

Wednesday 31<sup>st</sup> Oct 2018

# State of Waste

Current trends and opportunities in the  
Waste and Recycling industry

Presented by Mike Ritchie

11:40 AM - 12:15 PM

25 min presentation + 10 min Q&A



Environment Institute  
of Australia and  
New Zealand Inc.

## EMERGING PROFESSIONALS

Hear from a range of rising professionals who will talk about how they got to where they are, what they do in a day, and their advice for starting a career in the environment industry.

WEDNESDAY 31 OCTOBER 2018

EIANZ STUDENTS AND EARLY CAREERS CONGRESS

The Coal Loader Centre for Sustainability | 2 Balls Head Drive, Waverton NSW 2060

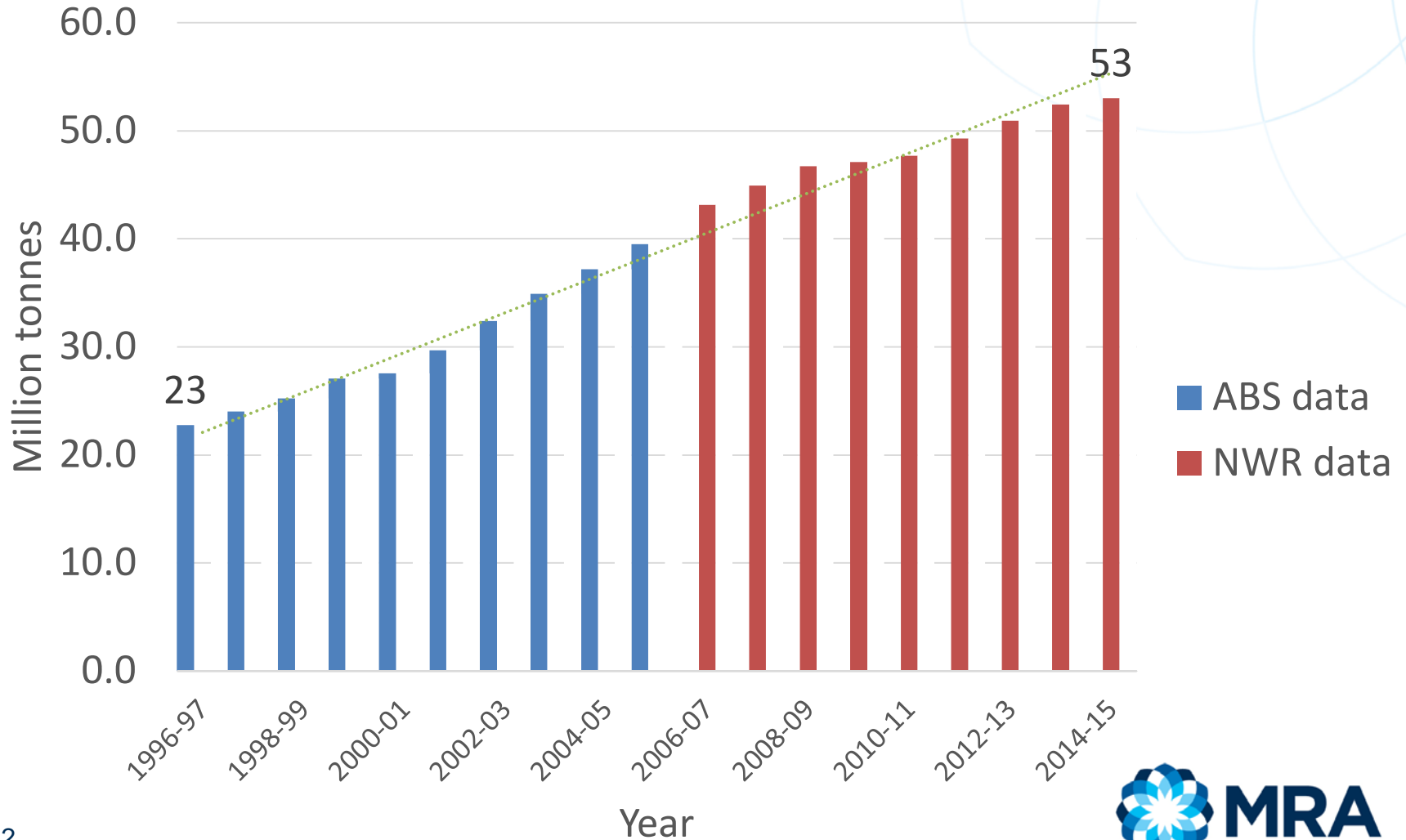


The specialists in recycling, waste and carbon

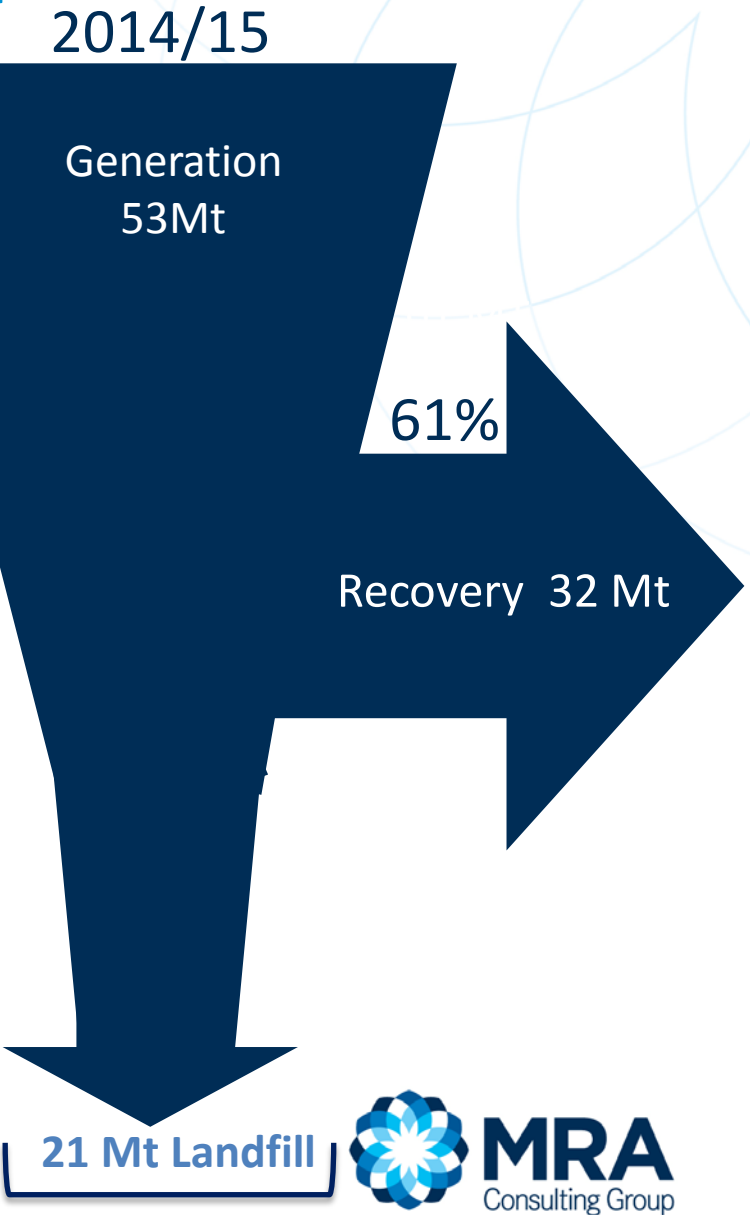


