



Waste levy review

A Marsden Jacob Report

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# Executive Summary

The waste levy is a key policy instrument that supports the targets of Waste Strategy 2030 by influencing waste disposal practices in Western Australia. The levy currently applies to waste disposed at landfills within the Perth metropolitan area, or waste from the Perth metropolitan area disposed at landfills elsewhere in Western Australia. The levy provides a financial incentive to reduce the quantity of material disposed to landfill and also raises funds to improve the management of waste. The waste levy increased substantially between 2015 and 2018.

A range of reforms are being considered by DWER to resolve specific issues associated with the waste levy or to provide improved waste data that will assist in measuring progress against the Waste Strategy. This report provides research, analysis and expert advice to support a DWER review of the scope and application of the waste levy in Western Australia.

## Levy's role in meeting recycling targets

While the waste levy targets landfill, it may encourage recycling activities that are cost effective compared with the cost of landfilling plus the cost of the waste levy. An important part of this study was to consider the extent to which recycling might be impacted by any further increase in the waste levy.

While by no means definitive, a high-level comparison of WA's recycling rates with other jurisdictions suggests that there is scope for WA to increase its recycling of masonry, organics, paper and cardboard. DWER has advised that, based on a more fundamental review, measures identified in the Waste Strategy also recognise that these categories offer potential.

Some of the most important opportunities for increasing recycling of organic waste and masonry waste are the rollout of better practice waste collection services (coupled with effective product stewardship systems and waste communications) and the increased use of masonry in road bases respectively. Both opportunities rely on uptake by local government, which will be strongly influenced by factors other than the waste levy, such as state government strategy and local government's existing contractual obligations and tolerance for risk.

Another major opportunity is for local reprocessing of paper and cardboard waste. The Council of Australian Governments (COAG) has recognised that current domestic paper and cardboard processing capacity cannot absorb the volume that is currently being exported and so all governments have committed to investigating new processing methods and infrastructure needs to create value added products.

An increase in the waste levy would increase the cost of landfill disposal and improve the comparative financial advantage of these and other recycling opportunities. While recycling rates could improve if the levy is increased, the complex dynamics of each of the major opportunities mean that it is not possible to predict the potential magnitude of the improvement or even whether it would be material.

## Levy's role in meeting waste generation and landfill targets

Current data suggests that WA might be on a trajectory to meet the Waste Strategy's 2025 waste generation targets. Reported Construction and Demolition (C&D) waste generation is already well below the target but the projection must be treated with caution because there are large stockpiles of unprocessed waste material. While the waste levy plays an important role in promoting recycling, it has a lesser impact on waste generation because waste disposal is a relatively low cost compared with the cost of producing or purchasing most goods, and because there are limited alternatives. A potential exception is C&D, which generates large volumes of waste and the cost of disposal represents a comparatively high proportion of the industry's total production costs.

The Waste Strategy also targets a reduction in waste that is sent to landfill from the Perth and Peel regions by 2030. The significant reductions in reported C&D waste mean that the quantity sent to landfill (from all waste streams combined) has already reduced by more than the target. Again, the results may overstate actual performance because some materials have been stockpiled rather than sent to landfill. Nevertheless, there is currently no evidence to indicate that an increase in the rate of the levy is justified specifically to meet the Waste Strategy's waste generation or landfill targets.

## Levy's role in supporting waste related programs

The funding hypothecated to support waste related programs is currently set at a minimum 25 percent of the revenue raised by the waste levy. This funding supports actions under Waste Strategy 2030. The impacts of many of these programs involve behaviour change that will take some time to become fully evident in the data, implying that they will be difficult to evaluate at this relatively early stage in their life cycle. In the future, it might become apparent that more or less expenditure is justified, at which time government could fund the additional costs either by increasing the levy (and leaving the proportion of revenue spent on waste at 25%) or increasing the proportion spent on waste above 25%. There are currently no plans to increase the levy or the hypothecation rate for the (sole) purpose of raising more funds or increasing expenditure on waste-related programs.

## Levy's role in achieving Waste Strategy 2030 targets

The waste levy supports the Waste Strategy's landfill diversion and recycling targets. The recent increase in the waste levy has had only a modest effect on Municipal Solid Waste (MSW) and Commercial and Industrial (C&I) landfill diversion targets, but has had a clear impact on C&D waste disposal rates, which have fallen dramatically in recent years. C&D has exceeded both its waste generation and recycling targets, although it is unclear whether this achievement has been the result of undesirable behaviours such as excessive stockpiling and illegal disposal. It is also possible that C&D disposal rates may return to higher levels, although perhaps only temporarily, if and when existing stockpiles of unprocessed material are reclassified as waste.

MSW could conceivably meet its targets without an increase to the waste levy but is unlikely to do so by 2025. C&I recycling is significantly short of its targets. The targets for both C&I and MSW come under increased pressure when the proposed national waste export ban is implemented. An increase in the waste levy would assist in making marginal technologies more viable and accelerate progress toward the target, although it is not possible to predict the rate of improvement.

## Geographic scope of the levy

Currently, the waste levy applies to waste received for disposal at landfills in the Perth metropolitan region, and Perth metropolitan waste received for disposal at regional landfills. Other states with a waste levy apply the levy to regional areas, albeit generally at a reduced rate, with some exceptions for remote communities.

WA could also consider extending the geographic boundary of the waste levy to assist in meeting waste strategy targets in the regions and improve its equitable application across the state. Our study reviewed a number of potential reasons that the regions might face different circumstances to Perth, including the opportunities for material recovery, the risk of undesirable avoidance behaviour and the additional cost involved. We found that there are recycling opportunities in regional areas and that the risks of undesirable behaviours and cost to waste managers do not outweigh the implied benefits of the waste levy. Government should consider the additional monitoring and enforcement costs required, noting that the levy will also generate additional revenue that might fully or partly offset these costs.

On balance, we find that there is a strong argument for extending the waste levy to regional areas, except for remote areas, which would have limited recycling opportunities. The lower material recovery targets for MSW in major regional centres imply that a lower waste levy could be justified for regions (other than the Peel region).

## Levy exemptions

While there is no specific evidence that the number of exemptions is resulting in undesirable consequences, it is in principle preferable to minimise exemptions, limiting them to those that are relevant to current circumstances and achieve a clear public benefit. Minimising the number and scope of exemptions not only provides a clearer message to waste generators but also reduces administrative costs and the opportunities for levy avoidance. While the *Closing the Loop* consultations are in progress we do not recommend any additional action on exemptions but propose that a periodic reviewing of waste levy exemptions should be undertaken in the longer term. The review would aim to either remove or tighten the scope of each exemption unless it can be demonstrated that the exemption provides material net benefits to Western Australia.

## Differentiation of waste levy rates

The waste levy is currently a uniform rate of \$70 per tonne (or the equivalent thereof) for all non-exempt applicable waste sent to landfill. Our study examined a number of reasons the waste levy might be differentiated by waste generator or waste stream but found that there is not a sufficient variation in the costs or environmental impacts of disposing of different types of waste to warrant such differentiation. One exception is the potential for a lower waste levy rate in regional areas, as noted above.

## Levying energy recovery

The Waste Strategy gives preference to material recovery over energy recovery and includes a target to recover energy only from residual waste. One option for meeting the target would be to apply the waste levy to non-residual waste used in energy recovery. Such a levy would only be required if other, more direct options for addressing the target are not implemented, such as amendments to environmental licence conditions or other regulatory options.

## Future levy rates

Economic theory suggests that an increase in the waste levy would promote faster take up of otherwise marginal recycling technologies and provide additional financial incentives for local governments and businesses to reduce the quantity of waste sent to landfill. We expect that the most significant impact of an increase in the levy would be to reduce any government assistance that might be required to establish local reprocessing of paper and cardboard. Increases in the waste levy can support the viability of recycling infrastructure by increasing demand for material recovery options, as landfill disposal will become comparatively more expensive. Accordingly, an increase in the waste levy might improve recycling via market forces rather than through direct financial support from government, although the extent of any potential improvement has not yet been established.

The other major opportunities for recycling, including better practice collection systems and greater use of recycled materials in road bases, are likely to be accelerated by an increase in the levy, but substantial improvements in recycling rates are more likely to be driven by state government facilitation and direction than by levy considerations.

An increase in the waste levy would not be costless. The economic cost would impact households and industry in the same manner as an increase in taxation. An increase in the levy would also increase the incentive for undesirable levy avoidance behaviours such as stockpiling and illegal disposal, and affect the viability of recycling industries that generate high levels of residual waste but cannot recover the increased cost through higher gates fees or other mechanisms.

The Waste Strategy targets have been developed by government based on its value judgement about their potential benefits to society. Therefore a value judgement by government is also required to assess the trade-off between the targets and the other impacts of an increase in the waste levy.

Regardless of the ultimate rate of the waste levy, we recommend that the rate is automatically adjusted by the Consumer Price Index (CPI) each year to ensure that any pricing signal is maintained in line with other cost increases faced by waste generators and waste managers.

## Mitigating undesirable consequences

A higher waste levy may encourage greater recycling and better waste management practices but may also increase the risk of inappropriate disposal of waste in order to avoid paying the levy.

While historic data suggests that MW and C&I waste generation has not changed substantially with the recent increase in the levy, C&D waste generation has decreased rapidly with no corresponding increase in recycling. We estimate that around half of the reduction can be explained by the recent reduction in development activity in WA). Some of the reduction might also be explained by industry repurposing of C&D materials that would otherwise be considered waste (excavated sand, excess bricks, etc) but the extent of such repurposing is unknown. Two unintended consequences associated with the increase in the waste levy are an increase in stockpiling and the increased risk of illegal disposal practices. The former has in recent years represented between 5 and 8 percent of total waste generation. The extent of the latter is unclear and warrants further investigation.

We offer three potential strategies to assist in mitigating undesirable behaviours below.



### Strategy 1: Improved C&D data through consolidation of information and targeted study

The extent of undesirable levy avoidance in WA's C&D sector is currently unknown and could potentially be worth millions of dollars a year in lost revenue to the state. Accurate data is a key means of understanding where attention might be required. Recent consultation papers have proposed imposing some reporting requirements on various market participants. Government could also consolidate existing C&D information, in addition to working with the source industries to establish greater clarity on the volumes and destination of wastes. A targeted study of waste generation and waste flows from a broadly representative sample of residential and commercial construction sites would improve clarity on the expected volumes of different waste products and their reuse or disposal destination. Such information would allow a better understanding of where and by how much reported C&D practices across the state differed from expected practice, which would assist to direct compliance activities.

### Strategy 2: Greater focus on investigation

Potential methods of levy avoidance include unlawful arrangements with authorised facility operators and/or disposal to unauthorised sites. Auditing is less likely to identify these behaviours than investigative research. Some investigation could potentially be conducted on a desktop basis using information from existing or increased reporting requirements, focussing on the largest C&D businesses. To support these investigations, strengthened powers relating to waste that is being transported between locations or to an unlicensed facility may be useful, particularly for inert wastes.

### Strategy 3: Strengthen deterrence

An increase in the waste levy has the potential to increase the risk of illegal activities such as levy evasion and illegal dumping. Penalties included in waste and environmental legislation are intended as a deterrent against such activities. DWER may be able to improve deterrence without changing primary legislation by increasing the actual likelihood of being caught (see Strategies 1 and 2), increasing the *perceived* likelihood of being caught, or speeding up the timing of prosecutions. Additional legislative reform that DWER could consider include increasing investigation powers for unlicensed sites (see Strategy 2), increasing the maximum penalty for unlawfully disposing of waste, and introducing civil penalties and modified penalties (such as infringement notices). A more detailed discussion is included in the body of this report.

# 1 Introduction

The *Waste Avoidance and Resource Recovery Levy Act 2007* (WARR Levy Act) and its regulations provide for a levy to be applied to waste received at metropolitan landfills and metropolitan waste received at landfills outside the metropolitan area (henceforth “the waste levy”).

The waste levy is a key policy instrument used to influence waste disposal practices in Western Australia by providing a financial incentive to reduce waste to landfill and by generating funds for a range of waste and environmental purposes.

The *Waste Avoidance and Resource Recovery Strategy Action Plan 2030* (Action Plan) commits government to a review of the scope and application of the waste levy in consultation with stakeholders. The purpose of the review is to ensure that the levy meets the objectives of the overarching *Waste Avoidance and Resource Recovery Strategy: 2030* (the Waste Strategy). The Waste Strategy also includes a commitment to establish a five-year schedule of levy rates.

## 1.1 Purpose of this report

In accordance with the commitments in the Action Plan, this report provides research, analysis and expert advice to support a DWER review of the scope and application of the waste levy in Western Australia. The report considers the effectiveness and efficiency of the waste levy as a tool for achieving the objectives of the waste levy and provides practical advice on improvements to better achieve those objectives.

The DWER review and this report focus on the scope and application of the levy only insofar as they achieve the defined objectives of the levy. The report does not advise on:

- the stated objectives of the waste levy or targets of the Waste Strategy or Action Plan;
- any issues related to policy outcomes beyond the objectives of the levy;
- the effectiveness and efficiency of levy expenditure or of other measures to encourage recycling.

## 1.2 Structure of the report

This remainder of this report is structured as follows:

- Section 2 provides background and context.
- Section 3 outlines the objectives of the levy and Waste Strategy.
- Section 4 analyses the waste levy as a tool for meeting the objectives of the Waste Strategy.
- Section 5 considers the scale and scope of the waste levy.
- Section 6 considers implementation and compliance issues.
- Section 7 provides a summary of the findings and conclusions.

## 2 Background and context

The waste levy is a key policy instrument used to influence waste disposal practices in Western Australia. It was first introduced in 1998 and currently applies to the landfill disposal of waste generated in the Perth metropolitan area. It increases the cost of landfill disposal, which provides a financial incentive to decrease the quantity of material disposed to landfill. It also raises funds to improve the management of waste. The waste levy is a key instrument for achieving the targets in the Waste Strategy 2030.

In 2012 the Waste Authority advised the government that an increase to the rate of the waste levy was required in order to meet the strategy's waste diversion targets. A five-year schedule of increases was subsequently implemented, commencing 1 January 2015. Between 2015 and 2018 the waste levy increased from \$12 per cubic metre (approximately \$8 per tonne) at inert waste landfills to \$105 per cubic metre (approximately \$70 per tonne), and from \$28 per tonne at putrescible waste landfills to \$70 per tonne (Table 1).

Table 1: Waste levy rates

Period	Inert Rate/m <sup>3</sup>	Approx. inert rate/tonne	Putrescible rate/tonne
31 December 2014	\$12	\$8	\$28
1 January 2015 – 30 June 2016	\$60	\$40	\$55
1 July 2016 – 30 June 2017	\$75	\$50	\$60
1 July 2017 – 30 June 2018	\$90	\$60	\$65
1 July 2018 onwards	\$105	\$70	\$70

### 2.1 Waste strategy 2030

The Waste Strategy includes eight headline strategies. The fifth of those strategies is to:

*Review the scope and application of the waste levy to ensure it meets the objectives of Waste Avoidance and Resource Recovery Strategy 2030 and establish a schedule of future waste levy rates with the initial schedule providing a minimum five year horizon.*

The Action Plan identifies a number of actions to support Strategy 5, of which the two key actions relevant for the current study are:

*5.1 Waste levy review: In consultation with relevant stakeholders, undertake a review of the scope and application of the waste levy to ensure it meets the objectives of the waste strategy.*

*5.2 Schedule of levy rates: Establish a schedule of future waste levy rates that provides a minimum five year projection.*

This study will inform DWER's broader consultative review and will provide practical recommendations in relation to these two actions.

## 2.2 Recent work

A range of reforms are already being considered by DWER to resolve specific issues associated with the waste levy or to provide improved waste data that will assist in measuring progress against the Waste Strategy. These reforms include:

- Amendments to the *Waste Avoidance and Resource Recovery Regulations 2008* (WARR Regulations) to require recordkeeping and reporting of waste and recycling data from local governments, waste recyclers and licensees of major regional landfills. This has been enacted from 1 July 2019 and the first of the required reports will be submitted by 1 October 2020.
- *Closing the Loop – Waste reforms for a circular economy in Western Australia* is a consultation paper being developed by DWER to address a range of important legislative issues, many of which directly or indirectly affect the waste levy and its implementation.
- Review of the uncontaminated fill thresholds in Table 6 of the *Landfill Waste Classification and Waste Definitions 1996 (as amended 2019)*
- Proposed amendments to the WARR Levy Regulations to require the use of weighbridges for Category 63, 64 and 65 landfill premises to calculate levyable waste.
- *Waste not, want not – valuing waste as a resource* – a consultation to inform development of a legislative framework to provide for beneficial re-use of waste-derived materials.

The *Closing the Loop* consultation paper in particular addresses a wide range of reforms to the application and enforcement of the WARR Act, licensing of waste facilities and the landfill levy, including:

- Aligning the EP Act with waste avoidance and resource recovery objectives.
- Clarifying the application of the waste levy (how waste premises pay the levy for waste that they receive).
- Modernising landfill licensing and levy liability for waste disposal .
- Simplifying the solid waste licensing categories.
- Minimising stockpiling at waste storage premises.
- Waste levy exemptions.
- Improving solid waste reporting from waste facilities.
- Compliance and enforcement measures for waste.
- Improving the administration and collection of the waste levy.

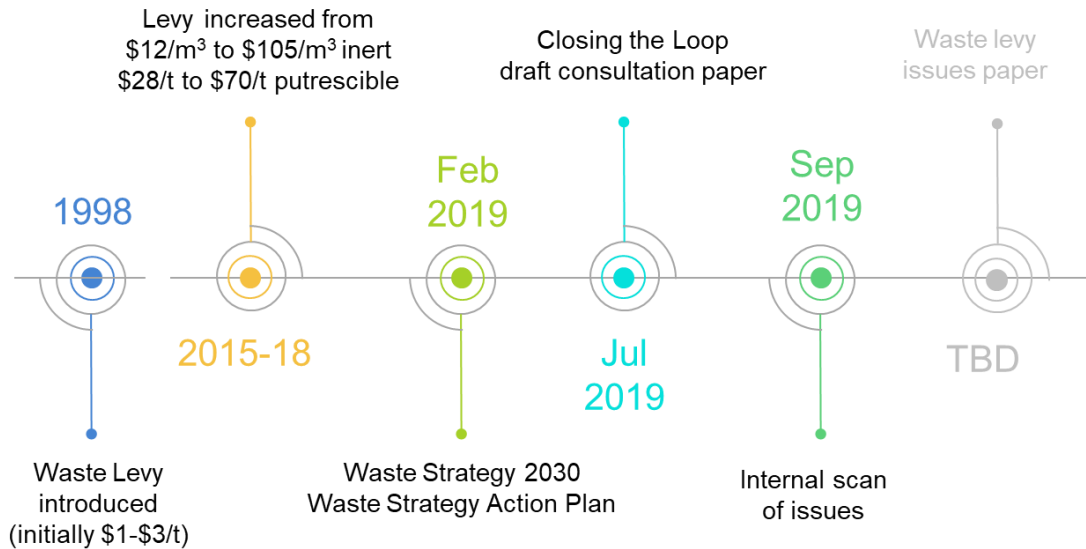
A summary of the key recent consultations and proposed reforms are set out in Appendix 1.

While these reforms address a range of specific issues, DWER has not yet undertaken a comprehensive review of the waste levy which would identify the full range of issues and potential solutions to improve its effectiveness. Furthermore, it could be some time before reforms identified in the consultation papers can be implemented.

## 2.3 Timeline of key events

Figure 1 provides a timeline for the waste levy and some key milestone dates.

Figure 1: Waste levy timeline



The Action Plan includes a public commitment to review the waste levy, including through stakeholder consultation. In March 2020, DWER is released an issues paper seeking feedback on future levy rates and other strategic issues.

The current study draws on independent research, internal DWER knowledge, and experience from other jurisdictions to inform a broad review of the waste levy and provides practical recommendations for action.

# 3 Objectives of the waste levy and Waste Strategy targets

## 3.1 Objectives and targets of Waste Strategy 2030

This report takes the objectives of the levy to include the objectives of the government’s waste strategy, as currently set out in the *Waste Avoidance and Resource Recovery Strategy 2030*.<sup>1</sup> An examination of the relationship between the objectives of the levy and its legislative basis is provided in Appendix 5.

The Waste Strategy includes three objectives to “guide the Western Australian community and enable the development of a sustainable, low-waste and circular economy”. The objectives, shown in Figure 2, frame the priorities and strategies that contribute to delivering on the vision.

