dumping and removal of the 'exclusion provision' under the Act as being currently considered. The removal of the Regulation will, therefore, have no bearing on the penalty regime.

However, as noted earlier, many transporters of asbestos waste must package the waste in accordance with the requirements of the Dangerous Goods Code, an industry approved code of practice.

The Dangerous Goods (Road and Rail Transport) Regulation 2009, administered by Environment and Protection Authority and WorkCover NSW, adopts uniform national requirements for the transport of dangerous goods including the requirements of the Australian Dangerous Goods Code. Asbestos is categorised by the Code as a Class 9 dangerous good and is subject to special provision 168 which states:

> Asbestos which is immersed or fixed in a natural or artificial binder (such as cement, plastics, asphalt, resins or mineral ore) in such a way that no escape of hazardous quantities of respirable asbestos fibres can occur during transport is not subject to this Code. Manufactured articles containing asbestos and not meeting this provision are nevertheless not subject to this Code when packed so that no escape of hazardous quantities of respirable asbestos fibres can occur during transport.[75]

Therefore, it is not clear the extent to which industry practices in regards to transporting of asbestos will change if the regulation is removed.

If, however, there was a substantial change in industry practices then the removal of these provisions in the regulation related to asbestos waste could be expected to increase the risk of to the community of contracting asbestos related diseases. Again, there is limited information available that would allow us to assess how the risk to human health and the environment of asbestos related diseases from any changes in transportation practices or disposal to licensed compared to unlicensed waste facilities.

Nevertheless, there are significant health risks associated with inhalation of even minute quantities of asbestos. Therefore, while the probability of contracting asbestos related diseases is low the cost is high (if contracted). Some recent estimates related to Chrysotile Asbestos, for example, estimate treatment costs to be around $667 000 per person (for lung cancer and mesothelioma) and $182 200 (for asbestosis). In addition to this there is also the costs of death which have been estimated by various academic studies to be between $1.5 million to $6.1 million.[76]

While there is limited data to estimate the changes to the operational costs for the asbestos related waste sector and the risks to human health from contracting asbestos related diseases, the analysis above suggests that where operational costs associated with complying with the current regulation are low there is likely to be a significant payoff to society from small reductions in the risks to society.

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75 NSW Government (2011) Asbestos Blueprint A guide to roles and responsibilities for operational staff of state and local government, Nov, p18.

76 National Occupational Health and Safety Commission (2001), Regulatory Impact Statement of the proposed phase out of chrysotile asbestos, p.p. 13-14.

Waste tyres

Under the POEO Act tyre retailers, tyre retreaders and waste tyre transporters are all responsible for ensuring that tyres are transported to a place that can lawfully accept them. They must keep accurate written records to prove that this has occurred.

Waste tyres are specified as special waste. However, unlike for asbestos and clinical waste, there are currently no specific regulations relating to waste tyres.

Nature and size of the problem

An estimated 12.6 million equivalent passenger units (EPUs, a standardised measure of the quantity of tyres) reached the end of their productive lives in NSW in 2009-10.[77] The destination of more than 60 per cent of waste tyres across Australia is unknown.[78]

Over the past five years, the EPA has undertaken six operations relating to waste tyres. These operations have uncovered enough evidence to suggest that problems associated with waste tyres are potentially significant. In total, these operations have led to the following.

- Identification of 26 unlicensed waste tyre facilities
- Identification of 5 unlawful facilities, which were closed
- 12 warning letters
- 10 penalty notices
- 12 clean-up notices.

More generally, these operations have revealed that many tyre retailers and waste tyre processing facilities are unaware of their statutory obligations.

Illegal dumping

One form of unlawful activity in relation to waste tyres is illegal dumping. There is no reliable information readily available on the quantity of waste tyres illegally dumped in NSW. Between 2012 and April 2014, EPA received 28 reports of illegally dumped waste tyres in private property, including farms, pasture and rural areas (including waterways and remote bushland tracks). This implies around 12 reports of illegal dumping of waste tyres per year. If there were (say) 10 tonnes of tyres collected for each report, this implies around 120 tonnes of waste tyres reported per year. At a clean-up cost of $323 per tonne (see chapter 2), this suggests that the clean-up costs for illegally dumped tyres could be in the order of $38 760 per year or around $291 000 in present value terms over ten years (using a discount rate of 7 per cent).

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77 Hyder, 2012, *Study into domestic and international fate of end-of-life tyres: Final report*, Prepared for the COAG Standing Council on Environment and Water, p. 12.

78 Hyder, 2012, *Study into domestic and international fate of end-of-life tyres: Final report*, Prepared for the COAG Standing Council on Environment and Water, p. 32.

However, this estimate is likely to significantly understate the true volume of tyres dumped because many more dumping sites may be reported to the local council rather than the EPA, or go unreported.

There have been various estimates of the proportion of tyres that are illegally dumped. However, the basis for these estimates are not adequately explained.

- A submission by the Australian Tyre Recyclers Association (ATRA) to the Productivity Commission Inquiry reported that around 10 per cent of waste tyres are illegally dumped. However, the ATRA also noted that this is not considered a reliable estimated and is undoubtedly overstated.[79] Based on the estimated 12.6 million (in EPU terms) waste tyres generated in NSW every year,[80] this implies that less than 1.26 million tyres would be dumped in NSW annually.
- URS (2006) reported that in total around 14 per cent of all waste tyres are estimated to be illegally dumped.[81] The Productivity subsequently weighted this estimate on EPU terms to estimate that around 9 per cent of total tyres are dumped in EPU terms. This implies that around 1.14 million waste tyres could be dumped in NSW annually in EPU terms.
- The Boomerang Alliance reports that nationally, around 2.9 million out of more than 48 million tyres are illegally dumped or landfilled on unlicensed sites per year (also in EPU terms). This implies that less than 6 per cent would be illegally dumped, or less than 762.5 Kt in NSW.[82]

We previously estimated that the clean-up costs associated with illegally dumped waste is around $323 per tonne (in 2013 dollar terms). Based on the various estimates outlined above, the total clean-up costs associated with illegally dumped tyres could vary between $0.04 million and $3.23 million per year (table 5.5)

5.5 Estimates of the annual clean-up costs for illegally dumped tyres

Source	Share	Implied number	Implied weight	Implied clean-up cost
	Per cent	EPUs	Tonnes	$ million
Illegal dumping reports to EPA	n.a.	n.a.	120	0.04
ATRA	10	1 262 099	10 010	3.23
Productivity Commission based on URS	9	1 135 889	9 009	2.91
Boomerang Alliance	6	762 518	6 048	1.95

Source: CIE estimates.

79 Australian Tyre Recyclers Association, *Submission to the Productivity Commission Inquiry into Waste Management*, 8 February 2006, p. 4.

80 Hyder, 2012, *Study into domestic and international fate of end-of-life tyres: Final report*, Prepared for the COAG Standing Council on Environment and Water, p. 12.

81 URS, *Market Failure in End-of-life Tyre Disposal*, Prepared for the Department of Environment and Heritage, 8 September 2006, p. 3-7.

82 Boomerang Alliance, *Put the Brakes on Toxic Tyres: Waste Tyre Overview*, Fact Sheet, September 2013, p. 1.

Tyre fires

Another risk to human health and safety and the environment associated with waste tyres relates to fires. Excessive stockpiling or illegal dumping of tyres can create a fire hazard. Burning tyres are a direct threat to human safety and property and emit a range of toxins, including particles, dioxins, polyaromatic hydrocarbons and volatile organic compounds. Burning tyres can also cause a range of short-term health effects, such as eye, nose and throat irritation, asthma attacks and other respiratory problems.

Tyre fires can also be difficult to extinguish and therefore costly to control. Atech Group (2001) estimated the cost of fighting three actual tyre fires (table 5.6). These costs ranged from $4050 (or $5600 in 2013 dollars) for a fire in a pile of tyres, up to around $0.8 million (or $1.1 million in 2013 dollars) for a major fire in a tyre dump.[83]

5.6 Cost of fighting tyre fires

	Cost (2001)	Cost (2013)
	$	$
Fire A[a]	4 050	5 617
Fire B[b]	129 600	179 747
Fire C[c]	813 600	1 128 410

[a] Tyre pile was 35 metres by 100 metres and 3-4 tyres deep. The fire burned for 5 hours and required 15 fire fighters to control it. [b] Fire B was in an A-frame building 15 metres by 20 metres by 6-7 metres high was filled with tyres and tyres were also stacked 20 metres in front and 5 metres to the side. The fire burned for 20 hours and required 120 fire fighters to control it. [c] Fire C was at a tyre dump 80 metres by 150 metres by 12 metres high. The fire burned for 60 hours and required 288 fire fighters to control it.

Source: Atech Group, *A National Approach to Waste Tyres*, Appendix 1: Unctrolled Tyre Fires, Prepared for Environment Australia, June 2001, pp. 1-2; ABS; The CIE.

The Boomerang Alliance reports that in NSW, the Fire Service has identified 322 fires involving tyres over the past five years, implying around 65 tyre fires per year.[84] However, the Boomerang Alliance does not reference the source document for this information. Information provided to the EPA from the NSW Fire Brigades suggests that between 2010 and April 2014, there were 40 fires for which tyres were the ignition source. This implies around 9-10 tyre fires per year. This suggests the annual cost of tyre fires could range anywhere between around $50 000 and $10.5 million per year.

Mosquito-borne illnesses

Waste tyres can also provide a breeding ground for mosquitoes. In particular, the Boomerang Alliance claims that poor management of waste tyres is a significant factor behind the spread of dengue fever. While dengue fever has previously been detected in NSW, it is not currently considered a dengue fever area.[85]

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[83] Atech Group, *A National Approach to Waste Tyres*, Appendix 1: Uncontrolled Tyre Fires, Prepared for Environment Australia, June 2001, pp. 1-2

[84] West, D. and Lazzaro, A., *Put the brakes on toxic tyres*, Boomerang Alliance, 24 June 2014, p. 3.

[85] NSW Health website, http://www.health.nsw.gov.au/Infectious/factsheets/Pages/Dengue.aspx, accessed 8 September 2014.

Options for addressing the problem

Before we consider options for addressing the problems caused by waste tyres, it is important to understand existing efforts to address them and other proposals that affect waste tyres.

The EPA already undertakes a range of enforcement and education operations relating to waste tyres. This has included: enforcement activities, such as inspections and audits, which has resulted in multiple warning letters, clean-up notices and penalty notices (see above); as well as education activities, such as information nights, issuing a waste tyre brochure means and sending letters reminding stakeholders of their obligations.

As discussed previously, the licensing threshold for waste tyre storage and processing facilities has been reduced from 50 tonnes or 5000 tyres to 5 tonnes or 500 tyres as part of the changes to the waste levy collection arrangements. These facilities will also incur a waste levy liability. These proposed changes were addressed in chapter 2.

In addition, a voluntary Tyre Product Stewardship Scheme recently commenced operation (box 5.7).

