

Western Sydney Waste Management: Capacity, Needs and Infrastructure

A submission to the Australian Council of Recycling

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This report is intended to be a set of information, ideas and recommendations to foster debate about optimal resource recovery in Western Sydney only.

All data estimates on waste flows are provisional only, based on key assumptions, subject to sensitivity analysis and necessarily limited by data access and management issues in NSW.

Document

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Executive Summary

Western Sydney is experiencing a significant increase waste generation due to population increases and high-levels of infrastructure development. This growth offers enormous potential for job growth opportunities in Western Sydney. This report evaluates current waste flows in the region and the forecasted demand for additional waste processing capacity by 2021-22.

Waste infrastructure Requirements

Western Sydney is considered the “waste hub” of Greater Sydney, due to the high concentration of waste processing facilities in the region. Facilities in Western Sydney do not just process waste generated in the Western Sydney region, but for the rest of Greater Sydney as well.

As waste generation rates across municipal, commercial, and construction waste streams increase, it is necessary to ensure that there is sufficient waste processing capacity to meet the region’s (and broader Sydney’s) needs in the future.

The NSW Waste Strategy has set the following resource recovery targets for 2021-22:

- 70% for municipal solid waste (MSW)
- 70% for commercial and industrial (C&I) waste
- 80% for construction & demolition (C&D) waste

Table 1 below summarises the estimated 2021-22 capacity and investment requirements for MSW, C&I and C&D waste, and the high-level economic benefits of investment in the sector.

There are 3 key caveats for this analysis:

1. C&I on-site sorting is assumed to be constant but increases in the levy will drive additional on-site sorting.
2. It is assumed that 9.2 jobs are created for every 10,000 tonnes per annum of additional recycling capacity built (Deloitte Access Economics, 2009). This figure is an average across all waste streams and is likely to be an overestimate for C&D job creation.
3. The analysis on current processing capacity does not include facilities in the pipeline. These proposals still need government to champion approval, particularly through local government.

A total of 5.18 million tonnes per annum of additional capacity from 36 new facilities will be required by 2021-22 to meet state resource recovery targets. Up to 4,766¹ jobs will be created through the development of this infrastructure. \$994 million of capital investment is required, and \$1.1 billion of economic value per annum will be generated from gate fees.

¹ It is unlikely that all the identified infrastructure needs will be met by 2021-22. Therefore, these figures for job creation will be spread over the time it takes to build and commission these facilities.

Table 1: 2021-22 infrastructure requirements and economic benefits

	Residual MSW to AWT	Residual MSW to EfW	Recyclable MSW	Organic MSW	C&I	C&D	Total
Additional processing capacity (tpa) required to meet 2021-22 resource recovery targets	120,000	140,000	90,000	80,000	1,500,000	3,250,000	5,180,000
Facilities required	Two 60,000 tpa AWT facilities	One 140,000 tpa EfW facility	Three 30,000 tpa MRF facilities	Two 40,000 tpa organics processing facilities	Fifteen 100,000 tpa C&I MRF facilities	Thirteen 250,000 tpa C&D processing facilities	36
Jobs created	111	129	83	74	1,380	2,990	4,766
Capital investment	\$120 million	\$300 million	\$18 million	\$60 million	\$450 million	\$46 million	\$994 million
Economic value per annum	\$36 million	\$42 million	\$14 million	\$14 million	\$390 million	\$585 million	\$1.1 billion

Recommendations to government

- Government should recognise the significant economic benefits and jobs growth potential that the recycling industry offers for Western Sydney.
- Plan the investment horizon to facilitate development of new infrastructure worth \$1 billion of capital investment
- The waste and recycling industry requires government leadership in the form of planning and policy to achieve waste diversion targets in Sydney:
 - The development of industrial ecology parks should be considered to co-locate new waste processing infrastructure and provide synergies for resource recovery operations in Western Sydney. These will also serve to preserve buffers around waste assets.
 - Focus more of the Waste Less Recycle More grant funding on infrastructure
 - Develop a priority infrastructure plan
 - Coordinate with industry via new governance and engagement processes
 - Accelerate government procurement of recycled content products in infrastructure developments.

Contents

Executive Summary	iii
Contents	v
List of Tables	vi
1 Introduction.....	1
2 Waste processing infrastructure	2
3 Waste generation forecasts and infrastructure gaps in Sydney	4
3.1 Municipal Solid Waste.....	4
3.1.1 AWT facilities – Household Residual Waste	4
3.1.2 EfW facilities – Household Residual Waste	5
3.1.3 MRF – Household Recycling.....	6
3.1.4 Composting – Household Organic Waste	6
3.2 Commercial & Industrial Waste	6
3.3 Construction & Demolition Waste	7
3.4 Summary	12
4 Other recommendations to government.....	13
4.1 Industrial Ecology Parks	13
4.2 Focus grant funding on waste processing infrastructure development	13
4.3 Develop priority infrastructure plan	14
4.4 Governance and engagement with industry.....	14
4.5 Positive procurement of recycled content products in infrastructure developments	15
5 Conclusion	16
Appendix A Other key considerations	18

List of Tables

Table 1: 2021-22 infrastructure requirements and economic benefits	iv
Table 2: List of selected waste facilities in Greater Sydney.....	2
Table 3: MSW waste generation forecasts.....	4
Table 4: Residual waste generation forecast	4
Table 5: Approved major infrastructure projects in Greater Sydney (Currently in development)	7
Table 6: Potential upcoming infrastructure projects in Greater Sydney (Possible future developments)	8
Table 7: 2021-22 infrastructure requirements and economic benefits	12
Table 8: Waste Less Recycle More grant program summary	13
Table 9: 2021-22 infrastructure requirements and economic benefits	16
Table 10: Key reforms enforced by the Protection of the Environment Operations Legislation Amendment (Waste) Regulation 2018	20
Table 11: Richmond Review recommendations.....	22

List of Figures

Figure 1: Selected waste facilities in Greater Sydney.....	3
Figure 2: Estimated waste generation from major infrastructure projects (MRA)	9
Figure 3: Approved major infrastructure projects for Greater Sydney	10
Figure 4: Three pillars of Smart Cities Plan.....	19

1 Introduction

The Australia Council of Recycling (ACOR) has organised a roundtable discussion on the materials management opportunity in Western Sydney inviting key stakeholders including government ministers, government advisors, waste industry representatives, consultants, and other government agency representatives.

ACOR engaged MRA Consulting Group to present a brief on the needs and opportunities for resource recovery infrastructure in Sydney at present and in the near future.

The resource recovery sector provides significant opportunities for job creation. Jobs in resource recovery are largely recession proof as recycling rates do not generally swing as high or as low as the broader economy. According to the Federal Department of the Environment and Energy, resource recovery generates many more jobs than landfill for managing the same quantity of waste. The estimated direct Full Time Equivalent (FTE) employment per 10,000 tonnes of waste is 9.2 for recycling and 2.8 for landfill disposal (Access Economics, 2009).

Currently the recycling sector employs over 50,000 people and is worth over \$14 billion per year while it also is one of the fastest growing manufacturing sectors in Australia. These are green, sustainable jobs covering technical (engineering, chemistry, science), commercial (sales, business) and operational skills.