# National Waste Generation

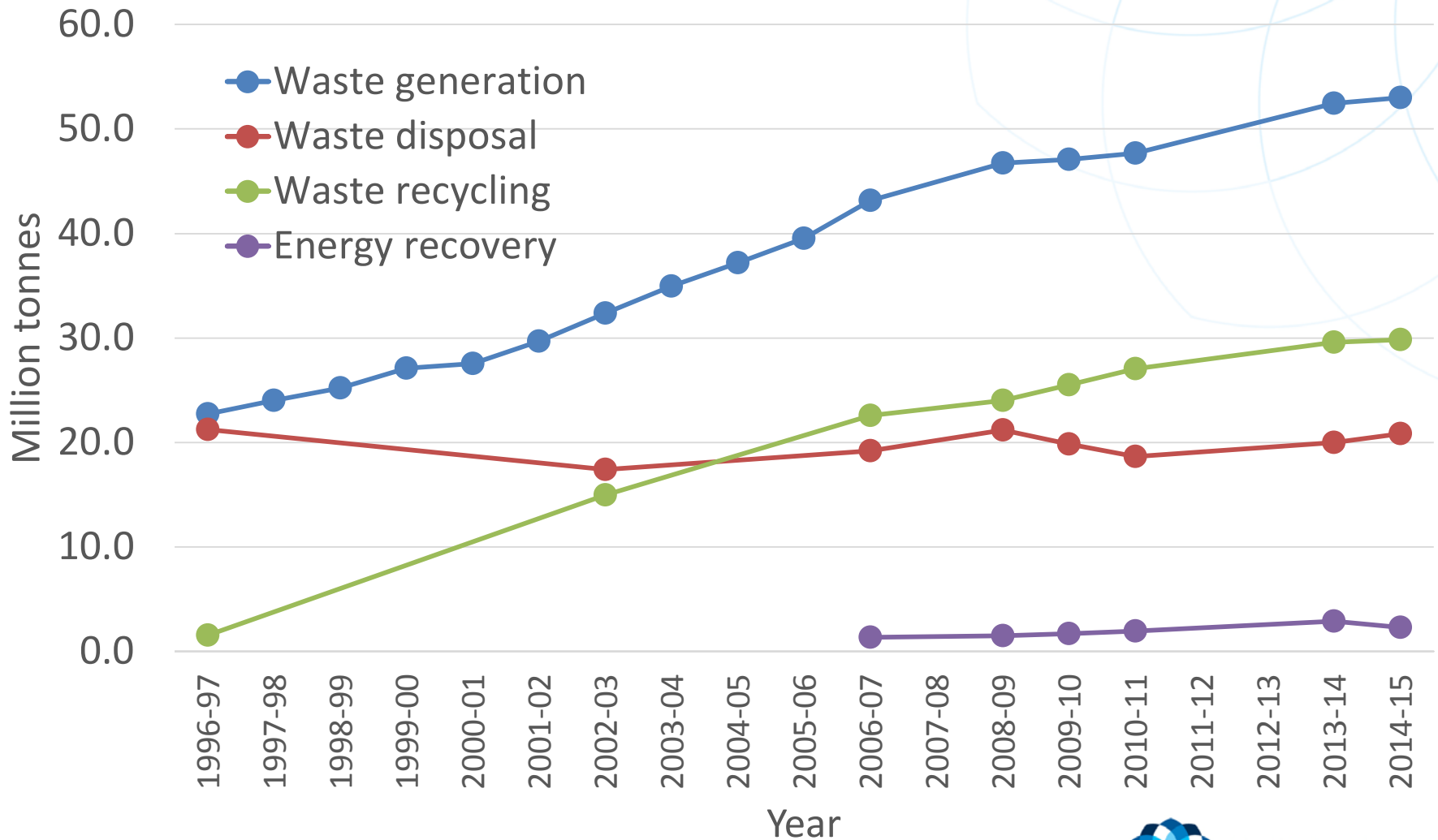
compound annual growth rate of 6.2%



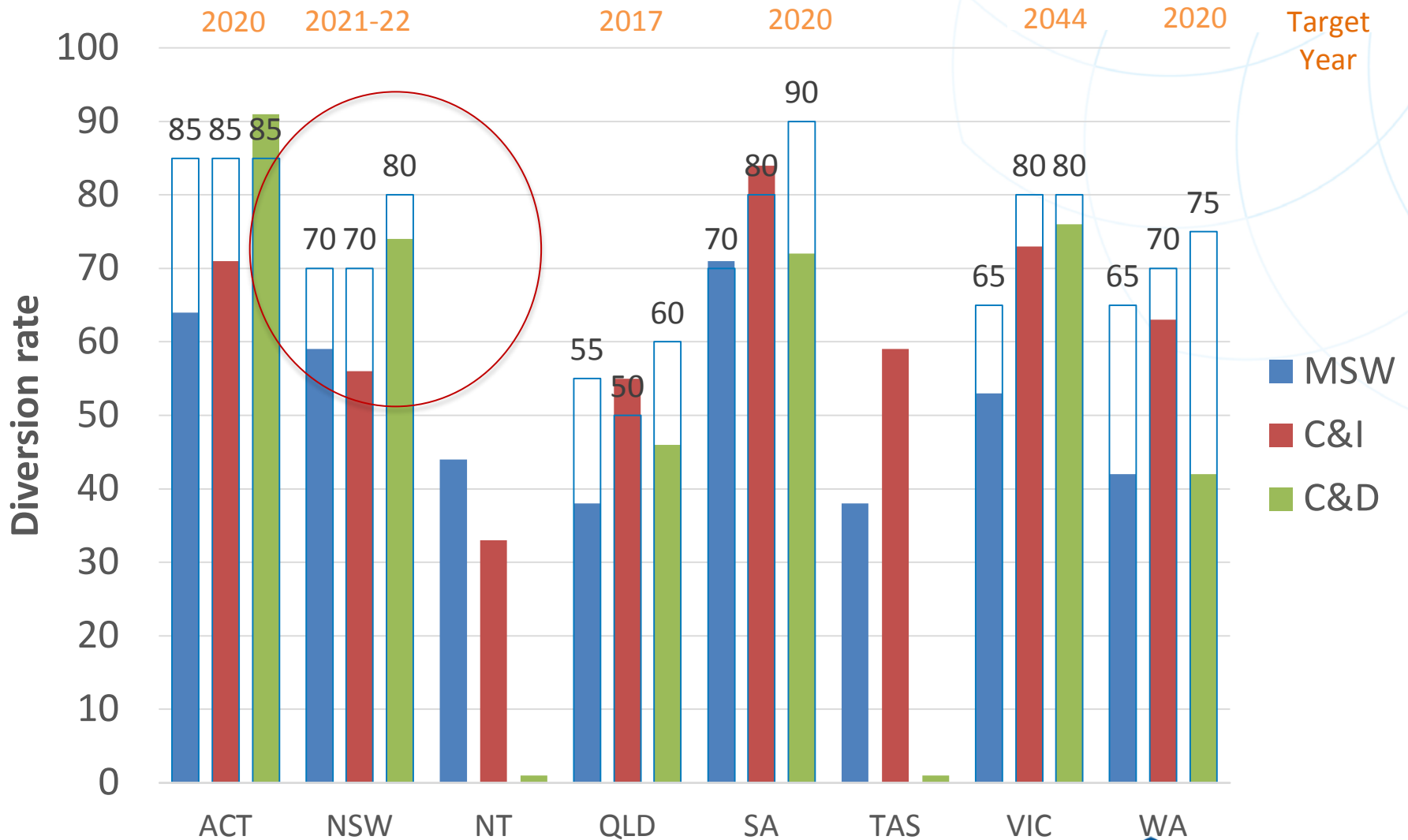
# Total - Australia



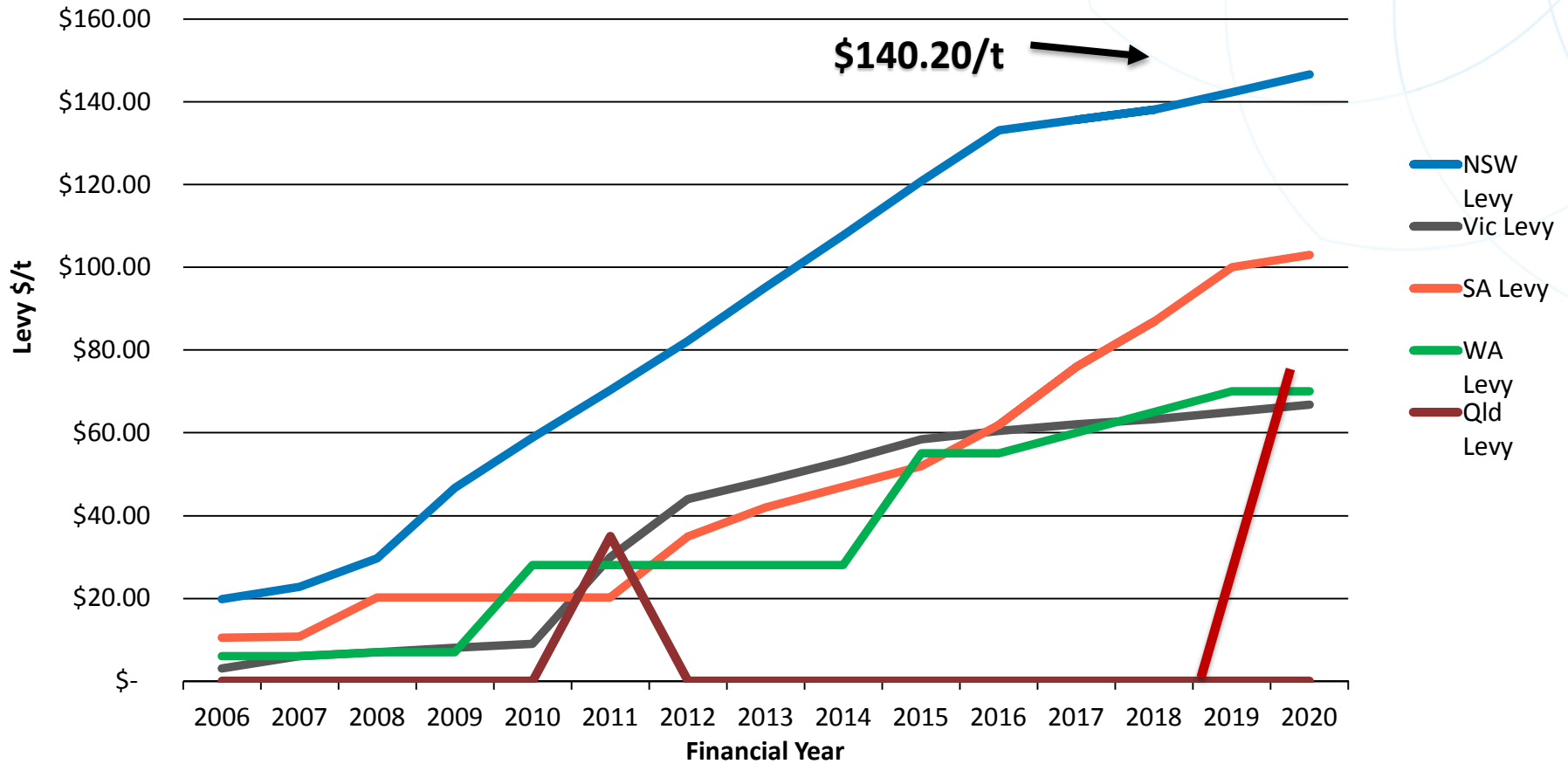
# More waste, more recycling



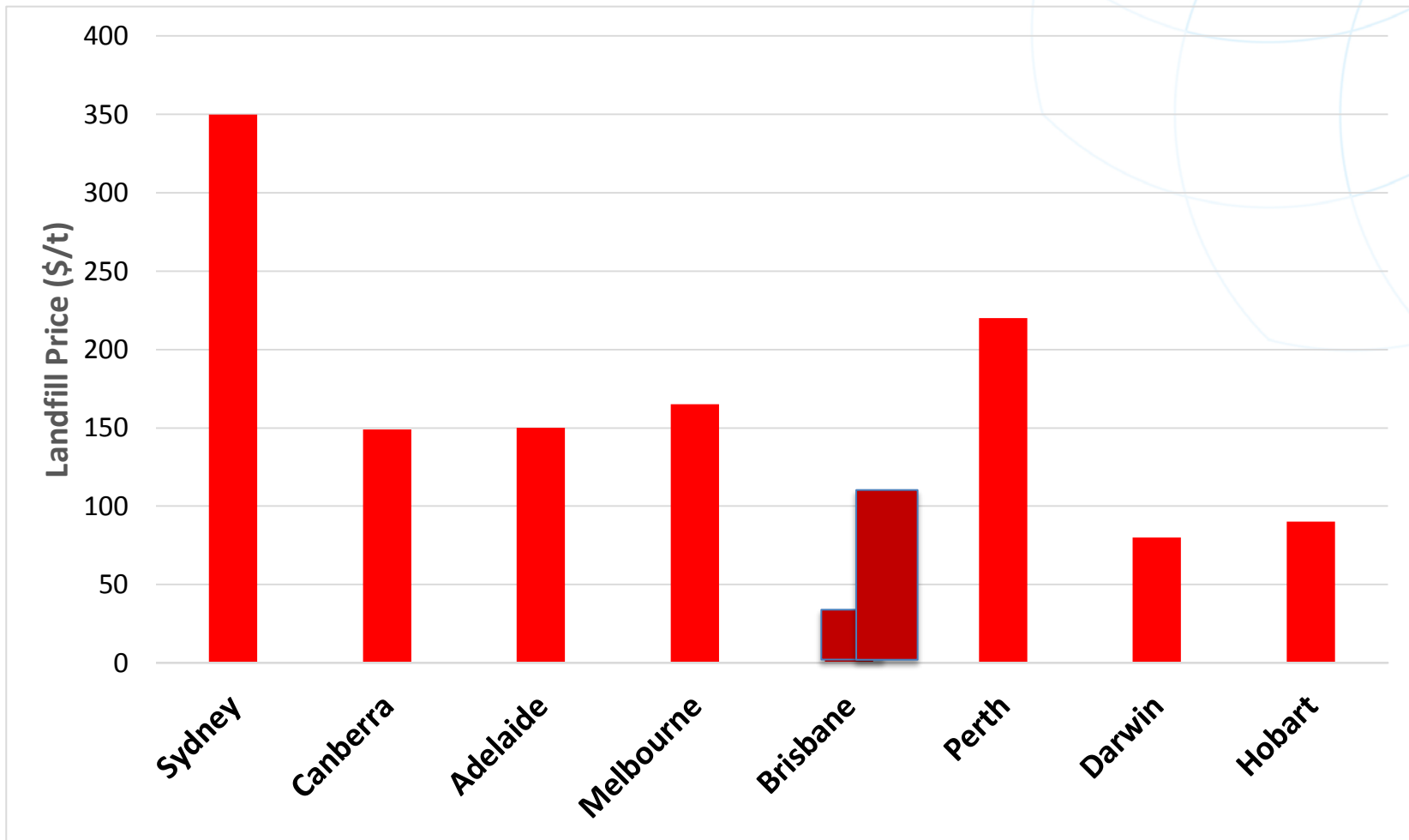
# State/Territory Targets



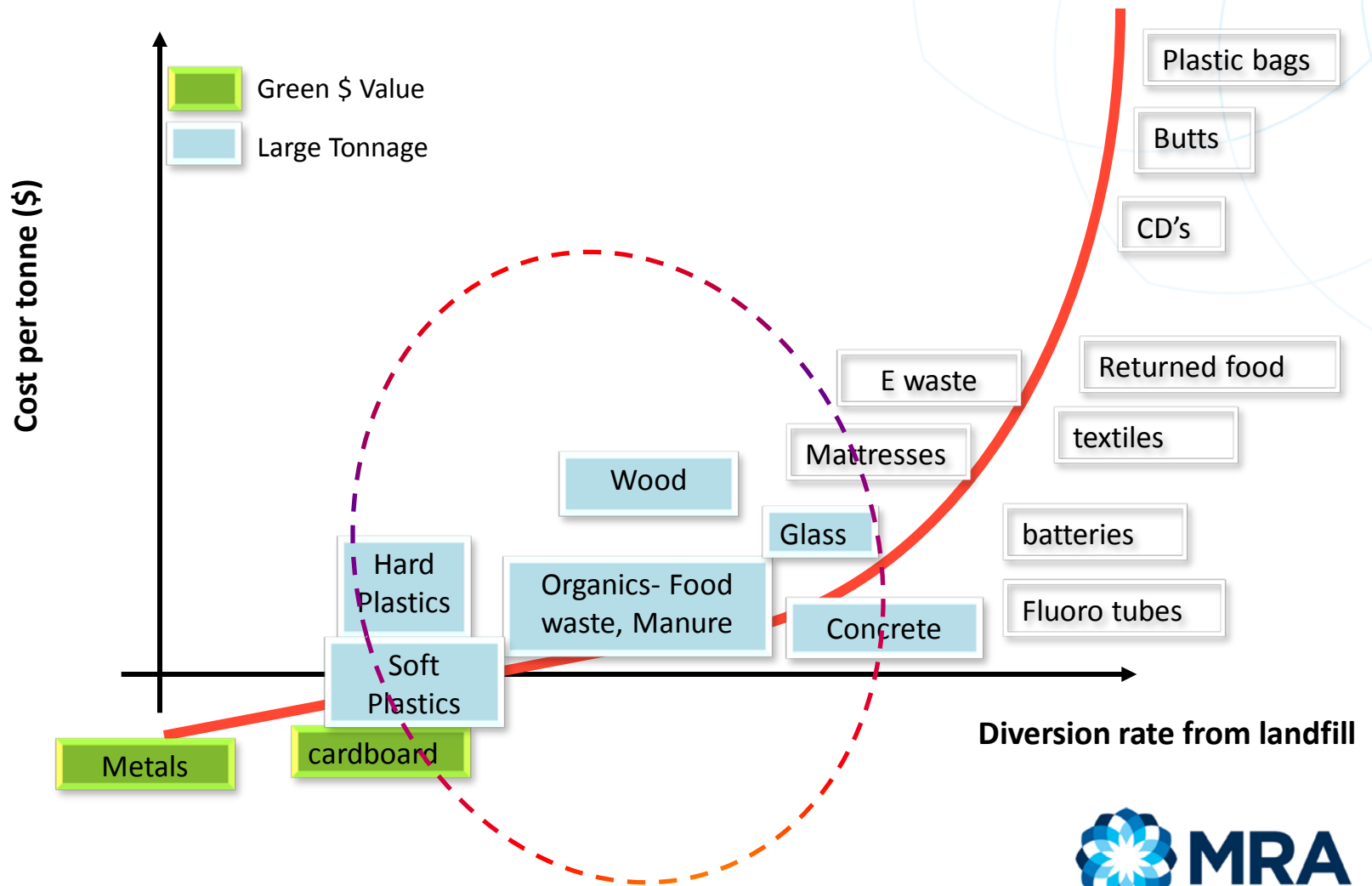
# Landfill Levies



# Landfill Pricing

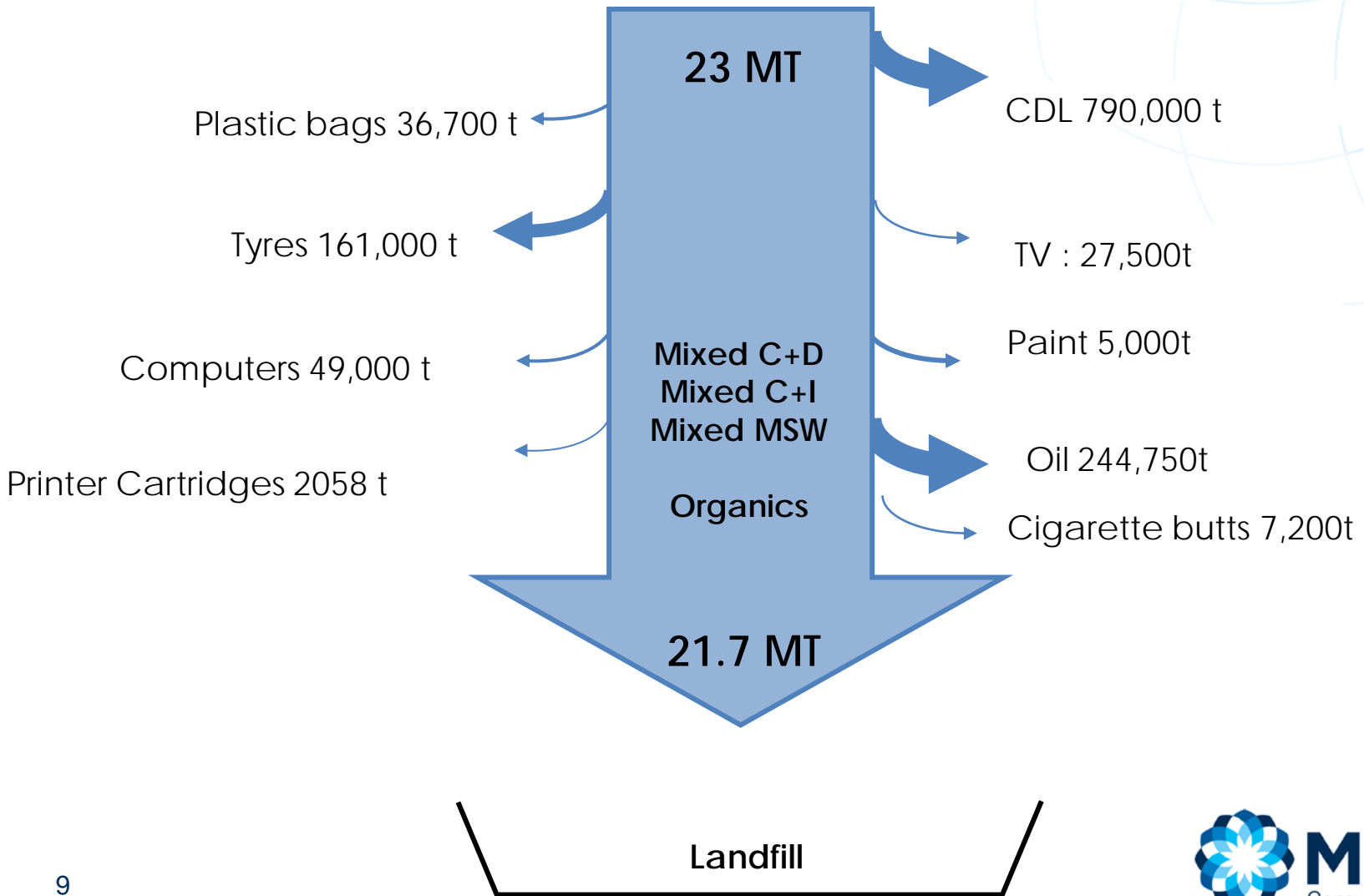


# Economics of Waste





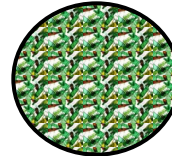
# Focus on mixed waste streams



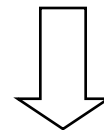
# Key trends – Organics out of landfill



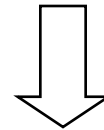
**1.3 MT**



- Plastic bags
- Tyres
- Computers
- Printer Cartridges
- TV
- CDL
- Household paint
- Oil
- Cigarette butts