5.7 The Tyre Product Stewardship Scheme[86]

The Tyre Product Stewardship Scheme commenced operation on 1 July 2014. This a voluntary scheme funded by a 25 cent levy (per EPU) on the sales of new tyres sold by participating tyre companies. It is designed to increase resource recovery and recycling and to minimise the environmental, health and safety impacts of all end-of-life tyres generated in Australia; and develop Australia's tyre recycling industry and markets for tyre derived products.

This will be achieved through the establishment of:

- Tyre Stewardship Australia, a body responsible for administering the scheme and for removing impediments to the development of a sustainable domestic tyre recycling industry
- a series of commitments requiring participants in the scheme to play their part in ensuring end-of-life tyres are disposed in a way that represents environmentally sound use. Compliance with the commitments made by individual organisations through participation in the scheme will be enforced through random and risk-based audits
- enterprise to enterprise agreements or contractual arrangements between individual businesses and organisations, which give effect to industry wide commitments
- a tyre stewardship fund used to support the activities of the scheme and for investment in research and development for new technologies and market development
- performance measures and targets.

86 Tyre Stewardship Australia, Tyre Product Stewardship Scheme: Guidelines, 17 August 2012, p. 8.

Proposed changes to the current regulations

In addition to lowering the licensing threshold for waste tyre storage and processing facilities, the Government is also proposing to implement a waste tyre tracking system, similar to the tracking systems for asbestos and clinical waste through the remade waste regulations. Under this tracking system consignors, transporters and receivers would be required to report details to the EPA for movements of at least 20 tyres or 200 Kg of waste tyres.

Other options

NSW Government Guidelines require consideration of a 'do nothing' option. Here we assume that the 'do nothing' option means that the changes to the regulation of waste tyre storage and processing facilities will be implemented (see chapter 2) and that existing compliance and enforcement measures and the Tyre Product Stewardship Scheme will continue.

Since a range of non-regulatory and quasi-regulatory approaches to achieving the objectives are already occurring, no other options have been considered here.

Impact of the proposed regulations

The impact of changes to the waste levy collection arrangements, including lower licensing thresholds, was addressed in chapter 3. The question here is what incremental impact a waste tyre tracking system woul have on top of the impact of the proposed changes to the waste levy collection arrangements.

Potential costs of a waste tyre tracking system

Compared to asbestos, there is much less existing regulation of waste tyres. The tracking system will therefore impose *additional* record-keeping and reporting costs on consignors, transporters and recipients, as well as additional costs on the EPA. Since the tracking system is yet to be developed, the associated costs are not yet clear.

Nevertheless, the Atech Group (2001) estimated the costs associated with a national waste tyre tracking system, based on the system that operated in South Australia at that time. The Atech Group estimated that the cost of developing South Australia's paper-based waste tyre tracking system was around $120 000 (or around $166 000 in 2013 dollars).

The compliance costs associated with the South Australian waste tyre tracking system were estimated at around $67 000 per year based on 40 000 Waste Tracking Forms (WTFs) at a cost of $1.67 per WTF. This estimate assumed it would take four minutes to complete and handle each WTF at a gross wage of $25 per hour. No extra cost associated with counting tyres for the WTF were included because stakeholders are required to collect this information already.

Based on this information, Atech Group estimated that the compliance cost would be around $0.17 per tyre ($0.24 per tyre in 2013 dollars). The enforcement costs imposed on EPA were estimated at an additional $0.02 per tyre ($0.03 per tyre in 2013 dollars). This

implies that the cost of a paper-based tracking system similar to the South Australian system could be around $3.3 million per year for NSW.

Based on the above information, the costs associated with a paper-based waste tyre tracking system for NSW could be around $20.4 million in 2013 dollar present value terms over ten years (assuming the scheme began operating in the second year), using a discount rate of 7 per cent.

However, EPA is proposing an electronic tracking system, rather than the paper-based system. This is likely to cost more to develop, but would be much more efficient to operate. It is also likely that the additional cost of a waste tyre tracking system would be greater than for the asbestos tracking system because there are already reporting requirements relating to asbestos, but not tyres.

As an indication of the potential costs of the proposed waste tyre tracking system, we assume:

- the development costs are around $100 000 more than indicated above
- the compliance costs on industry are around one quarter of those indicated above
- the administration costs for EPA are around $25 000 per year, in line with the costs associated with administering the existing waste tracking system.

Based on these assumptions, the proposed waste tyre tracking system could:

- impose an upfront cost of around $266 000 on EPA to develop the system, plus an additional $25 000 per year to administer it
- impose annual compliance costs on industry of around $744 000.

In present value terms, the total cost of the proposed system could be around $5.3 million over ten years, using a discount rate of 7 per cent (table 5.8).

5.8 Potential costs of a alternative waste tyre tracking system for NSW

Cost item	Paper-based system	Electronic system
	$	$
Upfront costs		
System development costs	166 432	266 432
Annual costs		
Compliance costs on industry	2 975 762	743 941
Administration costs for EPA	350 090	25 000
Total	**3 325 852**	**768 941**
Net present value estimates[d]		
Industry	19 387 781	4 846 945
EPA	2 447 348	429 313
Total	**21 835 129**	**5 276 258**

[a] Assumes that an electronic system would cost an additional $100 000 to develop. [b] Compliance costs for industry under an electronic system are assumed to be around one-quarter of a paper-based system. [c] Assumed to be $25 000 per year, based on the administration costs for the existing waste tracking system. [d] Estimated over ten years, using a discount rate of 7 per cent.

Source: CIE estimates based on Atech Group, *A National Approach to Waste Tyres*, Prepared for Environment Australia, June 2001, pp. 26-28.

Potential benefits of a waste tyre tracking system

Lowering the licensing threshold will bring more waste tyre storage and processing facilities under the regulatory framework. These facilities will also incur a waste levy liability, which means that there will already be additional record keeping and reporting requirements. This is likely to reduce the opportunity for these facilities to dump waste tyres illegally, even without the additional tracking requirements.

We would also expect that bringing more tyre storage and processing facilities under the regulatory framework would lead to better compliance with the NSW Fire Brigades *Guidelines for Bulk Storage of Rubber Tyres*.[87] The Boomerang Alliance notes that there has not been a single fire incident at a licensed tyre recycler's facility in NSW over the past five years.[88] It is therefore likely that tighter regulation of tyre storage and processing facilities will reduce the number and/or severity of tyre fires.

Changes to the waste levy collection arrangements are likely to reduce illegal dumping by storage and processing facilities and tyre fires, even without a waste tyre tracking system.

The main advantage of a waste tyre tracking seems to be that it could prevent illegal dumping that may occur by transporters of waste tyres.

- Changes to the licensing arrangements for waste tyre storage and processing facilities do nothing to prevent unscrupulous individuals from collecting the tyres from a retailer and then dumping them illegally (or taking them to an unlicensed facility) without the retailer's knowledge, rather than taking them to a licensed storage, processing or disposal facility.[89]
- A waste tyre tracking system could make such activities easier to uncover. The retailer would report that the tyres had been collected, but there would be no record of the tyres arriving at a licensed facility.

However, a waste tracking system (or tighter regulation of waste tyre storage or processing facilities) would not prevent the retailer from illegally dumping any waste tyres collected, or colluding with the transporter.

In addition, the Tyre Product Stewardship Scheme could potentially address some of the above issues, without the need for a tracking system. In particular, under the Tyre Product Stewardship Scheme, participating retailers commit to:

- deal only with collectors and recyclers accredited by Tyre Stewardship Australia when disposing of end-of-life tyres; or
- where dealing with a non-accredited collector, ensure contractual arrangements specify that all end-of-life tyres are provided to an accredited tyre recycler for environmentally sound use.

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87 NSW Fire Brigades, 2009, *Guidelines for Bulk Storage of Rubber Tyres*, Policy No. 2.

88 West, D. and Lazzaro, A., *Put the brakes on toxic tyres*, Boomerang Alliance, 24 June 2014, p. 5.

89 While tyre retailers are legally responsible for ensuring waste tyres are transported to a facility that can legally accept them, EPA compliance and enforcement activities have shown that many retailers are unaware of their statutory responsibilities.

Break-even analysis

Estimating the incremental impact of the waste tyre tracking system on illegal dumping and tyre fires, over and above the impact of changes to the waste levy collection arrangements and the Tyre Product Stewardship Scheme is difficult. Instead, we undertake a break-even analysis.

Specifically, we estimate the annual quantity of waste tyres the waste tyre tracking system would need to prevent for the benefits to break-even with the costs estimated above. We focus on illegal dumping, rather than tyre fires because the risk of tyre fires relates more to the way that tyres are stored; waste tyre storage issues are addressed more effectively through the proposed changes to the licensing arrangements for waste tyre storage and processing facilities, rather than through the waste tyre tracking system (although to the extent that illegally dumped tyres are a fire risk, the waste tyre tracking system may have some impact on the number of tyre fires).

Based on clean-up costs associated with illegal dumping of around $323 per tonne estimated previously, the waste tyre tracking system would need to reduce the quantity of waste tyres illegally dumped by around 2507 tonnes per year (from the second year onwards) for the benefits of the tracking system to match the costs. This is based on a ten year period using a discount rate of 7 per cent. This is the equivalent of around 316 000 tyres (in EPU terms).[90]

This implies that:

- the waste tyre tracking system is likely to deliver a net benefit to the community if it reduces illegal dumping of waste tyres by more than around 2500 tonnes
- the waste tyre tracking system is likely to impose a net cost on the community if it reduces illegal dumping of waste tyres by less than around 2500 tonnes.

Conclusion

Several reports suggest that the illegal dumping and unsafe storage of waste tyres could impose significant costs on the community. The magnitude of these costs are not known with any certainty, but the information available suggests it could be several million dollars per year in NSW.

The EPA has proposed a tracking system to address these issues relating to waste tyres. The question is whether a waste tyre tracking system is needed in addition to:

- proposed changes to the regulation of waste tyre storage and processing facilities
- the voluntary Tyre Product Stewardship Scheme that began operation in July 2014.

Our estimates suggest that the costs of a waste tyre tracking system could be in the order of $5.3 million in present value terms over ten years (using a discount rate of 7 per cent).

For the benefits of the waste tyre tracking system to outweigh these costs it would need to prevent around 2500 tonnes of tyres per year from being illegally dumped, in addition to any reductions achieved through other recent measures. This is in the range of 20-30 per cent of

[90] This is based on a conversion factor of 7.9 Kg per EPU.

the estimated total volume of waste tyres currently illegally dumped in NSW (although the robustness of these estimates are not clear).

Given that there are other measures to address the problems caused by waste tyres that have either been recently implemented or are likely to be implemented in the near future, it may be preferable for the EPA to wait and see whether these measures are sufficient to address the problem before imposing additional compliance costs on businesses.

6 Prohibition against using certain waste for growing vegetation

Contribution to objectives of the waste regulation

Part 5 of the *Protection of the Environment Operations (Waste) Regulation 2005*, setting out the prohibition against using certain waste for growing vegetation, commenced in December 2005.

The objective of Part 5 of the waste regulation is to minimise the potential for adverse environmental and human health impacts associated with the application of certain waste to land for the purpose of growing vegetation. This includes protection of agricultural land, produce and the environment from contamination by the inappropriate application of potentially harmful wastes to land.