The predicted population and housing growth in the Sydney Metropolitan Area, construction of major infrastructure projects such as the Badgerys Creek Airport as well as the flow of waste back to NSW with the introduction of the waste levy in Queensland is expected to provide many challenges and opportunities for the resource recovery industry in Sydney, particularly the lack of sufficient processing capacity for the future.

The majority of Sydney's resource recovery infrastructure is located in Western Sydney. Government should recognise the essential services provided by the sector and its significant contribution to economic growth. Investment in the resource recovery sector provides opportunities for increased employment, better environmental outcomes and increased rates of diversion from landfill.

Finding solutions to the barriers to entry for new resource recovery infrastructure and the expansion or modification of existing resource recovery infrastructure is key to unlocking the potential of the sector in the near term.

The structure of the report is as follows:

1. List and map of current waste processing infrastructure in Sydney
2. Waste generation forecasts and infrastructure gaps in Sydney
3. Other recommendations to government
4. Conclusion
5. Appendix (Other considerations)

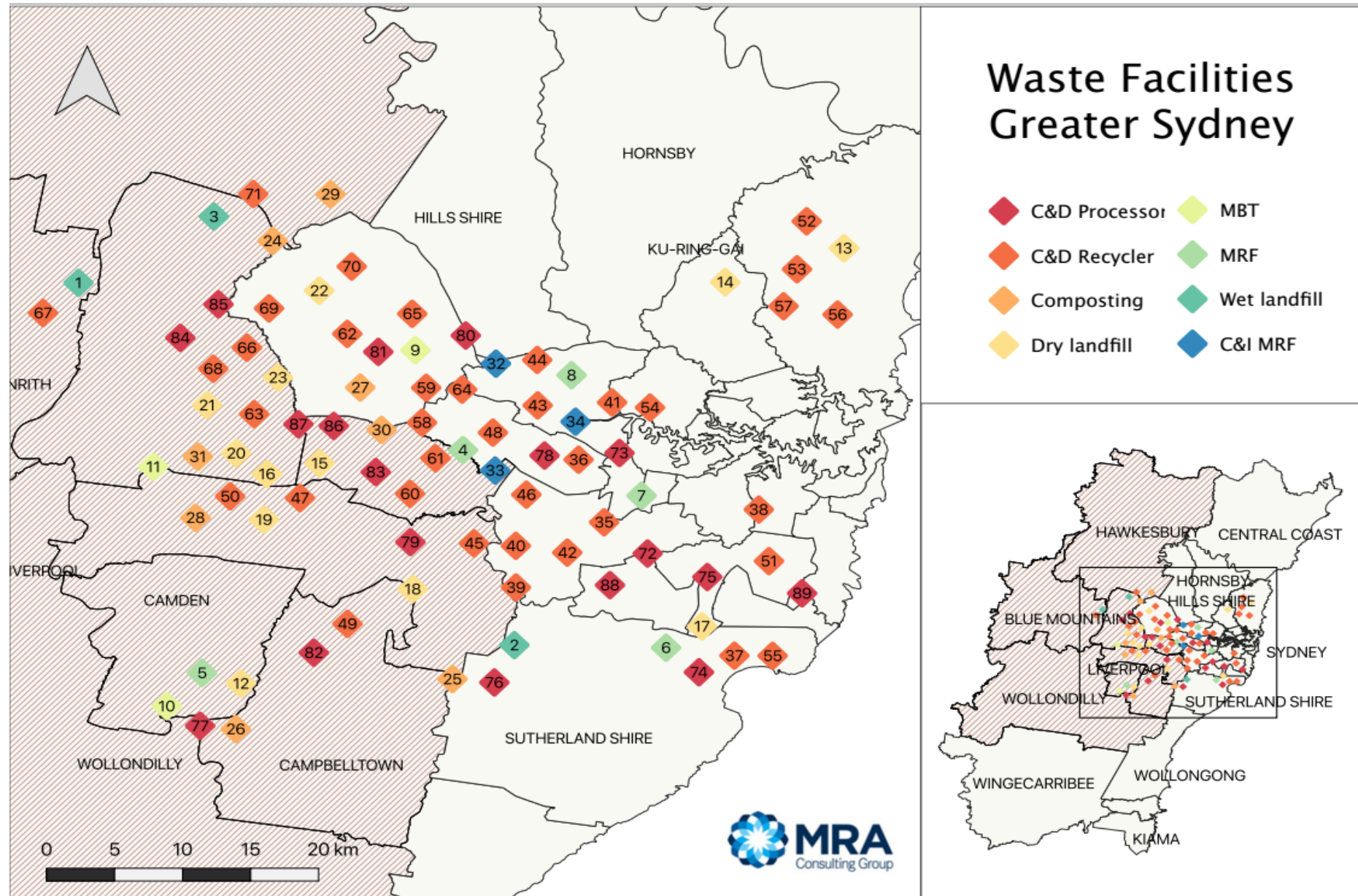
2 Waste processing infrastructure

The Western Sydney region hosts the majority of Greater Sydney's waste management facilities. There are also a number of facilities outside of Western Sydney that serve the region. Major waste facilities servicing the Western Sydney region are pictured in Figure 1 and listed in Table 2.

Table 2: List of selected waste facilities in Greater Sydney

No.	Name and Operator	No.	Name and Operator	No.	Name and Operator	No.	Name and Operator
1	Blaxland Waste Management Facility	24	Scotts Australia Berkshire Park	47	Brandown	70	Back to Earth The Mulch Makers
2	SUEZ Lucas Heights	25	SUEZ Lucas Heights	48	The Brick Pit	71	Rock & Dirt Recycling
3	Hawkesbury City Waste Management Facility	26	SUEZ Camden	49	Affordable Pallets	72	Loumbos
4	VISY Smithfield	27	SUEZ Eastern Creek	50	ANL Badgerys Creek	73	SUEZ Auburn
5	SUEZ Spring Farm	28	ANL Badgerys Creek	51	Sell & Parker Banksmeadow	74	Remondis Taren Point
6	VISY Taren Point	29	Bettergrow	52	Kimbriki	75	SUEZ Rockdale
7	Polytrade Enfield	30	Veolia Horsley Park	53	ANL Terrey Hills	76	SUEZ Lucas Heights
8	Polytrade Rydalmere	31	SUEZ Kemps Creek	54	Darwin	77	SUEZ Spring Farm
9	Global Renewables UR-3R	32	Wastefree	55	ReGYP Kurnell	78	Bingo Auburn
10	SUEZ Spring Farm	33	Doyle Bros	56	A E Biggs	79	Liverpool Community Recycling Centre
11	SUEZ Kemps Creek	34	SUEZ Camellia	57	Benedict Recycling Belrose	80	SUEZ Seven Hills
12	SUEZ Spring Farm	35	Has-a-bin	58	Boral Recycling	81	Cleanaway Blacktown
13	Kimbriki	36	Cooke's Metal Recyclers	59	IS Recycling	82	Cleanaway Environmental
14	Greenwood Landfill	37	Kurnell Landfill (Breen)	60	Abbey Pallets	83	SUEZ Wetherill Park
15	Veolia Horsley Park	38	Sims Metal Alexandria	61	Sustainable Resource Centre	84	Cardboard King
16	Sydney Recycling Park Wanless	39	Sims Metal Milperra	62	Cleanaway Glendinning	85	Bingo St Marys
17	Kurnell Landfill (Breen)*	40	Expanded Polymer Solutions	63	Cleanaway Erskine Park	86	Veolia Horsley Park
18	Glenfield Waste Services	41	Concrete Recyclers	64	ANL Seven Hills	87	Genesis Xero Waste
19	Brandown	42	Gow Street Recycling Centre	65	Sell & Parker Kings Park	88	Bingo Mortdale
20	SUEZ Elizabeth Drive	43	Thuroona Services	66	Enviro Pallets	89	Bingo Banksmeadow
21	Patons Lane	44	Parramatta Scrap Metal	67	Blaxland Waste Management Facility		
22	Blacktown Waste Services	45	Benedict Recycling Chipping Norton	68	Sims Metal St Marys		
23	Dial a Dump Industries	46	Total Scrap Metals Recycling	69	Camel's Bins		