Figure 2: Waste Strategy 2030 objectives



The Waste Strategy also sets targets that underpin these objectives, including targets for waste avoidance, resource recovery and environmental protection, including the diversion of waste disposed to landfill. The Waste Strategy targets are set out in Figure 3.

Figure 3: Waste Strategy 2030 targets

Avoid	Recover	Protect
Western Australians generate less waste.	Western Australians recover more value and resources from waste.	Western Australians protect the environment by managing waste responsibly.
<ul style="list-style-type: none"> <li>2025 – 10% reduction in waste generation per capita</li> <li>2030 – 20% reduction in waste generation per capita</li> </ul>	<ul style="list-style-type: none"> <li>2025 – Increase material recovery to 70%</li> <li>2030 – Increase material recovery to 75%</li> <li>From 2020 – Recover energy only from residual waste</li> </ul>	<ul style="list-style-type: none"> <li>2030 – No more than 15% of waste generated in Perth and Peel regions is landfilled</li> <li>2030 – All waste is managed and/or disposed to better practice facilities</li> </ul>

A guiding concept for the Waste Strategy is the waste hierarchy, a decision making tool which ranks waste management options in order of their general environmental desirability (Figure 4). Waste avoidance is the most preferred option in the hierarchy, while disposal is the least preferred.

<sup>1</sup> <https://www.wasteauthority.wa.gov.au/publications/view/strategy/waste-avoidance-and-resource-recovery-strategy-2030>

Figure 4: Waste hierarchy based on the WARR Act



In Section 4 we consider the extent to which a waste levy is an appropriate tool to meet these objectives; in Section 5.15 we consider the rate and scope of the waste levy and its contribution to meeting the targets; and in Section 6 we consider implementation and compliance issues and strategies that could strengthen the waste levy’s contribution to meeting the targets.

For comparison purposes, an overview of the waste levy and strategies of selected other Australian jurisdictions is provided in Appendix 1.

## 4 The role of the waste levy

The waste levy is an economic instrument for influencing waste management practices, including reducing waste to landfill, which also raises funds to support waste-related programs.

In this section we examine the reasoning that supports (or otherwise) the use of a waste levy as a tool for achieving the objectives of the Waste Strategy. We also consider whether there is evidence that supports or undermines the case for a waste levy as a tool for meeting those objectives.

We consider:

- the role of the waste levy in meeting waste generation targets;
- the role of the waste levy in meeting recycling targets;
- the role of the waste levy in meeting landfill targets;
- the role of the waste levy in supporting waste related programs; and
- broader waste management actions.

### 4.1 Role of the waste levy in meeting waste generation targets

As indicated in Table 2, the C&D waste stream and overall Waste Strategy 2025 waste generation targets were met in 2017-18 due to the large decrease in reported C&D waste (which may require further investigation, as discussed in Section 6.2). Both MSW and C&I waste are within 1 percent of meeting their respective 2025 targets. If the generally downward trend continues, assisted by any new strategies the state adopts, the 2025 targets could potentially be met without any further increase in the levy.

While current data suggests that WA might be on a trajectory to meet the 2025 waste generation targets, the projection must be treated with caution because there are currently large stockpiles of unprocessed waste material. If and when stockpiling is better addressed through regulation and other means, the generation statistics could increase. If illegal disposal of large volumes of waste was discovered and/or was reduced by proposed reforms, this could also affect generation statistics.

In general, the waste levy plays only a minor role in reducing waste generation because of the relatively low cost of waste disposal and the fact that many households and businesses are charged flat fees for waste collection services. General waste might be reduced by methods such as home composting, repairing and repurposing (rather than new purchases), and low waste packaging choices, but these options tend to be driven by environmental ethos rather than a price signal.

The rate of the levy may have a greater influence on C&D waste generation because C&D generates large volumes of waste and disposal costs represent a comparatively high proportion of the industry's total production costs. In response to the levy, C&D material that would otherwise be considered waste, such as sand and asphalt, can sometimes be repurposed onsite or used in other developments. Developers can also more carefully estimate the materials required for a development to minimise overordering. The waste levy will typically be passed on to developers through commercial waste management fees (e.g. skip bin fees) or, where the developer disposes of their own waste, via landfill gate fees. By repurposing the materials before they become classified as waste, the developer avoids the disposal fees and effectively reduces the volume of waste they have generated.



Table 2: Waste generation per capita compared to Waste Strategy targets

	MSW (kg/capita)	C&I (kg/capita)	C&D (kg/capita)	All waste (kg/capita)
Baseline 2014-15	630	618	1,188	2,437
2015-16	626	643	730	1,999
2016-17	594	584	604	1,782
2017-18	604	591	574	1,769
2025 Target	599	587	1,010	2,193
2030 Target	567	556	832	1,950

## 4.2 The levy's role in meeting recycling targets

Table 3 shows that C&D recovery rates are within 2% of the 2025 Waste Strategy recycling target (assuming the reported generation rates are correct) but MSW and C&I lag markedly behind their respective targets.

Table 3: Recovery rates by waste stream compared with Waste Strategy targets

	MSW (Perth)	C&I	C&D
Current WA (2017-18)	40%	45%	75%
2025 Target	67%	75%	77%
2030 Target	70%	80%	80%

While the waste levy does not directly target recycling, it may encourage recycling activities if there are realistic opportunities in WA that are cost effective compared with the cost of landfilling plus the cost of the waste levy.

### Comparison of recycling in WA with other jurisdictions

This report does not aim to assess the effectiveness of the Waste Strategy or the appropriateness of its targets. Instead, the study considers how the waste levy might contribute to meeting the objectives and targets of the Waste Strategy. Accordingly, an important part of the exercise is to determine which waste materials have the most scope to be influenced by a waste levy.

A “bottom up” approach to understanding the potential impacts of the waste levy would involve a targeted study, business models and industry surveys related to each waste material. Such a detailed review is beyond the scope of this general study. However, one high-level method that can be used to gain a sense of which materials might be most readily influenced by a waste levy (subject to further investigation) is a comparison of recycling rates between the states. This approach is not intended to be definitive but provides a direction that allows us to concentrate on specific categories of material in which WA lags the recycling rate of other states. Our subsequent analysis of each material then provides a better basis for understanding the likely impact of an increase in the levy for that material.

Table 4 provides an analysis of recycling rates per capita in each state.

Table 4: Kilograms recycled per capita 2016-17

Category	Types	NSW	Vic	QLD	WA	SA	SA vs WA
Masonry materials	Asphalt	78	27	71	14	157	
	Bricks	153	94	9	1	24	
	Concrete	153	362	302	93	437	
	Rubble (incl. non-haz. foundry sands)	134	157	0	317	14	
	Plasterboard & cement sheeting	2	5	4	1	1	
	<b>Masonry materials</b>	<b>519</b>	<b>646</b>	<b>386</b>	<b>425</b>	<b>634</b>	<b>+208</b>
Metals	Steel	173	148	144	200	159	
	Aluminium	13	18	10	13	10	
	Non-ferrous metals (ex. aluminium)	13	7	7	8	11	
	<b>Metals</b>	<b>199</b>	<b>174</b>	<b>162</b>	<b>221</b>	<b>179</b>	<b>-42</b>
Organics	Food organics	36	6	14	37	5	
	Garden organics	141	87	120	83	172	
	Timber	36	45	21	24	146	
	Other organics	93	14	0	2	327	
	Biosolids (non-contaminated)	37	77	66	39	73	
	<b>Organics</b>	<b>344</b>	<b>228</b>	<b>221</b>	<b>185</b>	<b>723</b>	<b>+538</b>
Paper & cardboard	Cardboard	37	78	62	67	99	
	Liquid paperboard	1	0	0	0	1	
	Newsprint & magazines	36	31	0	20	40	
	Office paper	14	4	53	3	5	
	<b>Paper &amp; cardboard</b>	<b>88</b>	<b>113</b>	<b>115</b>	<b>89</b>	<b>145</b>	<b>+56</b>
Plastics	<b>Plastics</b>	<b>11</b>	<b>21</b>	<b>8</b>	<b>5</b>	<b>17</b>	<b>+11</b>
Glass	<b>Glass</b>	<b>26</b>	<b>22</b>	<b>22</b>	<b>22</b>	<b>39</b>	<b>+17</b>
Textiles leather & rubber	Textiles		1			2	
	Leather & rubber (excl. tyres*)		1	0		12	
	<b>Textiles, leather &amp; rubber (excl. tyres)</b>	<b>7</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>14</b>	<b>+13</b>
Other	<b>Other</b>	<b>136</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>+0</b>
<b>Total</b>	<b>TOTAL</b>	<b>1,329</b>	<b>1,422</b>	<b>915</b>	<b>948</b>	<b>1,750</b>	<b>+802</b>

Source: National Waste Reporting Tool 2018, prepared for Department of the Environment and Energy

\* Note that the national waste reports account separately for tyres and other waste considered hazardous. In 2016-17, around 19,000 tonnes of tyres were recycled in WA.

Table 4 provides an imperfect method of determining which opportunities are most easily achievable in WA for several reasons:

- There are some recycling opportunities unique to a state, as demonstrated by the large spike in certain materials in some states, such as timber and other organics recycled in SA.
- There remains some room for interpretation between the categories. For example, the very low figure reported in WA for brick recycling suggests that bricks may be captured under another masonry category, e.g. rubble. (Note that this report often refers to the National Waste Reporting figures, so uses the term “masonry materials” consistently with the national report. In the Recycling Activity in Western Australia reports, the equivalent category would be “Inert C&D materials”, with the term “masonry” reserved for a specific type of inert C&D material.<sup>2</sup>)
- The level of waste generated for each material type differs by state (e.g. from different industry types) as does the proximity to different markets, implying that the opportunities for recycling will differ.
- There may be readily achievable opportunities for improvement that have not been enacted in any of the states.
- There might be differences in the methods of measurement or classification between the states that artificially skew the data.

Despite these limitations, the results do provide some guidance about where other states are focussing their attention and therefore where there might be achievable gains are in WA. SA stands out as the current industry leader in recycling, across almost every material category. The final column in Table 4 presents the difference between the kilograms of waste per capita recycled in SA compared with WA. The results show that greatest differences are masonry materials and organics. NSW and Victoria also recycle considerably more per capita of these materials than WA.

While the figures in Table 4 provide a broad indication of the scope for improvement in WA, they include high values for recycling of specific products (such as timber) in other states which may skew the results. Some of these opportunities may not be available in WA if the industries generating this waste are not established in the state and consequently their waste resources are not available for reprocessing.

Therefore, we have also examined the quantity of waste that is disposed to landfill (Table 5) focussing in particular on the three largest areas that show scope for improvement in WA – masonry, organics, and paper and cardboard. By focussing in the per capita quantity of material sent to landfill we have a better idea of the “unrecyclable” quantities and avoid the issue of whether each state has different opportunities or whether there are inconsistencies in how each state defines recycling.

Table 5 shows that WA landfills almost 360 kilograms per person per year more masonry, organics, and paper and cardboard than SA. We note that the figures should be interpreted with caution because the national reports use extrapolation techniques, based on national averages, to arrive at the breakdown between material categories for WA. While the figures provide the best available indication of the breakdown, they could potentially be significantly different in WA.

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<sup>2</sup> In the Recycling Activity in Western Australia reports the broader category is Inert Construction and Demolition (C&D) Materials, which includes concrete, masonry, bricks, waste derived inert fill and the like. Masonry is a subcategory of the Inert C&D Materials category. In the national reporting, “masonry materials” is the general category referring to all inert construction and demolition material (concrete, cement, bricks, waste derived inert fill and the like).

Table 5: Kilograms per capita sent to landfill 2016-17

	WA	SA	Difference
Masonry	165	39	126
Organics	307	134	173
Paper and cardboard	94	34	60

In case SA is unique, Table 6 also considers WA’s position with respect to the second lowest level of landfill per capita (from NSW, Victoria or Queensland). With regard to masonry sent to landfill, WA currently records the second lowest level of landfill per capita. For organics, WA landfills 108 kilograms per capita more than NSW and for paper and cardboard, WA landfills more than 60 kilograms per capita more than Victoria.

Table 6: Kilograms per capita sent to landfill 2016-17

	WA	Second best	Difference
Masonry	165	>165	-
Organics	307	199 (NSW)	108
Paper and cardboard	94	48 (Vic)	46

If the national reporting data is accurate and WA were to achieve the same level of landfill per capita as the second-best state, solely through recycling, then the diversion rate would move from the first to the second row of Table 7. If WA were to achieve the same level of landfill per capita as SA solely through recycling, then the diversion rate in WA would move from the first to the third row of Table 7. The final two rows show the Waste Strategy 2030 targets.

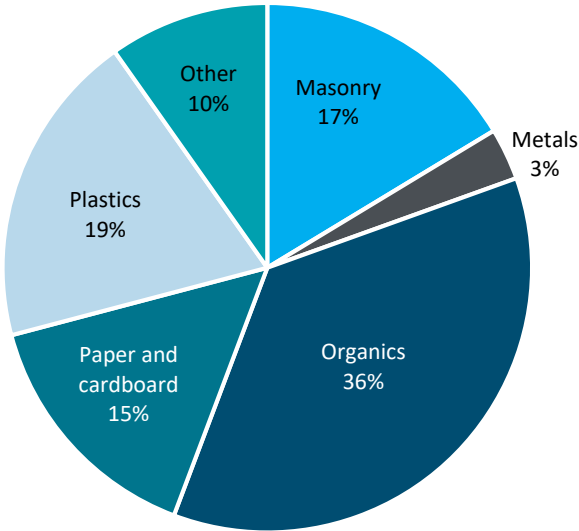
Table 7: Diversion rates if lowest Australian landfill per capita rates were achieved in WA through recycling

	MSW (Perth)	C&I	C&D
Current WA (2017-18)	40%	45%	75%
With second best landfill per capita	56%	54%	76%
With best (SA) landfill per capita	66%	65%	91%
2025 Target	67%	75%	77%
2030 Target	70%	80%	80%

Table 7 indicates that WA would be close to the Waste Strategy 2025 MSW diversion target if it matched the leading state’s (SA’s) landfilling rates for the three key materials through recycling. WA would be close to the 2025 diversion target for C&I if its landfilling rates reduced to align with the second-best state through recycling, and would exceed even the 2030 target if it met SA’s rates.

C&I would continue to lag substantially under either of the scenarios. The C&I category captures waste from a diverse range of businesses, which is reflected in the wide spread of commercial and industrial waste materials sent to landfill (Figure 5). The diversity makes a targeted strategy for C&I more difficult, although the three most significant recycling opportunities (masonry, organics, and paper and cardboard) account for 68 percent of C&I waste. Plastics represent a further 19 percent of C&I waste. WA recycles around 2 kilograms of C&I plastic waste per capita (3 percent of C&I plastic waste generated), while the industry leader, Victoria, recycles around 9 kilograms per capita. The difference suggests there is some room for improvement in plastics recycling WA, although any opportunities will be constrained by the proposed export ban on plastic materials given that most of WA’s recycled plastic waste (over 70 percent<sup>3</sup>) is currently exported overseas (see ‘Paper and Cardboard’ below for more discussion on the proposed ban).

Figure 5: Estimated commercial and industrial waste sent to landfill 2016-17



Source: National Waste Report 2018 national averages; data specific to WA is not available.

In the following sections we examine the potential for expanding recycling in WA for each of the key opportunity areas - masonry, organics, and paper and cardboard.

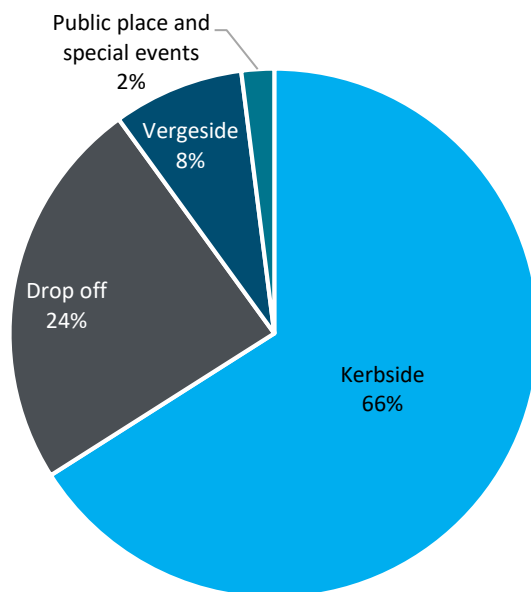
DWER has advised that measures identified in the Waste Strategy also recognise these categories offer potential. In developing the Waste Strategy, a more fundamental approach was taken to identifying areas with the greatest potential than is permitted within the scope of this study.

<sup>3</sup> ASK (2019) *Recycling Activity in Western Australia 2017-18*, prepared for DWER on behalf of the Waste Authority

## Organics

One of the most important opportunities for organic recycling is from household waste. Organic material, including food organics and garden organics (FOGO), makes up over half of the waste generated by households. Around two thirds of municipal waste in WA is sourced from weekly or fortnightly kerbside collections in WA (Figure 6).

Figure 6: Municipal waste collected by source



Source: *The 2017–18 census of Western Australian local government waste and recycling services*

Separation of organics in kerbside collection systems services greatly improves the viability of municipal recycling. High-performing waste collection services (including three-bin systems waste and better practice hard waste collection) have the potential to achieve recovery rates of about 65 percent.<sup>4</sup>

The Waste Strategy commits to a consistent three-bin kerbside collection system, which includes separation of FOGO from other waste categories, to be provided by all local governments in the Perth and Peel region by 2025 and supported by Western Australian Government through the application of financial mechanisms.

A 2016 investigation of various municipal waste technologies by the Southern Metropolitan Regional Council (SMRC) found that diversion rates in the order of 89 percent might be achievable through a combination of three-bin collections with organic waste (green lid) composted with residual waste (red lid plus the residual from composting) being treated at a waste to energy facility.<sup>5</sup> The study also found the such an option would be the lowest cost of the three-bin collection options examined, but noted that the cost estimates for waste to energy were unproven, so recommended a staged approach which involved sending waste (red bin) to landfill and FOGO to a composting facility (thereby achieving a recovery rate of less than 60 percent) in the near term.

<sup>4</sup> Waste Authority (2019) *Position statement on food organics and garden organics (FOGO) collection systems*

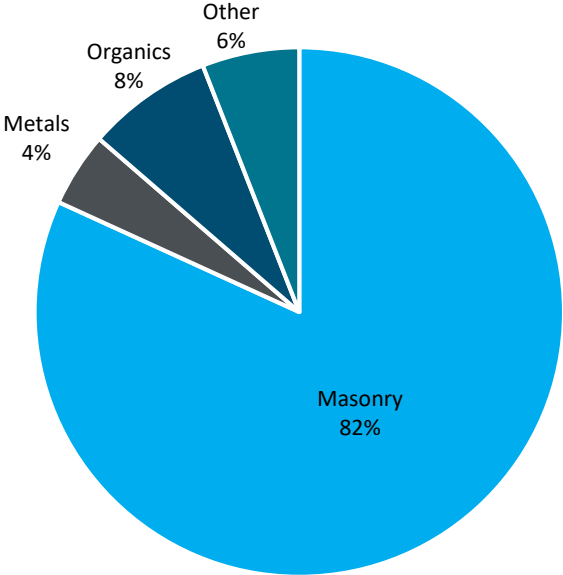
<sup>5</sup> Southern Metropolitan Regional Council (2016) *Strategic Waste Management Plan*

Hence, the Western Australian Government’s commitment to three-bin kerbside collection will make a substantial contribution to meeting the MSW target but other waste recovery methods could also add value. The recovery rates may benefit from the emergence of waste to energy technologies, although we note that the Waste Strategy has a target that energy recovery should be from residual waste only. The analysis undertaken by SMRC indicates that even for residual waste, waste to energy technologies may be cost competitive with landfill (including the current levy) but confidence in the technologies and cost estimates will only come with time. Circumstances vary between councils, so it is possible that three-bin collections plus an alternative technology might be viable for some councils but unviable for others.

**Masonry**

Masonry materials (rubble, concrete, asphalt, bricks, etc) account for an estimated 82 percent of C&D waste (Figure 7) and 17 percent of C&I waste (Figure 5) sent to landfill in WA in 2016-17.

Figure 7: Estimated construction and demolition waste sent to landfill 2016-17



Source: National Waste Report 2018 data. Estimates are based on national averages as data specific to WA is not available.