What is covered?

Waste specified as residue waste is not to be applied to land that is used for the purpose of growing vegetation. The regulation specifies residue waste as:

- fly ash or bottom ash from any furnace
- lime or gypsum residues from any industrial or manufacturing process
- residues from any industrial or manufacturing process that involves the processing of mineral sand
- substances that have been used as catalysts in any oil refining or other chemical process
- foundry sands and foundry filter bag residues
- residues from any industrial or manufacturing process, that involves the refining or processing of metals or metallic products
- any substance that is hazardous waste or restricted solid waste.

The EPA has identified the above substances as higher risk wastes when used for the purpose of growing vegetation.

Clause 46 of the regulation enables the EPA to grant an exemption where the person or business wanting to use the waste can clearly demonstrate that it will be beneficial to growing vegetation and will not harm the environment, human health or agriculture.[91]

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91 NSW EPA, *Residue Waste: Frequently Asked Questions*. http://www.epa.nsw.gov.au/waste.residue/rwfaq.htm

Rationale for the regulation

In the absence of Part 5 of the regulation, there may be a risk of harm to the environment, agriculture or human health from the application of residue waste to land for the purpose of growing vegetation. NSW EPA notes that while incidents of potential harm are not frequent, there have been instances where potentially harmful wastes such as solvents have been mixed with organic waste and applied to land as 'fertiliser'.[92]

The risk of harm depends on the type and extent of contaminants present in the residue waste. The risk is also dependent on the concentration or rates of application. For instance, components of residue waste which may be beneficial for growing vegetation may also be harmful at certain concentration levels. [93]

Base case

Under the base case the current regulation prohibiting the application of certain waste to land for the purpose of growing vegetation will lapse.

Implications for industry

Industry will have discretion to assess whether or not there is likely to be harm to the environment or human health from the proposed re-use of residue wastes. The main benefit for industry is the flexibility to manage production inputs to minimise both disposal costs of residue wastes and alternative input costs.

This option does pose risks to the protection of human health and the environment if industry does not adequately determine and adhere to an appropriate level of environmental risk.

Implications for the community

In the absence of the regulation, there is a risk of harm to the environment, agriculture or human health from inappropriate application of residue waste to land for the purpose of growing vegetation. The extent of this impact on the community will depend on the prevalence and severity of incidents and the cost of an incident on community, whether through additional human health or environmental costs.

Implications for government

There is evidence of non-compliant operators within the waste industry who attempt to avoid the waste levy and other costs. Non-compliant behaviour will impose costs on

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92 NSW EPA, *Residue Waste: Frequently Asked Questions*. http://www.epa.nsw.gov.au/waste.residue/rwfaq.htm

93 NSW EPA, *Residue Waste: Frequently Asked Questions*. http://www.epa.nsw.gov.au/waste.residue/rwfaq.htm

government relating to investigations and remediation efforts from incidents causing potential harm to the environment or human health.

Conversely there will be administrative cost savings for government from not being required to regulate the use of residue waste for the purpose of growing vegetation.

Impacts of remaking the current waste regulation

The alternative option to the base case is to remake this component of the current regulation with no amendments. This option applies a risk management approach in the absence of sufficient information to set acceptable limits for all potential contaminants.

Implications for industry

Remaking the current regulation imposes costs on industry relating to the restriction of re-using waste and instead having to face disposal charges. The cost to industry is the disposal cost (gate fee, inclusive of waste levy where applicable) applied to the total quantity of residue waste that is deferred to landfill instead of used for the purpose of growing vegetation.

There is also a cost imposed on industry when applying for and complying with an exemption, as the onus is on the proponent to demonstrate the use of the residue waste is of benefit to growing vegetation and does not cause harm to the environment, agriculture or human health. On average there is one application for a resource recovery exemption per year that is applicable to residue waste.[94]

When applying for an exemption, a proponent will incur costs related to the application including testing and identification of contaminants in the residue waste, outlining proposed application rates that do not adversely affect soil health, and identifying any risk to animal health from exposure to or ingesting residue waste materials and demonstrating how such risks will be minimised. The cost of an application would be approximately $10 000, however this cost is variable and dependent on the type and variability of the waste, and whether the application is completed by the applicant themselves or outsourced to a consultant.[95]

After an exemption is granted, the proponent may need to meet ongoing reporting and testing conditions. It is assumed that the cost to industry to apply and comply with an exemption, per tonne of residue waste, is less than the disposal cost plus the cost of the alternative material applied to land, otherwise the waste would be disposed of regardless.

Implications for the community

Under the current regulation the community avoids potential environmental and human health costs resulting from contamination of land and produce.

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94 Information provided by NSW EPA.

95 Information provided by NSW EPA.

Implications for government

The exemptions provide a mechanism to align the environmental risk of the material with its appropriate use. One of the primary costs to the NSW Government associated with the proposed amendments is due to the administrative efforts of preparing and assessing exemptions relating to residue waste.

Conclusion

A qualitative assessment of the costs and benefits of remaking the current regulation relative to the base case is detailed in table 6.1.

6.1 Qualitative assessment of costs and benefits of remaking current regulation relative to base case

Costs	Benefits
Increased disposal costs to industry and potentially increased cost of inputs used instead of residue waste.	Avoided risk of harm to the environmental and human health
Increased cost to apply for and comply with an exemption from the EPA.	Avoided costs to government relating to investigations and remediation efforts from illegal incidents.
Additional administration costs to government to assess exemption applications	

Source: CIE.

With the information available, the preferred option is to remake the regulation as it currently stands due to the fact that the costs of the regulation are minimal, whilst the benefit, from avoided risk of harm to the environment and human health, is potentially large.

7 Recycling of consumer packaging

Part 8 of the proposed waste regulation effectively require a 'brand owner' of a product who has a turnover of more than $5 million and is not a signatory to the Australian Packaging Covenant to meet targets set by the EPA relating to the following.

- The recovery of material used in packaging products — the target set by EPA is currently 70 per cent of all material used in packaging
- Review of packaging design — the EPA has set a target of 100 per cent of new packaging and 50 per cent of existing packaging to be reviewed using the Sustainable Packaging Guidelines. These targets are to be achieved by June 2015.

Part 8 of the proposed regulation also:

- requires 'brand owners' to prepare a waste action plan — this is required to set out:
  - a baseline on the current performance in respect of the use, recovery, re-use and recycling of materials used in packaging
  - how the targets set by EPA will be met
  - how the brand owner will ensure a continuous reduction in the number of packaging items in the litter stream
- imposes a number of record keeping requirements on brand owners.

Fines can be imposed for non-compliance.

Background

The national regulatory framework for packaging is described as a co-regulatory model because it involves a combination of industry self-regulation and government regulation. The key elements of this model are:

- The Australian Packaging Covenant (APC) — this is the voluntary component of the co-regulatory model. The Australian Packaging Covenant is a voluntary agreement between companies in the supply chain and all levels of government to reduce the environmental impacts of consumer packaging by:
  - designing packaging that is more resource efficient and more recyclable;
  - increasing the recovery and recycling of used packaging from households and away-from-home sources; and
  - taking action to reduce the incidence and impacts of litter.[96]
- The National Environmental Protection (Used Packaging Materials) Measure (2011) — while participation in the APC is notionally voluntary, non-signatory 'brand

[96] Australian Packaging Covenant, p. 4.

owners' with a turnover of more than $5 million are subject to the NEPM enforcement provisions, which the NEPM requires state governments to legislate and enforce. The proposed regulation is the NSW Government's legislation to give effect to the NEPM. According to the Used Packaging Material Consultation RIS, the NEPM provides protection to brand owner Covenant signatories against 'free riders'.[97]

However, as noted by the Productivity Commission, describing the self-regulatory component of a co-regulatory model — in this case the APC — as voluntary is misleading because the only other option for individual firms is to 'volunteer' for government regulation.[98]

The APC (formerly the National Packaging Covenant) and the NEPM have been periodically subjected to national-level RISs. For the NEPM, this most recently occurred in 2010. This RIS essentially considered only two substantially different options:

- Implementation of the APC without the NEPM (i.e. the non-regulatory option)
- Implementation of the APC, supported by the NEPM (the RIS considered three variations on this option).

The RIS concluded that the regulatory approach was preferred because the government objectives of efficient and effective arrangements to reduce the environmental impacts of packaging and address community expectations for increased resource recovery would be unlikely to be met under voluntary arrangements.[99] However, the RIS did not estimate any benefits or costs. It did not therefore establish that the regulation is consistent with best practice regulatory principles.

While Part 8 of the regulations are part of a national system for dealing with used packaging, it should nevertheless be subjected to scrutiny under the NSW Government's regulatory impact statement process to ensure it is in the best interests of the NSW community.

Need for government action

What are the market failures?

Government intervention is typically only warranted when there is some form of market failure. According to the most recent national-level RIS for the used packaging NEPM:

> "Government action is needed because the price signal driving a reduction in the contribution of packaging in Australia's waste stream or to deliver against the objectives of the National Waste Policy is incomplete. In the absence of government intervention the external and

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97 Environment Protection and Heritage Council, *Decision Regulatory Impact Statement: Used Packaging Materials*, 18 June 2010, p. 1.

98 Productivity Commission, 2006, *Waste Management*, Inquiry Report No. 38, p. 263.

99 Environment Protection and Heritage Council, *Decision Regulatory Impact Statement: Used Packaging Materials*, 18 June 2010, p. 2.

> environmental and social costs associated with packaging are not fully represented in the costs incurred by producers or consumers. There is therefore limited incentive for producers or consumers to influence the quantity and design of packaging or to reduce waste. Information asymmetries also exist for both consumers and producers. There is inadequate information available for producers and consumer to make good decisions about packaging."[100]

The key market failure that extended producer responsibility (EPR) schemes such as the co-regulatory arrangements are trying to address seems to be that neither the producer nor the consumer bear the costs of disposing of used packaging. This reduces the incentive for:

- producers to minimise packaging or to design packaging in a way that minimises disposal costs
- consumers to consider the cost of disposing of packaging in their consumption decisions or to dispose of their packaging in a way that minimises the cost to the community.

In the absence of government intervention, consumers and producers are unlikely to consider any of the costs associated with waste disposal. According to the OECD, EPR is 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. There are two related features of EPR policy:

- the shifting of responsibility (physically and/or economically; fully or partially) upstream toward the producer and away from municipalities
- to provide incentives to producers to incorporate environmental considerations in the design of their products.

A closely related class of policy instruments are product stewardship (PS) schemes. The Environment Protection and Heritage Council defined PS as:

> As an approach which recognises shared responsibility for the environmental impacts of product throughout its full life cycle, including end of life management, and seeks to reduce adverse impacts and internalise unavoidable costs within the product price, through action at the point(s) in the supply chain where this can be most effectively and efficiently achieved.[101]

While there is no price signal to encourage producers or consumers to consider waste disposal costs in their decisions in the absence of regulation, there are nevertheless incentives to recycle used packaging further down the chain. The cost of household waste disposal is usually borne by local government. If the net cost of recycling household packaging waste is less than the cost of sending it to landfill, councils have an incentive to recycle.