Figure 1: Selected waste facilities in Greater Sydney



3 Waste generation forecasts and infrastructure gaps in Sydney

There are 3 significant caveats for this analysis:

1. C&I on-site sorting is assumed to be constant (but increases in the levy will drive additional on-site sorting).
2. It is assumed that 9.2 jobs are created for every 10,000 tonnes per annum of additional recycling capacity built (Deloitte Access Economics, 2009). This figure is an average across all waste streams and is likely to be an overestimate for C&D job creation.
3. The analysis on current processing capacity does not include facilities in the pipeline. These proposals still need government to champion approval, particularly through local government.

3.1 Municipal Solid Waste

The number of dwellings in the Sydney Metropolitan Area in 2014-15 was 1,549,281 and is forecasted to increase by 22% to 1,891,500 by 2021. Applying the 22% growth to municipal waste generation in the SMA gives the forecasted MSW waste generation by stream summarised in Table 3 below.

Table 3: MSW waste generation forecasts

Year	No of households	Residual waste generated	Recyclable waste generated	Organic waste generated
2014-15	1,549,281	1,092,207	384,319	326,140
2021 forecast	1,891,500	1,333,463	469,211	398,181
Increase	342,219	241,256	84,892	72,041

New developments in the region will be both Multi Unit Dwellings (MUDs) and Single Unit Dwellings (SUDs). High density dwellings are expected in the urban centres while the suburbs projected to be created as multiple greenfield sites are released will predominantly be standalone houses and row houses. In view of the high population growth of the Western Sydney region, the pressure on waste management systems will grow significantly.

3.1.1 AWT facilities – Household Residual Waste

Approximately 500,000 tpa of residual MSW is sent to AWT (Alternative Waste Treatment) facilities, with the remaining 592,207 tonnes to landfill. The forecasted increases in demand for AWT and disposal of residual waste are listed in Table 4 below.

Table 4: Residual waste generation forecast

Year	Residual waste to AWT	Residual waste direct to disposal
2014-15	500,000	592,207

2021 forecast	610,444	723,019
Increase	110,444	130,812

There will be a 110,444 tpa increase in demand for additional AWT facilities. AWT capacity for Sydney is currently constrained with the 4 facilities servicing the region already operating at capacity.

To meet this additional demand by 2021, two 60,000 tpa AWT facilities would be required.

AWT summary

An additional two 60,000 tpa AWT facilities are required by 2021.

The economic benefits of meeting the additional capacity requirement for AWT facilities is as follows:

- 111 jobs created
- \$120 million² capital investment
- \$36 million³ in gate fee revenues per year

[MRA notes the October 2018 decision of the NSW EPA to restrict the application of AWT Municipal Waste Organic Outputs (MWOO) to land in NSW. This has significantly altered the potential future growth in the AWT sector and particularly investment in new plants. If the limitation on the use of MWOO is maintained then all of the diversion attributed to AWT will need to be achieved through commensurate growth in FOGO processing. The current absence of policy clarity makes the allocation task impractical.]

3.1.2 EfW facilities – Household Residual Waste

An additional 130,812 tpa of residual waste will be disposed directly by 2021. The two main putrescible landfills servicing the SMA are Suez Lucas Heights and Veolia Woodlawn. These facilities currently accept a combined 1.6 million tonnes per annum (including approximately 500,000 tpa of C&I waste). It is expected that there is sufficient capacity to accept this additional waste by 2021.

An alternative solution for disposal of the additional residual waste is the development of an energy-from-waste (EfW) facility. A single 140,000⁴ tpa capacity facility would be able to meet this additional demand.

EfW summary

One additional 140,000 tpa EfW facility is required by 2021.

The economic benefits of a 140,00 tpa EfW facility are summarised below:

- 129 jobs created
- \$300 million capital investment
- \$42 million⁵ in gate fee revenues per year

² Capital expenditure of \$60 million per AWT facility

³ Gate fee revenue of \$300/t

⁴ Note that this does not include further potential demand for incineration of C&I waste

⁵ Gate fee revenue of \$300/t

3.1.3 MRF – Household Recycling

384,319 tonnes of MSW recyclables was generated in the SMA in 2014-15 and is forecasted to increase to 469,211 by 2021. The four Material Recovery Facilities (MRFs) servicing the SMA are operating close to or at capacity.

There will be an 84,892 tpa increase in demand for additional MRF capacity by 2021. To meet this additional demand, three new 30,000 tpa MRF facilities would be required.

MRF summary

An additional three 30,000 tpa MRF facilities are required by 2021.

The economic benefits of meeting the additional capacity requirement for MRF facilities is as follows:

- 83 jobs created
- \$18 million⁶ capital investment
- \$14 million⁷ in gate fee revenues per year

3.1.4 Composting – Household Organic Waste

326,140 tonnes of organic waste were generated in the SMA in 2014-15 and is forecasted to increase to 398,181 by 2021. Organics processing infrastructure servicing the SMA is at capacity.

There will be a 72,041 increase in demand for additional organics processing capacity by 2021. To meet this additional demand, two new 40,000 tpa organics processing facilities would be required.

Composting summary

An additional two 40,000 tpa organics processing facilities are required by 2021.

The economic benefits of meeting the additional capacity requirement for composting facilities is as follows:

- 74 jobs created
- \$60 million⁸ capital investment
- \$14 million⁹ in gate fee revenues per year

3.2 Commercial & Industrial Waste

Commercial and Industrial (C&I) waste remains a major challenge with recycling rates in the sector remaining relatively low. The NSW EPA's WARR Strategy targets a 70% recycling rate for C&I waste by 2021-22.

The 2016 National Waste Report¹⁰ reported that only 56% of C&I waste was recovered in 2014-15. This amounts to approximately 1.85 million tonnes currently being recovered in Sydney. By 2021-2022, approximately 3.7 million tonnes of C&I waste will be generated in Sydney. To meet the 70% target, 2.59 million tonnes must be recovered in 2021-22.