The most significant opportunity for masonry waste materials is use in road bases. Local governments use around 4 million tonnes per year and Main Roads around 1-2 million tonnes per year.<sup>6</sup> For context, around 0.3 million tonnes of masonry material was disposed to landfill in 2016-17 and around 1.1 million tonnes was recycled.

<sup>6</sup> Estimated from reported activities, WALGA 2015, and Main Roads WA 2014. Quoted in WA Pavements Group working group report “The Use of Recycled Materials for Pavements in Western Australia” (2016).

Main Roads WA introduced a sub-base specification for Crushed Recycled Concrete (CRC) and Comingled Demolition Material (CDM) in 1995, which was withdrawn in 2012 due to concerns about asbestos contamination. The specification was reissued later but its use was severely curtailed by new restrictions that were introduced (in particular restrictions on the pH level in concrete).

In 2016 a working group from the WA Pavements Group (a subcommittee comprising consultants, researchers, Main Roads WA, local government and material suppliers) published a document that investigated the use of recycled materials in road construction with the objective of facilitating wider adoption. The report noted that compared with WA, the eastern states of Australia had a longer history of recycling material sourced from C&D waste. They found that the WA industry was less receptive despite the reports of several successful demonstration projects.

The working group reported on an industry survey that identified inhibitors to the use of recycled products in road construction, which included:

- a lack of confidence in the performance of recycled products;
- a fear of change as the use of conventional techniques and materials was well established;
- a perception that the use of recycled materials increases the level of risk in pavement performance;
- concern over contaminants including heavy metals, poisons and asbestos;
- ignorance about product specifications and design procedures;
- insufficient information to assess the economic advantages;
- insufficient knowledge about construction techniques;
- lack of a landfill levy outside the metropolitan area; and
- performance concerns and a lack of promotion and endorsement from state agencies especially concerning the use of demolition material.

In 2018 the State Government commenced the Roads to Reuse program, which aims to encourage State Government organisations, local governments, regional councils and the private sector to use recycled C&D products in civil applications, such as road construction. The Roads to Reuse product specification applies to recycled road base (sealed with asphalt) and recycled drainage rock. The product specification sets out requirements for the preparation, sampling and testing of C&D waste materials to provide confidence to purchasers about the suitability of the material.

In 2019, the Waste Authority, DWER, and Main Roads WA entered into a partnership to undertake a pilot project, which includes Main Roads WA using material produced under the program in the Kwinana Freeway widening project.

Should the Roads to Reuse program increase the uptake of recycled materials it is likely that WA will meet and even exceed the Waste Strategy 2025 and 2030 targets of 77 and 80 percent respectively for C&D.

While the 2016 working group report (discussed above) suggested that WA might lag behind other Australian states with respect to recycling in road bases, WA reports a lower per capita disposal to landfill than NSW, Victoria and Queensland. As the rate falls further, we would expect the quality and variability of the residual material being sent to landfill to become increasingly less suited to recycling, making it progressively more difficult to increase the recovery rate.

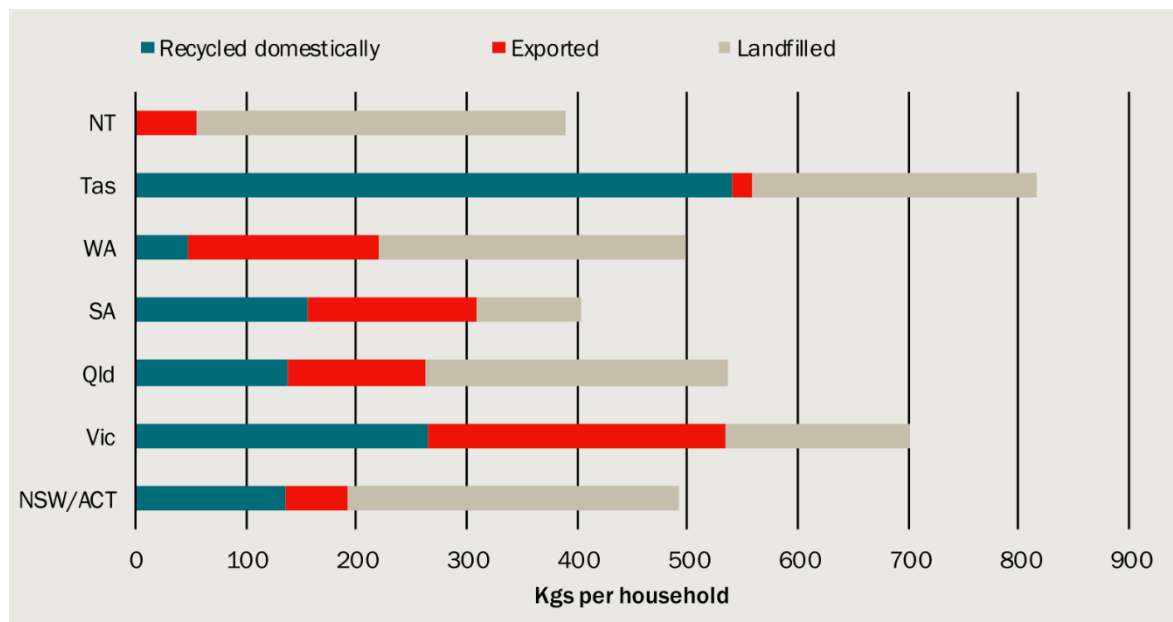


Research on recycling in road construction continues around the country and other potential source materials that may eventually become mainstream include plastic, scrap tyre rubber and glass (as glass sand). Actions 3.11 to 3.15 of the Waste Strategy Action Plan relate specifically to the increased use of recycled materials in Main Roads Western Australia road bases.

### Paper and cardboard

Around 75 percent of recycled paper and cardboard comes from cardboard and packaging materials. WA sent 94 kilograms per capita of paper and cardboard waste to landfill in 2016-17, while the industry leaders, SA and Victoria sent only 34 and 48 kilograms per capita respectively. Figure 8 shows that other states and territories (except NT) have a higher proportion of local reprocessing than WA, which may at least partially explain the higher landfilling rates in WA.

Figure 8: Annual paper and cardboard flows per household by jurisdiction



Note: Exports include interstate waste transfers and may overstate jurisdictional proportions.  
Source: The CIE (2020) Costs and benefits of banning exports of waste

The *Recycling Activity in Western Australia 2017-18* report for the Waste Authority indicated an even more extreme situation, reporting that over 99 percent of Western Australia’s recycled paper and cardboard was exported for reprocessing internationally.<sup>7</sup> The international market for waste products is currently weak and variable, particularly in light of the waste import restrictions imposed by China and other countries.

<sup>7</sup> ASK (2019) *Recycling Activity in Western Australia 2017-18*, prepared for DWER on behalf of the Waste Authority

Recycling of paper and cardboard will become even more challenging when the export ban proposed by the Council of Australian Governments (COAG) is implemented. In 2019 COAG agreed that Australia should establish a timetable to ban the export of waste plastic, paper, glass and tyres, while building Australia's capacity to generate high value recycled commodities and associated demand.<sup>8</sup> COAG has agreed that the ban should commence on 1 July 2020 with a phased approach:

- all waste glass by July 2020 (however delays have occurred in implementing legislation);
- mixed waste plastics by July 2021;
- all whole tyres including baled tyres by December 2021;
- single resin/polymer plastics by July 2022; and
- remaining waste products, including mixed paper and cardboard, by July 2024.

In the lead up to the ban, Australia's governments and industry will consider investing in new technologies and infrastructure to process paper in Australia. Upgrades to sorting equipment at material recovery facilities, separate bin collection, and investment in new technology (such as drum pulping using recycled water) are some of the opportunities which have been identified in industry consultation.

The Western Australian Government has commenced preliminary investigations of the potential for establishing paper, cardboard and plastic reprocessing facilities locally. The investigations have yet to conclude but a higher waste levy might allow a recycling facility to charge higher gate fees, consequently increasing its potential financial viability.

### 4.3 The levy's role in meeting landfill targets

The clearest impact of a waste levy as an economic instrument is its role as a pricing signal to reduce disposal to landfill (see Appendix 3 for more information on the waste levy and the price elasticity of demand). The Waste Strategy targets a reduction of 15% in waste that is sent to landfill from the Perth and Peel regions by 2030. The significant reductions in C&D waste (unless found to be the result of illegal activity) mean that the quantity sent to landfill has already reduced by more than the target. Hence, no further increase in the waste levy is required to specifically support the landfill target.

### 4.4 Role of the waste levy in supporting waste related programs

Currently, \$20.75 million per annum (25%) of the forecast revenue from the waste levy is allocated to waste-related actions administered by the Waste Authority or undertaken by the department. This funding supports actions under Waste Strategy 2030 and is guided by an evaluation framework, which considers the degree to which actions are meeting the intent of Waste Strategy. The intention of the framework is to ensure evaluations are consistent, transparent, consultative and evidence based.

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<sup>8</sup> <https://www.environment.gov.au/protection/waste-resource-recovery/waste-export-ban>

The funding hypothecated to support waste related programs is currently set at a minimum 25% of the revenue raised by the waste levy. The scope of this study explicitly excludes a review of the effectiveness or efficiency of the waste related programs. The programs will be cost effective if they are the lowest cost means of achieving the goals of the Waste Strategy and they will be economically efficient if the benefits from the program outweigh the costs. The impacts of many of these programs involve behaviour change that will take some time to become fully evident in the data, implying that they will be difficult to evaluate at this relatively early stage in their life cycle.

In the future, it might become evident that more or less expenditure is justified. If at any time it were demonstrated that the expenditure is below the optimal level, government could fund the additional costs either by increasing the levy (and leaving the hypothecation rate at 25%) or increasing the proportion of existing revenue spent on waste. Currently, there are no plans to increase the levy or the hypothecation rate for the (sole) purpose of raising more funds or increasing expenditure on waste-related programs.

## 4.5 Broader waste management actions

A levy on landfill is one means to meet the objectives and targets of the Waste Strategy. Other measures include regulations, investment, research, market coordination and other state government interventions. These interventions are beyond the scope of this study, but several important complementary actions identified in the Waste Strategy or in this report include:

- *Compliance and enforcement:* A number reforms to waste legislation have been proposed by the state government (see Appendix 1). Many of these reforms will improve compliance and potentially improve the integrity of the waste industry and (possibly) lead to increased recycling. Perversely, if waste that is currently being disposed illegally is landfilled rather than recycled, the reported waste generation rates could actually increase, causing the diversion rates to decrease as a proportion of generation. That fact should not prevent the government from vigorously pursuing an end to unlawful activities.
- *Research and investment:* Continued research, development and investment in the use of recycled materials in road bases will improve the diversion targets for C&D in particular, but potentially also C&I and MSW. Government intervention may also be required to stop the collapse of the recycled paper, cardboard and plastics in WA. The state might assist through research and market priming, and potentially financial assistance.
- *Guidance and regulation:* The state has set a strategy and timetable for the roll out of three bin collection services by local governments across the state. By providing guidance and leadership on best practice, this vision could be wholly or partly achieved without the need for regulation. If non-residual waste could be used to generate energy, increased regulation of energy recovery is one option that government could consider to ensure that energy is not generated from non-residual waste.

Alternatives to a waste levy could be conceived that have some theoretical advantages over a levy. While such alternatives have their own disadvantages and are not advocated by this report, they help to illustrate the waste levy's practical limitations.

A wholesale alternative to a waste levy might be a levy on activities that generate waste in feeder industries. For example, a levy could be applied to the sale of products that were deemed to result in high levels waste, such as excessive packaging, single use or short life products, or processes for which there were low waste alternatives. This option would not necessarily be of benefit for industries that already face a pricing signal from the levy, such as those that dispose directly to landfill or use commercial waste managers, and therefore indirectly pay the levy via gate fees and hire charges. But for those industries that do not face a pricing signal for the volume of waste they generate, including those that pay flat fees for local government disposal and those whose avoidable waste is generated indirectly (e.g. via their customers), targeted charges could positively influence their waste management practices by encouraging lower levels of waste generation and disposal to landfill. Charges based on processes or inputs specifically associated with the volume of waste generated by a business would be better than industry averages as the latter would not be tied to the performance of individual organisations. Targeted charges could also be seen as an equitable way to raise revenue for waste management programs.

A levy on activities that generate waste in feeder industries may be challenging to implement for practical or legal reasons. For instance, it may be difficult to determine exactly what constitutes “excessive” waste in an industry or how to cost effectively implement a charge. From a legal perspective, the *Mutual Recognition Act 1992*, which protects the free flow of goods and services between Australian jurisdictions, requires that goods traded between jurisdictions be unencumbered by the target State or Territory from unilateral economic burdens (apart from some exceptions and exclusions identified under that Act). It is also possible that levies at different parts of the value chain could be considered a duty, which may require execution by the Commonwealth.

To determine whether industry-based charges were warranted, government would need to consider any legislative constraints, in addition to the public and private costs of implementation compared with the expected benefits of waste reduction.

An alternative would be to continue applying a waste levy to waste sent to landfill, but to differentiate the rate based on the industry sector. A differentiated levy would more directly target industries in which performance was lagging. A disadvantage is that an industry based differentiated levy would provide a signal that waste in some industries is inherently more or less harmful than others. Existing evidence suggests that, other than hazardous waste, the difference in the environmental and social costs associated with different waste streams is relatively small compared with the magnitude of the levy (see Section 5.4). Any differentiation that was attempting to capture the environmental harm of the feeder industry more broadly (e.g. the source of raw materials or the impact of manufacturing processes on the environment) would be better addressed through penalties or levies more directly related to the harm in question. Regardless of the conceptual concerns, targeted levies would be more complex to administer and monitor, and might dampen the simplicity of the signal to the community at large.

Finally, the waste levy is applied to waste sent to landfill, thereby influencing the quantity landfilled but not explicitly ensuring that diversion targets will be met. Diversion targets could more directly be met through government investment in recycling activities or through regulatory controls, such as a prohibitions on certain waste materials or a reduction in the licenced volumes of waste that can be accepted at landfill sites each year.

## 5 Scale and scope of the waste levy

Section 4(2) of the WARR Levy Act allows the regulations to establish the scope and scale of the levy, including exceptions to the levy and different amount of levy in different cases. In this section, we explore:

- the rate of the waste levy;
- the geographic area of the waste levy;
- exemptions to the levy;
- differential rates;
- levying waste to energy; and
- future levy rates.

### 5.1 Rate of the waste levy

As outlined in Table 8, the waste levy in Perth is the lowest of Australia’s five major metropolitan cities and WA has no regional levy, unlike other states.

Table 8: Waste levy rates as at December 2019 (Dollars per tonne)

	Metropolitan	Regional	Exempted regions
Western Australia	\$70	-	
New South Wales	\$143.60	\$82.70	Remote/less populated
Queensland	\$75	\$75	Remote/less populated
South Australia	\$140	\$70	
Victoria	\$65.90 rising to \$125.90 over 3 years <sup>9</sup>	\$33.03 rising to \$62.95 over 3 years <sup>10</sup>	

The objective of the levy is to act as an economic instrument to encourage better waste management practices and to raise funds for waste management programs. As such, there are three potential methods that might be applied to determine the appropriate level of the waste levy:

- cost reflectivity;
- the cost of externalities; or
- a pricing signal to achieve the Waste Strategy targets.

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<sup>9</sup> Waste from three larger regional cities (Ballarat, Bendigo and Geelong) is levied at the metropolitan rate.

<sup>10</sup> *Recycling Victoria: A New Economy, Feb 2020*. Regional rate shown is municipal rate. Higher rate applies for industrial waste.

## Cost reflectivity

One of the objectives of the waste levy is to raise funds for programs to improve the management of waste. However, only 25 percent of the funds raised by the levy are hypothecated specifically for waste-related programs. The fact that minimum expenditure is set at less than 100 percent implies that the rate of the waste levy is not set based on the optimal expenditure required to fund the waste programs.

## Charge to correct externalities

The waste levy can play a role in sending a pricing signal to waste generators about the costs of landfill, including the broader costs to society and the environment (externalities). Previous research has found that the waste market fails to capture these broader costs, which include carbon emissions and impacts on local air and water quality. That is, without a levy, individuals and organisations are not faced with a cost of waste disposal that includes these “non-market” costs, which are additional to the costs of processing and disposal faced by waste management organisations. If the value of these externalities can be determined in monetary terms, then a levy can be applied to send a more accurate pricing signal.

Numerous studies have found the cost of externalities associated with landfilling are well below the current levy rate of \$70/tonne. A 2013 report prepared for the (then) Department of Environment and Regulation found that the environmental externality from a landfill site *not run* at best practice standards could be as high as \$31.90 per tonne for putrescible waste and \$10.70 per tonne for inert waste. By contrast, the externalities associated with a well-run landfill could be as low as \$6.40 per tonne for putrescible waste and \$4.40 per tonne for inert waste.<sup>11</sup>

Accordingly, it is likely that the waste levy not only meets, but even exceeds the rate required to correct for environmental externalities. By implication, the waste levy at its current level might result in a net welfare loss to society, i.e. the economic benefits of applying the levy might be less than the economic costs to society.

As the revenue from the levy is applied to waste-related programs and other government expenditure, the extent of the welfare loss will depend on whether the government would raise additional revenue by other means in the absence of the waste levy. If a lowering of the levy led the government to introduce other revenue raising measures (e.g. an increase in stamp duty) then there would only be a welfare loss if the alternative measures were less distortionary than the waste levy – that is, if the alternative measures resulted in a lower economic loss than the waste levy (the so-called deadweight loss of taxation).

In practice, the ability of government to raise additional revenue in response to a reduced levy would be limited. More likely, expenditure would be reduced. However, as it is not possible within the scope of this study to determine which government programs would be scaled back, let alone assessing the benefits and the efficiency of those programs, we limit our analysis of the distortionary effect of alternative revenue raising methods.

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<sup>11</sup> ACIL Allen (2013) *Economic Drivers of Waste*, report prepared for the Department of Environment and Regulation.

The distortionary effect of government revenue raising measures depends in large part on the extent to which the measures influence the behaviour of households and businesses. Unlike a general consumption tax, the waste levy targets a specific service, so it is tempting to assume that the levy would be one of the more distortionary methods of raising revenue, particularly as some sectors, such as C&D, appear to have been highly sensitive to changes in the levy rate. However, there are two important contrary considerations. The first is that past sensitivity of waste generators to a change in the levy may not be reflective of future sensitivity (in economics terms, the price elasticity of demand may have reduced). The recent increase in the waste levy saw C&D waste generation fall to around 50 percent of its previous level (see Section 6.2). Some of this reduction may have been “low hanging fruit” that could be easily implemented. Further decreases may be more difficult, particularly as around 75 percent of C&D waste is already being recycled. While the waste levy might represent an economic loss to society, that loss would also be incurred through other methods of taxation, but many of those alternative methods might also artificially distort consumption or production behaviour.

The second and more important consideration is that the distortion caused by the levy is exactly the behaviour being targeted by the Waste Strategy – a decrease in landfill and/or an increase in recycling. Nevertheless, the levy is not a costless method of achieving these objectives because it also incurs costs associated with collection, administration, monitoring and compliance costs, and the potential for undesirable avoidance and evasion behaviours (see Section 6.2). By setting the Waste Strategy targets above current performance, government has effectively deemed the implied consequences tolerable, although they are unlikely to have been explicitly considered in developing the targets.

### Achieving Waste Strategy 2030 targets

The rate of the levy could be decided with the aim of achieving the Waste Strategy’s diversion from landfill and/or recycling targets. As the targets are different for different waste types, setting the waste levy in such a way would either imply different levies for different waste streams or a single levy that would achieve the most difficult target and might consequently overachieve the other targets. We examine each waste stream in turn below.

*Municipal waste:* A recent report for DWER conducted a “back-of-the-envelope” calculation using price elasticity estimates, which suggested that the waste levy would need to be increased to around \$200 per tonne to increase the diversion rate for MSW to 65 percent. However, this estimate assumed that the waste levy would be the only influence on behaviour. In practice, the recycling rate is expected to increase over time as more local governments adopt better practice collection services. If high performing collection systems were rolled out, then a diversion rate of up to 65 percent might be expected even without a levy increase.

To meet the 2025 target of 67 percent would require additional practices or technological solutions. As discussed in Section 4.2, a recent business case developed by the SMRC indicated that sending residual waste to an energy recovery facility could achieve diversion rates of almost 90 percent at a similar cost to landfilling the residual (with the current levy). These estimates remain unproven, but if true would imply that an increase in the levy may not be required to meet the targets. However, the difference between current waste recovery rates for MSW (40 percent) and the 2025 MSW target (67 percent) are substantial and unlikely to be fully bridged in just five years. A higher levy might improve the speed of transition and may make some marginal technologies more viable. Many local governments would have long term waste management and recycling contracts already in place, so the speed of transition may remain slow regardless of the incentives. Cost risk and performance risk may also continue to be major deterrents for some councils in the near term.