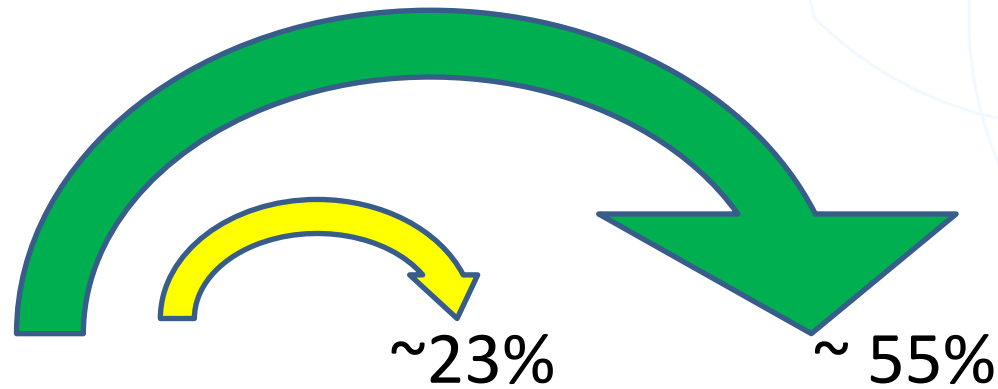


**Methane**

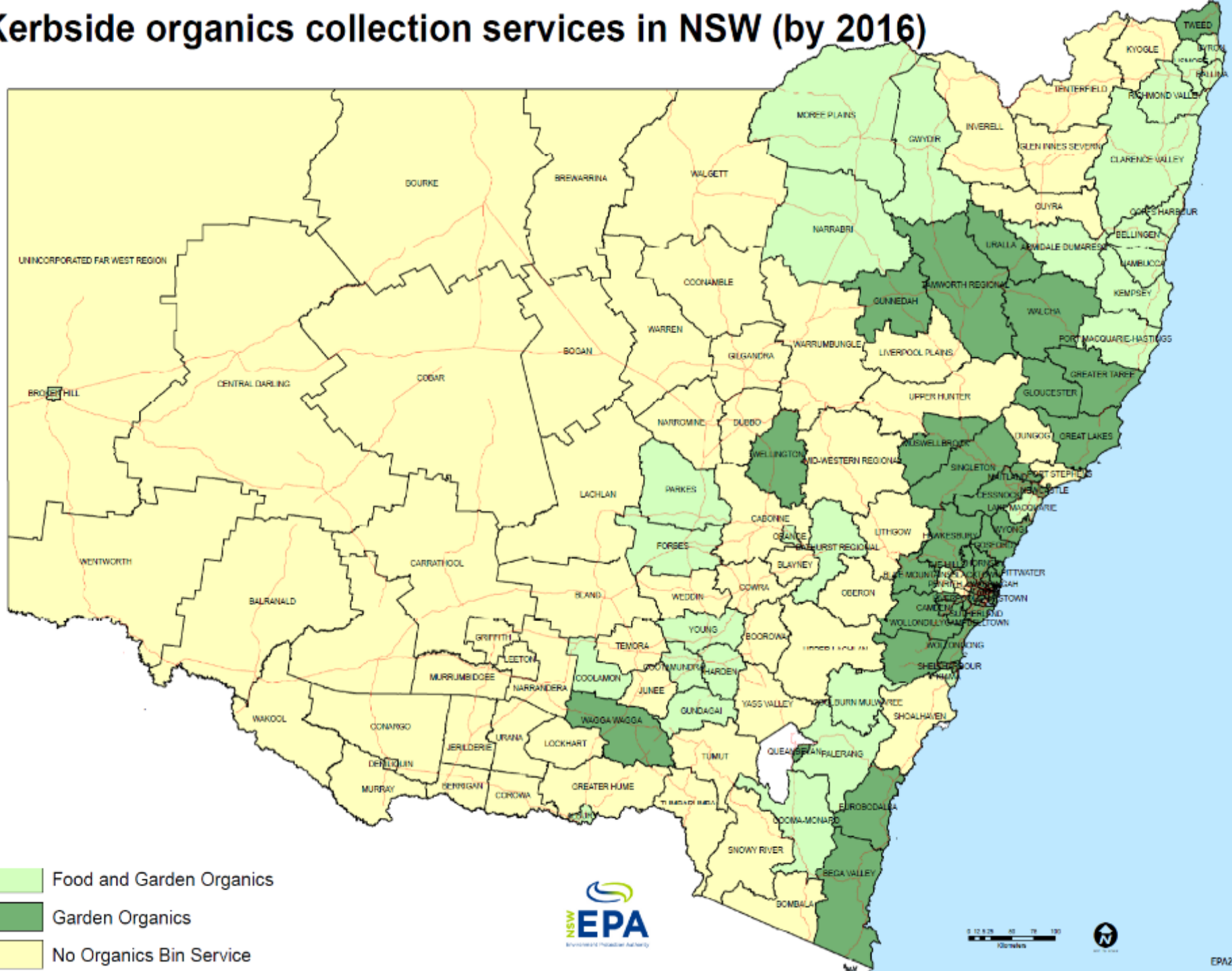


**Climate change**

# Can you achieve the state targets with 3 bins? – YES (but only with Food in the green bin)



# Kerbside organics collection services in NSW (by 2016)



# FOGO

## Bin Systems

- 67 councils GO NSW
- 11 councils FOGO NSW
- 25 councils implementing FOGO NSW
  
- 30 metro Melbourne FOGO
- Approx 8 rural VIC
  
- 12 metro Adelaide FOGO
- 4 metro Perth FOGO



# Key trends – Govt grants for infrastructure



## Waste Less, Recycle More 2017–21 Extension A \$337 million grants and funding initiative

Local Government Waste & Resource Recovery Program		Waste and Recycling Infrastructure Package \$168 million				
<b>\$70 million</b>	<b>\$65 million</b>	<b>Organics Infrastructure Fund and Program</b>	<b>Waste and Recycling Infrastructure Fund</b>	<b>Systems for household problem wastes</b>	<b>Recycling Innovation Fund</b>	<b>Business Recycling Program</b>
Better Waste and Recycling Fund <b>\$39 million</b>	Illegal dumping, clean up, prevention and engagement programs <b>\$4 million</b>	<b>\$35.5 million</b>	<b>\$48 million</b>	<b>\$57 million</b>	<b>\$5 million</b>	<b>\$22.5 million</b>
Regional coordination and strategy for the Greater Sydney Region <b>\$4.5 million</b>	Regional Illegal Dumping (RID) Squads and Programs <b>\$9 million</b>	Organics Infrastructure (large and small) grants <b>\$14 million</b>	Resource recovery expansion and enhancements grants <b>\$8 million</b>	Community recycling centre receptacles and processing <b>\$37 million</b>	Infrastructure and research grants <b>\$5 million</b>	Business advisory services and rebates, including Bin Trim grants <b>\$12.5 million</b>
Regional coordination and strategy for the Voluntary Regional Waste Groups <b>\$8 million</b>	Compliance Programs <b>\$52 million</b>	Food waste avoidance grants and program <b>\$7 million</b>	Major resource recovery infrastructure grants <b>\$25 million</b>	Community recycling centre infrastructure grants <b>\$3 million</b>		Industrial ecology business support <b>\$5 million</b>
Landfill consolidation and environmental improvements <b>\$5 million</b>	<b>Litter Prevention and Enforcement Fund</b> <b>\$30 million</b>	Organics market development <b>\$4.5 million</b>	Audits, education and support programs <b>\$14.5 million</b>	Household chemical collection events <b>\$9 million</b>		Other business support initiatives <b>\$5 million</b>
Waste management in Aboriginal communities <b>\$4 million</b>	Local government litter programs <b>\$4 million</b>	Local government organics collection grants <b>\$10 million</b>	Weighbridges <b>\$0.5 million</b>	Education training and support <b>\$8 million</b>		Heads of Asbestos Coordination Authorities programs <b>\$4 million</b>
Education campaign and support <b>\$9.5 million</b>	Litter prevention programs, including the Hey Tossert! campaign <b>\$24.5 million</b>					
	Community Litter Grants <b>\$1.5 million</b>					