⁶ Capital expenditure of \$6 million per MRF facility

⁷ Gate fee revenue of \$150/t

⁸ Assumed capital expenditure of \$30 million per composting facility

⁹ Assumed gate fee revenue of \$180/t

¹⁰ <http://www.environment.gov.au/protection/waste-resource-recovery/national-waste-reports/national-waste-report-2016>

There are only three small C&I MRFs in Sydney (SUEZ Camellia, Waste Free and Doyle Bros) sorting mixed commercial waste into reusable products for sale. The combined processing capacity of these facilities is approximately 100,000 tonnes per annum.

The majority of C&I recycling happens on site at waste generator locations via source separation. Assuming that the C&I sector has achieved maximum source separation potential, an additional 740,000 tpa of C&I waste must be recovered in 2021-22 to meet the 70% target.

Assuming a C&I MRF efficiency of 50%, an additional 1.47 million tonnes of C&I processing capacity is required. Fifteen 100,000 tpa facilities at 50% recovery rate would be required to meet the 70% target.

C&I MRF summary

An additional fifteen 100,000 tpa C&I processing facilities are required by 2021-22 to meet the 70% diversion target.

The economic benefits of meeting the additional capacity requirement for C&I MRFs is as follows:

- 1,380 jobs created
- \$450 million¹¹ capital investment
- \$390 million¹² in gate fee revenues per year

3.3 Construction & Demolition Waste

The construction industry in Sydney is currently experiencing an unprecedented level of investment and activity. The government has significantly increased spending on large infrastructure projects such as WestConnex, Sydney Metro and the Western Sydney Airport. These projects are currently generating and will continue to generate large amounts of C&D waste for the foreseeable future.

The forecasted cost and delivery date of the approved major waste generating projects in the Greater Sydney area are provided in Table 5, and potential waste generating projects in Table 6^{13,14}.

Table 5: Approved major infrastructure projects in Greater Sydney (Currently in development)

Project	Forecasted Costs	Delivery due date
Western Sydney Airport	\$5.3 billion	2026 at earliest
WestConnex	\$16 billion	Finishes 2023
Sydney Metro (Northwest Stage)	\$10.5 billion	Mid 2019
Sydney Metro (City & South West)	\$8.9 billion	2024
Pacific Highway Upgrades	\$4.9 billion	2019
Parramatta Light Rail	\$1 billion	Stage 1 – 2023; Stage 2/3 - unknown
NorthConnex	\$3.1 billion	2020
Westmead Redevelopment Project	\$1 billion	2022
Western Sydney Infrastructure Plan – road projects	\$3.6 billion	Early 2020's
Education Infrastructure NSW	\$6.8 billion	Funds committed in 2018-19 budget and tenders expected to progressively put to market

¹¹ Assumed capital expenditure of \$30 million per C&I MRF facility

¹² Assumed gate fee revenue of \$260/t

¹³ http://www.infrastructure.nsw.gov.au/media/1682/nsw_infrastructure_pipeline_july-2018-web-version.pdf

¹⁴ <https://ia-priority-list.herokuapp.com/pdf>

Project	Forecasted Costs	Delivery due date
M4 Smart Motorways Stage 1-3	\$470 million	Late 2020
Moorebank intermodal freight terminal	\$1.8 billion	2030
Easing Sydney's congestion	\$1.7 billion	2021
Other projects	\$10.2 billion	Various

Table 6: Potential upcoming infrastructure projects in Greater Sydney (Possible future developments)

Project	Forecasted Costs	Stage of Development
F6 Extension Stage 1	\$2.2 to 2.6 billion	Investment approved
Campbelltown Hospital Redevelopment (Stage 2)	\$632 million	Final business case
Nepean Hospital Redevelopment (Stages 1 & 2)	\$1 billion	Procurement
Rouse Hill Health Service	\$300 million	Planning
Randwick Campus Redevelopment	\$720 million	Progress planning
Concord Hospital Redevelopment	\$341 million	Investment approved
New Museum of Applied Arts and Sciences (MAAS)	\$645 million government contribution	Investment approved
Stadium Australia	\$810 million	Business case development
Liverpool Health and Academic Precinct	\$740 million	Business case development
Port Botany Rail Line Duplication	\$400 million	Planning
Central Station Precinct Renewal	Over \$1 billion	Planning
Circular Quay Upgrade	\$200 million	Procurement
Badgerys Creek Aerotropolis precinct	unknown	Planning
Western Harbour Tunnel and Beaches Link	unknown	Final business case
Sydney Gateway – Airport and Port Botany	unknown	Business case development

Figure 2 below shows the estimated C&D waste generation from these projects over time. Figure 3 on page 10 shows the locations of the approved projects.

Figure 2: Estimated waste generation from major infrastructure projects (MRA)