To significantly alter the diversion rates, local governments could also increase recovery of high volume recyclates such as plastics, paper and cardboard. As noted in Section 4.2, the opportunities or recycling such materials via existing channels will diminish as a result of the upcoming national export ban. The state government is currently reviewing the potential to establish local reprocessing facilities for paper, cardboard and plastic waste in WA. It is possible that local reprocessing may only be a commercially viable if a capital grant is provided by government. Alternatively, rather than a capital grant, an increase in the waste levy might also improve the commercial viability of a reprocessing facility by allowing the proponent to increase their gate fee accordingly. The rate of the waste levy required to stimulate a reprocessing industry can potentially be calculated by converting any upfront subsidy required by a proponent to an annualised unit rate.

If an increase in the levy was explicitly calculated to target paper and cardboard recycling, the impact on other waste streams would also need to be considered. As discussed under “Charge to correct externalities” (above) any increase in the levy may come at an economic cost to the state, so government would need to assess whether the benefits of meeting the paper and cardboard recycling target outweighed the economic impact across all of the waste streams.

We would also expect a higher levy to increase the risk of undesirable levy avoidance.

*C&D waste:* Based on current data, it appears possible that the C&D diversion target might be met or exceeded without any change to the levy, particularly if there is an improvement in confidence in the use of recycled materials for road bases. The reported C&D performance should be treated with caution and might be negatively impacted if and when stockpiles begin to reduce or if any large-scale illegal disposal activities are discovered in the future.

*C&I waste:* C&I waste includes an assortment of commercial and industrial businesses that generate a variety of waste materials (see Section 4.2). Recycling of some C&I waste will be driven by the recycling practices and technologies adopted in other sectors. Organics, paper, cardboard and plastics, which account for around 70 percent of all C&I waste, will potentially be able to take advantage of technologies adopted primarily for MSW waste, such as additional FOGO composting or local paper and plastic reprocessing, while assorted materials such as masonry, rubber and glass might benefit from research on road bases. Based on our review of recycling performance in other states (see Section 4.2) it appears challenging to meet the 2025 C&I target regardless of the size of the levy. Thus, there is no specific levy that will allow C&I to meet its targets by 2025, but we would expect any increase in the levy to assist, at least marginally. Paper, cardboard and plastic represent a reasonable portion of C&I waste, so any increase that would make local reprocessing viable would also help to stem the potential reduction in diversion rates that might result from the export ban.

## 5.2 Geographical area of the waste levy

Currently, the waste levy applies to Perth metropolitan waste received for disposal to landfill, or waste received for disposal at landfills in the Perth metropolitan region. In addition to targets for metropolitan waste, the Waste Strategy includes resource recovery targets in major regional centres of WA.<sup>12</sup> New South Wales, South Australia and Victoria apply levies on landfill in regional areas, with some exceptions for remote communities. The waste levy in regional areas is around half the rate applied in metropolitan areas (see Section 5.1, Table 8). Queensland apply a regional levy that is the same as the metropolitan area.

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<sup>12</sup> Waste Strategy 2030 lists Albany, Busselton, Bunbury, Greater Geraldton and Kalgoorlie-Boulder as major regional centres.



Historically, the waste levy has targeted waste generated in the metropolitan area as the opportunities for recycling in non-metropolitan areas were considered limited. One unintended consequence of this policy may be to provide an incentive for waste producers to misclassify the origin of metropolitan waste and transport it to regional landfills to avoid the waste levy.

We understand that the limited available information does not show that misclassification of the geographic origin of waste is a major contributor to waste levy avoidance. Any levy avoidance that is occurring might be reduced by expanding and more strongly enforcing the reporting and measurement of waste in regional areas. Increasing the area to which the levy applies may make detection of significant fraudulent activity easier because there would be fewer exempt areas and lesser volumes of exempt waste, particularly near Perth where most potentially misclassifiable waste would still originate. The potential for misclassification would be eliminated entirely if the waste levy applied to all waste at the same rate regardless of the origin.

A more compelling argument for expanding the waste levy to apply to regional waste is that the Waste Strategy contains targets for regional waste recovery that are not currently being met. The target for MSW material recovery in major regional centres is 55 percent in 2025 and 60 percent in 2030, compared with current performance of 28 percent.<sup>13</sup> The performance of regional areas also contributes to meeting the state-wide MSW and C&D targets.

Furthermore, some of the environmental concerns about landfilling are likely to be similar whether the landfill is located in Perth or a regional area, including greenhouse gas emissions, the potential to pollute water sources, and the long-term degradation of the site. Air quality concerns may be lower in regional areas as they are less populated.

Starting from the presumption that a waste levy should apply uniformly across the state unless there are reasons to the contrary, we examine a number of arguments that have been presented for the exclusion of regional areas:

- the opportunities for material recovery in regional areas;
- the greater risk of undesirable avoidance behaviour;
- the additional cost involved; and
- lower material recovery targets for MSW in major regional centres in the Waste Strategy.

### Opportunities for material recovery in regional areas

In regional areas, recycling opportunities may be less viable than Perth if materials must be transported to Perth for reprocessing or export. In practice, many recycling opportunities are in fact viable in regional centres, such as composting organic waste or using masonry materials in road bases. The price for high value metals and plastics also means that transporting some materials, often for export, may still be worthwhile. Should the state or federal government support local reprocessing of papers, cardboard and plastic following the national waste export ban, that support could extend to facilitating the transfer of waste from the regions (or, less likely, reprocessing in the regions) but details have yet to be determined.

Despite the fact that the waste levy does not apply to waste from non-metropolitan sources, about 40% of total non-metropolitan waste is already being recycled. Hence it is clear that at least some opportunities for recycling are present in regional areas.

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<sup>13</sup> Waste Authority (2019) *The 2017–18 census of Western Australian local government waste and recycling services*

An important exception is remote areas with a low population base. In these areas there may not be the economies of scale required to efficiently undertake any material recovery and the distances involved may make transporting waste materials to regional centres infeasible.

### Greater risk of undesirable avoidance behaviour

Some smaller regional local governments dispose of waste at large well managed and regulated landfill sites in major regional centres. A waste levy in regional areas could discourage this practice if it is designed without appropriate safeguards or exemptions. The risk of the illegal dumping of waste also increases as the geographic scope to which the waste levy applies increases.

We regard these as serious risks but note that the same risk consideration would have applied when the levy was applied to the Perth metropolitan area. Small local governments near Perth are discouraged from sending waste to well managed metropolitan landfills and the risk of illegal dumping applies to all metropolitan waste. To the extent that the benefits of the waste levy in Perth outweigh the risk of undesirable behaviours, we propose that the benefits in the regions would similarly outweigh the risks. In fact, by applying the waste levy to waste from any origin, the risk of misclassification will be reduced as will the risk that local governments may preference sending their landfill to any one landfill over another solely to (legally) avoid the levy.

One valid concern may be that it will be more difficult to detect illegal dumping in areas with the lower population density in regional areas, which would require a greater compliance and enforcement effort.

### Additional costs involved

In addition to the cost of compliance monitoring and investigation, an expanded levy area may also require additional infrastructure costs such as weighbridges for large landfills. On the basis that the infrastructure costs are justified in the metropolitan area, we consider that they would also be justified in non-metropolitan areas. For smaller landfills, simpler methods of estimating waste quantities may be warranted, in line with any requirements imposed on smaller metropolitan landfills.

With regard to government resources, an extension of the geographic boundaries will imply greater administrative, compliance and reporting requirements. The costs may be proportionally greater than the costs in Perth due to longer distances involved in monitoring and enforcing the application of a levy.

Any decision to expand the waste levy should consider the effect on compliance costs compared with the expected benefits in supporting the Waste Strategy, particularly in less populated areas. Importantly, the additional revenue raised from a state-wide waste levy (potentially around \$10 million per year if the regional levy is half that in the metropolitan area) would assist in meeting the additional costs to government.

### Lower regional targets

Regional areas have lower diversion targets for MSW than the Perth metropolitan region (Table 9).

Table 9: Targets for municipal solid waste material recovery (Waste Strategy 2030)

Year	Perth and Peel	Major regional centres
2025	67%	55%
2030	70%	60%

As the targets for regional centres are lower than those in the Perth and Peel region, the waste levy required to achieve those targets might be correspondingly lower. A rate half that of the metropolitan area, in line with most other jurisdictions, could be a reasonable starting point until progress toward the targets became evident.

It would be logical to extend the full levy to the Peel region, which has the same MSW target as Perth and is adjacent to Perth, so may have similar recycling opportunities.

## Conclusions

Environmental concerns about landfilling apply to both metropolitan and regional landfills. Combined with the fact that the Waste Strategy contains targets for regional waste that are not currently being met, the *prima facie* arguments for applying a waste levy to Perth also apply to regional areas.

We have examined a number of potential counterarguments that suggest regional areas face significantly different circumstances to Perth, including the opportunities for material recovery, the risk of undesirable avoidance behaviour and the additional cost involved. We have found that there are recycling opportunities in regional areas and that the risks of undesirable behaviours and cost to waste managers do not outweigh the implied benefits of the waste levy. Government should consider the additional monitoring and enforcement costs required, noting that the levy will also generate additional revenue that might fully or partly offset these costs.

On balance, we find that there is a strong argument for extending the waste levy to regional areas, except for remote areas, which would have limited recycling opportunities. We envisage that the exceptions would be identified as multiple separate areas, although it is possible that when combined they might form a single contiguous area (particularly as the most populated areas in WA lie either on the coast or in the South West of the state).

The lower material recovery targets for MSW in major regional centres imply that a lower waste levy could be justified for regions other than the Peel region.

## 5.3 Exemptions

Under Regulation 5(1) of the WARR Levy Regulations 2008, landfill licensees may apply for a waste levy exemption under certain circumstances. The current exemptions are summarised in Table 10, and DWER also publishes advice on the exemptions, including fact sheets.

Table 10: Current exemptions

Regulation	Summary of exemption
5(1)(a)	Waste that is, or is to be, used after the completion of landfill operations to cover waste disposed of on the premises <a href="#">Fact sheet</a>
5(1)(b)	Waste which is collected and stored for reuse, reprocessing, recycling or use in energy recovery
5(1)(c)	Waste reasonably removed from an orphan site by a public authority
5(1)(d)	Hazardous waste reasonably removed by a public authority
5(1)(e)	Waste resulting from a natural disaster that cannot reasonably be reused, reprocessed, recycled or used in energy recovery
5(1)(f)	Waste deposited on a shoreline by the action of water that is reasonably removed by a public authority and cannot reasonably be reused, reprocessed, recycled or used in energy recovery
5(1)(g)	Waste used for construction or maintenance work carried out on the licensed landfill <a href="#">Fact sheet</a>
5(1)(h)	Waste used for cover as required by a closure notice
5(1)(i)	Asbestos containing material
5(2)	An exemption from the requirement for category 64 or 65 licensed landfills to weigh waste on a weighbridge
5(3)	An exemption from the requirement for Category 63 licensed landfills to conduct and lodge a quarterly volumetric survey
5(3A)	Uncontaminated soil or other clean fill that was accepted prior to 5 February 2020 to be used after the completion of landfill operations to cover, to a depth of 500 mm, waste disposed of on the premises <a href="#">Fact sheet</a>

Source: <https://www.der.wa.gov.au/your-environment/waste/151-landfill-levy>

[https://www.der.wa.gov.au/images/documents/your-environment/waste/landfill-levy/Guideline\\_Waste\\_levy\\_exemptions.pdf](https://www.der.wa.gov.au/images/documents/your-environment/waste/landfill-levy/Guideline_Waste_levy_exemptions.pdf)

When considering the effectiveness and efficiency of exemptions there is inevitably a natural tension between sending a clear and simple message to waste generators and other considerations such as promoting the public good (such as exempting hazardous waste) and equity (such as waste from a natural disaster, which is not generated by anyone in particular).

Exemptions may act to reduce transparency and make compliance more difficult to monitor and enforce. The scope of exemptions could potentially also allow for levy avoidance, e.g. if small amounts of hazardous waste are included with otherwise uncontaminated waste.

The *Closing the Loop* consultation paper proposes broad reforms to exemptions, reducing access to exemptions in certain circumstances and increase access in others (Appendix 1). The reforms are not specifically aimed at minimising the number of exemptions.

While there is no evidence that the number of exemptions is resulting in undesirable consequences, it is in principle preferable to minimise exemptions, limiting them to those that are relevant to current circumstances and achieve a clear public benefit. Minimising the number and scope of exemptions not only provides a clearer message to waste generators but also reduces administrative costs and the opportunities for levy avoidance.

While the *Closing the Loop* consultations are in progress we do not recommend any additional action on exemptions. In the longer term, a periodic reviewing of waste levy exemptions would be warranted, with an aim to either remove or tighten the scope of each exemption unless it can be demonstrated that the exemption provides a material net benefit to Western Australia, taking into account the resourcing requirements and potential for misuse.

As part of the review it would be important to report on the total value of exemptions to the state as an indication of the appropriate level of resourcing for the review. We understand the required information is currently gathered but not reported in aggregate.

## 5.4 Differentiation of waste levy rates

The waste levy is currently a uniform rate of \$70 per tonne for all non-exempt metropolitan waste sent to landfill (regardless of the location of the landfill). There are a number of reasons the waste levy might be differentiated for different waste generators or waste streams. Some of these reasons have been explored elsewhere in this report, but we summarise them here for completeness, together with some that have not yet been considered.

*Environmental impact:* It would be possible to differentiate the waste levy on the basis of the impact of the type of waste on the environment. Environmental costs (externalities) associated with different waste streams (other than hazardous waste) fall into two general categories – inert waste and putrescible waste. The externalities associated with inert waste have been estimated at between \$4.40 and \$10.70 per tonne for inert waste and between \$6.40 and \$31.90 per tonne for putrescible waste (in 2013 dollars, see Section 5.1). On that basis, the differentiation between inert waste and putrescible waste is in the order of \$2 to \$20 per tonne, with the lower end representing a modern, well run landfill and the upper end representing a more poorly run landfill. Assuming that current and future landfills will tend toward better practice in the future, the difference in externalities would be toward the lower end of the range, which is relatively low compared with the absolute size of the levy (\$70 per tonne). On that basis, we do not recommend differentiating the waste levy on the basis of the type of waste received. A single rate provides a clearer and simpler message to waste generators and lower administrative costs for the state.

*Waste from other jurisdictions:* NSW in particular has previously held concerns about the cross border movement of waste in order to avoid paying the state's waste levy (see Section 6.3). As WA has one of the lowest waste levies in the country, and applies no levy to hazardous waste or (currently) to non-metropolitan waste, there is potential for waste to be transported into WA to avoid the levy or pay a reduced levy. While such importing is possible in theory, the long travel distances would make such transport a costly exercise for the waste generator. At an estimated \$10 per tonne hour, waste sent from Adelaide to Kalgoorlie would cost over \$200 per tonne either way, which would be greater than any waste levy currently charged in Australia. Nevertheless, there may be unforeseen circumstances in the future in which waste importing becomes financially attractive. It would not be unreasonable to proactively legislate to guard against the possibility by requiring that landfill from other jurisdictions be levied at the maximum of the WA or home state rate, but it should not be regarded as a high priority at this time.

*Waste streams:* The Waste Strategy includes different targets for different waste streams. Some of these will be more difficult to meet than others (for example, we expect the 2025 C&I and MSW targets to be harder to meet than the C&D target). To reflect these differences, it would be possible to differentiate the waste levy by waste stream. Differentiating the waste levy by waste stream would impose additional administrative and compliance costs and would be difficult to enforce – particularly in the distinction between C&D and C&I waste. While the separate waste stream targets were considered plausible and achievable at the time they were developed, we understand that they were not developed with the intention that price signals would be used to achieve any one of those targets over another. Accordingly, we do not recommend differentiating the waste levy by waste stream.

*Geographic area* (Section 5.2): There is currently no waste levy applied to waste generated outside of the Perth metropolitan area. If, as proposed in this report, the waste levy is extended across WA, the waste levy for regional and remote areas could differ from those applied to the metropolitan area. Waste generation targets are higher for the Perth and Peel regions than they are for WA’s major regional centres. Hence, WA could – following the lead of other jurisdictions – apply a reduced waste levy rate to regional areas. Remote areas, and others considered on an exception basis, could be exempt from the waste levy due to the limited opportunities for waste recovery.

*Exempt waste* (Section 5.4): Certain categories of waste are exempt from the waste levy to promote various public benefits. We do not propose any changes to the current exemptions in the near term beyond those contemplated in the *Closing the Loop* consultation. In the longer term we recommend that as a matter of principle the number and scope of exemptions be regularly reviewed and constrained to those that provide a material net benefit to the community.

In summary, we do not propose any differentiation of the waste levy rate other than any current/proposed exemptions and the potential for a lower waste levy rate (if applicable) in regional areas.

## 5.5 Levying energy recovery

The waste hierarchy set out in the Waste Strategy ranks waste management options in order of preference. Energy recovery is the least preferred waste management option after disposal to landfill. By implication, the Waste Strategy gives preference to material recovery over energy recovery and includes a target to recover energy only from residual waste. Residual waste is the waste that remains after better-practice source-separation approaches have been exhausted.

One option for meeting the target would be to apply the waste levy to non-residual waste used in energy recovery. A waste levy on residual waste accepted for energy recovery would not have any beneficial effect as the residual waste would otherwise be disposed to landfill.

Using results from a recent business case on waste disposal options prepared by the Southern Metropolitan Regional Council, Marsden Jacob estimates that the full levy (rather than a portion thereof) would need to be applied to non-residual waste to ensure that energy recovery was less financially attractive than material recovery options.

With regard to the economic or environmental impact of applying the waste levy to non-residual waste used in energy recovery, we are not aware of any analysis that demonstrates that material recovery is any more (or less) environmentally or economically beneficial to the community than energy recovery.

Extending the waste levy to energy recovery should only be contemplated if regulatory measures do not already ensure that non-residual waste is not used in energy recovery processes. In March 2019, the Minister for the Environment amended the implementation conditions for two waste-to-energy facilities in accordance with the EPA's recommendations. These amendments could potentially ensure that only residual waste (as defined by the Waste Strategy) is used to generate energy in WA. Additional regulation to prevent energy recovery from non-residual waste is also an option open to government in the future.

Under the WARR Levy Act the waste levy applies to waste disposal, rather than specifically to landfill. At the time the Act was introduced there was no intention to apply the levy to anything other than waste in landfill, but the interpretation of 'waste disposal' could potentially be broadened to include energy recovery feedstock that has undergone limited processing.

## 5.6 Future levy rates

The waste levy is currently reviewed on an ad-hoc basis and does not include any automatic adjustments. Greater certainty about future waste levies would allow waste generators and managers to budget more accurately and to better assess the feasibility of new material recovery projects. Action 5.2 of the Waste Strategy Action Plan commits government to establishing a schedule of future waste levy rates that provides a minimum five-year projection.

From the analysis in Section 5.1, there is reason to believe that the Waste Strategy targets for C&D might be met without an increase in the levy. The 2025 targets for MSW and C&I will be difficult to meet, even with an increase in the waste levy. An increase in the levy might, at least marginally, increase the speed at which local governments adopt three bin collection services and energy recovery technologies.

The most significant impact of an increase in the levy would be to encourage local reprocessing of paper and cardboard, and the lesser volumes associated with plastics. With the waste export ban due to be phased in over the next four years, there is a strong chance that progress against the Waste Strategy targets (particularly C&I) could be stalled or reversed if there is no intervention by government. The commercial viability of local paper and plastic reprocessing is still being investigated by government and industry. Once finalised, it may be possible to identify the increase in the waste levy required to make the reprocessing operations feasible without government support. If government obtains an indication of the capital grant required by proponents (assuming the current waste levy), the increase in the waste levy rate required to remove the grant can potentially be calculated by annualising the grant at the industry's cost of capital and converting it to a rate per tonne. With a higher waste levy, proponents could increase their gate fee to match the revised landfill charges including the higher levy.

If the levy is increased specifically to meet the requirements of paper and plastic reprocessing, it will have a flow-on effect to other waste materials. Other material recovery processes that are currently marginal would become more attractive, which would provide some (albeit potentially minor in many cases) improvement in the recovery rates of other waste materials.