For more information on the initiative and how to apply for grants through the NSW Environment Protection Authority visit [www.epa.nsw.gov.au](http://www.epa.nsw.gov.au)

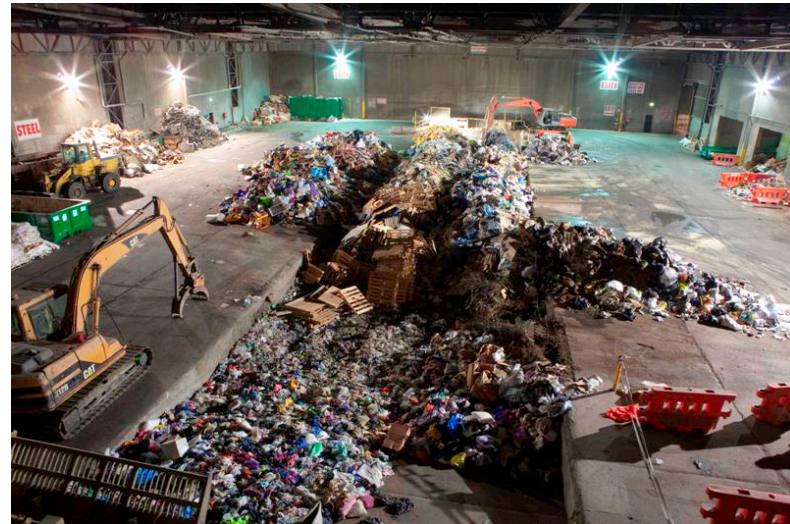
# Infrastructure - C+I Sorting facilities



1. Camellia, Sydney – 20,000 t/yr

2. Doyle Brothers – 29,000 t/yr

3. WasteFree – 15,000 t/yr



# RDF

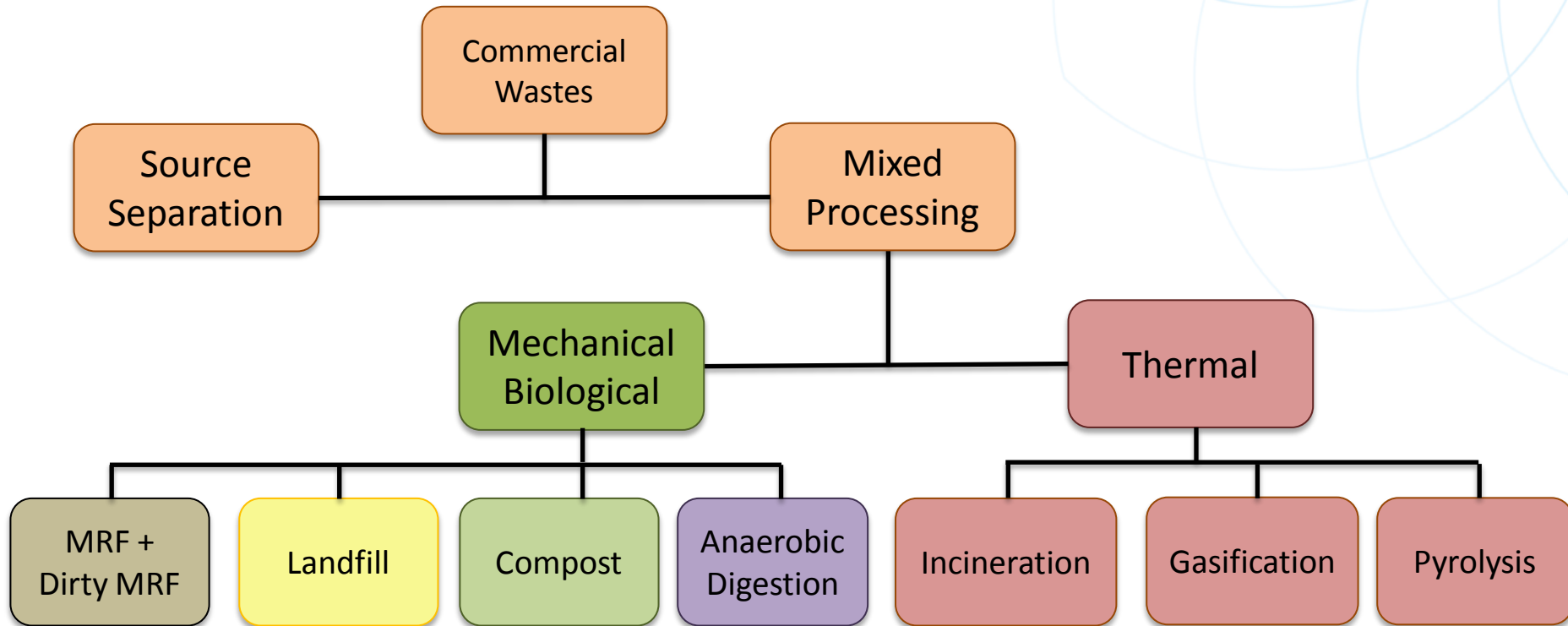




# RDF Manufacturing Facilities in Australia

Company	Location	Facility	Status	RDF/PEF Output Capacity (tpa)
Biocoal	NSW	Earthcare SRF	Operational	50,000
Global Renewables	NSW	Eastern Creek Ur-3R Facility	Awaiting Licence	60,000
ResourceCo	NSW	Eastern Creek PEF Facility	Pipeline	57,000
ToxFree	NSW	St. Mary's	Operational	3,000
Visy	NSW	Smithfield MRF	Operational	45,000
Veolia	NSW	Camellia Recycling Centre	In Development	45,000
Doyle Brothers	NSW	Fairfield MRF	Operational	5,000
SUEZ-ResourceCo	SA	Alternative Fuels	Operational	85,000
KTS Recycling	Vic	Knox Transfer Station Process Engineered Fuels	In Development	30,000
<b>TOTAL</b>				<b>380,000</b>

# Infrastructure Options



# The Next Generation Incinerator, Eastern Creek (almost refused)

- Proposed
- Moving grate incinerator
- 1.35 Mtpa of residual waste
- \$800m capex
- 140MW electricity