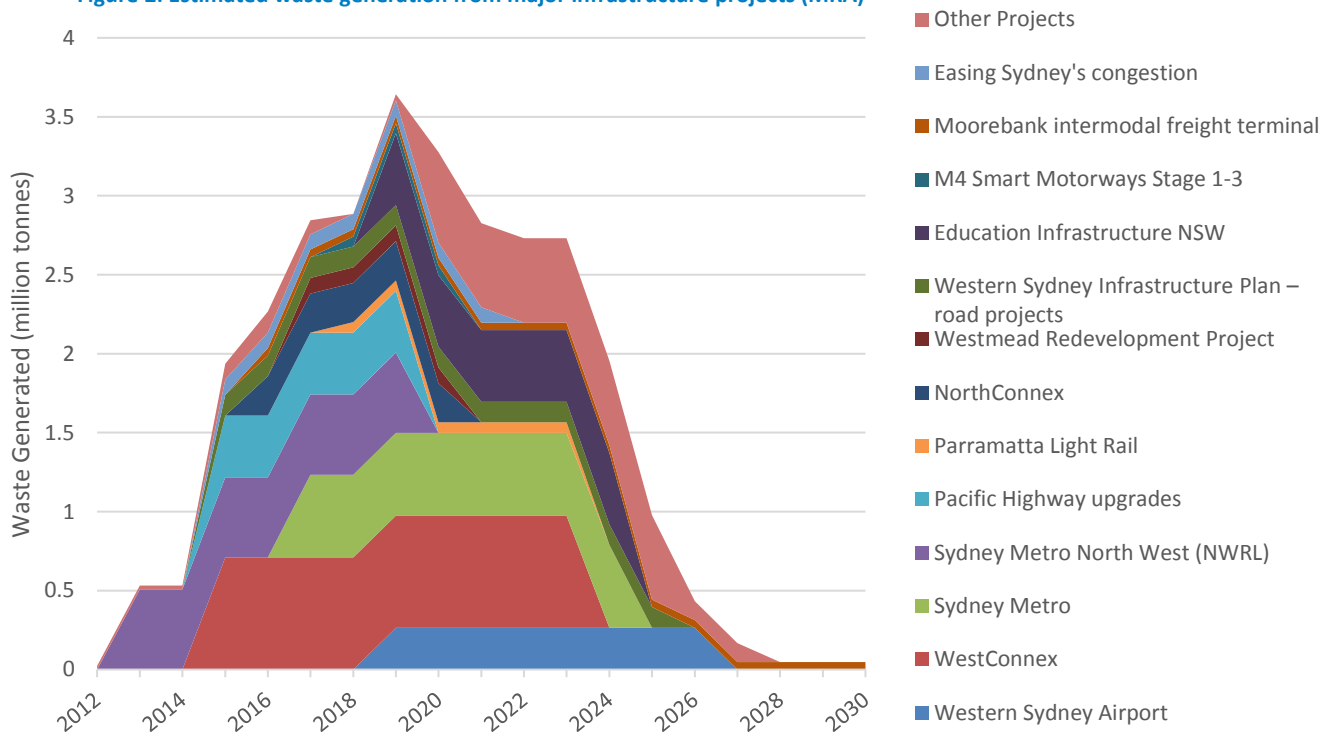
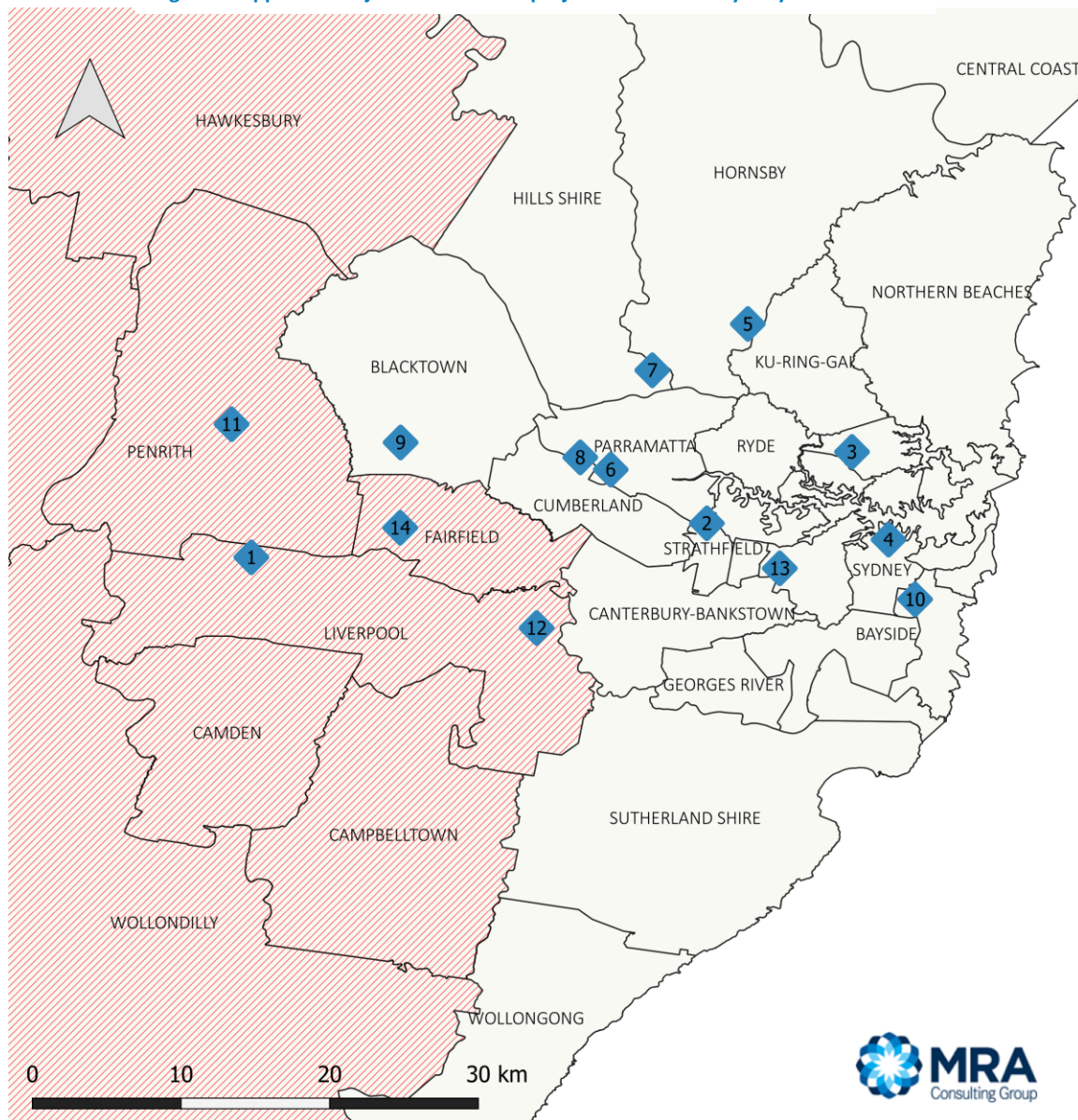


Figure 3: Approved major infrastructure projects for Greater Sydney



Major Infrastructure Projects Greater Sydney



Name	Number
Western Sydney Airport	1
West Connex Induction	2
Sydney Metro (Northwest Stage)	3
Sydney Metro (City & South West)	4
Pacific Highway Upgrades	5
Parramatta Light Rail	6
NorthConnex	7
Westmead Redevelopment Project	8
Western Sydney Infrastructure Plan - road projects	9
Education Infrastructure NSW	10
M4 Smart Motorways Stage 1-3	11
Moorebank Intermodal Freight Terminal	12
Easing Sydney's congestion	13
Other projects	14

Based on historical correlations between C&D waste generation and construction spending, MRA estimates that 0.4 million tonnes of C&D waste is generated for every \$1 billion spent. On the basis of announced government expenditure on infrastructure projects we predict that 2.73 million tonnes of C&D waste will be generated by these projects in 2021-22.

MRA estimates that a total of 9.5 million tonnes of C&D waste will be generated in the SMA in 2021-22, including the return of waste to Queensland. The WARR Strategy sets an 80% recycling rate target for C&D waste by 2021-22. To meet the 80% recycling target, 7.64 million tonnes need to be recovered.

MRA estimates that 5.13 million tonnes of C&D waste was processed in the SMA in 2018. An additional 2.51 million tonnes of C&D waste must be recovered in 2021-22 to meet the 80% target. Assuming a C&D processing yard efficiency of 80%, an additional 3.13 million tonnes of C&D processing capacity is required. Thirteen 250,000 tpa facilities at 80% recovery rate would be required to meet the 80% diversion target.

C&D Summary

An additional thirteen 250,000 tpa C&D processing facilities are required by 2021-22 to meet the 80% diversion target.

The economic benefits of meeting the additional capacity requirement for C&D processing facilities is as follows:

- 2,990 jobs created
- \$46 million¹⁵ capital investment
- \$585 million¹⁶ in gate fee revenues per year

¹⁵ Assumed capital expenditure of \$3.5 million per C&D processing facility

¹⁶ Assumed gate fee revenue of \$180/t

3.4 Summary

Table 7 below summarises the estimated 2021-22 capacity and investment requirements for MSW, C&I and C&D waste, and the high-level economic benefits of investment in the sector.