The potential benefits of increasing the waste levy to assist in meeting the Waste Strategy targets should be weighed against the increased risk of undesirable behaviours and the potential economic losses caused because the levy exceeds the economic costs (including externalities) of landfill disposal. An increase in the levy might also impact the viability of recycling industries that generate high levels of residual waste and who cannot recover the increased cost through higher gates fees or other mechanisms.

The Waste Strategy targets have been developed by government based on its value judgement about their potential benefits to society. Therefore a value judgement by government is also required to assess the trade-off between the targets and the other impacts of an increase in the waste levy.<sup>14</sup>

Regardless of the ultimate rate of the waste levy, we recommend that the rate is automatically adjusted by the Consumer Price Index (CPI) each year to ensure that any pricing signal is maintained in line with other cost increases faced by waste generators and waste managers. A similar approach has been adopted by NSW.<sup>15</sup> By comparison, both Victoria and SA have recently introduced substantial step increases in their levies. Queensland has only recently reintroduced its waste levy.

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<sup>14</sup> Given sufficient information, cost-benefit analysis could theoretically compare the benefits and costs of a levy increase, including environmental benefits. However, it not theoretically possible for cost-benefit analysis to quantify the government's judgement of the benefits of achieving its chosen targets and compare it to other impacts of a levy increase.

<sup>15</sup> Clause 11 of the Protection of the Environment Operations (Waste) Regulation 2014.



## 6 Levy implementation and compliance

In this section we examine the extent to which the waste levy is being effectively implemented and monitored. Some of the issues considered are:

- general awareness of the waste levy;
- whether there have been any unintended consequences from the waste levy;
- experience in other jurisdictions regarding unintended consequences;
- strategies to mitigate any undesirable consequences; and
- a high-level discussion regarding the resources required to implement the mitigation strategies.

### 6.1 General awareness of the waste levy

In 2019, DWER commissioned Deloitte to provide an evaluation plan for the effectiveness of the waste levy framework and systems. While much of the plan is not relevant to this study, one pertinent point was the importance of awareness about the waste levy and the consequences for non-compliance. The waste levy will only be effective if those subject to it are aware of how it will impact them.

While most households and businesses would have little understanding of the waste levy, municipal waste is managed by local governments on their behalf. Domestic waste generators indirectly face the levy charge through local government rates (for kerbside collection) or landfill gate fees (for drop-offs). In the Perth and Peel regions, most recovered domestic waste was collected from the kerbside.<sup>16</sup> Households and businesses primarily pay for kerbside waste collection through their local government rates and so face no direct pricing signal for waste generation. However, the attitudes of households and businesses who utilise kerbside collections are affected by state and local government campaigns targeting waste minimisation. As the 2025 waste generation targets for MSW and C&I are close to being met (see Section 2) there is no immediate reason to send a more targeted pricing signal directly to households and businesses, although the situation should continue to be monitored in coming years. More direct pricing signals (e.g. discounts for smaller than standard “red” bins or less frequent collection), if required, would be complex and would require careful consideration and design.

Material recovery is principally managed by local governments, who may have contracts or relationships with commercial waste managers. Local governments and commercial waste managers have a strong understanding of the waste levy and apply it in their decision making about waste management options. The waste levy is often higher than the cost of operating the landfill site. The waste levy is typically included as an explicit consideration in local government business cases (see for example the Southern Metropolitan Regional Council’s Strategic Waste Management Plan 2016). The landfill levy is also a significant consideration for private waste collection and waste recovery operators, who may prefer a higher waste levy rate to make recycling services more financially attractive (by allowing them to increase their own gate fees and remain competitive).

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<sup>16</sup> Waste Authority (2019) *The 2017–18 census of Western Australian local government waste and recycling services*

For generators of large quantities of waste, such as the C&D sector and some manufacturing businesses, the landfill levy would be a material cost that would be passed on indirectly through landfill gate fees or the costs of private collection. A recent survey of the C&D sector (provided in more detail in Appendix 4) indicates that there is low awareness of the levy itself but a keen awareness of costs from waste disposal businesses (e.g. skip hire firms). The survey suggests that cost was the most significant determinant of waste management practices, implying that the price signal from the waste levy is having an appropriate impact on the sector. More than 70% of respondents indicated that, as a minimum, they separated sand and rubble from other onsite waste.

We are not aware of any surveys that examine the C&D sector's awareness of penalties for non-compliance.

In summary, there is no direct pricing signal passed through to most domestic customers, but local governments are keenly aware of the levy and there is clear evidence that they have responded to that signal when making waste management decisions. For large waste generators, such as the C&D sector, the pricing signal is appropriately passed through via landfill gate fees and charges from private waste managers. Accordingly, we do not recommend any specific action in relation to awareness of the waste levy itself, but Section 6.4 outlines the case for expanding awareness of the penalties and likelihood of noncompliance.

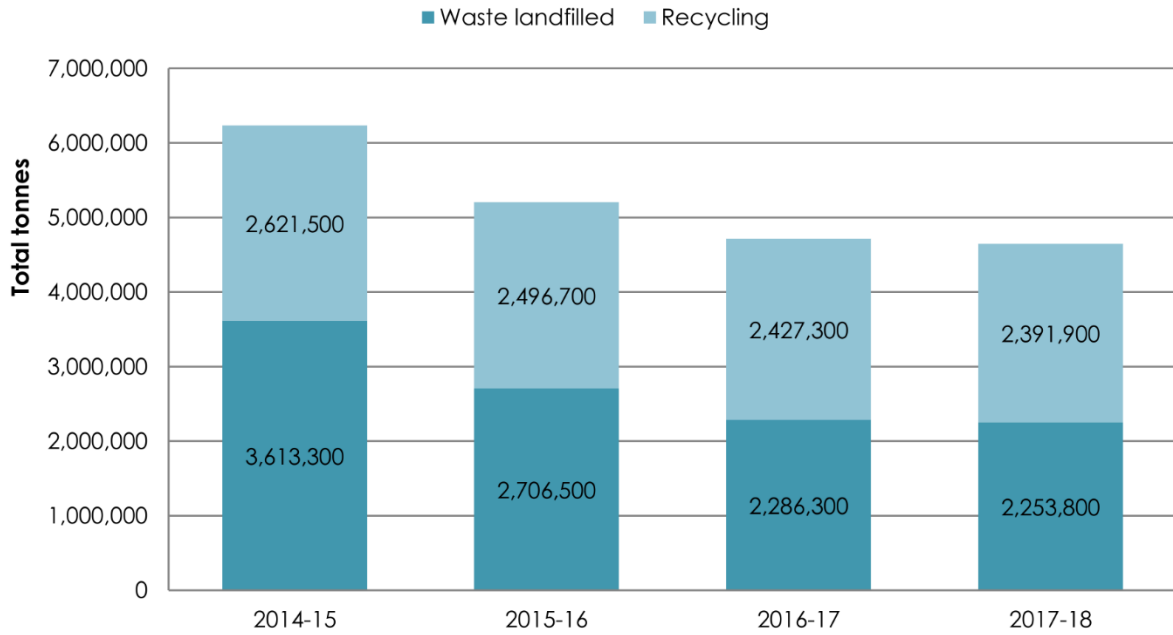
## 6.2 Evidence of unintended consequences

A higher waste levy may encourage greater recycling and better waste management practices but may also increase the risk of inappropriate disposal of waste in order to avoid paying the levy. Below we examine whether there is any evidence of inappropriate disposal from Western Australian data. As the levy was increased in 2015, the data covers a relatively short time period, which limits the definitive conclusions that can be drawn. Hence, we also consider evidence from other jurisdictions that have had a higher levy in place for greater length of time.

### Evidence from WA

The increase in the waste levy appears to have resulted in significantly reduced quantities of landfill in Western Australia, which fell from over 3.6 million tonnes in 2014-15 to 2.25 million tonnes in 2017-18 (Figure 9). Despite the reduction in landfill, recycling quantities have not increased and have in fact decreased by around 9% over the same time period.

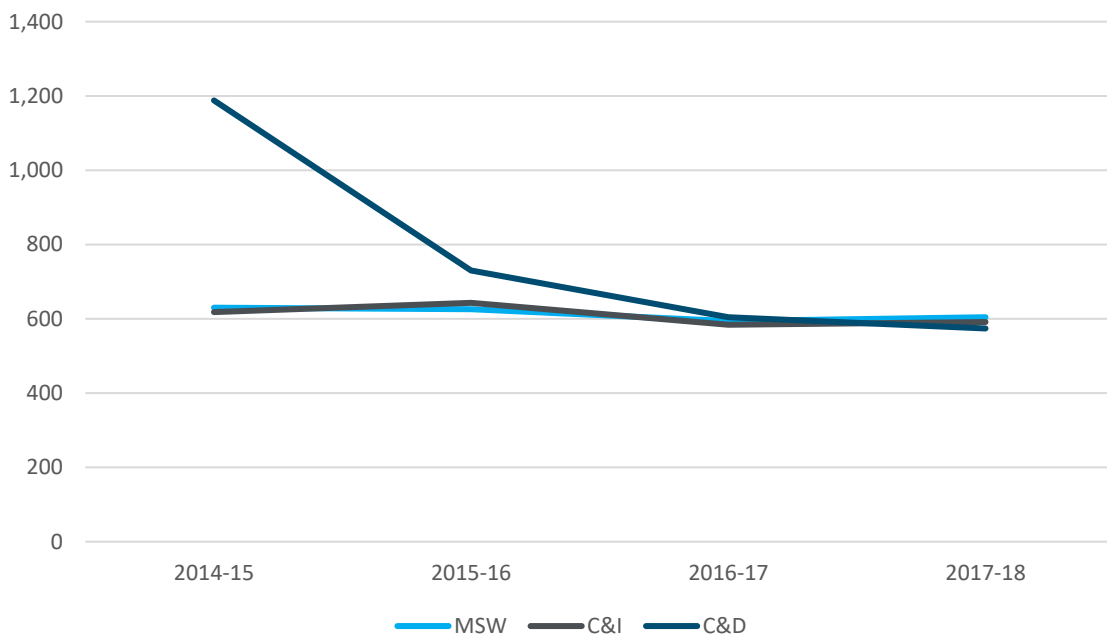
Figure 9: Reported recycling and waste activity for WA



Source: ASK (2019) Recycling Activity in Western Australia 2017-18

A closer inspection of the waste streams shows that reported MSW and C&I waste generation per capita has changed relatively little since 2015 (Figure 10) and recycling quantities have varied from year to year but the variation has been much lower than other waste streams and shows no clear trend (either upward or downward).

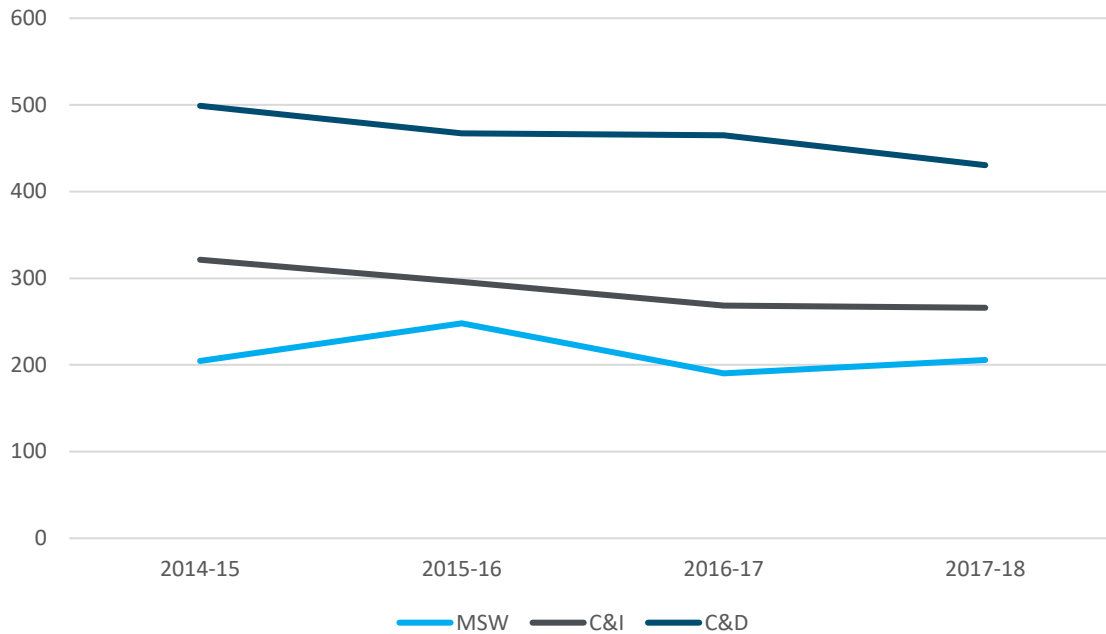
Figure 10: Waste generation per capita (kilograms) by waste stream



Source: ASK (2019) Recycling Activity in Western Australia 2017-18

Rather than showing a corresponding increase in recycling, the data shows that the quantity of recycling per capita has remained broadly the same for MSW and slightly decreased for both C&I and C&D (Figure 11).

Figure 11: Recycling per capita (kilograms) by waste stream



Source: Extrapolated from ASK 'Recycling Activity in Western Australia' reports for 2015-16, 2016-17 and 2017-18

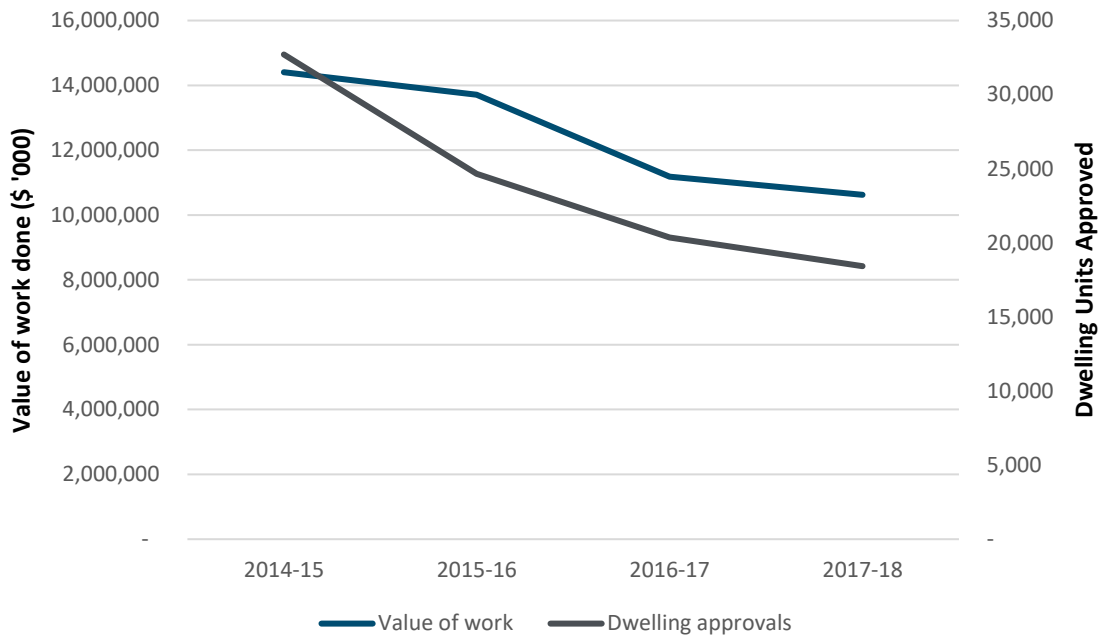
While the data does not indicate any significant concern regarding MW and C&I waste, the rapid decrease in C&D waste generation, with no corresponding increase in recycling, may be a cause for concern. Below we investigate several potential explanations for the large reduction in C&D waste generation:

- reduced activity in the C&D sector generally;
- an increase in desirable and acceptable avoidance, such as an increase in repurposing waste as clean fill or uncontaminated fill;
- an increase in authorised but undesirable behaviours, such as excessive stockpiling,
- an increase in unauthorised behaviours such as misclassification or unauthorised disposal.

#### Reduced C&D activity

Figure 12 suggests that building activity has declined significantly since 2014-15, with the value of building work dropping by 26% and the number of dwelling units approved dropping by 44%.

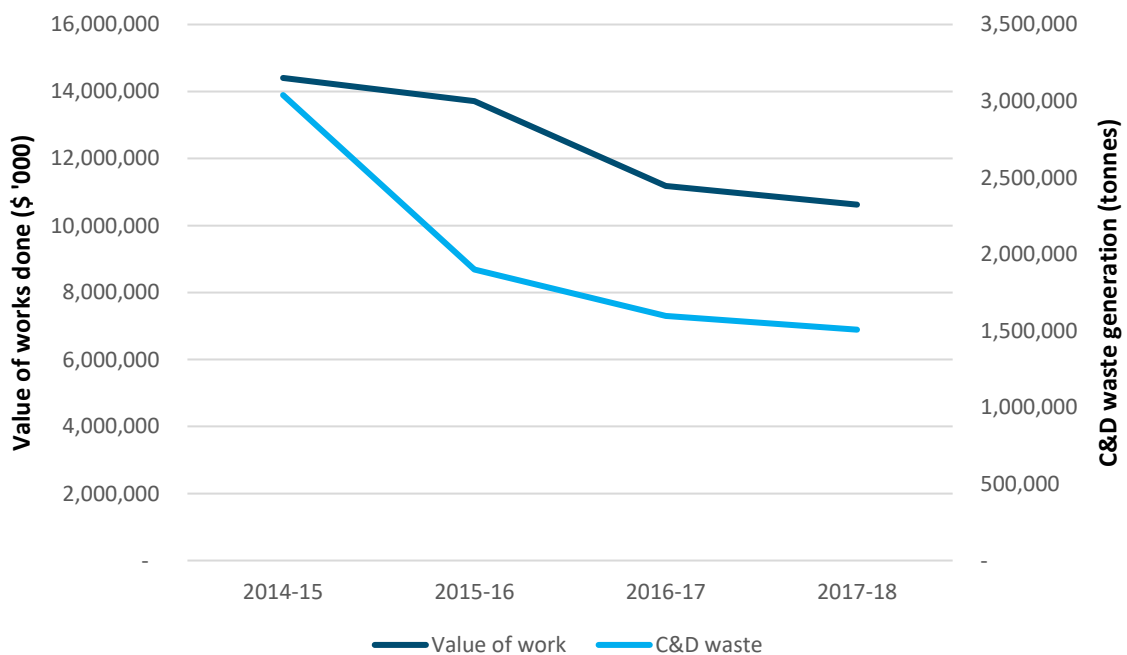
Figure 12: Value of building work and number of dwelling units approved by year, WA



Source: ABS catalogues 8752.0 and 8731.0

While the reduction in dwelling approvals provides a partial explanation of the reduced activity, the value of building work done provides a better indicator of overall activity in the C&D sector. Figure 13 shows the value of building works plotted against C&D waste generation each year.

Figure 13: Value of building work vs C&D waste by year, WA



Source: ABS catalogues 8752.0 and extrapolations from ASK 'Recycling Activity In Western Australia' reports

Figure 13 demonstrates that the total quantity of C&D waste has fallen by around 50 percent over the four years to 2017-18. The dampening of building activity is likely to have been a contributing factor, potentially accounting for around half of the reduction.

### *Stockpiling*

Estimates from information provided by DWER indicate that stockpiles of unprocessed C&D material grew by 93,000 tonnes in 2015-16 and 128,000 tonnes in 2016-17. Unprocessed stockpiles are not captured at all in the reported data on waste generation, recycling or landfilling.<sup>17</sup> The growth in unprocessed stockpiles thereby contributes to the reduction in reported C&D waste generation. The reported quantity would account for around 5 and 8 percent of the total C&D waste generated in 2015-16 and 2016-17 respectively.

The stockpiling data should be viewed with caution as it has varied substantially over time due to inconsistencies in reporting. Nevertheless, the quantities of unprocessed C&D waste held in stockpiles is likely to be material, but not the major contributor to the overall reduction in reported waste generation.

The *Closing the Loop* consultation paper identifies possible reforms to minimise stockpiling at waste storage premises. As set out in Appendix 1, the paper proposes to impose the landfill levy on premises that store waste for over 12 months, unless the processing of the waste has commenced, and the processed waste will be sold or used.

### *Repurposing and minimising waste*

The reduced rates of C&D waste generation could in part be explained by waste minimisation and improved repurposing of material that would otherwise be reported as waste. Material that is repurposed without being handled by a commercial waste manager or a landfill operator will not be reported as either generated waste or as recycling so is effectively excluded from the reported waste data. Repurposed materials might include, for example, excess building materials that are sent to another site or excavated materials that are used to recontour the site.