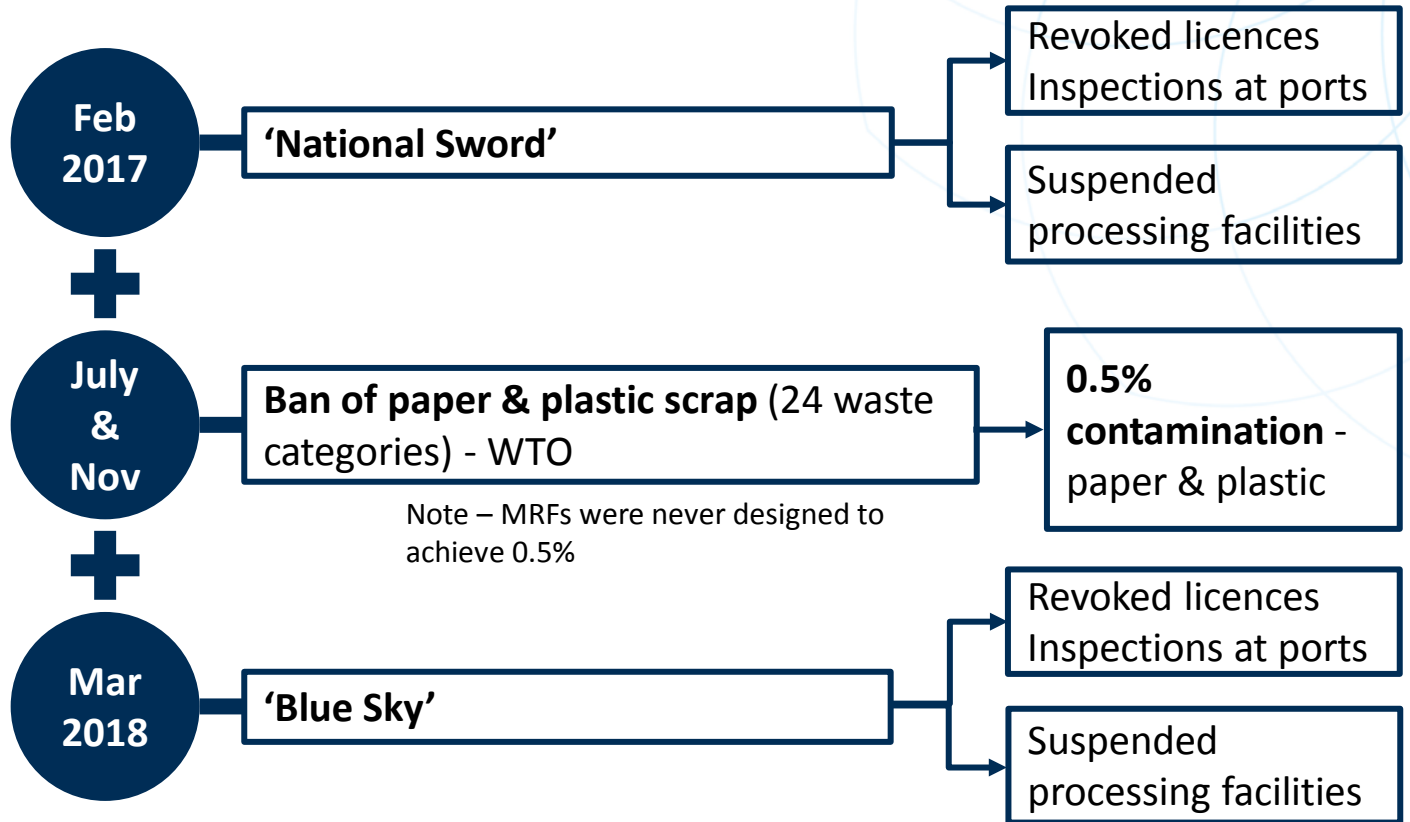


# Thermal Processing Facilities in Pipeline or Proposed

Company	Proposed Location	Cost (\$m)	Size (tpa)	Energy Outputs (MW)	Technology Type	Status
<b>Dial-a-Dump</b>	Eastern Creek (NSW)	\$700	1,200,000	140	HZI Moving grate	Unlikely to proceed.
<b>ReGroup</b>	Mt Piper Lithgow (NSW)	\$160	400,000	30	Moving grate	Construction 2019
<b>New Energy</b>	Port Hedland (WA)	\$180	130,000	18.5	Entech gasification	Construction 2019
<b>New Energy</b>	East Rockingham (WA)	\$160	130,000	18	HZI moving grate	Construction 2019
<b>Phoenix</b>	Kwinana (WA)	\$400	400,000	32	Martin GmbH reverse-acting grate	Subject to finance
<b>EMRC</b>	Hazelmere (WA)	\$25	13,000 Wood waste	3.5	Pyrolysis	Under construction.
Aust Paper	Merryvale Vic	\$200	MSW	?	Incinerator	Proposed

# China's National Sword

## The actions:



## The goal:

“Imports of solid waste that can be substituted by domestic resources will be phased out by the end of 2019” – State Council of China

- it is NOT about contamination. It is about industry policy.

# Australia - some key points

China takes half our exports: 600,000 t fibre; 40,000 t Plastic

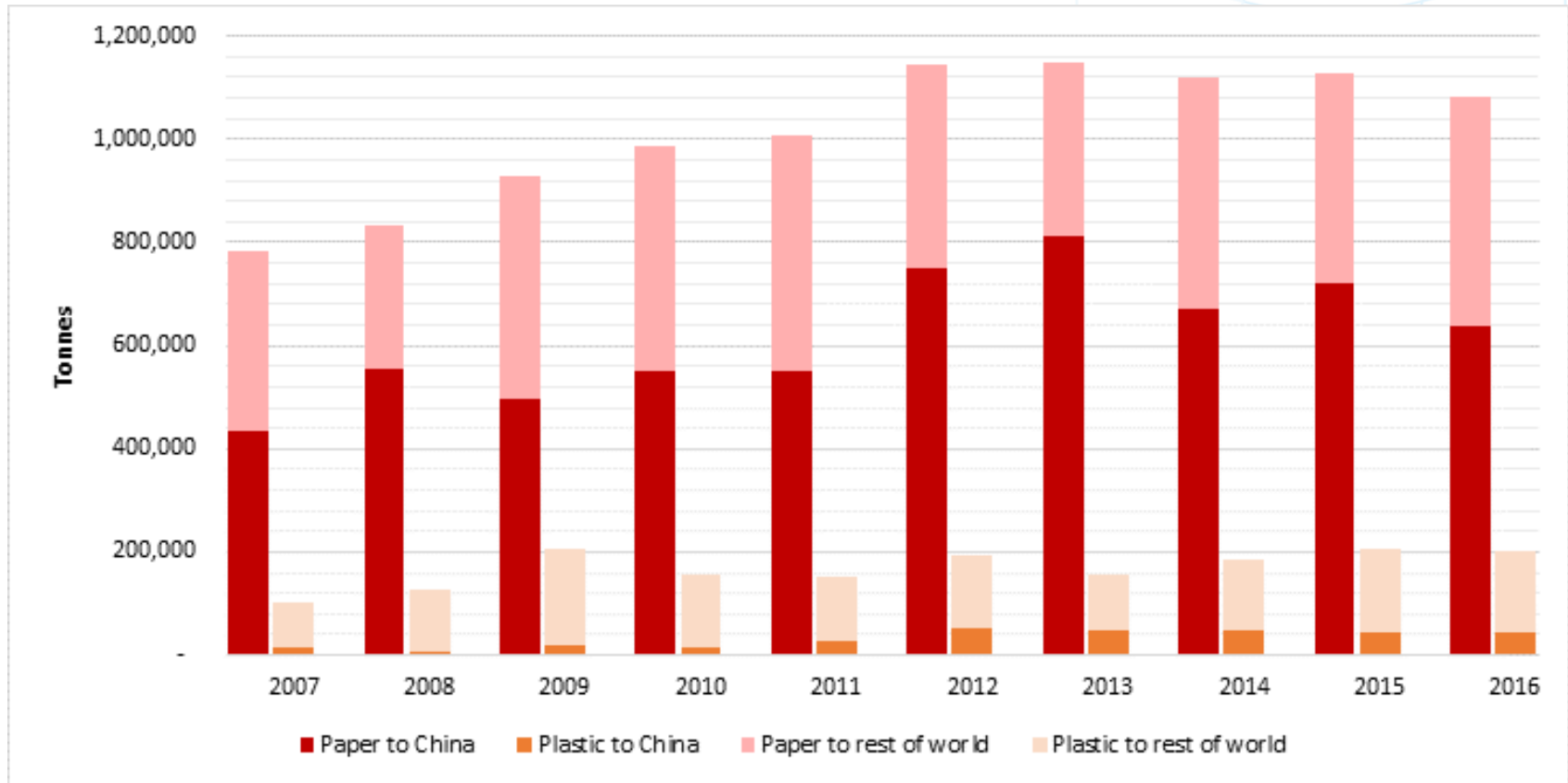
## Contamination

- MRF contamination is not the same as Export contamination  
Export contamination is contracted and logical