Table 7: 2021-22 infrastructure requirements and economic benefits

	Residual MSW to AWT	Residual MSW to EfW	Recyclable MSW	Organic MSW	C&I	C&D	Total
Additional processing capacity (tpa) required to meet 2021-22 resource recovery targets	120,000	140,000	90,000	80,000	1,500,000	3,250,000	5,180,000
Facilities required	Two 60,000 tpa AWT facilities	One 140,000 tpa EfW facility	Three 30,000 tpa MRF facilities	Two 40,000 tpa organics processing facilities	Fifteen 100,000 tpa C&I MRF facilities	Thirteen 250,000 tpa C&D processing facilities	36
Jobs created	111	129	83	74	1,380	2,990	4,766
Capital investment	\$120 million	\$300 million	\$18 million	\$60 million	\$450 million	\$46 million	\$994 million
Economic value per annum	\$36 million	\$42 million	\$14 million	\$14 million	\$390 million	\$585 million	\$1.1 billion

4 Other recommendations to government

4.1 Industrial Ecology Parks

Industrial Ecology (IE) provides a useful framework for planning waste infrastructure. Waste from one industrial process can serve as the raw material for another, thereby reducing the impact of industry on the environment (Frosch and Gallopoulos, 1989).

IE parks contains multiple facilities in which businesses cooperate with one another to reduce waste and pollution, efficiently share resources (such as information, materials, water, energy, infrastructure, and natural resources), and help achieve sustainable development, with the intention of increasing economic gains and improving environmental quality.

IE parks allow for potentially shared logistics, shipping/receiving facilities, and even shared local education and resource centres. This systematic approach allows for integrated activities between facilities and ensures the recovery of valuable resources generated by waste streams on-site and offsite, which would otherwise be lost. This helps to bring about a step-change towards a circular economy.

Local industry would significantly benefit from the development of new waste infrastructure in industrial ecology parks.

MRA recommends that the Department of Planning consider the establishment of IE parks to collocate waste processing infrastructure.

4.2 Focus grant funding on waste processing infrastructure development

A proportion of NSW waste levy is used to support the waste and recycling industry by providing funding for grants under the Waste Less Recycle More (WLRM) program. Phase 2 of WLRM will cover July 2017-June 2021 and is expected to award \$337 million over 4 years. A number of grant packages have been announced focusing on different sectors of waste management.

Table 8 below is a summary of the funding breakdown of the WLRM program.

Table 8: Waste Less Recycle More grant program summary

Grant Package	Grant value
Local Government Waste & Resource Recovery Program	\$70m
Waste and Recycling Infrastructure Package	\$168m
Illegal Dumping Fund	\$65m
Litter Prevention and Enforcement Fund	\$30m
Heads of Asbestos Coordination Authorities programs	\$4m

Of the \$337 m Waste Less Recycle More package, \$168 million is allocated to the Waste and Recycling Infrastructure Package. However, of this only \$47 million is for actual new waste processing facilities or upgrades. That is, infrastructure development receives only 13.9% of WLRM funding yet is the most urgent requirement to achieve the State Government landfill diversion targets.

To help achieve landfill diversion targets, Government should redirect further funding into the infrastructure package and prioritise projects that target the identified gaps in processing infrastructure.

The NSW Government is missing out on over \$126m annually in landfill levy revenues due to the transport of waste to QLD (900,000t/yr transport of waste to QLD landfills). If and when waste to Queensland is constrained (via the proposed Queensland levy) it is likely that a significant component of these tonnes will be landfilled in NSW contributing to additional landfill levy revenues. A significant proportion of these funds (up to the \$126m) could and should be used to fund the necessary new infrastructure. This would have no effect on the current allocations of landfill levy monies to other State programs such as roads and hospitals.

4.3 Develop priority infrastructure plan

The NSW Government should consider the development of a priority infrastructure plan to ensure waste management/processing infrastructure is developed in a timely manner to cope with the current and future needs of NSW.

A priority infrastructure plan is needed to assess, prioritise, and support the development of waste management/processing infrastructure as required and is important to ensure that future resource recovery targets are met. It is a precursor to a pipeline of investment and the growth in resource recovery jobs creation.

4.4 Governance and engagement with industry

The NSW Government should consider more focussed Governance arrangements such as those applied in VIC, SA and WA, wherein dedicated agencies pursue the waste reduction and improved recycling programs independent of the EPA regulatory enforcement function. The NSW EPA struggles to fulfil both functions with clarity.

Irrespective of governance structures, the Government should recognise industry's willingness to invest in the infrastructure necessary to achieve the State Government waste targets and engage proactively with industry leaders to fast-track the necessary investment. All too often the main interaction between industry and Government is through lengthy planning approval processes or enforcement proceedings via the EPA. This insufficiently recognises the strategic role of infrastructure and the investment required to achieve the State Government's objectives for landfill diversion, economic growth and jobs creation.

Government should:

- Examine options to facilitate industry investment via the Industry and Planning portfolios as well as the Environment Department;
- Enhance ongoing communication with industry representative bodies; and
- Separate the roles of Chair of the EPA from that of CEO of the EPA so that there is continuity of relationships with industry when one role is vacant.

4.5 Positive procurement of recycled content products in infrastructure developments

There is potential for a large proportion of C&D materials and to a lesser degree MSW and C&I materials to be recycled into new products for use in infrastructure projects, examples include:

- the use of tunnelling spoil and excavated materials as clean fill;
- the production of recycled aggregate which consists on crushed concrete, bricks and ceramics for pipe embedment works, retaining walls and drainage;
- the use of recycled glass fines trademarked as GlassSand for pipe embedment works by Sydney Water¹⁷;
- Sutherland Shire Council and Downer in collaboration with Close the Loop, RED Group and Plastic Police used waste products soft plastics, glass and toner as well as recycled asphalt to build a road, the first in NSW to use soft plastics in road construction¹⁸;
- the use of bollards, decking, fences, outdoor furniture and signs manufactured from recycled plastic waste by Replas¹⁹.

The NSW EPA has provided a funding framework for the continued and improved use of recycled content products thorough the following programs²⁰:

- grants from \$50,000 - \$1 million for the Product Improvement Program;
- grants up to \$150,000 for the Industrial Ecology Program; and
- grants up to \$250,000 for the Civil Construction Market Program.

Whilst the procurement of recycled content products is common in industry and government infrastructure projects in Sydney, there is anecdotally still a hesitance to use recycled products derived from C&D waste due to asbestos contamination risk.

MRA recommends that government develop procurement policies to facilitate the reuse of recyclable materials in the economy.

¹⁷https://www.sydneywater.com.au/Publications/Reports/AnnualReport/2009/docs/compliance/Waste_Reduction_and_Purchasing_Policy_Statement_V0.3_1210909.pdf

¹⁸<http://www.sutherlandshire.nsw.gov.au/Council/News-and-Publications/News/FIRST-NSW-ROAD-BUILT-WITH-PLASTIC-BAGS-AND-GLASS>

¹⁹<https://www.smh.com.au/national/nsw/changing-the-game-on-plastic-20180604-p4zjbh.html>

²⁰<https://www.epa.nsw.gov.au/working-together/grants>

5 Conclusion

A total of 5.18 million tonnes per annum of additional capacity from 36 new facilities will be required by 2021-22 to meet state resource recovery targets. Up to 4,766²¹ jobs will be created through the development of this infrastructure. \$994 million of capital investment is required, and \$1.11 billion of economic value per annum will be generated from gate fees.