The RIS also appears to be arguing that an additional market failure is that councils (and businesses that pay for their own waste disposal) may not consider the environmental and social costs associated with landfill. However, government agencies are much more likely to take into account environmental and social costs when making their decisions

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100 Environment Protection and Heritage Council, Decision Regulatory Impact Statement: Used Packaging Materials, 18 June 2010, p. 2.

101 EPHC 2004, p. 18 referred to in PC, p. 261.

than private sector agents. If the landfill is located in the local government area, it seems likely local government would take into account the associated environmental and social costs. It is however, possible that businesses responsible for their own waste disposal may not consider these external costs.

The RIS also states there is an information failure; producers and consumers do not have sufficient information to make socially optimal decisions.

How large is the problem?

The size of the problem of disposing of used packaging depends on both the quantity of used packaging generated and the cost of disposing of it.

The cost of disposing of the used packaging generated depends on how it is disposed. There are essentially three waste streams:

- resource recovery
- landfill
- litter

Each means of disposal has distinctly different benefits and costs. These are summarised in table 7.1.

7.1 Costs and benefits of packaging disposal

Disposal	Costs	Benefits
Landfill	▪ Capital and operating costs associated with landfill ▪ Cost of greenhouse gas emissions ▪ Other air emissions ▪ Leachate ▪ Disamenity for people living near the landfill (noise, odour)	▪ Gas capture (possibly)
Recycling	▪ Collection costs ▪ Processing costs	▪ The value of the materials recovered
Litter	▪ Cost of clean-up ▪ Disamenity from litter ▪ Risks to human health and safety (e.g. broken glass) ▪ Environmental costs	

Source: CIE.

The market failures above primarily relate to landfill and litter. Below, we review the available evidence on: the quantity of used packaging generated in NSW; the potential size of the social and environmental costs associated with landfill; and the size of the litter problem.

How much used packaging is generated in NSW?

One perspective on the size of the used packaging problem is the quantity of used packaging generated. In 2011-12, Australians consumed around 4.4 million tonnes of packaging (table 7.2). While there are no separate data for NSW available, the consumption of packaging in NSW could be around 1.4 million tonnes, based on NSW's share of the national population (around 32 per cent). National packaging consumption has been increasing at a modest rate of around 0.75 per cent annually over the past ten years. Assuming packaging consumption in NSW continues to grow at the same rate of the next five years, packaging consumption in NSW could increase to around 1.5 million tonnes by 2017-18.

7.2 Consumption of packaging — 2011-12

Material type	Consumption	Implied NSW share
	M Tonnes	M Tonnes
Paper/cardboard	2 561	822
Glass	1 164	373
Plastics	520	167
Steel cans	110	35
Aluminium cans	53	17
Total	**4 408**	**1 414**

Note: The implied NSW share is estimated as 32.1 per cent of the national total, based on NSW's share of the population as at December 2012.

Source: Australian Packaging Covenant, ABS, The CIE.

How big are the environmental and social costs associated with landfill?

The cost of disposing of waste to landfill depends on a range of factors, including the type of material, the size of the landfill, how it is managed and the local climate. BDA Group (2009) estimated the full cost of landfill disposal in Australia in various climates, under best practice controls, as well as poor controls. Since these estimates were published, the carbon price has been applied to landfills with direct emissions of more than 250 000 tonnes of carbon dioxide equivalent per year and then subsequently repealed.

Of the main packaging materials, only paper and cardboard incurs a carbon price liability. Based on the carbon pricing scheme that has now been repealed, we estimate that the carbon price liability arising from paper and cardboard sent to landfill in 2013 would have been around $34.15 per tonne. This estimate is based on:

- an emissions profile obtained from the Clean Energy Regulator's solid waste calculator
- the carbon price profile estimated by Commonwealth Treasury[102] — although there is some uncertainty around the future of the carbon price, this price profile is nevertheless a reasonable indicator of the cost of abatement in Australia
- a discount rate of 7 per cent.

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102 Commonwealth Treasury, 2011, *Strong growth, low pollution: Modelling a carbon price*, p. 90.

Since paper and cardboard makes up around 58 per cent of packaging material in Australia, this implies an average carbon price liability of around $19.80 per tonne. This compares to BDA's estimate of around $9.50 per tonne.

We also inflate the remaining components of BDA's estimates to 2012/13 dollars using the national Consumer Price Index (table 7.3).

7.3 Full cost of landfill disposal in Australia (2012/13 dollars)

	Small urban	Medium urban	Large urban	Small rural	Medium rural	Large rural
	$/tonne	$/tonne	$/tonne	$/tonne	$/tonne	$/tonne
Best controls						
Private costs	110.4	66.2	44.2	110.4	66.2	44.2
GHG emissions	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3
Other air emissions	1.1	1.1	1.1	0.1	0.1	0.1
Leachate	0.0	0.0	0.0	0.0	0.0	0.0
Disamenity	1.1	1.1	1.1	1.1	1.1	1.1
Total	**112.3**	**68.1**	**46.0**	**111.3**	**67.1**	**45.0**
Poor controls						
Private costs	81.7	48.6	33.1	81.7	48.6	33.1
GHG emissions	19.8	19.8	19.8	19.8	19.8	19.8
Other air emissions	0.8	0.8	0.8	0.2	0.2	0.2
Leachate	0.0	0.0	0.0	0.0	0.0	0.0
Disamenity	11.0	11.0	11.0	5.5	5.5	5.5
Total	**113.3**	**80.2**	**64.8**	**107.3**	**74.2**	**58.7**

Note: Estimates reported in the table are for a dry temperate climate and have been converted to 2012/13 dollars using the national CPI.

Source: BDA Group Economics and Environment, 2009, *The full cost of landfill disposal in Australia*, Prepared for the Department of the Environment, Water, Heritage and the Arts, pp. 75-77.

These estimates suggest that the total cost of landfill ranges between around $45 per tonne up to around $115 per tonne, depending on the size of the landfill and the controls in place.

Based on the results of a 2007 National Landfill Survey, most waste in NSW is disposed of in large metropolitan landfills (table 7.4).

7.4 Landfills by type

	Quantity	Share
	Tonnes	%
Small/rural landfill	136 182	2.1
Medium/regional landfills	1 404 539	21.8
Large/metro landfills	4 905 000	76.1
Total	**6 445 721**	**100.0**

Source: Standing Council on Environment and Water, 2011, *Attachment C: Cost benefit analysis report*, p. 120.

Weighting landfill costs by the quantity of waste disposed in each type of landfill suggests that the average cost of landfill in NSW is likely to range between $52 per tonne and $69 per tonne (table 7.5). The majority of these costs are private costs, which includes land, approvals for site development, best practice liner, leachate collection, gas recovery, amenity management, operations, capping and remediation and post-closure maintenance. These costs are fully recovered through gate fees.

7.5 Weighted average cost of landfill

	Best practice controls	Poor controls
	$/tonne	$/tonne
Private costs	50.37	37.51
GHG emissions	-0.33	19.84
External costs	2.19	11.68
Total	**52.22**	**69.04**

Source: BDA Group Economics and Environment, 2009, *The full cost of landfill disposal in Australia*, Prepared for the Department of the Environment, Water, Heritage and the Arts, pp. 75-77; Standing Council on Environment and Water, 2011, *Attachment C: Cost benefit analysis report*, p. 120; CIE.

Based on the carbon pricing scheme that has now been repealed the external cost of greenhouse gas emissions from landfill could be as high as around $20 per tonne.

The remaining external social and environmental costs are likely to be modest, ranging between around $2-12 per tonne. The remaining environmental impacts, which include other air emissions and leachate are estimated to be negligible, even in landfills with poor controls. The disamenity associated with landfills is estimated to be around $1.10 per tonne in landfills using best controls, $5.50 per tonne in poorly managed rural landfills and $10.10 per tonne in poorly managed urban landfills. One indicator of the potential size of the environmental and social costs associated with disposing of used packaging in landfill is to assume that all used packaging generated in NSW was sent to landfill. This is an upper bound estimate because some materials would be recycled, even without regulation.

If all the used packaging generated in NSW was sent to landfills with best practice controls, the total cost to the community is estimated to be around $70-75 million per year over the next five years, or around $320 million in present value terms (using a discount rate of 7 per cent). These costs are largely private. The environmental and social costs of disposing of packaging are estimated to be relatively modest at around $3 million per year, or around $14 million over the next five years in present value terms (using a discount rate of 7 per cent).

Even if the packaging was disposed of in poorly managed landfills, the environmental and social costs would be relatively modest at around $17million per year over the next five years, or around $75 million in present value terms (using a discount rate of 7 per cent).

7.6 Costs of disposing all packaging waste consumed in NSW to landfill

	Total packaging consumption	Private costs	External costs	Total
	Million tonnes	$ million	$ million	$ million
2013/14	1.4	71.8	3.1	75.0
2014/15	1.4	72.4	3.2	75.5
2015/16	1.5	72.9	3.2	76.1
2016/17	1.5	73.4	3.2	76.7
2017/18	1.5	74.0	3.2	77.2
Total		***364.5***	***15.9***	***380.5***
Present value		**319.5**	**14.0**	**333.5**

Source: BDA Group Economics and Environment, 2009, *The full cost of landfill disposal in Australia*, Prepared for the Department of the Environment, Water, Heritage and the Arts, pp. 75-77, CIE.

How big is the litter problem?

It is difficult to estimate the cost that litter imposes on the community. The Productivity Commission reported that local governments in NSW spent around $92 million per year on litter collection and management.[103] This estimate was based on a report by the Institute of Sustainable Futures from 2001, which is now somewhat out of date.[104]

More recently, the cost-benefit analysis underpinning the Consultation RIS estimated that litter clean-up costs could be around $13.90 per person per year.[105] This was based on litter clean-up costs incurred by Local Government in Victoria. This would imply that litter clean-up costs in NSW would be around $102 million per year.

According to the Consultation RIS, packaging makes up around 87 per cent of all litter in volume terms, but only around 37 per cent of the total number of items (this largely because cigarette butts make up around 50 per cent of items). Clean-up costs are more likely to be more closely related to volume, rather than the number of items. This implies that the clean-up costs associated with packaging litter in NSW could be around $89 million per year. In present value terms, this is around $364 million over five years (using a discount rate of 7 per cent).

This estimate also excludes social and environmental costs, such as disamenity from litter and damage to wildlife. A study by PWC for the Environment Protection and Heritage Council estimated that the community's willingness to pay to reduce litter could potentially be significant.[106]

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[103] Productivity Commission, 2006, *Waste Management*, Inquiry Report No. 38, p. 79.

[104] Institute of Sustainable Futures, 2001, *Independent Review of Container Deposit Legislation in NSW*, Volume II, University of Technology Sydney.

[105] Standing Council on Environment and Water, 2011, Packaging Impacts Consultation Regulatory Impact Statement, *Attachment C: Cost benefit analysis report*, p. 80.