A recent survey of the waste involved in the redevelopment of several residential properties found that over 70% of the waste materials were recovered, of which between 3% and 14% were reused onsite or at other sites.<sup>18</sup> Waste from the development of previously undeveloped (greenfield) sites potentially has less mixed waste and the larger scale would imply greater opportunities for repurposing materials across site, so may have higher recovery rates.

Repurposing of waste material sits above recycling on the waste hierarchy so should be encouraged where possible.

There have been no investigations of the repurposing of C&D waste since the waste levy increased, so it is unknown whether the practice has increased. Further investigations would be warranted (see Section 6.4 for recommendations).

### *Undesirable avoidance*

An increase in the waste levy increases the risk of undesirable avoidance practices such as:

1. illegal dumping of waste on public or private land without permission;

<sup>17</sup> Stockpiles of reprocessed material has been excluded as it is captured in both the waste generation and recycling data so does not require independent analysis.

<sup>18</sup> Murdoch University (no date) *Building Construction Waste Audit and Management Assessment*, Western Australia, prepared for Master Builders Association and the Waste Authority

2. storage or discarding of waste at an unlicensed site with consent from the landholder;
3. underreporting of waste volumes by landfill operators;
4. deliberate misclassification of waste to avoid the levy (e.g. misclassification as regionally generated, hazardous or other exempted categories).

We understand that DWER has received reports of illegal dumping since the waste levy was increased, which coincides with a greater focus on illegal dumping, including increased surveillance and cooperation between DWER and local governments. While there is no correlating evidence to suggest that the increase in the waste levy in WA has resulted in an increase in the rate of illegal dumping, investigations from other jurisdictions with a waste levy similar to or greater than WA (see next section) suggests that unauthorised storage and underreporting of waste volumes has the potential to be a significant issue. If the levy avoidance was, for argument's sake, half the total estimated for NSW in 2014 (i.e. half of 80,000 tonnes per year – see Section 6.3) it would represent between 2 and 3 percent of the total C&D waste generated in 2017-18 and lost revenue of \$2.8 million per year. As WA has seen a substantial decline in C&D waste sent to landfill, further investigation of the issue is warranted (see Section 6.4 for recommendations).

While the waste industry has raised concerns that some operators may be misclassifying the geographic origin of waste to avoid the levy, we understand from DWER that it is difficult to establish the extent of the issue due to limitations on the information that can be collected under current legislation and the nature of the industry. In Section 5.2 we recommend that the waste levy be extended to all landfills across the state (subject to exceptions), which would mitigate some of the concerns about geographic misclassification.

### Conclusion

There are two potentially benign explanations for the reduction in C&D waste over the last four years – the reduction in development activity and potential repurposing of waste onsite or at other sites. The reduction in development activity might account for at least half of the reduction in C&D waste. The extent to which waste is repurposed is unknown, but reusing waste is higher in the waste hierarchy than recycling and should be encouraged if possible.

Two unintended consequences associated with the increase in the waste levy are an increase in stockpiling and the increased risk of illegal disposal practices. The former has in recent years represented between 5 and 8 percent of total waste generation. The extent of the latter is unclear and warrants further investigation.

## 6.3 Evidence from other jurisdictions

NSW has the highest levy of all Australian states and has had a levy higher than WA's current levy for almost a decade. In 2013 a major investigation by the EPA targeted large-scale unlawful waste activities. According to the Regulatory Impact Statement for Proposed Protection of the Environment Operations (Waste) Regulation 2014 (p. 16):

*The investigation uncovered systemic unlawful waste disposal and levy avoidance activities by storage, recycling and reprocessing facilities in the waste sector. The investigation found sophisticated arrangements in place between intermediary facilities, waste transporters and landfills, to falsify records, intentionally misclassify waste and provide false and misleading information about waste to Government authorities. In one instance alone of this alleged illegal activity, the EPA puts the loss of NSW State revenue at approximately \$18 million. These schemes are invariably centred on avoiding proper disposal costs (including landfill gate fees*

*and the waste levy). The investigation also uncovered long-term stockpiling of waste on-site (as a levy avoidance technique), with no legitimate end use. The illegal dumping of waste on private property, state forests and national parks was also identified.*

The NSW government estimated that each year \$100 million was lost from incidents causing significant and long-lasting environmental harm, associated clean-up costs and unpaid waste levies.<sup>19</sup>

These issues appear to have been ameliorated by the introduction of increased penalties and additional powers under the *Protection of the Environment Operations Amendment (Illegal Waste Disposal) Bill 2013*. However, penalties for the illegal dumping of asbestos wastes were strengthened again in 2019<sup>20</sup> in line with recommendations from the Independent Commission Against Corruption.<sup>21</sup> This recommendation followed an investigation into enforcement officers in the Western Sydney Regional Illegal Dumping Squad not investigating illegal waste disposal.

A further concern at the time was the cross-border movement of waste to Queensland. NSW tried various methods to reduce the cross-border movement of waste including introducing a “proximity principle” which introduced 150 km distance restrictions on the transport of waste for disposal. The legislation was the subject of criticism and litigation from the time it was introduced and the diversion of waste continued until Queensland also introduced a waste levy.

While the EPA investigations uncovered organised, large scale avoidance in the C&D sector, other sectors are typically a greater concern for local governments. A 2015 survey of local governments reported that only 9% of illegal dumping incidents they attended were related to construction and demolition waste.<sup>22</sup> By contrast, household waste accounted for almost half of the total (Figure 14).

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<sup>19</sup> Legislative Assembly, 2013, Protection of the Environment Operations Amendment (Illegal Waste Disposal) Bill 2013. Second Reading., 30 May 2013. <https://www.parliament.nsw.gov.au/bills/Pages/bill-details.aspx?pk=3128>

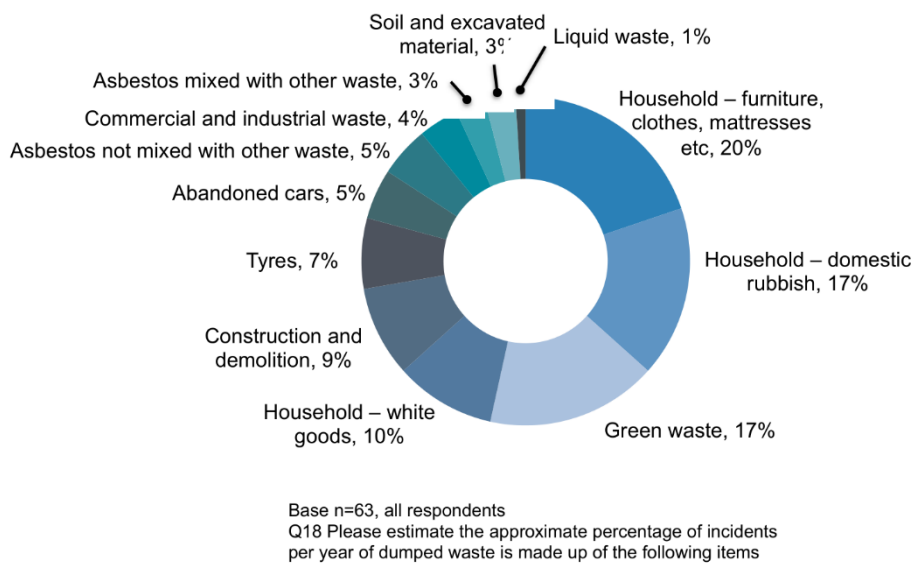
<sup>20</sup> Protection of the Environment Operations Amendment (Asbestos Waste) Bill 2018  
<https://www.parliament.nsw.gov.au/bills/Pages/bill-details.aspx?pk=3597>

<sup>21</sup> Independent Commission Against Corruption *Investigation into the conduct of a Regional Illegal Dumping Squad officer and others*, June 2017 <https://www.parliament.nsw.gov.au/la/papers/Pages/taled-paper-details.aspx?pk=71276&houseCode=la>

<sup>22</sup> EPA NSW (2015) *Illegal Dumping Research Report*



Figure 14: Types of waste illegally dumped



Source: EPA NSW (2015) *Illegal Dumping Research Report*

Cost avoidance and convenience were seen as key reasons that waste was dumped illegally. Cost avoidance was particularly thought to drive households, the construction and demolition sector and those disposing of asbestos.

A 2014 report for the NSW EPA estimated that just under 33,800 tonnes per year of waste from all sectors was (at the time) being illegally dumped in NSW, which represented 0.18 percent of the total waste generated in the state.<sup>23</sup> While no data on illegal stockpiling was available, they also assumed 15,000 tonnes per year was illegally stockpiled. Based on the EPA investigations they assumed a further 32,000 tonnes per year were being disposed to landfill sites but was unlawfully avoiding the levy.

Some of the concerns about levy avoidance will also have been ameliorated by the introduction of increased penalties and additional powers under the *Protection of the Environment Operations Amendment (Waste) Regulation 2014* and the subsequent reforms to it and the *Protection of the Environment Operations Act (1979)*.

NSW is not the only state to report large scale, organised illegal dumping. South Australia's EPA recently discovered an illegal waste site in the state's southern Murraylands.<sup>24</sup> The site was one of four the EPA has identified over the past 18 months. At least 12 waste transport companies reportedly used the unlicensed site, which contained about 50,000 tonnes of commercial, industrial and demolition waste. The site was one of the largest illegal disposal sites ever found in SA. Perversely, the EPA reported that most of the material at the site could have been recycled and would have avoided the levy.

<sup>23</sup> Based on information from a cost benefit analysis undertaken for South Australia and applied to NSW. The NSW report was: The CIE (2014) *NSW waste regulation- Final Draft Report*, prepared for the NSW Environment Protection Authority, April 2014

<sup>24</sup> Reported by ABC News <https://www.abc.net.au/news/2019-11-25/illegal-landfill-found-in-murraylands/11735090>

In Victoria, the primary area of concern related to the waste levy has been the stockpiling of recyclates. Actions to meet the state's waste reduction and recycling targets, including the imposition of the waste levy, have incentivised greater separation and collection of recyclates. However, the market prices for recyclates fluctuate, which has led some firms to stockpile the recyclates during periods when the prices are low in order to sell at a later time when the prices improve. The introduction of import constraints on recyclates by China and other potential export destinations have resulted in an extended drop in values for recyclates and the expansion of the stockpiles as well as contributing to some firms going into financial administration.

During 2017 and 2018 some recyclate stockpiles caught fire<sup>25,26</sup> and others were effectively left orphaned after the financial collapse of SKM recycling in 2019.<sup>27</sup> There was concern that fires were advantageous to the owners of some recycling businesses. As a result of these concerns the Victorian Government asked the Essential Services Commission to undertake a waste and resource recovery services review<sup>28</sup> which is yet to formally report.

Marsden Jacob is aware that some jurisdictions have raised concerns that waste producers, including local governments, are unable to track wastes once they have been through a Materials Recovery Facility or transfer facility. This makes the movement and destination of waste streams less transparent, which can facilitate undesirable behaviours. These facilities form key points in the waste process and reforms are being considered in relation to diversion targets at the facilities and other requirements such as increased reporting.

While there is ample evidence of undesirable avoidance of the waste levy in NSW, SA and Victoria, Marsden Jacob's perception is that the cost and volume of dumping are considered tolerable compared with the intended policy benefits of the waste levy and with the resulting volume of waste that avoids being sent to landfill or is recycled.

For many jurisdictions in Australia, the current focus has been on the significant changes facing the industry, particularly the restrictions on the export of waste materials to China and the more recent announcement by COAG proposing a ban on the export of any waste materials. Local reforms are also being pursued, such as container deposit schemes and grant programs to drive investment in recycling infrastructure, plus market development programs and market priming to drive demand for recyclates.

## 6.4 Mitigating undesirable consequences

While state and local governments are in the best place to understand and manage undesirable waste practices, we provide a brief high-level discussion of three relevant strategies that have become evident from our analysis of the levy and its consequences. The first strategy involves working with industry while the second and third are more traditional regulatory roles.

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<sup>25</sup> <https://www.abc.net.au/news/2019-08-01/skm-recycling-ordered-to-pay-million-dollar-settlement/11373754>

<sup>26</sup> <https://www.theage.com.au/national/victoria/major-fire-at-factory-belonging-to-notorious-melbourne-recycler-20190709-p525d5.html>

<sup>27</sup> <https://www.theguardian.com/australia-news/2019/aug/07/recycling-crisis-land-owners-face-millions-in-clean-up-costs-after-skm-collapse>

<sup>28</sup> <https://www.esc.vic.gov.au/other-work/waste-and-resource-recovery-services-review-2019#toc-later-advice-to-be-provided|tabs-container1>

### Strategy 1: Improved C&D data through consolidation of existing data and targeted study

The extent of undesirable levy avoidance in WA's C&D sector is currently unknown and could potentially be worth millions of dollars a year in lost revenue to the state (see Section 6.2). Accurate data is a key means of understanding whether the objectives of the waste levy have been achieved and, if not, where attention is required. Access to appropriate data can assist in developing targeted and more effective solutions.

An initial step may be to consolidate existing knowledge, such as the recent audit of several residential construction sites (Murdoch University, Master Builders WA and Waste Authority), Australian Bureau of Statistics data, national waste reporting data and Building Permit Data (Department of Mines, Industry Regulation and Safety). In combination, these might allow the development of some first pass estimates of expected waste generation from different build types and regions, although extrapolation and expert judgement would also be required.

In some instances, additional data could be collected by imposing reporting requirements on producers of waste or providers of waste services. We note that a number of the consultation documents set out in Appendix 1 will impose some reporting requirements on various market participants. While the current focus of regulatory reporting requirements is on landfill sites, working with the source industries may provide greater clarity on the volumes and destination of wastes.

A targeted study of wastes generated and their flows from a broadly representative sample of residential and commercial construction sites would provide some clarity on the expected volumes of different waste products and their reuse or disposal destination. We would expect the study to be more comprehensive than the comparatively limited study by Murdoch University for Master Builders and the Waste Authority.<sup>29</sup> If a study of this kind were undertaken with industry input and support then it need not impose significant costs on industry. As the study would be a short-term program (perhaps three to nine months) it would not require a long-term change to DWER resourcing.

With representative data it would be possible to construct a more accurate picture of the expected volumes of materials used onsite, at other developments or sent to transfer stations, landfill or recycling facilities. Such information would allow a better understanding of where and by how much reported C&D practices across the state differed from expected practice, which would assist to direct compliance activities.

### Strategy 2: Greater focus on investigation

If illegal C&D avoidance on a large scale is suspected, potential methods of avoidance include unlawful arrangements with authorised facility operators and/or disposal to unauthorised sites. Increased auditing is less likely to identify these methods than investigations targeted specifically at these issues.

Some of this investigation could potentially be conducted on a desktop basis using information from existing or increased reporting requirements, focussing on the largest C&D businesses. If Strategy 1 is undertaken, the actual volumes and flows of waste from each business could be compared against the expected volumes and flows. The desktop investigation would not provide conclusive evidence but would highlight any suspicious activity worthy of further investigation.

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<sup>29</sup> Murdoch University (no date) *Building Construction Waste Audit and Management Assessment, Western Australia*, prepared for Master Builders Association and the Waste Authority

Marsden Jacob do not have expertise in investigation but expect that a range of on-the-ground techniques could be employed to assist in identifying and tracking suspicious activity. Some of these activities could be implemented with existing legislative powers but others may require expanded powers.

We understand that the key legislative powers under the WARR Act are currently:

section 82 – an “authorised person” has power to require information or material;

section 83 – EP Act inspectors may also be an authorised person under the WARR Act

section 83(3) – Right of entry:

*An inspector may at any time ... enter any premises prescribed for the purposes of the EP Act Part V on which waste is deposited or stored and on those premises may do any act or thing, including the collection and removal of samples, records or other things, which in the opinion of the inspector is necessary to be done for a waste inspection.*

As there is a clear overlap between the WARR Act and the Environmental Protection Act, the investigative powers under the Environmental Protection Act (Part VI) are also likely to be relevant to investigation and enforcement of waste matters under the WARR Act.

While Marsden Jacob cannot provide legal advice, our impression is that these powers are clear and well defined for activities and premises that would require a licence under Part V of the Environmental Protection Act as well as actions that are likely to cause pollution or environmental harm. However, the investigative powers relating to waste that is being transported between locations or to an unlicensed facility (such as one that is processing less than 500 tonnes)<sup>30</sup> may be less well-defined, particularly for inert wastes, which may have lower environmental impacts than other wastes.

Any increase in investigative effort would require an increase in resourcing for these activities.

### Strategy 3: Strengthen deterrence

While there are several theories on the appropriate level for setting penalties, “deterrence theory” is commonly understood and is often applied. Historical theorists on deterrence have concluded that an appropriate punishment requires three characteristics – celerity (swiftness), certainty, and appropriate severity.

In a workshop with DWER subject matter experts, the delay between offences and prosecutions was identified as a potential concern. The delay would weaken the signal from the penalties and may exacerbate unlawful behaviour. Marsden Jacob do not have expertise in this area but suggest that DWER investigate whether prosecutions could be brought more swiftly within the current legislative arrangements or whether legislative amendments (introducing new forms of penalties) would be required.

Deterrence theory also suggests that (potential) law breakers make a rational choice when considering whether to break the law. In making this choice they would consider the:

- benefit of breaking the law;
- likelihood of being caught; and

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<sup>30</sup> The EP Act sets a threshold of 500 tonnes. Premises that store, reprocess, treat or sort waste above 500 tonnes require licensing so can be regulated (s. 88(1)(e) and 89(1)(f)(i).

- penalty that would arise if caught.

For a penalty to act as a deterrent, the benefit of breaking the law should be less than the likelihood of being caught and the penalty that would arise when caught, which can be written as:

$$\text{Benefit of breaking the law} < \text{Likelihood of being caught} \times \text{Penalty if caught}$$

Rearranging this equation, the likelihood of being caught should be greater than the benefit divided by the penalty:

$$\frac{\text{Benefit of breaking the law}}{\text{Penalty if caught}} < \text{Likelihood of being caught}$$

An illustrative example would be the misclassification of a single load of waste from a nominal 20 tonne tipper truck. If the waste were classified and disposed of correctly, the levy would be incurred by the landfill operator and may be passed on through the gate fees paid by the transport operator. The benefit of avoiding the levy (such as by deliberately misclassifying waste that should incur the levy) would be 20 tonnes at \$70/tonne, which totals \$1,400 per truck. The benefits would be greater if a large number of truckloads were misclassified. It is possible that a deliberate misclassification could be effected by the landfill operator (to avoid the levy), the waste transporter (to avoid gate fees), or by both in collusion.

The penalty for evading the levy is set out in section 78 of the WARR Act and would apply for deliberately misclassified waste.<sup>31</sup> For a single 20 tonne truck, the total value would be \$14,200.<sup>32</sup> As a significant component of the penalty (\$10,000) is fixed regardless of the quantity, the fine does not increase proportionately with the quantity (or the benefits of evading the levy).

Deterrence theory suggests that the current penalties will act as a deterrent if the likelihood of being caught is greater than the benefit divided by the penalty. In this instance, the likelihood of being caught would need to be greater than 10% for a single truckload and significantly more for larger quantities. It is unlikely that the likelihood of being caught is currently so high.

We note that the penalty has not changed since the legislation was introduced in 2007.<sup>33</sup> However, the levy (and therefore the benefit of breaking the law) has increased substantially. Since 2014 the levy for inert waste has increased from \$12 per cubic metre to \$105 per cubic metre.

The penalty for illegally dumping waste is higher at \$62,500 for an individual and \$125,000 for a body corporate. Consequently, the theory suggests that the likelihood of a body corporate being caught illegally dumping 20 tonnes of waste would only need to be greater than 1% for the penalty to act as a deterrent.<sup>34</sup>

<sup>31</sup> We note that dumping waste would incur a larger penalty under s. 49A(2) EP Act - \$62,500 for an individual and 125,000 for a body corporate.