Table 9: 2021-22 infrastructure requirements and economic benefits

	Residual MSW to AWT	Residual MSW to EfW	Recyclable MSW	Organic MSW	C&I	C&D	Total
Additional processing capacity (tpa) required to meet 2021-22 resource recovery targets	120,000	140,000	90,000	80,000	1,500,000	3,250,000	5,180,000
Facilities required	Two 60,000 tpa AWT facilities	One 140,000 tpa EfW facility	Three 30,000 tpa MRF facilities	Two 40,000 tpa organics processing facilities	Fifteen 100,000 tpa C&I MRF facilities	Thirteen 250,000 tpa C&D processing facilities	36
Jobs created	111	129	83	74	1,380	2,990	4,766
Capital investment	\$120 million	\$300 million	\$18 million	\$60 million	\$450 million	\$46 million	\$994 million
Economic value per annum	\$36 million	\$42 million	\$14 million	\$14 million	\$390 million	\$585 million	\$1.1 billion

Recommendations to government are as follows:

- Government should recognise the significant economic benefits and jobs growth potential that the recycling industry offers for Western Sydney.
- Plan the investment horizon to facilitate development of new infrastructure worth \$1 billion of capital investment
- The waste and recycling industry requires government leadership in the form of planning and policy to achieve waste diversion targets in Sydney:

²¹ It is unlikely that all the identified infrastructure needs will be met by 2021-22. Therefore, these figures for job creation will be spread over the time it takes to build and commission these facilities.

- The development of industrial ecology parks should be considered to co-locate new waste processing infrastructure and provide synergies for resource recovery operations in Western Sydney. These will also serve to preserve buffers around waste assets
- Focus more of the Waste Less Recycle More grant funding on infrastructure
- Develop a priority infrastructure plan
- Coordinate with industry via new governance and engagement processes
- Accelerate government procurement of recycled content products in infrastructure developments.

It should also be noted that many of these recommendations were made in the State Government Richmond Review of Waste Strategy and Policy in NSW. Refer to Table 11 in Appendix A for a summary of the recommendations from the Review and an interpretation of their implementation status in the intervening years.

Appendix A Other key considerations

The need for strategic planning for resource recovery infrastructure development

Recently, additional pressures on the waste and recycling industry have been imposed due to China's implementation of the *National Sword Policy* and the announcement by the Queensland government to impose a \$70/tonne levy on interstate waste. These measures would result in a significant number of additional tonnes being processed in NSW and require further investment in waste and recycling infrastructure.

The Waste Less Recycle More Grants program provides leverage for investment in NSW facilities, however, in terms of planning, there are no solid measures to meet the growing demand, and the initiative is left to private investment.

Strategic planning would give opportunity to impose buffer zones and create industrial 'hubs' for waste management infrastructure, for the benefit of waste facilities and amenity of sensitive users.

Planning and licensing processes

The vast majority of waste facilities are required to obtain planning approvals and to apply for an Environmental Protection Licence (EPL). A facility requires licencing if it surpasses the thresholds for activities listed in Schedule 1 of the *Protection of the Environment Operations (POEO) Act*.

If the development is below Designated Development thresholds, a Statement of Environmental Effects (SEE) is required to accompany the application. Designated Development projects are those which are high-impact developments or are located in or near an environmentally sensitive or residential area. They are defined by Schedule 3 of the *Environmental Planning & Assessment (EP&A) Regulation 2000*. Depending on the scale, potential impact and economic value of the proposed waste facility, the development can also be categorised under the following categories:

- Regional Development – classified under Schedule 4A of the *EP&A Act* and assessed by the relevant Planning Panel.
- State Significant Development – classified under Schedule 4A of the *EP&A Act* and assessed by Department of Planning and Environment or planning commission.
- Integrated Development – classified as integrated development when the consent is linked with any associated approval, licence, consent, permission or permit required under other legislation.

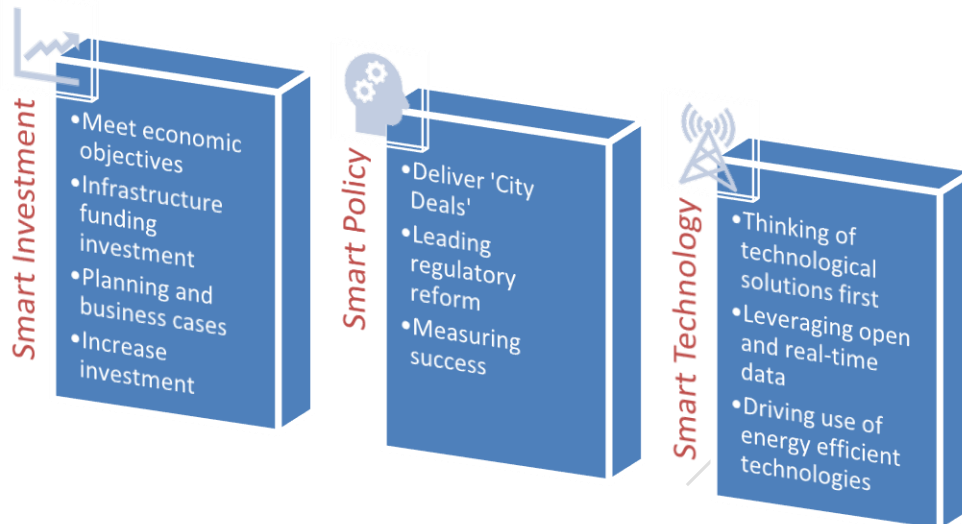
Obtaining the required planning approvals can be challenging and long process, and this can be a significant barrier to entry for the private sector in establishing new resource recovery facilities.

Impact of the Smart Cities program

Smart Cities is a Federal Government initiative to respond to growth in the economy and re-think how our cities are planned and managed. The *Smart Cities Plan* sets out the vision for Australian cities and considers

how to maximise potential. It includes three pillars: smart investment: smart policy and smart technology (Figure 4).

Figure 4: Three pillars of Smart Cities Plan



Waste management is a vital concern to growing cities, especially considering that waste generation is outstripping population growth²². The Smart City reforms offer an opportunity for the Western Sydney region to improve waste management practices by:

- Including waste precincts in planning policy;
- Encouraging the use of Greenstar and NABRs ratings for waste and recycling systems in buildings;
- Investment in innovative technologies to enable best-practice waste and resource recovery;
- Applying the principles of the circular economy to future cities; and,
- Accessing grant funding for infrastructure and technology projects.

NSW Policy changes

C&D Waste

The Protection of the Environment Operations Legislation Amendment (Waste) Regulation 2018²³ relating to construction and demolition (C&D) waste came into force on 16 November 2018. Significant reforms are listed in Table 10.

²² NSW EPA, 2017, Draft Waste and Resource Recovery Strategy

²³ Protection of the Environment Operations Legislation Amendment (Waste) Regulation 2018 under the Protection of the Environment Operations Act 1997, Published LW 16 November 2018 (2018 No 643).