[106] Environment Protection and Heritage Council, 2010, *Estimating consumers' willingness to pay for improvements to packaging and beverage container waste management*, June.

The total costs associated with litter could therefore be quite significant. This is despite the fact that the Consultation RIS estimated that only around 6 per cent of the total volume of packaging material is littered.[107]

Is there a need for government action?

Based on the above analysis, there does not appear to be a strong case that government action to encourage more recycling of consumer packaging is needed.

While there may be a market failure to the extent that there is no price signal to ensure that producers and consumers take into account the full cost of disposal into their decisions, the environmental and social costs associated with a well sited landfill with best practice controls are generally modest. Furthermore, there are already significant policy measures in place to discourage disposal of waste in landfill. In particular, a waste levy of more than $100 per tonne applies in the SMA and ERA. The carbon price also applies to landfills with emissions of more 250 000 tonnes of $CO_{2\text{-}e}$ per year, which addresses the externality associated with carbon emissions.

On the other hand, there is a stronger case for government action to address the litter problem. The relevant market failure here is that some members of the community do not take into account the social and environmental costs of their actions when they choose to litter used packaging. There may also be information failures relating to the disposal of consumer packaging. The evidence reviewed also suggests that costs to the community imposed by litter are significant.

Contribution to objectives

As the over-arching objectives of the waste regulation are to manage the environmental and social costs associated with waste, it is reasonable to infer that the objectives of the consumer packaging component are to manage the environmental and social costs associated with packaging waste. In addition, the objectives of part 7 are to comply with the NEPM requirements on NSW to introduce legislation to support the APC. The objective of managing environmental and social costs is broadly consistent with a key Productivity Commission recommendation that waste policy should focus on reducing risks to human health, the environment and social amenity from waste to acceptable levels.

Since this particular regulation is part of a broader national regulatory framework, it is important to understand the national level objectives (table 7.7).

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107 Standing Council on Environment and Water, 2011, Packaging Impacts Consultation RIS, *Attachment C: Cost benefit analysis report*, p. 30.

7.7 National level objectives

Organisation	Document	Stated objectives
COAG Standing Committee on Environment and Water	Packaging Impacts — Consultation Regulation Impact Statement (2011)	The objectives of government action are to: ▪ Reduce packaging waste and increase packaging resource recovery ▪ Reduce the need to landfill recyclable packaging materials ▪ Reduce the negative amenity, health and environmental impacts of packaging waste and litter in line with community expectations ▪ Promote a consistent national approach to regulating packaging.
Environment Protection and Heritage Council	Used Packaging Materials — Decision Regulatory Impact Statement (2010)	The objective of government action is efficient and effective arrangements to reduce the environmental impacts of packaging and address community expectations for increased resource recovery (p. 2).
Australian Packaging Covenant		The goals of the Australian Packaging Covenant are: 1 Design — packaging optimised to achieve resource efficiency and reduced environmental impacts without compromising product quality and safety. 2 Recycling — the efficient collection and recycling of packaging. 3 Product Stewardship — a demonstrated commitment to product stewardship by the supply chain and other signatories.
National Waste Policy		The aims of the National Waste Policy are to: ▪ Avoid the generation of waste, reduce the amount of waste (including hazardous waste) for disposal ▪ Manage waste as a resource ▪ Ensure that waste treatment, disposal, recovery and re-use is undertaken in a safe, scientific and environmentally sound manner ▪ Contribute to the reduction in greenhouse gas emissions, energy conservation and production, water efficiency and the productivity of the land.
National Environment Protection (Used Packaging Materials) Measure 2011		The goal of the Measure is to reduce environmental degradation arising from the disposal of used packaging and conserve virgin materials through the encouragement of waste avoidance and the re-use and recycling of used packaging materials by supporting and complementing the voluntary strategies in the Covenant and by assisting the assessment of the performance of the Covenant.

Source: The Allen Consulting Group, 2009, National Waste Policy: Regulatory Impact Statement, Report to the Department of the Environment, Water, Heritage and the Arts; COAG Standing Committee on Environment and Water, 2011, *Packaging Impacts — Consultation Regulation Impact Statement*; Environment Protection and Heritage Council, 2010, Used Packaging Materials — Decision Regulatory Impact Statement; National Environment Protection (Used Packaging Materials) Measure 2011; Australian Packaging Covenant website, http://www.packagingcovenant.org.au/, accessed 17 July 2013.

These national level objectives are not always entirely consistent with the stated objectives of the NSW waste regulation. In particular, they tend to focus on increasing the level of recycling of packaging. The NSW Government *Guide to Better Regulation* requires that objectives be specified in terms of ends (i.e. to minimise the costs associated

with disposing of used packaging), rather than means to an end. Increased recycling is a means to an end, rather than an end in itself.

Options

Best practice regulatory principles require consideration of a range of options for meeting the Government's objectives, as well as a 'do nothing' option.

There are a wide range of policy instruments that could be used to address the social and environmental costs associated with litter and landfill, including several that are already in place (such as the waste levy). It is beyond the scope of this exercise to consider all of these measures here.

The purpose of this exercise is to assess whether the NEPM regulations are necessary in **addition** to other existing measures. That is, in this context the 'do nothing' option means no additional regulation, beyond other measures that are already in place.

As alternative options, we also look at:

- changes to the current national arrangements — these would obviously require the agreement of the other states and could not be implemented by the NSW Government on its own
- direct state-based measures that the NSW Government could implement to address the social and environmental costs associated with litter and landfill.

These options are discussed in greater detail below.

No additional government intervention

As discussed above, the 'do nothing' option means no additional regulation relating to consumer packaging, beyond other measures that are already in place.

The 'do nothing' option would involve NSW withdrawing from the NEPM arrangements. This is likely to have national implications. In particular, it could affect the viability of the APC and the NEPM more generally. The NSW Government would therefore need to take into account these political considerations.

Nevertheless, consideration of a 'do nothing' option is required under the NSW Government's *Guide to Better Regulation*. This is particularly important given that the Productivity Commission (2006) was not convinced that the APC and NEPM arrangements had been adequately justified.[108] In our view, more recent national-level RISs have also failed to adequately justify the APC and NEPM arrangements.

[108] Productivity Commission, 2006, *Waste Management*, Inquiry Report No. 38, p. 294.

Changes to the national arrangements

A number of studies have reported that a national scheme is likely to be less costly than inconsistent state-based schemes.[109] Alternative national level arrangements could therefore be considered.

Changes considered at the national level

Various alternative options for increasing recycling rates and reducing litter have been considered at the national level. Most recently, the COAG Standing Council on Environment and Water (SCEW) released a Consultation RIS relating to used packaging material in 2011. We understand that a Decision RIS is due to be released later in 2014.

The Consultation RIS considered a range of national measures that could potentially have a tangible impact on recovery rates and litter reduction. The options included the following.

- A National Packaging Waste Strategy (Option 1) — this included various non-regulatory measures, including:
  - A national recycling education/advertisement initiative
  - A national education initiative aimed at litter prevention
  - The development of a national litter methodology
  - National programs to increase away from home recycling at core consumption areas through improved bin labelling
  - Information sharing between state and local governments
  - Consistent labelling of recycling bins
- Co-regulatory Packaging Stewardship schemes — three options were considered:
  - Replacing the APC with a co-regulatory arrangement under the Product Stewardship Act (Option 2A)
  - An Industry Packaging Stewardship Scheme (Option 2B)
  - An Extended Packaging Stewardship Scheme (Option 2C)
- A Mandatory Advance Disposal Fee — this would be a weight-based fee per tonne of packaging material, with the fee varying depending on material type, the cost of recycling the material or end of life disposal of that material (Option 3).
- Mandatory Container Deposit Schemes — two CDS sub-options were considered (Option 4A and 4B).

However, the Consultation RIS found that the benefits exceeded the costs for only one of these options. This option involved replacing the APC with similar co-regulatory arrangements under the Product Stewardship Act. The cost of all of the remaining options was found to exceed the benefits (table 7.8).

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[109] See for example, Allen Consulting Group, 2009, *National Waste Policy: Regulatory Impact Statement*, Report to the Department of the Environment, Water, Heritage and the Arts.

7.8 Estimated benefits and costs of proposed options

	Option 1	Option 2A	Option 2B	Option 2C	Option 3	Option 4A	Option 4B
	$ million	$ million	$ million	$ million	$ million	$ million	$ million
Benefits	311	258	554	984	981	2 125	2 471
Costs	262	304	503	786	786	710	710
Net benefits	-49	46	-51	-198	-195	-1 414	-1 761

Note: Based on the net present value of benefits and costs measured over the years from 2011 to 2035 using a discount rate of 7 per cent.

Source: COAG Standing Council on Environment and Water, *Packaging Impacts Consultation Regulation Impact Statement*, December 2011, p. 38.

Since these options are being considered at the national-level, they will not be considered further here. However, previous RISs — including the recent Consultation RIS — have failed to adequately consider a 'do nothing' option or indeed any options requiring significantly less intervention, as is required under NSW RIS guidelines. The Consultation RIS assessed the various options against a 'business as usual' option, which means continuing with the existing APC and NEPM arrangements. This is quite different to a 'do nothing' option, which would mean no additional government action on consumer packaging.

Alternative funding arrangements for the APC

As discussed above, NSW withdrawing from the NEPM arrangements could potentially result in the collapse of the APC. If the viability of the APC is a concern, alternative funding arrangements could be considered with the same objectives of the co-regulatory arrangement. In particular, the APC or another arrangement could be fully funded by governments.

Direct state-based measures to address packaging-related costs

The NSW Government could also consider whether more direct state-based measures are a more effective way of addressing the environmental and social costs associated with landfill and litter.

Direct measures to address the externalities associated with landfill

National level arrangements have also typically had an explicit objective of increasing recycling rates. However, the objectives of the regulation are to manage the environmental and social costs associated with packaging waste, rather than to increase recycling *per se*. An alternative approach is to manage any environmental and social costs associated with packaging waste in a more direct way, such as better siting and regulation of landfills (or better enforcement of licensing conditions), as suggested by the Productivity Commission. Policies aimed at managing the environmental and social costs directly have generally not been considered at the national level due to the focus on increasing recycling.

Back in 2006, the Productivity Commission found that compliance with landfill licence conditions in Australia appears to be relatively poor, and enforcement somewhat variable

and lax.[110] Addressing the externalities associated with landfill more effectively could therefore include better enforcement of existing regulation.

Direct funding of litter reduction measures

As it relates to litter, the APC encompasses both individual business action, as well as collective funding. However, stakeholders generally agreed that litter reduction actions are most effectively undertaken at the community-wide level, rather than the individual business level. The APC is therefore effectively a funding arrangement for litter-reduction projects, rather than a specific policy measure *per se*.

The NSW Government could therefore consider funding specific litter reduction measures directly, rather than through the APC.

Impact analysis

As discussed above, we consider five options:

- The current NEPM arrangements
- Alternative funding arrangements for the APC
- Direct measures to address the environmental and social costs of landfills
- Direct measures to address the environmental and social costs of litter
- No government intervention.

The potential impacts of each of the options requiring government action are assessed below.