<sup>32</sup> The fine is \$10,000 and treble the amount evaded or attempted to be evaded.  $\$10,000 + (\$1,400 \times 3) = \$14,200$

<sup>33</sup> The Waste Avoidance and Resource Recovery Bill 2007 as introduced is available here [https://www.parliament.wa.gov.au/Parliament/Bills.nsf/SADE18E604C7F24FC8257377000F1C2D/\\$File/Bill152-2.pdf](https://www.parliament.wa.gov.au/Parliament/Bills.nsf/SADE18E604C7F24FC8257377000F1C2D/$File/Bill152-2.pdf)

<sup>34</sup> Dumping Waste, s. 49A(2) EP Act

While theorists focus on facts (such as the actual chance of being caught), members of the public and industry will alter their behaviour based on perceptions. As members of the public and potential law breakers would not know the actual likelihood of being caught, an increase in the perceived chance of being caught would also strengthen deterrence. One method may be increased publicising of successful prosecutions, particularly if proposed reforms result in an increase in successful prosecutions. .

*Possible improvement in deterrence without legislative reforms*

DWER may be able to improve deterrence without changing primary legislation by:

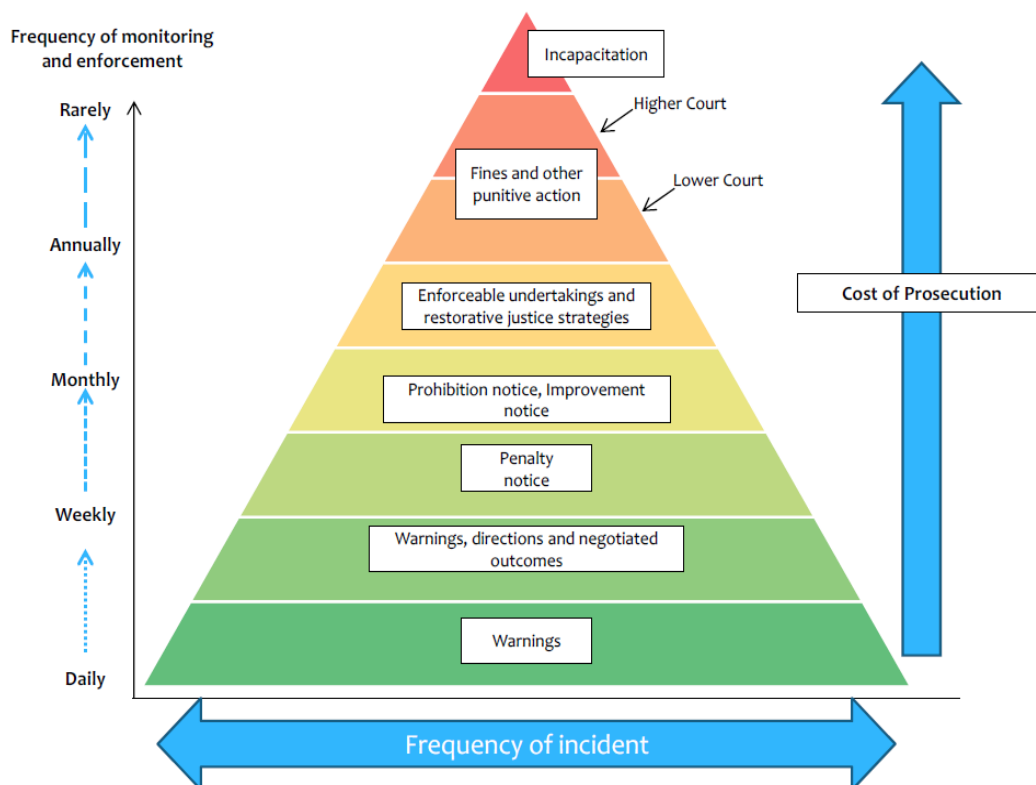
- increasing the actual likelihood of being caught (see Strategies 1 and 2);
- increasing the perceived likelihood of being caught;
- speeding up the timing of prosecutions.

*Possible legislative reforms to penalties*

As the maximum penalties are set in legislation, an increase would require an amendment to the WARR Act. If DWER were to change the penalties in legislation then it should consider the full range of potential penalties, ranging from infringement notices that may be issued on the spot, to significant fines and potentially pursuing company executives with either jail time or banning them from the industry. Clearly the highest penalties would be used rarely while warnings or infringement notices may be issued regularly.

The Braithwaite pyramid (as shown in Figure 15) provides a useful framework for conceptualising the range of penalties and their frequency of use.

Figure 15: Braithwaite pyramid



Currently DWER appears to have only one penalty for intentionally misclassified waste (section 78 of the WARR Act), whereas applying the Braithwaite pyramid would indicate that the Department could apply a broad range of penalties depending on the offence. The range of penalties is likely to include modified penalties (infringement notices) for lower level infringements and could extend to civil penalties,<sup>35</sup> which would bring the relevant Levy sections in line with other parts of the WARR Act.

The *Closing the Loop* consultation paper proposes reforms to penalties and enforcement of the WARR Act. Chapter 14 of the paper addresses Compliance and enforcement measures for waste. In that chapter, Option 2 (which is identified as the preferred option) proposes:

*“a new offence to address waste disposal at unlicensed waste facilities, to target large-scale illegal waste operations.”<sup>36</sup>*

It also proposes the introduction of:

- Waste Restriction Notices;
- GPS tracking of waste transport vehicles;
- new penalties for repeat offenders;
- new penalties for excessive waste stockpiles;
- CEO notices for waste transport record- keeping and video monitoring at waste facilities;
- new powers to identify persons in charge of vehicles; as well as
- new infringement reviews and more:

These proposed reforms are set out in detail in Appendix 1.

In summary, additional legislative reform that DWER could consider to increase deterrence include:

- increasing investigation powers for unlicensed sites (see Strategy 2);
- increasing the maximum penalty for unlawfully disposing of waste; and
- introducing civil penalties and modified penalties (such as infringement notices).

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<sup>35</sup> A civil penalty is a monetary penalty (fine) imposed by courts exercising a civil rather than criminal jurisdiction. Civil penalties do not include criminal convictions or imprisonment.

<sup>36</sup> [Closing the loop – waste reforms for a circular economy](#), Page 66

## 7 Summary of key findings

The key findings from our review of the waste levy are summarised below.

### Objectives of the waste levy

The objectives of the levy are to function as an economic instrument for influencing waste management practices and to raise funds to support waste-related programs. More specifically, the waste management practices targeted by the levy should align with the objectives and targets of the Waste Strategy.

The *Closing the Loop* consultation paper proposes amending the Environmental Protection Act to incorporate waste avoidance and resource recovery objectives, aligning landfills' licences under Part V of the EP Act with the requirements of the WARR Act. These proposed reforms are set out in detail in Appendix 1.

### Role of the waste levy

As an economic instrument, the waste levy acts as a pricing signal to promote the objectives and targets of the Waste Strategy. An increase in the levy is likely to have different impacts on each waste stream, as discussed below.

*Municipal waste:* The difference between current waste recovery rates for MSW (40 percent) and the 2025 MSW target (67 percent) are substantial and unlikely to be fully bridged in the next five years. Current evidence suggests that better practice waste collection systems, coupled with effective product stewardship systems and waste communications, could increase material recovery rates to around 65 percent, with further recovery possible where residual waste streams undergo further processing. However, the 2025 Waste Strategy target is optimistic given the current waste management arrangements, and it is likely that significant change and innovation would be required to meet the target.

A higher levy might make some currently marginal technologies more viable, although there are some that already claim to be viable but remain unproven. There is no evidence to support any particular level of take up or improvement to the targets from an increase in the levy. We expect that cost uncertainty and performance risk for the new technologies will be a major deterrent for some local governments. Many local governments also have long term waste management and recycling contracts in place, so the speed of transition may remain slow regardless of the rate of the levy.

The opportunities for recycling will also diminish as a result of the upcoming national export ban. Australian governments have committed to investigating new processing methods and infrastructure needs to create value added products. An increase in the waste levy might improve the commercial viability of new processing facilities by allowing the proponent to increase their gate fee accordingly. If an increase in the levy was explicitly calculated to target local reprocessing of specific materials, the impact on other waste streams would also need to be considered, as would the increased risk of undesirable levy avoidance.



*C&D waste:* Based on current data, it appears possible that the C&D diversion target might be met or exceeded without any change to the levy, particularly if there is an improvement in confidence in the use of recycled materials for road bases. However, the reported C&D performance might be negatively impacted if and when current stockpiles of unprocessed material begin to reduce, or if any large-scale illegal disposal activities are discovered in the future.

*C&I waste:* C&I waste includes an assortment of commercial and industrial businesses that generate a variety of waste materials. Organics, paper, cardboard and plastics, account for around 70 percent of all C&I waste, and increased recovery of these materials will potentially be supported by expansion of material recovery infrastructure for managing MSW waste. Infrastructure expansions that might benefit C&I recovery include additional compositing capacity to process local government FOGO collections or the introduction of new local paper and plastic reprocessing, while other materials such as masonry, rubber and glass might benefit from initiatives to support the production and use of recycled products, such as support for recycled products used in road application and other infrastructure. Regardless of the rate of the levy, the 2025 C&I target will be challenging to meet as there is a large difference between the current C&I recycling rate (45 percent) and the 2025 target (70 percent).

### Availability of recycling opportunities

There are significant opportunities for increased recycling of organic waste, masonry waste and local reprocessing of paper and cardboard waste.

*Organics:* One of the most important opportunities for organic recycling is from household waste, which makes up over half of the waste generated by households. A significant improvement in organics recycling is expected to result from local government roll-out of three-bin collection systems, which include a dedicated FOGO bin. A high performing kerbside collection system, with FOGO collections, can achieve a recovery rate of around 65 percent. Some analyses have indicated that alternative technologies with even higher recovery rates may be cost competitive with landfill (including the current levy) but confidence in the technologies and cost estimates will only come with time.

*Masonry:* The most significant opportunity for masonry waste materials is through use in road bases. Some industry stakeholders believe that WA lags other Australian states in this respect, with local governments citing perceptions of risk and concerns about the variability of materials. The WA Government is supporting an increase in the use of recycled materials in road bases through research, the ongoing development of road base standards and large-scale demonstration projects. Other source materials that are being investigated here and in other jurisdictions include plastic, scrap rubber and glass (as glass sand).

*Paper and cardboard:* Most of WA's recycled paper and cardboard has previously been exported for reprocessing. The international market for waste products is currently weak and variable, particularly in light of the waste import restrictions imposed by China and other countries. Recycling of paper and cardboard will become even more challenging when the export ban proposed by the Council of Australian Governments (CAOG) is implemented. COAG has recognised that current domestic paper and cardboard processing capacity cannot absorb the additional volume of mixed paper from municipal collection that is currently being exported. High capital costs to install modern technology, volatile international markets with fluctuating commodity prices and long and expensive planning approvals make attracting investment a challenge. In the lead up to the ban, Australia's governments have announced that, in conjunction with industry, they will investigate new processing methods and infrastructure needs for paper to create value added products. Increases in the waste levy can support the viability of recycling infrastructure by increasing demand for material recovery options, as disposal options will become comparatively more expensive. Accordingly, recycling might be encouraged via market forces rather than direct financial support from government.

### Rate of the waste levy

Current evidence suggests that the 2025 C&D and overall waste generation and diversion targets in the Waste Strategy should be met without an increase in the waste levy, although there is cause to believe that these targets might not be met if stockpiling and other undesirable behaviours are eliminated. From our desktop investigation it appears unlikely that MSW and C&I diversion targets will be met by 2025.

An increase in the waste levy could accelerate the take up of new recycling technologies and would improve the recycling rates, even if not by the full amount required to meet the targets. The benefit of increasing the waste levy is likely to be more substantial if the increase in the levy stimulates local reprocessing of paper and cardboard waste. The rate of the waste levy required to stimulate a reprocessing industry can potentially be calculated by converting any upfront subsidy required by proponents to an annualised unit rate, which would allow the proponent to increase their gate fee accordingly.

If an increase in the waste levy is applied to all waste streams, any benefits should be weighed against the increased risk of undesirable behaviours and the economic loss associated with a levy that exceeds the economic costs (including externalities) of landfill disposal.

Regardless of how the rate of the levy is established in the short term, automatic CPI adjustments should be applied to meet ensure the objectives of the levy continue to be met in the future.

### Geographic area of the levy

Arguments for environmental protection, combined with the fact that the Waste Strategy contains targets for regional waste that are not currently being met, suggest that the waste levy be extended to regional areas. We have considered potential counterarguments and found that, on balance, there is a strong argument for extending the waste levy to regional areas, except for remote areas, which would have limited recycling opportunities.

The lower material recovery targets for MSW in major regional centres imply that a lower waste levy could be justified for regions other than the Peel region.

## Unintended consequences of the waste levy

There is substantial evidence of undesirable avoidance of the waste levy in other jurisdictions that have imposed a relatively high waste levy, although the consequences appear to be considered tolerable compared with the overall benefit of the levy.

In WA, reported C&D waste generation (landfill plus recycling) has reduced by almost half since the waste levy increases commenced in 2015. There are two potentially benign explanations for the reduction – the lower development activity, which might account for at least half the reduction in waste, and potential repurposing of C&D materials onsite or for other developments, the extent of which is unknown. Two unintended consequences that could be associated with the increase in the waste levy are an increase in stockpiling and the increased risk of illegal disposal practices. The former is known to represent relatively small quantities compared with total waste generation but the extent of the latter is unclear and warrants further investigation.

# Appendix 1: Consultations on waste reform

There are a number of consultation papers DWER have published in the last twelve months that consider possible reforms to waste management in Western Australia and some of these reforms overlap with the analysis and recommendations set out in this paper.

Key DWER documents that Marsden Jacob have reviewed are:

- *Closing the loop* – waste reforms for a circular economy Consultation paper, February 2020.
- *Waste not, want not: valuing waste as a resource* - Consultation to inform development of a legislative framework for waste-derived materials, June 2019.
- *Mandatory use of weighbridges by landfill premises to calculate leviable waste* Consultation paper on proposed amendments to the Waste Avoidance and Resource Recovery Levy Regulations 2008 to require the use of weighbridges for category 63, 64 and 65 landfill premises, May 2019.
- Proposed estimation/calculation methods for non-metropolitan landfills receiving more than 20,000 tonnes of waste per annum under proposed amendments to the Waste Avoidance and Resource Recovery Regulations 2008 – Consultation paper, April 2019.

The key elements of each of these consultation and proposed reforms are summarised below.

## Closing the loop

The *Closing The Loop*<sup>37</sup> consultation paper identifies a number of possible reforms to landfills and the exact wording of their levy liability. These include:

- Chapter 7: Aligning the EP Act with waste avoidance and resource recovery objectives
- Chapter 8: Clarifying the application of the waste levy (how waste premises pay the levy for waste they “receive
- Chapter 9: Modernising landfill licensing and levy liability for waste disposal (no preferred option identified)
- Chapter 10: Simplifying the solid waste licensing categories (no preferred option identified)
- Chapter 11: Minimising stockpiling at waste storage premises (no preferred option identified)
- Chapter 12: Waste Levy Exemptions (no preferred option identified)
- Chapter 13: Improving solid waste reporting from waste facilities (no preferred option identified)
- Chapter 14: Compliance and enforcement measures for waste
- Chapter 15: Improving the administration and collection of the waste levy

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<sup>37</sup> Department of Water and Environmental Regulation, [Closing the loop - Waste reforms for a circular economy](#) Consultation Paper, February 2020

In the Closing the Loop paper, Chapter 6 provides a summary of the legislative proposals, and their relationship to the guiding objectives, outcomes and strategies for waste reform in Western Australia. Potential cost impacts resulting from the proposed reforms are also highlighted. Please note that further detailed information on the legislative options is contained in the chapters of this consultation paper.

## Waste not, want not: valuing waste as a resource

The current legislation does not include a framework for waste-derived materials. It does not prescribe when waste-derived materials will cease to trigger the licensing and waste levy regimes under the EP Act, WARR Act, WARR Levy Act and their regulations made under these Acts.

Industry has reported that the uncertainty around whether material is waste (and hence, whether its storage, burial, discharge onto land, irrigation or incineration will attract licensing and waste levy requirements) is inhibiting the uptake of and market development for waste-derived materials. This is potentially driving a preference for the use of virgin raw materials and resulting in valuable non-virgin resources being sent to landfill.

This uncertainty is contrary to the circular economy approach encouraged by the Waste Strategy 2030, where most waste generated is valued as a resource that can be reused or recycled for the benefit of the state's economy.

Currently, the department receives occasional requests to 'approve' the use of waste-derived materials in certain circumstances. While the department is able to give advice and indicate its general views regarding the use of such materials, the legislation does not allow the department to approve such requests, even if the use is beneficial and has very low risk to the environment and human health.

Feedback from industry indicates support for the development of a legislative framework that provides for a risk-based assessment and approval process for bespoke use of waste-derived materials.

## Mandatory use of weighbridges by landfill premises to calculate leviable waste

The paper set out that DWER had identified a number of significant issues with the current methods for calculating leviable waste. These issues related to both volumetric survey, required under the WARR Levy Regulations for all inert (category 63) landfill premises in the metropolitan area, and the Chief Executive Officer's (CEO) 'approved manner for estimating waste volume or weight received at and disposed of to landfill'. The reform options considered in the consultation paper were:

- Option 1: No change – the existing methods to calculate waste levy liability remain.
- Option 2: Liable landfill premises must install a weighbridge onsite with levy calculation based on tonnes.
- Option 3: Waste that is to be disposed of to landfill or received at liable landfill premises, must be weighed on a weighbridge with levy calculation based on tonnes.

The paper was open for a 12 week consultation period which closed in late July 2019.

## Estimation/calculation methods for liable non-metropolitan landfills

DWER was amending the WARR Regulations to require annual reporting of waste and recycling data. The consultation paper sought feedback on the methods set out in the document and was open for consultation until May 2019.

The paper set out that liable non-metropolitan landfills would be required to report the following information annually for the most recently concluded financial year:

- Amount of waste received (tonnes);
- Amount of waste disposed (tonnes);
- Amount of stockpiled waste at the beginning and end of the reporting period (tonnes);
- Amount of material removed from the site (tonnes per annum);
- Destination/fate of material removed from site (recycling, waste-to-energy or disposal to landfill);
- Material category of waste received;
- Source waste stream of waste received (municipal solid waste (MSW), commercial and industrial (C&I) or construction and demolition (C&D)); and
- Geographic source of material received (Perth metropolitan region, Peel region or other regions).

## Appendix 2: Legislation and waste strategies in other jurisdictions

This appendix provides a summary of legislation related to waste strategies in other selected jurisdictions. The information is not intended to be exhaustive and is provided for comparison purposes only.

### New South Wales

In New South Wales (NSW) the waste levy is established under powers in the *Waste Avoidance and Resource Recovery Act, 2001*.<sup>38</sup>

The objects of this Act are as follows:

- (a) to encourage the most efficient use of resources and to reduce environmental harm in accordance with the principles of ecologically sustainable development,
- (b) to ensure that resource management options are considered against a hierarchy of the following order:
  - (i) avoidance of unnecessary resource consumption,
  - (ii) resource recovery (including reuse, reprocessing, recycling and energy recovery),
  - (iii) disposal,
- (c) to provide for the continual reduction in waste generation,
- (d) to minimise the consumption of natural resources and the final disposal of waste by encouraging the avoidance of waste and the reuse and recycling of waste,
- (e) to ensure that industry shares with the community the responsibility for reducing and dealing with waste,
- (f) to ensure the efficient funding of waste and resource management planning, programs and service delivery,
- (g) to achieve integrated waste and resource management planning, programs and service delivery on a State-wide basis,
- (h) to assist in the achievement of the objectives of the Protection of the Environment Operations Act 1997.

NSW waste objectives are set out in the Waste Avoidance and Resource Recovery Strategy 2014-2021.<sup>39</sup> The strategy sets the following targets:

- avoiding and reducing the amount of waste generated per person in NSW
- increasing recycling rates to:
  - 70% for municipal solid waste
  - 70% for commercial and industrial waste

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<sup>38</sup> [www.legislation.nsw.gov.au](http://www.legislation.nsw.gov.au)

<sup>39</sup> <https://www.epa.nsw.gov.au/your-environment/recycling-and-reuse/warr-strategy>

80% for construction and demolition waste

- increasing waste diverted from landfill to 75%
- managing problem wastes better, establishing 86 drop-off facilities and services across NSW
- reducing litter, with 40% fewer items (compared to 2012) by 2017
- combatting illegal dumping, with 30% fewer incidents (compared to 2011) by 2017.

Reporting data indicates that the targets are broadly being achieved for Municipal Solid Waste as well as Construction and Demolition wastes. However, Commercial and Industrial wastes are not achieving the target recycling rates.

New South Wales are currently in the planning stage for the new Strategy – which will cover a 7 year period and may include revised targets.