Table 10: Key reforms enforced by the Protection of the Environment Operations Legislation Amendment (Waste) Regulation 2018

Reform	Details
Prohibition on exhuming waste	Applies to current and former landfills. Maximum penalties include \$44,000 for a corporation and \$22,000 for individuals.
Handling of asbestos waste	General requirements applying to the packaging, transportation and disposal of asbestos waste to ensure safety. Increased penalty notice amounts for asbestos waste offences.
Transported waste deductions	Provisions with respect to waste contributions for waste received or transported for recovery, recycling or processing.
Waste for bedding layers and biofilters	Permission for use of waste as biofilters or bedding layers in a landfill with approval of the EPA.
Monitoring waste activities	Video monitoring systems at scheduled waste facilities.
Definition of land pollution	Certain activities carried out for remediation of contaminated land is not land pollution.
Licensing requirements	Occupiers of a landfill site that receives only virgin excavated natural material are exempt from certain reporting requirements.
References to LGAs	Updating references to merged and renamed local government areas.

In November 2018, “Standards for managing construction waste in NSW” (Standards) was released and a new concessional levy rate for recovered fines applied as daily cover at landfills that will come into force from 15 May 2019 was announced²⁴. The main requirements from the Standards include²⁵:

- Two-stage inspection process to ensure asbestos and other contaminants do not enter the facility;
- Sorting and waste storage requirements to improve the quality of recovered resources and avoid cross-contamination of materials;
- Ensure that construction waste is only transported from the facility if it has been handled in accordance with the Standards on-site; and
- Ensure that all staff managing, supervising or undertaking tasks required by the Standards have been appropriately trained (including in asbestos awareness).

²⁴ NSW EPA (2018) Standards for managing construction waste in NSW, <https://www.epa.nsw.gov.au/-/media/epa/corporate-site/resources/wasteregulation/18p1270-standards-for-managing-construction-waste-in-nsw.pdf>, accessed 19 Nov 2018.

²⁵ NSW EPA (2018) Waste management reforms commence on 16 November 2018, <https://www.epa.nsw.gov.au/your-environment/waste/industrial-waste/construction-demolition/construction-and-demolition-waste>, accessed 19 Nov 2018.

Asbestos

Asbestos is common in the NSW built environment. The NSW EPA is responsible for regulating asbestos waste under the *Protection of the Environment Operations Act 1997* and the *Protection of the Environment Operations (Waste) Regulation 2014*.

In November 2018, the NSW EPA released a Draft Asbestos Waste Strategy 2018-22²⁶ for public consultation. The strategy is focused on reducing illegal dumping and unsafe disposal, as well as promoting appropriate disposal of asbestos waste including asbestos in soil. The reforms to managing asbestos handling, transport and disposal proposed in the draft strategy are:

- Making asbestos waste disposal easier;
- Making asbestos waste disposal cheaper;
- Increasing awareness and changing behaviour;
- Closing loopholes and increasing transparency;
- Disrupting unlawful business models; and
- Monitoring and evaluating of the above reforms' performance against baseline data.

The asbestos strategy is anticipated to increase lawful disposal of asbestos. There is no current baseline for lawful disposal of asbestos. A baseline will be determined in the first year of the NSW Asbestos Waste Strategy 2018-22.

Transport and logistics issues

Congestion in Sydney has been listed in the recent research as being Australia's most congested city²⁷⁻²⁸. The Bureau of Transport, Infrastructure and Regional Economics (BITRE) in a 2015 report stated that congestion is costing \$6.1 billion a year in Sydney and these costs are projected to more than double by 2030²⁹. In October 2017, Infrastructure Australia (IA) said that congestion cost \$5.5 billion in Sydney with these costs projected to increase to \$14.8 billion by 2031³⁰.

Congestion in Sydney acutely affects the waste management sector due to the nature of their operations. Transport costs which lead to increased disposal costs for the waste management sector is exacerbated by collection vehicles being affected by congestion due to the following:

- restricted access times to licenced waste disposal/recycling facilities, usually between standard business hours;
- restricted operating hours for construction and demolition sites in order to reduce noise complaints to nearby residents; and
- restricted access times for collections (noise and C&I operating hour considerations).

²⁶ NSW EPA (2018) NSW Asbestos Waste Strategy 2018-22 – Draft for consultation, <https://www.epa.nsw.gov.au/-/media/epa/corporate-site/resources/waste/18p1228-asbestos-waste-strategy-2018.pdf>.

²⁷ <https://www.smh.com.au/national/nsw/sydney-s-congestion-at-tipping-point-20180520-p4zgfq.html>

²⁸ <https://www.caradvice.com.au/695067/traffic-congestion-report/>

²⁹ https://bitre.gov.au/publications/2015/files/is_074.pdf

³⁰ <https://grattan.edu.au/wp-content/uploads/2017/10/892-Road-congestion.pdf>

Allowances for licenced waste facilities to operate or just receive waste outside of standard business hours may assist in reducing heavy vehicle movements in peak periods, reducing congestion for other commuters and waste costs.

Review of state policy

In 2010 a comprehensive review of NSW's waste strategy and policy (the "Richmond Review"³¹) was carried out by independent experts and State Government departments. The review set out a number of key recommendations for improving waste management in NSW.

Table 11 below summarises these recommendations and MRA's view on the extent each goal has been achieved.

Table 11: Richmond Review recommendations

Focus	Recommendation	Achievement
Targets	Develop annual targets for MSW, C&I, C&D	✓
	FOGO and cardboard targets	✗
Strategy implementation Plan	Sub-targets, actions, timeframes, responsibilities arising from the Strategy	✗
Data	Accurate, timely and transparent	✗
Reporting by EPA	Improve analysis and reporting of progress	Mixed
Municipal waste	75% recovery of dry recyclables	✗
	FOGO bins or AWT	Mixed
	Mandate these by 2014	✗
Education	Waste avoidance and source separation	✓ (Ongoing)
Target priority waste	Hazardous waste, gas bottles, plastic bags – bans and policies	✓
Drop Off and Recycling	Build network of drop off facilities	✓ (Ongoing)
C&I recycling	3 bin system (incl. FOGO) or AWT, recycling, dirty MRFs	✗
Place based collection	Collection via precincts	✗
Financial Assurance	Finalise financial assurance policy for facilities	✗
Levy funding	Levy expenditure toward best practice systems	✓
AWT output AWTDORF	Amend limitations; Permit on ag lands	✓

³¹ <https://www.epa.nsw.gov.au/~media/EPA/Corporate%20Site/resources/wastestrategy/101034-rev-waste-strat.ashx>

Focus	Recommendation	Achievement
Orders/Exemptions	Establish expert panel to advise	✗
Energy from Waste	Develop policy	✓
Infrastructure funding	Establish Waste Infrastructure Fund	✓
Innovation and Investment	Establish an investment strategy with Treasury	✓
Waste governance	Establish clear accountability for waste policy and enforcement within department and EPA	✗
Advice	Establish waste industry forum incl. councils	✗
Infrastructure strategy	EPA and Dept Planning develop an Infrastructure plan	✗
Land use planning	Dept Planning to develop standard conditions of development incl. source separation	✗
Case management	Dept Regional Development facilitate new entrants into waste via case management	✗
National waste	Support National Waste Policy and Australian Government grants for infrastructure	Mixed