Impact of the NEPM regulation

National-levels RISs for the NEPM regulation have argued that the impact of the regulation is minimal, because most relevant businesses have joined the APC. However, they also argue that regulation is necessary to support the APC and that in the absence of the regulation, few businesses would join the APC. This suggests that the true counterfactual is that the NEPM regulation has forced most relevant businesses to join the APC. Many of the impacts that have been attributed to the APC can therefore be attributed to the NEPM regulation.

The APC potentially affects recycling rates and the quantity of litter through:

- projects funded by the APC
- actions by individual members that they would not have otherwise taken — this could include use of the Sustainable Packaging Guidelines (SPG) and other actions identified in action plans.

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[110] Productivity Commission, 2006, *Waste Management*, Report No. 38, Canberra, p. XLIX.

While the RIS for the waste regulation should be forward looking (i.e. assessing the impacts of the regulation over the next five years), it is nevertheless useful to understand what impact the APC has had on recycling rates and litter over recent years.

It is beyond the scope of this report to undertake a 'bottom up' analysis of the impacts of each APC-funded project or each APC signatory has had on recycling rates and litter. However, a look at recent trends and where possible, the extent to which these trends can be attributed to the APC is nevertheless informative.

Impact of the Australian Packaging Covenant on recycling

The APC key performance indicators (KPIs) relevant to the proposed regulation are shown in table 7.9.

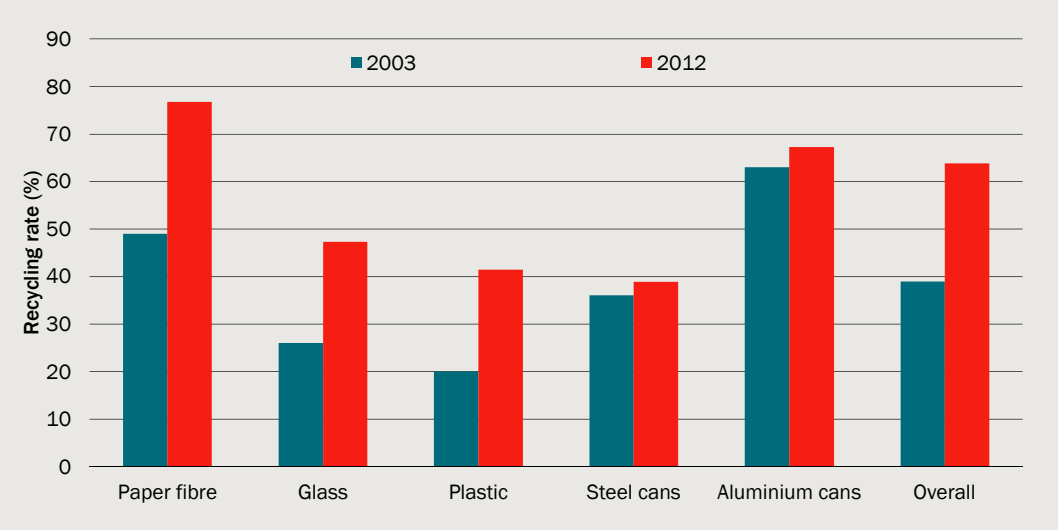
7.9 APC performance against KPIs — 2011-12

KPI	Target by 2015	Progress
% of signatories that have documented policies and procedures for evaluating and procuring packaging using the Sustainable Packaging Guidelines or equivalent (KPI 1)	70 per cent	67 per cent
% of signatories reviewing all new packaging (KPI 1)	70 per cent	33 per cent
% of signatories reviewing half of existing packaging (KPI 1)	50 per cent	26 per cent
Recycling rate for used packaging (KPI 2)	70 per cent	63.8 per cent

Source: Australian Packaging Covenant, 2012, Annual Report, p. 8.

Recycling of packaging material has increased significantly over the past decade, from around 39 per cent in 2003 to around 64 per cent in 2012 (chart 7.10). The materials that have seen the largest increases in recycling rates are paper fibre, glass and plastics. It is possible that the recycling target has produced a perverse incentive to focus on recycling glass. Anecdotally the costs of recycling glass outweigh the benefits. However, the recycling target is based on tonnes and glass is a relatively heavy material. It is therefore unlikely that the target could be met without a significant increase in the quantity of glass recycled.

7.10 Recycling rates



Data source: Australian Packaging Covenant, Annual Report, 2011/12, p. 9.

The Australian Packaging Covenant estimates that around 32 per cent of the increase in recycling since 2005 can be attributed to APC-funded projects. This suggests that an additional 1.4 million tonnes of recycled packaging can be attributed to APC projects (table 7.11).

Assuming the share of additional recycling in NSW was proportional to its share of the national population (around 32 per cent), this suggests that an additional 0.5 million tonnes of packaging waste may have been recycled in NSW. The environmental and social costs of landfill are potentially in the range of $2-32 per tonne (this includes the cost of greenhouse gas emissions, since the carbon price did not apply for most of this period). This implies that APC projects may have generated environmental and social benefits to NSW of between $0.9 million and $14.7 million over this seven year period, or between $0.6 million and $10.8 million in present value terms (using a discount rate of 7 per cent).

7.11 Increase in material recycled attributable to the APC

	Packaging material recycled	Increase in material recycled since 2005	Increase in recycling attributable to APC [a]	Estimated NSW share of increased recycling [b]	Potential environmental and social benefits to NSW (low estimate) [c]	Potential environmental and social benefits to NSW (high estimate) [d]
	Kt	Kt	Kt	Kt	$'000	$'000
2005	1 909	-	-	-	-	-
2006	2 135	226	73	24	45	761
2007	2 378	469	152	50	93	1 580
2008	2 487	578	187	62	115	1 948
2009	2 397	487	158	52	97	1 642
2010	2 763	854	277	91	169	2 878

	Packaging material recycled	Increase in material recycled since 2005	Increase in recycling attributable to APC [a]	Estimated NSW share of increased recycling[b]	Potential environmental and social benefits to NSW (low estimate)[c]	Potential environmental and social benefits to NSW (high estimate)[d]
	Kt	Kt	Kt	Kt	$'000	$'000
2011	2 760	850	275	91	169	2 866
2012	2 812	902	292	96	179	3 042
Total		*4 366*	*1 414*	*467*	*866*	*14 716*
NPV					**635**	**10 789**

[a] Based on 32.4 per cent, as reported by the APC. [b] Assumed to be 32.1 per cent of the national increase based on NSW's share of the national population. [c] Estimate assumes external environmental and social costs of landfill of $1.86 per tonne in landfills with best practice controls (includes greenhouse gas emissions). [d] Estimate assumes external environmental and social costs of landfill of $31.53 per tonne in landfills with poor controls (includes greenhouse gas emissions).

Source: APC Annual Reports, CIE.

The impact of the actions of individual signatories is more difficult to estimate. The KPIs show that around two-thirds of signatories have documented policies and procedures for evaluating and procuring packaging using the Sustainable Packaging Guidelines (SPG) or equivalent (see table 7.9). However, only one third of signatories had reviewed all of their new packaging using the SPG and a quarter of signatories had reviewed half of their existing packaging.

The sustainable design strategies outlined in the Sustainable Packaging Guidelines are summarised in box 7.12.[111] It is also noted that the APC has an ongoing audit and compliance program to increase compliance with the SPG and to meet the APC's KPIs.

111 See Australian Packaging Covenant website, http://www.packagingcovenant.org.au/data/Resources/Sustainable_Packaging_Guidelines.pdf, accessed 15 October 2013.

7.12 Sustainable Packaging Guidelines — sustainable design strategies

3 Maximise water and energy efficiency — where possible, energy and water consumption should be reduced by: minimising the amount of material used for packaging; taking steps to make production and distribution more efficient; and considering the use of renewable energy.

4 Minimise materials (source reduction) — minimising packaging by using the optimal combination of primary, secondary and/or tertiary packaging. This includes eliminating unnecessary materials in packaging design, reducing the size, weight or thickness of packaging and optimising void space within the design.

5 Use recyclable materials — packaging should maximise the use of recycled material where it reduces the environmental footprint, is physically possible, is not detrimental to the function of the packaging or packaged product and would not violate acceptable health and safety standards.

6 Use renewable materials — packaging should be designed to use renewable and/or recyclable materials wherever possible.

7 Minimise risks associated with potentially toxic and hazardous materials — companies should consider using their common law liabilities, assess the packaging for potentially toxic or hazardous substances that are likely to pose risk and endeavour to reduce the risk accordingly.

8 Use materials from responsible suppliers — packaging materials should be purchased from companies that have a commitment to environmental sustainability and a documented environmental management system.

9 Design for transport — packaging should be designed to maximise the efficiency of transport through light weighting, fully utilising shipping space and using bulk packaging for distribution where appropriate.

10 Design for reuse — companies should consider whether reuse is practical and environmentally beneficial. Reusable packaging, including distribution packaging, should be designed to be reused safely and cost effectively.

11 Design for recovery — packaging should maximise recovery and recycling at end-of-life by using recyclable materials, avoiding materials or components that may contaminate the recycling process and by informing consumers about appropriate disposal.

12 Design for litter reduction — any package that tends to be found in the litter stream should be designed to reduce the likelihood of it becoming litter.

13 Design for consumer accessibility — for packaging to be accessible it must be designed to be easy for the consumer to open, have legible labelling and not compromise safety or quality.

14 Provide consumer information on sustainability — where possible, any environmental claims about such things as recycled content of packaging, recyclability or degradability should be made clear to consumers of the packaging or packaged product through clear information or advice.

Many of these design strategies represent good business practice and are likely to be used by producers, even without regulation. This includes strategies that:

- minimise the private costs incurred by the producer
- may assist with marketing of the product.

Other strategies are aimed at reducing environmental and social impacts. This includes strategies that:

- reduce downstream external costs
- reduce upstream external costs and resource depletion.

Table 7.13 links each strategy to each of the above benefits.

7.13 The benefits of sustainable design strategies

Strategy	Reduce private costs	Other commercial incentives (e.g. marketing)	Reduces downstream externalities	Reduces upstream resource use or externalities
Maximise water and energy efficiency	Yes	No	No	Yes
Minimise materials	Yes	Possibly	Yes	Yes
Use recycled materials	No	Possibly	No	Yes
Use renewable materials	No	Possibly	No	Yes
Minimise risks associated with potentially toxic and hazardous materials	No	Possibly	Yes	No
Use materials from responsible suppliers	Possibly	Possibly	Possibly	Possibly
Design for transport	Yes	No	No	Yes
Design for reuse	No	Possibly	Yes	Yes
Design for recovery	No	Possibly	Yes	Yes
Design for litter reduction	No	Possibly	Yes	No
Design for consumer accessibility	No	Yes	No	No
Provide consumer information on sustainability	No	Possibly	Possibly	Possibly

Source: Sustainable Packaging Guidelines, CIE.