## Victoria

In Victorian the Landfill Levy is raised under Division 3 of the *Environment Protection Act, 1970*.<sup>40</sup>

Due to the levy being included in the Environment Protection Act, Victoria does not have an Act that is focussed specifically on waste reduction. Marsden Jacob is aware that Victoria has considered whether the development of a separate Waste Act would improve clarity for the waste

The following long term waste goals are specified in the *Statewide Waste and Resource Recovery Infrastructure Plan (SWRRIP)*:<sup>41</sup>

GOAL 1: Landfills will only be for receiving and treating waste streams from which all materials that can be viably recovered have been extracted.

GOAL 2: Materials are made available to the resource recovery market through aggregation and consolidation of volumes to create viability in recovering valuable resources from waste.

GOAL 3: Waste and resource recovery facilities including landfills are established and managed over their lifetime to provide best economic, community, environment and public health outcomes for local communities and the state and ensure their impacts are not disproportionately felt across communities.

GOAL 4: Targeted information provides the evidence base to inform integrated statewide waste and resource recovery infrastructure planning and investment at the state, regional and local levels by industry, local government, waste and resource recovery groups, government agencies and the broader community.

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<sup>40</sup> <https://www.legislation.vic.gov.au/in-force/acts/environment-protection-act-1970/213>

<sup>41</sup> <https://www.sustainability.vic.gov.au/About-us/What-we-do/Strategy-and-planning/Statewide-Waste-and-Resource-Recovery-Infrastructure-Plan>



## Australian Capital Territory

Waste management in the Australian Capital Territory is managed through the *Waste Management and Recovery Act, 2016*.<sup>42</sup>

The objects of this Act are to—

- (a) manage waste according to the following hierarchy:
  - I. minimise the generation of waste;
  - II. maximise the recovery and re-use of resources;
  - III. minimise the amount of waste that goes to landfill; and
- (b) support innovation and investment in waste management; and
- (c) promote responsibility for waste reduction; and
- (d) promote best-practice waste management.

ACT Waste Management Strategy 2011–2025<sup>43</sup> sets out the following objectives:

*The goal of the ACT Waste Management Strategy 2011–2025 is to ensure that the ACT leads innovation to achieve full resource recovery and a carbon neutral waste sector.*

*This goal is supported by four key outcomes and identifies 29 strategies that will enable the achievement of the outcomes. The objectives are:*

*Outcome 1: less waste generated*

*Outcome 2: full resource recovery*

*Outcome 3: a clean environment*

*Outcome 4: a carbon neutral waste sector*

The ACT does not currently have a Waste Levy, however, in 2019 it was considering introducing a Waste Levy or increasing landfill gate fees by an amount equivalent to a levy.

## South Australia

In South Australia the Waste Levy is established under section 113 of the *Environment Protection Act, 1993*. Regulation 70 of the *Environment Protection Regulations, 2009* prescribes the waste levy payable.

South Australian's waste objectives are set out in *South Australia's Waste Strategy 2015-2020*<sup>44</sup> the waste strategy objectives are:

- *a resource efficient economy where the best or full value is secured from products and materials produced, consumed and recovered across the State*
- *a stable and efficient market for investors through a clear policy framework providing a solid platform for investment decisions*

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<sup>42</sup> [www.legislation.act.gov.au](http://www.legislation.act.gov.au)

<sup>43</sup> [https://www.environment.act.gov.au/\\_data/assets/pdf\\_file/0007/576916/ACT-Waste-Strategy-Policy\\_access.pdf](https://www.environment.act.gov.au/_data/assets/pdf_file/0007/576916/ACT-Waste-Strategy-Policy_access.pdf)

<sup>44</sup> <https://www.greenindustries.sa.gov.au/sa-waste-strategy>

- *a culture enabling the South Australian community, businesses and institutions to continue and strengthen their role in implementing zero waste strategies and programs locally, nationally and internationally.*

## Appendix 3: Price elasticity of demand

This appendix provides information on the own-price elasticity of demand in the waste sector.

### *Putrescible waste*

Although there is significant variation, the price elasticity estimates in existing literature tend to suggest a very low or zero own-price elasticity for putrescible waste.<sup>45</sup> That is, increase in the waste levy are expected to generate a less than proportional decrease in the material diverted from landfill. The low response is partly because putrescible waste is mainly generated as municipal waste and rate payers do not face any direct pricing signal for generating more or less waste. That is, households and businesses that generate and dispose of less waste do not receive reduced local government rates (although there are exceptions such as different payments for different sized bins and on-demand services). The response also reflects the limited number of options for reusing putrescible waste in the household.

By contrast, the impact of the levy in municipal disposal decisions is substantial as it can account for around a third of the total cost of collecting and disposing of municipal waste to landfill.<sup>46</sup> The waste levy plays a particularly important role in decisions about FOGO waste. Rather than landfill, FOGO can be recycled as compost. All putrescible waste can also be used in a waste to energy facility, which also avoids the levy.

While the levy rate is an importance determinant of putrescible recycling rates, it not the sole determinant. The level of recycling is also influenced by regulation, government strategies and community pressures.

Previous research for DWER has indicated that a first order approximation of own-price elasticity for putrescible waste is - 0.2 and - 0.7.<sup>47</sup>

### *Inert waste*

C&D waste typically has a greater responsiveness to a waste levy because there is greater opportunity to recycle masonry materials (including concrete, sand, asphalt and rubble) than most other materials. Waste disposal statistics indicate a significant decrease in waste sent to landfill following increases in the levy (Figure 16).

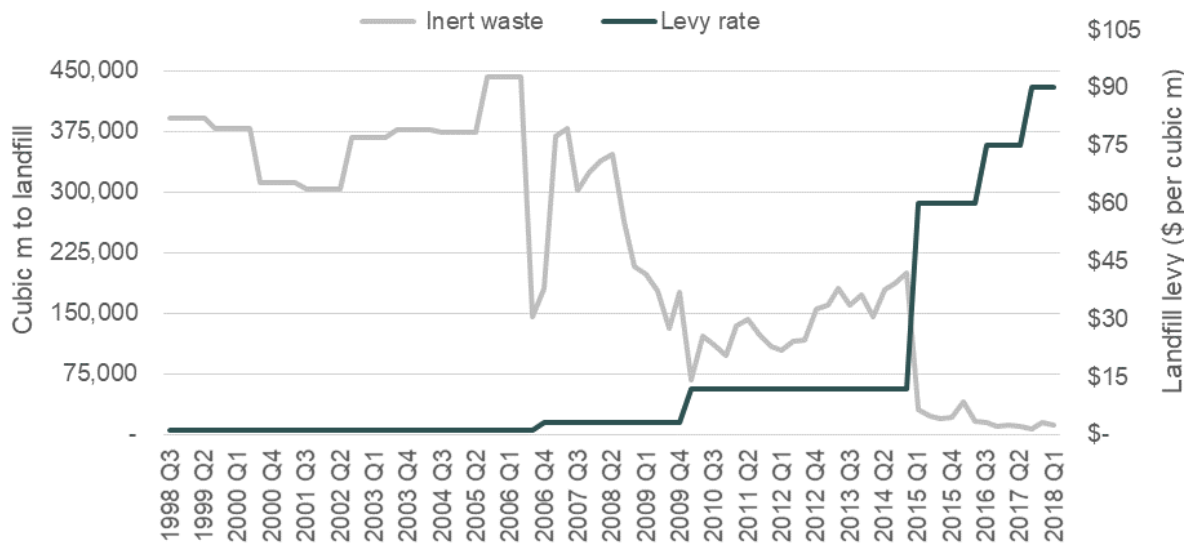
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<sup>45</sup> Bel, G.B. and Gradus, R. (2016) Effects of unit-based pricing on household waste collection demand: A meta-regression analysis, *Resource and Energy Economics*, Vol. 44, p. 169-182.

<sup>46</sup> Assuming a \$70/t waste levy and rule of thumb costs of \$100/t for collection and \$40/t for landfilling.

<sup>47</sup> Fogarty J.J. (2019) A review of the operation of the landfill level in Western Australia, prepared for the Department of Water and Environmental Regulation

Figure 16: Response in the inert waste market to the levy



Source: Department of Water and Environmental Regulation; in Fogarty (2019)

Previous research has indicated that a first order approximation of own-price elasticity for inert waste is – 1.7 to -3.6.<sup>48</sup>

<sup>48</sup> Fogarty J.J. (2019) A review of the operation of the landfill level in Western Australia, prepared for the Department of Water and Environmental Regulation

# Appendix 4: Smart Waste Survey Report 2016

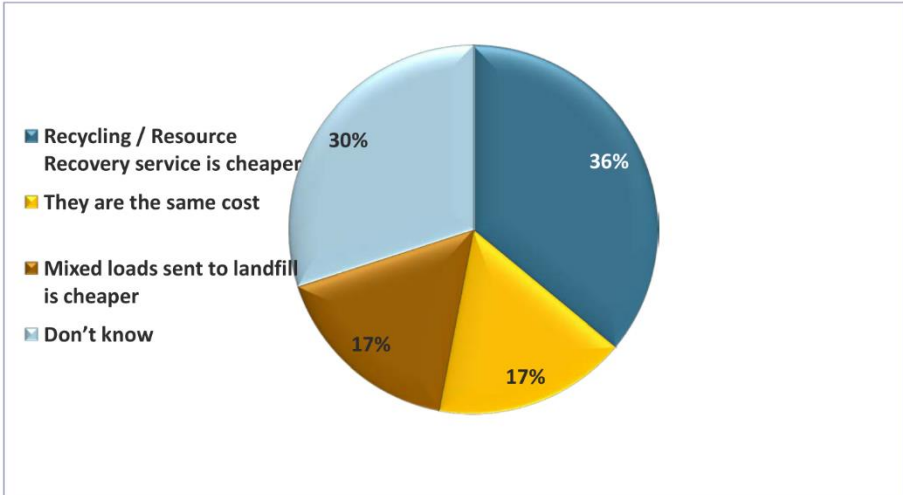
The results below provide a snapshot of relevant information from a survey undertaken by Master Builders and the Waste Authority in 2016.

The report highlights that 96% of builders regard waste management as important to their business, which indicates the potential for a high level of engagement amongst builders. The survey results show that each builder, on average, was able to think of 1.8 motivations for managing waste. While cost was the dominant motivation, mentioned by 81% of builders, the second most mentioned motivator was the ‘environment’ (42%). The waste levy rated much lower, mentioned by only 12% of builders, as a motivator to manage waste.

The report indicates that the vast majority (82%) of builders were unable to provide an informed estimate of the Levy costs. Of those offering an estimate of the cost, about half were correct or close to correct and the other half mostly over-estimated the cost. The authors did not find the result surprising given that builders pay the waste levy as part of a fee for the skip bin or truck removing waste from site.

Figure 6 from the report shows that the general awareness of the levy translates into a mixed response regarding the least cost method of waste management. In practice, the costs of resource recovery services and landfill also vary according to geography, scale and type of material.

**Figure 6: Perceived cheapest waste service method (including the Landfill Levy cost)**



Q2.2.3 Now that the Landfill Levy has increased, which waste management service do you think is cheaper per load? n=225 (Metro builders only)

Figure 7 of the survey showed that between 11% and 24% of builders reported being ‘Highly’ or ‘Somewhat Likely’ to adopt specific better waste management practices included in the survey. Other practices, such as the use of clean fill, were not specifically included in the survey.

**Figure 7: Intended response to Landfill Levy increases (Metropolitan)**

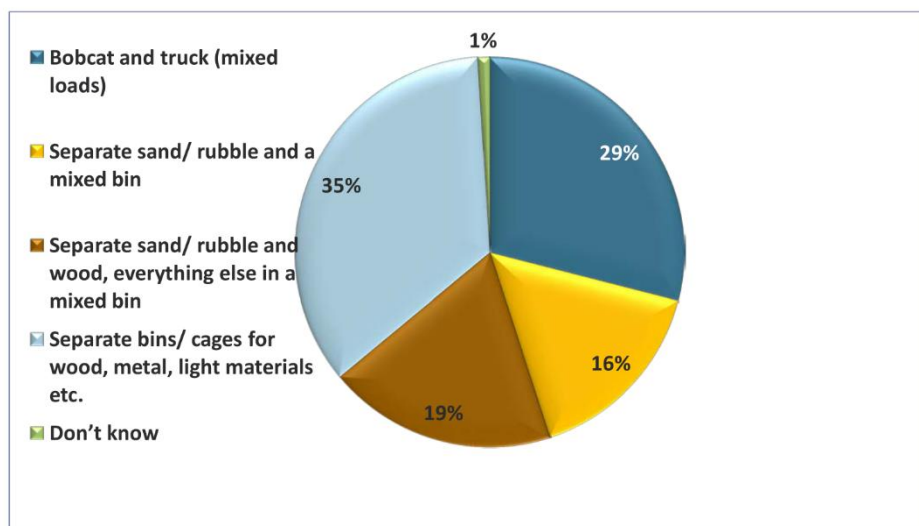
<b>% of all metro builders (n= 225)</b>	<b>Already doing</b>	<b>Highly Likely to start</b>	<b>S'What Likely</b>	<b>S'What Unlikely</b>	<b>Very Unlikely</b>	<b>Not Possible/ applicable to sites</b>
Reduce over-ordering	86	7	4	2	0	1
Design to materials sizes	72	8	4	3	4	9
Keep off-cuts/ spares for reuse	75	6	5	3	10	1
Engage a resource recovery (recycling) provider	50	8	16	12	12	2
Sort materials on site ready for recycling	61	9	13	6	8	3

Question: As the levy will increase each year, how likely are you to do the following things to reduce your landfill waste?

67% of builders reported no change in their practices over the previous year.

Figure 11 of the report identified the on-site separation methods currently being utilised by builders, indicating that 29% of respondents did not use any form of waste separation.

**Figure 11: Current on-site waste management system**



Q2.3.3 How do you usually organise your waste on site during a build n=308

# Appendix 5: Linkages between the Waste Levy and the Waste Strategy objectives

The *Waste Avoidance and Resource Recovery Levy Act, 2007* (the WARR Levy Act) establishes a head of power for the waste levy to be prescribed in regulation. In reviewing the rate and the scope of the levy, it is important to ensure that any recommendations are not contrary to the WARR Levy Act and that the recommendations align with the objectives of levy, to the extent that those objectives are made clear in the legislation and its supporting documentation.

**Please note that Marsden Jacob are not lawyers and the following does not constitute legal advice.**

## WARR Levy Act

The WARR Levy Act does not include objectives and is a relatively short Act which refers specifically to the *Waste Avoidance and Resource Recovery Act, 2007* (the WARR Act) and the *Environment Protection Act, 1986* (the EP Act).

The separation of the WARR Levy Act from the WARR Act is standard practice as it is a requirement that bills and acts which appropriate revenue or money for the ordinary annual services of the Government should deal only with this appropriation.<sup>49</sup>

As the objectives of the WARR Levy are not explicit in the WARR Levy Act, interpretation is required to determine the objectives. Indications can potentially be found in:

- the second reading speech when the Bill was introduced into parliament;<sup>50</sup>
- the process for setting the levy; and
- the objectives of the WARR Act.

## WARR Levy Act – Second reading speech

When the WARR Levy Bill was debated in Parliament, the same second reading speech was used in both the Legislative Assembly<sup>51</sup> and the Legislative Council<sup>52</sup>. The speeches include the following statement relating to objectives:

<sup>49</sup> Section 46(6) of the [Constitution Acts Amendment Act, 1899](#)

<sup>50</sup> Section 19 of the [Interpretation Act, 1984](#) sets out Extrinsic material, use of in interpretation

<sup>51</sup> [www.parliament.wa.gov.au/hansard/hansard.nsf/0/C56010E76D932A95C8257570007F762C/\\$FILE/A37%20S1%2020071017%20p6313b-6314a.pdf](http://www.parliament.wa.gov.au/hansard/hansard.nsf/0/C56010E76D932A95C8257570007F762C/$FILE/A37%20S1%2020071017%20p6313b-6314a.pdf)

<sup>52</sup> [www.parliament.wa.gov.au/Hansard/hansard.nsf/0/10c7c9f0515e49ccc825758a0027bfeb/\\$FILE/C37+S1+20071120+p7346b-7346b.pdf](http://www.parliament.wa.gov.au/Hansard/hansard.nsf/0/10c7c9f0515e49ccc825758a0027bfeb/$FILE/C37+S1+20071120+p7346b-7346b.pdf)

*There are two objectives of the landfill levy. It functions as an economic instrument for influencing waste management practices, including reducing waste to landfill, by increasing the price of landfill disposal. The funds raised by the landfill levy are then used to support waste-related programs that have the effect of reducing waste to landfill.*

*The effect of the bill is essentially unchanged, but the name has been changed to reflect the companion bill, the Waste Avoidance and Resource Recovery Bill 2007.*

The objectives imputed from this speech are that the levy aims to:

- influence waste management practices;
- reduce waste to landfill; and
- use the funds raised by the levy to support waste-related programs.

While the speech does not specifically mention recycling, there is broad scope to interpret the phrase “influence waste management practices”.

## Process for setting the levy

Section 4 of the WARR Levy Act specifies the method for setting the Levy and illustrates the strong linkage between the WARR Levy Act and the WARR Act. It states:

*(1) The Governor may, on the recommendation of the Minister, make regulations under the Waste Avoidance and Resource Recovery Act 2007 prescribing an amount by way of levy that is to be payable in respect of waste received at disposal premises.*

*(2A) The Waste Authority may provide advice to the Minister for the purpose of making a recommendation under subsection (1) as to the amount by way of levy to be prescribed.*

*(2B) The Minister must give due weight to, but is not bound to accept, the advice of the Waste Authority under subsection (2A).*

From this it is clear that the Waste Authority (established under the WARR Act) may provide advice on the amount of the levy. If advice is provided, it must be considered, but is not binding on the Minister.

## WARR Act - Functions of the Waste Authority

Schedule 2 of the WARR Act sets out the functions of the Waste Authority. Of the functions set out in Schedule 2, two elements appear particularly relevant:

- 2. To act as an advocate for the objects of this Act.*
- 3. To develop, promote and review the waste strategy and coordinate its implementation.*

## WARR Act - objects of the Act

The objectives of the WARR Act are set out in section 5 of the Act, which states:

- 1. The primary objects of this Act are to contribute to sustainability, and the protection of human health and the environment, in Western Australia and the move towards a waste-free society by —*



- a. *promoting the most efficient use of resources, including resource recovery and waste avoidance; and*
  - b. *reducing environmental harm, including pollution through waste; and*
  - c. *the consideration of resource management options against the following hierarchy —*
    - ii. *avoidance of unnecessary resource consumption;*
    - iii. *resource recovery (including reuse, reprocessing, recycling and energy recovery);*
    - iv. *disposal.*
2. *The principles set out in the EP Act section 4A apply in relation to the objects of this Act.*

It should also be noted that the Explanatory Memorandum that accompanied the WARR Bill provides some further detail on the primary and secondary objectives of the Act.<sup>53</sup>

### Object and principles of Environmental Protection Act, 1986

Section 4A of the EP Act sets out five principles. For this review principles 4 and 5 are most relevant, which are shown below:

*The object of this Act is to protect the environment of the State, having regard to the following principles —*

....

#### *4. Principles relating to improved valuation, pricing and incentive mechanisms*

- (1) Environmental factors should be included in the valuation of assets and services.*
- (2) The polluter pays principle — those who generate pollution and waste should bear the cost of containment, avoidance or abatement.*
- (3) The users of goods and services should pay prices based on the full life cycle costs of providing goods and services, including the use of natural resources and assets and the ultimate disposal of any wastes.*
- (4) Environmental goals, having been established, should be pursued in the most cost effective way, by establishing incentive structures, including market mechanisms, which enable those best placed to maximise benefits and/or minimise costs to develop their own solutions and responses to environmental problems.*

#### *5. The principle of waste minimisation*

*All reasonable and practicable measures should be taken to minimise the generation of waste and its discharge into the environment.*

<sup>53</sup> See page 3 of the *Explanatory Notes for the Waste Avoidance and Resource Recovery Bill 2007* [https://www.parliament.wa.gov.au/Parliament/Bills.nsf/5ADE18E604C7F24FC8257377000F1C2D/\\$File/EM%2B-%2BBill%2B152-1.pdf](https://www.parliament.wa.gov.au/Parliament/Bills.nsf/5ADE18E604C7F24FC8257377000F1C2D/$File/EM%2B-%2BBill%2B152-1.pdf)