This above analysis suggests that at least four of the sustainable design strategies are likely to be used by business, even without regulation. Several other strategies are mainly targeting upstream external costs and resource depletion. However, the Productivity Commission argued that these issues are best addressed directly, rather than through waste policy.[112]

That leaves around four strategies that could potentially be having some impact on the environmental and social costs associated with waste disposal: minimise risks associated

[112] Productivity Commission, 2006, *Waste Management*, Report No. 38, Canberra, p. XLVI.

with potentially toxic and hazardous materials; design for reuse; design for recovery; and design for litter reduction. There is some evidence to suggest that packaging design and labelling can have an impact on litter.[113] However, the extent to which businesses will follow these guidelines in cases where it is not in their commercial interests to do so is not clear.

The above information implies that the impact of the regulation requiring businesses to review new and existing packaging material are likely to be relatively small. Relatively few businesses have reviewed new or existing packaging using the Sustainable Packaging Guidelines, although these percentages are increasing to meet the APC's 2015 targets. Furthermore, any benefits from complying with the SPG in addition to what businesses would have an incentive to do anyway, are likely to be limited to just four of the 13 strategies.

Impact of the APC on litter

The EPA has advised that litter reduction has been a more significant focus of the APC in recent years.

The decision to litter is made by the consumer, rather than the producer. The main ways to change consumer behaviour is through providing sufficient bins and through education campaigns. This is most effectively provided at the community-wide level.

We have been advised that the APC has funded some litter reduction projects. However, the NSW Government has not applied for any litter-reduction funding from the APC and consequently, there have been no APC-funded litter reduction projects in NSW.

The actions that can be taken by businesses to reduce littering of their packaging is generally limited. The Sustainable Packaging Guidelines focus on design to reduce litter by:

- reducing the number of separable parts
- providing advice on the label to encourage appropriate disposal or recovery.

As discussed above, only around one-third of APC signatories have reviewed new packaging in line with the sustainable packaging guidelines, while only a quarter of signatories have reviewed existing packaging.

Furthermore, the quantity of packaging-related litter has not shown any significant decline in NSW over recent years. The National Litter Index (NLI) is one indicator of the quantity of litter in various locations. The NLI suggests that although there has been a downward trend in both the volume of litter and the number of items of litter in NSW over the past seven years, these trends may not have been related to littering of consumer packaging.

- The downward trend in the volume of litter appears to have been mainly driven by a reduction in illegal dumping. If anything, the volume of packaging-related litter appears to have been on a slight upward trend.[114]

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113 See for example, Wever, R. 2005, *Influence of packaging design on littering behaviour*, the 15th IAPRI World Conference on Packaging.

114 The National Litter Index 2012/13, Annual Report, p. 37.

- Similarly, the downward trend in the number of items littered appears to have been mainly driven by a reduction in the number of cigarette butts. There does not appear to be a significant trend in the number of items of the major categories of packaging-related litter.[115]

Based on the evidence presented above, it seems unlikely that the APC has had a significant impact on packaging-related litter in NSW to date.

Alternative funding arrangements for the APC

The APC is currently funded partly through membership fees and partly by government. Since the current NEPM regulations effectively force relevant businesses to be a member of the APC, the membership fees effectively operate as an industry levy.

It is beyond the scope of this report to assess whether the benefits of the APC outweigh the costs. However, if a rigorous study showed that the benefits of APC-funded projects outweigh the costs, these projects could continue to be funded through increased government contributions. This would allow the APC to continue without the need for supporting regulation.

The key impact of this would be:

- there would be no requirement for relevant businesses to prepare and report on action plans
- a shift in the burden of funding the APC from industry to the taxpayer.

The key question is whether what is effectively an industry levy is likely to be a more efficient funding mechanism than broad based taxes.

In its Inquiry into Cost Recovery by Government Agencies, the Productivity Commission argues that cost recovery arrangements should only be applied to improve economic efficiency.[116] If a levy (or membership fees) could be applied to each business based on the disposal costs imposed by their packaging, this could potentially provide an incentive for producers to consider the cost of disposing of their packaging in the design. However, this approach is unlikely to be feasible.

An industry levy imposed on any other basis is unlikely to improve efficiency. This would mean the industry levy would effectively be a hypothecated tax on brand owners. In general, broad based taxes are likely to be a more efficient means of funding the APC than a narrow-based tax.

Direct measures to address the externalities associated with landfill

The environmental and social costs associated with landfill depend on a range factors, such as how well the landfill is managed and location. BDA estimates shown in table 7.3 show that there is a trade-off between the private costs of landfill and the social and environmental

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115 The National Litter Index 2012/13, Annual Report, p. 36.

116 Productivity Commission, 2001, Cost Recovery by Government Agencies, Inquiry Report No. 15, p. LV.

costs. That is, reducing the social and environmental costs involves increasing the private costs. The key question for regulators is whether the environmental and social benefits of tighter controls outweigh the private costs.

The Productivity Commission recommended that:

> "Landfill regulation should focus on the policy-relevant externalities of landfill disposal. It should be based on a rigorous assessment of the risk of damage from those externalities, and should aim to reduce that risk to levels at which the cost of further reductions begins to exceed the benefit.
>
> Regulation should consist of a mix of prescriptive and performance-based measures and should provide for alternative methods of compliance, if there is a likelihood that a particular requirement could impose unjustifiably high compliance costs."[117]

Direct state-based measures to reduce litter

As discussed previously, the environmental and social costs associated with litter are most effectively addressed at the community-wide level.

Insofar as it relates to litter, the APC is effectively a funding mechanism for community-wide litter reduction projects, rather than a specific policy measure *per se*. Without knowing what litter reduction projects the APC is likely to fund in the period ahead, it is not possible to assess the likely impacts on the level of litter in NSW.

As discussed above, individual projects aimed at reducing litter are likely to be more efficiently funded by government than by some form of levy on industry. The relevant question is therefore whether litter issues are best addressed at the national level or the state level.

The social and environmental costs associated with litter are mostly localised. It is possible that packaging littered in one state moves across a state border through either wind or through waterways; however, it is arguable that the social and environmental costs associated with litter are more often localised in the area where it occurred. This suggests that litter reduction programs may be best operated at the state level.

There may be some instances where a national approach would be beneficial. It is possible that there are some economies of scale associated with a national level awareness campaign, compared to separate state-based campaigns.

Also, a national approach may be required, when tackling litter that moves across state borders, or possibly if it was considered appropriate to ban a particular type of packaging due to the environmental damage it causes.

Benefits and costs of the options

Where possible, the benefits and costs of each option are assessed against the counterfactual of doing nothing. This means that if the benefits of each option requiring government action do not exceed the costs, then the 'do nothing' option is preferred.

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[117] Productivity Commission, 2006, *Waste Management*, Report No. 38, Canberra, p. XLVIII.

NEPM regulations

As discussed above, the main impact of the NEPM is likely to be diversion of additional packaging waste from landfill to recycling. There are also various compliance costs imposed on APC signatories.

Benefits and costs of diversion from landfill to recycling

The future impacts of the NEPM on recycling rates depends on future recycling targets and the extent to which these targets are achieved. The diversion targets in the NEPM regulation are based on the targets set by the Australian Packaging Covenant. The targets appear to be set somewhat arbitrarily and are not based on careful analysis of the benefits and costs of additional recycling. The current target is 70 per cent, although the Used Packaging Consultation RIS suggests this could be increased in the future.

The benefits of diverting packaging waste from landfill to recycling is essentially the value of the resources recovered and the avoided private and social costs of landfill. However, there are also additional costs associated with collection and processing.

Whether additional recycling delivers a net benefit to the community will depend on a range of factors, such as the composition of the additional materials recovered, the market price of these materials, the size of the landfill the material is being diverted from, its location and the controls in place. It is therefore possible that in some instances recycling packaging will result in a net benefit to the community, while in others it will result in a net cost. Nevertheless, we use publicly available data to provide some insights as to whether diverting used packaging from landfill to recycling is likely to provide a net benefit to the community on average.

APC performance data provides an indicator of the composition of the additional materials recycled as a result of the APC. Table 7.14 shows the increase in the volume of recycled material since 2002/03. Most of the increase has been paper and cardboard and glass. These tend to be the lower value materials. The increase in the recycling rates for steel and aluminium cans has been minimal. Based on the composition of additional material recycled and the prices reported in the Cost benefit reporting underpinning the recent Consultation RIS, the weighted average value of each additional tonne of material recycled could be around $177.

7.14 Estimated value of additional recovered material

	2002/03	2011/12	Increase	Share of increase	Prices
	Tonnes	Tonnes	Tonnes	Per cent	$/tonne
Paper/cardboard	1 211 000	1 968 000	757 000	64.3	181
Glass	238 500	550 000	311 500	26.5	30
Plastics	127 397	215 538	88 141	7.5	530
Steel cans	29 871	42 700	12 829	1.1	280
Aluminium cans	28 500	35 600	7 100	0.6	1 560
Total	**1 635 268**	**2 811 838**	**1 176 570**	**100.0**	**177**[a]

[a] Weighted average price.

Source: APC Annual Report, p. 9; PricewaterhouseCoopers and Wright Corporate Strategy, 2011, Attachment C: Cost benefit analysis report, Prepared for the Standing Committee on Environment and Water, p. 124 ; CIE.

The avoided cost of diverting waste from a large landfill is estimated at around $50-70 per tonne, including both private and external costs (see table 7.5).

According to the Cost benefit report underpinning the recent Used Packaging Consultation RIS, the additional cost of recycling is around $272 per tonne. This includes the additional cost of kerbside collection, which is estimated at $187 per tonne (this estimate is likely to be the average cost, the marginal cost may be somewhat lower) and the cost of processing the material at a MRF, which is estimated at $85 per tonne.[118]

7.15 Net benefits of diverting waste from landfill to recycling

	Diversion from a landfill with best practice controls	Diversion from a landfill with poor controls
	$/tonne	$/tonne
Benefits		
Market value of resources recovered	177	177
Avoided landfill costs (including private and external costs)	52	69
Total	*229*	*246*
Costs		
Kerbside collection	187	187
Processing at MRF	85	85
Total	*272*	*272*
Net benefit	**-43**	**-26**

Source: PricewaterhouseCoopers and Wright Corporate Strategy, 2011, Attachment C: Cost benefit analysis report, Prepared for the Standing Committee on Environment and Water, CIE.

This analysis suggests that on average, additional recycling may impose a net cost on the community of between $26 and $43 per tonne.

The benefits and costs would vary, depending on a range of factors such as the price of recovered material, the type of landfill the waste is diverted from as well as the costs of collection and processing recycled material. These factors are likely to vary considerably over time meaning at some times, diverting additional waste from landfill may deliver a net benefit to the community and at other times it may not.

Nevertheless, the above analysis indicates that diverting waste from landfill to recycling is not necessarily in the best interests of the community.

Benefits of reduced litter

The benefits associated with litter reduction are hard to measure. As discussed above, it seems unlikely that the APC has had any significant impact on the level of litter in NSW over the past seven years.

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118 PricewaterhouseCoopers and Wright Corporate Strategy, 2011, Attachment C: Cost benefit analysis report, Prepared for the Standing Committee on Environment and Water, p. 58 and p. 117.

As discussed above, the APC as it relates to litter reduction is a funding mechanism, rather than a specific policy measure. It is possible that the APC may fund some litter reduction projects in NSW in the next five years. However, without knowing what these projects are, it is not possible to assess what impact they may have on litter in NSW.

Nevertheless, since the costs associated with litter are estimated to be quite high, even a modest reduction in litter could deliver significant benefits to the community.

Compliance and enforcement costs

Previous work has shown there are significant compliance costs associated with membership of the APC. These compliance costs include the costs associated with preparing an action plan and annual reporting. These costs have been estimated at between $6000 and $30 000 depending on the size of the business.

According to the 2012 APC Annual Report, there are 786 signatories to the APC. If the distribution of signatories by size was as reported by Hyder Consulting in the mid-term review of the National Packaging Covenant[119], this implies that the total compliance costs for businesses could be around $11.9 million per year across Australia. Assuming the share contributed by NSW businesses was in proportion to its share of the population, the compliance costs on NSW businesses could be around $3.8 million per year. Over the five year regulatory period, this could be around $15.6 million in present value terms (using a discount rate of 7 per cent).

7.16 Compliance costs on business

Size of business	Businesses[a]	Action plan development costs	Annual reporting	Total compliance costs for business	NSW share of compliance costs
	No.	$ per business	$ per business	$ million	$ million
Small	51	3 000	3 000	0.31	0.10
Medium	700	5 000	10 000	10.50	3.37
Large	35	10 000	20 000	1.04	0.33
Total	**786**			**11.85**	**3.80**

[a] Assumes the size distribution of businesses remain as reported in Hyder Consulting, 2008, National Packaging Covenant mid-term review, p. 68.

Source: APC Annual report 2012; Hyder Consulting, 2008, National Packaging Covenant mid-term review, p. 68; CIE.

In addition, signatories contributed around $4.1 million in membership fees to the APC. The NSW share (based on population) would be around $1.3 million per year, or around $5.4 million over the five year regulatory period in present value terms (using a discount rate of 7 per cent).

The national RIS also reports additional costs associated with the APC, incurred by industry associations ($504 000), state and federal governments ($5 940 000), local governments ($390 000) and environment groups ($15 360). It is not clear whether these

119 Hyder Consulting, 2008, National Packaging Covenant mid-term review, p. 68.

organisations would continue to contribute to the APC if the NSW Government chose not to remake the NEPM regulations.

Other benefits

Various reports have argued that there are additional benefits associated with the community's willingness to pay for increased recycling and reduced litter. In particular, the cost-benefit analysis underpinning the Packaging Consultation RIS and the Consultation RIS itself argued that on average, households are willing to pay:

- an additional $2.77 per year for every 1 percentage point increase above current recycling rates[120]
- an additional $4.15 for every 1 per cent decrease in litter (although these estimates were not reported in the Consultation RIS).[121]

These estimates were based on the results of a choice modelling study undertaken by PWC in 2010.

The Consultation RIS did not explicitly include these estimates in the benefit-cost analysis because of concerns over double-counting, as well as methodological issues; the PWC report was peer reviewed by ABARES, which commented that the report does not represent good choice modelling practice.

Nevertheless, the estimates of the willingness to pay for recycling are reported in the Consultation RIS and could potentially be used to justify policies that are not estimated to deliver a net benefit to the community, based on tangible economic, environmental and social benefits and costs (including non-market environmental and social benefits and costs).

Notwithstanding methodological difficulties associated with measurement, it is appropriate to consider the community's willingness to pay to reduce litter when formulating policy. The community's willingness to pay is likely to reflect the community's attitude towards the disamenity associated with litter, as well as perceived environmental costs. These are tangible environmental and social outcomes that in most studies, have not already been taken into account in the benefit and cost estimates.

On the other hand, it is not appropriate to consider the willingness to pay estimates when formulating policy relating to recycling. As discussed previously, increased recycling is not a tangible environmental or social outcome in itself. Rather, it is potentially a means of achieving environmental and social outcomes. While there is a role for estimating non-market benefits and costs in the context of a RIS, this should be applied to tangible environmental and social outcomes, not the means of getting there.

In the Consultation RIS, the willingness to pay estimates for each of the options considered are generally much higher than the estimated net benefits, which include all of the tangible economic, environmental and social benefits and costs (most options are estimated to

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120 COAG Standing Council on Environment and Water, 2011, Packaging Impacts Consultation Regulation Impact Statement, December, pp. 39-40.

121 COAG Standing Council on Environment and Water, 2011, *Attachment C:Cost benefit analysis report*, Prepared by PricewaterhouseCoopers and Wright Corporate Strategy, p. 86.

impose a net cost on the community). Some have interpreted this as demonstrating there is an intangible 'feel good' factor associated with recycling.

The Consultation RIS acknowledges households' stated willingness to pay for additional recycling may partly reflect the perceived market value of the resources recovered through recycling.[122] It would also reflect the perceived environmental and social benefits of recycling (i.e. the avoided environmental and social costs of landfill). All of these benefits have already been taken into account in the benefit-cost analysis.

That households' willingness to pay for additional recycling far exceeds the actual net benefits is more likely to reflect over-inflated perceptions of the net benefits of recycling, rather than an intangible 'feel good' factor. The survey did not provide any information to respondents on the economic, environmental and social benefits and costs of increased recycling. Virtually no households would have had full information on the tangible benefits and costs of recycling, including financial, environmental and social benefits and costs.

While the willingness to pay estimates demonstrate some level of community support for recycling, popularity with the public is not necessarily synonymous with good policy. The purpose of the RIS process is to identify the best policy options, based on the tangible economic, environmental and social benefits and costs.

Summary

Remaking the NEPM regulation could impose compliance costs on NSW businesses of up to $3.8 million per year and APC membership fees of around $1.3 million per year. In present value terms, the cost to business could be around $21.0 million over the five year regulatory period (using a discount rate of 7 per cent).

The benefits of increased recycling vary. Based on publicly available data, our analysis suggests that on average, additional recycling could impose a net cost on the community. However, this will depend on a range of factors, such as the composition and market price of recovered materials and the private and social costs associated with landfill.

As litter reduction is best achieved at the community level, rather than through the actions of individual businesses, the benefits of litter reduction to NSW will largely depend on whether the APC funds any litter reduction projects in NSW over the regulatory period.

Overall, it seems highly unlikely that the benefits of the NEPM regulation will outweigh the costs.

Alternative funding arrangements for the APC

As discussed above, assessing the benefits and costs of the APC is beyond the scope of this study. The efficiency losses associated with different types of funding arrangements are difficult to measure. However, as discussed above, broad-based taxes are generally more efficient than narrow-based taxes. This suggests that the cost of funding APC projects

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[122] COAG Standing Council on Environment and Water, 2011, *Attachment C:Cost benefit analysis report*, Prepared by PricewaterhouseCoopers and Wright Corporate Strategy, p. 96.

through some compulsory impost on industry is likely to be higher than the cost of government funding.

Direct measures to address externalities associated with landfill

Based on the estimates shown in table 7.3, the net benefits of shifting from a poorly managed landfill to best-practice management is shown in table 7.17. In general, there is a trade-off between the private costs and the social and environmental costs. That is, improving the management of a landfill increases the private costs, but reduces the environmental and social costs.

This analysis suggests that applying best practice controls on landfills results in a net benefit to the community in most circumstances, although small rural landfills a potential exception.

7.17 Benefits and costs of better management of landfills

	Small urban	Medium urban	Large urban	Small rural	Medium rural	Large rural
	$/tonne	$/tonne	$/tonne	$/tonne	$/tonne	$/tonne
Private costs	-28.7	-17.7	-11.0	-28.7	-17.7	-11.0
GHG emissions	20.2	20.2	20.2	20.2	20.2	20.2
Other air emissions	-0.3	-0.3	-0.3	0.1	0.1	0.1
Leachate	0.0	0.0	0.0	0.0	0.0	0.0
Disamenity	9.9	9.9	9.9	4.4	4.4	4.4
Total	**1.1**	**12.1**	**18.7**	**-4.0**	**7.0**	**13.7**

Note: Negative numbers represent a cost, while positive numbers represent a benefit.

Source: BDA Group Economics and Environment, 2009, *The full cost of landfill disposal in Australia*, Prepared for the Department of the Environment, Water, Heritage and the Arts, pp. 75-77, CIE.

This suggests that directly addressing the environmental and social costs associated with landfill is likely to be the most efficient way of addressing these costs.

Conclusions and recommendations

Managing the social and environmental costs associated with landfill

The social and environmental costs associated with a well-managed and appropriately sited landfill are minimal. Based on the above analysis, addressing any social and environmental costs associated with landfill directly through appropriate siting of new landfill sites and, where necessary, regulation is likely to be a more efficient way of managing costs of used packaging than through additional regulation to increase recycling.

The benefits associated with recycling are likely to vary, depending on factors such as the type of material recovered, the price of recovered material, the location of the landfill the material is diverted from and the controls in place. There are already significant incentives in place to discourage used packaging from being diverted into landfill. In

particular, a waste levy of more than $100 per tonne applies in the SMA and ERA. This compares to the external costs associated with used packaging of between $2-30 per tonne. In most circumstances, these existing measures will ensure that used packaging will be recycled when there is a net benefit from doing so.

The broad-based recycling target has possibly led to some perverse outcomes. In particular, there appears to have been a significant focus on increasing recycling of glass in order to meet the target. However anecdotally, the costs of recycling glass outweigh the benefits. This is consistent with the findings in the Productivity Commission Inquiry.[123]

The current NEPM regulations also impose significant red tape costs on business through the action plan and reporting requirements.

Managing the social and environmental costs associated with litter

The costs associated with littering are difficult to estimate, but are likely to be significant.

The choice to litter is made by consumers, rather than producers. Litter reduction therefore requires changing consumer behaviour and is likely to be most effectively achieved at the community-wide level through providing bins and education campaigns, rather than through the actions of individual businesses.

These activities are likely to be more efficiently funded by government, rather than industry. In most circumstances, the costs associated with litter are quite localised, so in most circumstances may be better addressed at the state level.

[123] Productivity Commission, 2006, *Waste Management*, Report No. 38, Canberra, p. XLVIII.

8 Land pollution offence

Under the Act it is an offence to pollute land, however what constitutes pollution of land is not clearly articulated. The EPA is proposing to include in the *Protection of the Environment Operations (General) 2009 Regulation* a list that prescribes matters that constitutes land pollution. This list would serve the same function that the list of prescribed matter that constitutes water pollution as specified in Schedule 5 of the *Protection of the Environment Operations (General) Regulation 2009*.

The current proposal includes prescribing land pollution as:

- hazardous waste
- restricted solid waste
- >10 tonnes of asbestos waste
- >5 tonnes or > 500 waste tyres

The benefit of a list that prescribes matters that constitute land pollution is to remove the burden of proof for the regulator and provides clarity to the regulated community. This would reduce enforcement and legal costs to the government. The costs to industry and government of the proposed change are expected to be minimal. Although not quantified, it is expected this proposed change will result in a net benefit to society.

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