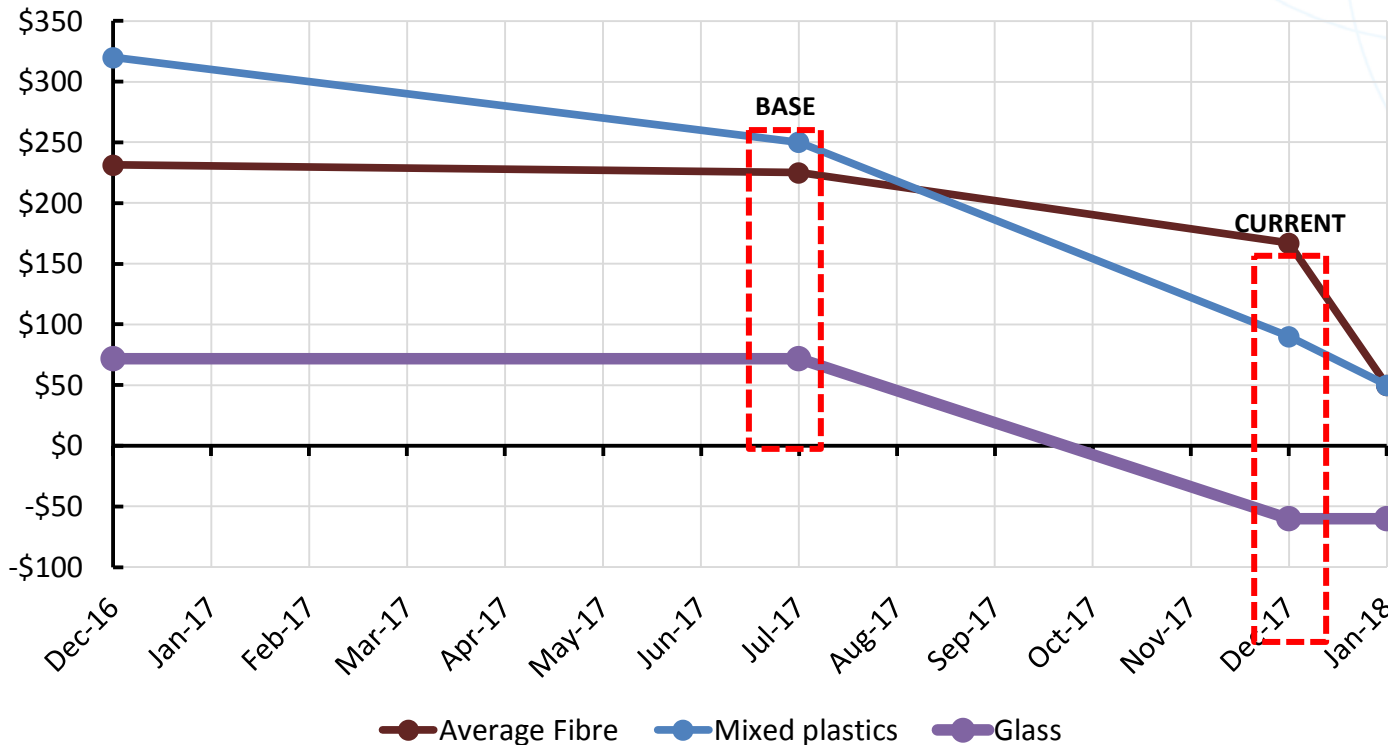
It is efficient to capture the last 5% in the secondary re-processor

- Reflected in the price

## Relative importance – it is all about fibre



# The impacts on commodity prices – China Product Glut & Glass Crash

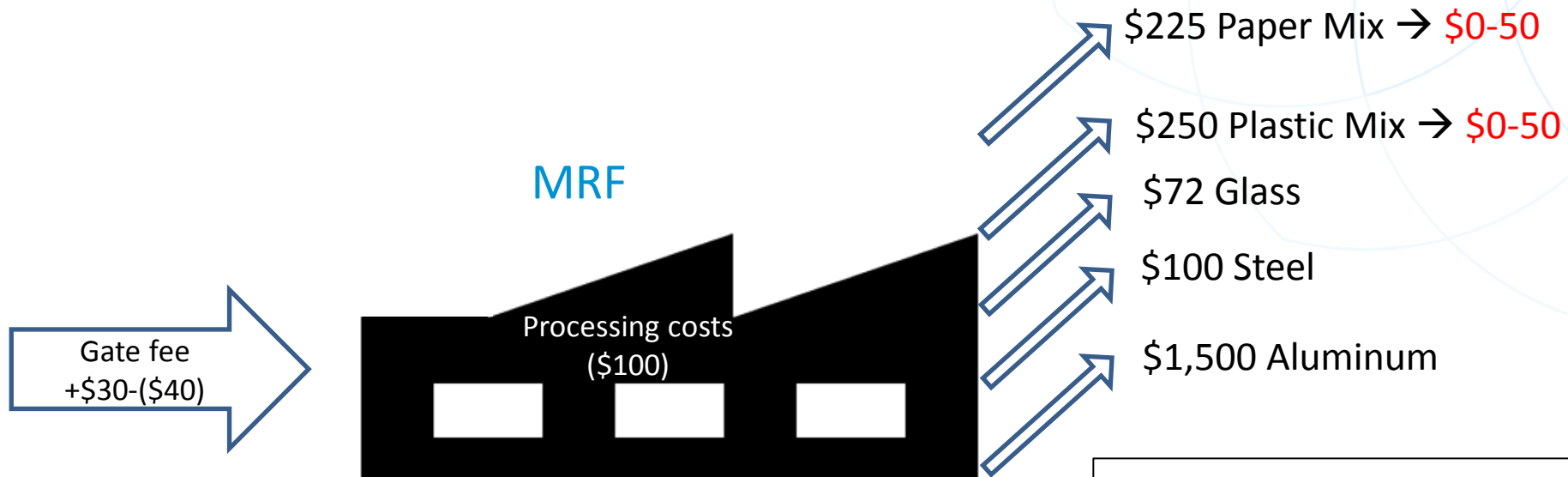


## The impacts:

1. Reduced import licenses
2. Oversupply
3. Crash in price globally



# The impacts on MRF's



MRFs are no longer profitable at new commodity prices and existing gate fees

**Weighted Av loss:**  
**Simple MRF = \$112/input t**  
**Full sort MRF = \$60/input t**

# The impacts on Australian Councils and households

Increased Simple MRF costs - \$112/t (\$60 for Full Sort MRF)

Rate increase per Household: \$31/year (80c per week)

Approx 4% increase in rates

- not including future falls

Average household generates 5.4 kg/wk<sup>1</sup> or 280kg/yr

<sup>1</sup>Source: NSW Local Government WARR Data Report

# What is happening now?

Recyclables ARE still being exported, albeit at lower prices

- Prices for pure streams still strong
  - PET \$250
  - HDPE \$400
  - Alum \$1500
  - OCC fibre \$150
- Mixed paper and Mixed Plastic \$0-50 – stabilised recently

MRF gate fees are increasing

- but they remain lower than landfill
- most Councils currently negotiating

# What next: Options

**Accept the lower sale price** of exporting to other Asian countries

Cost \$60-112/t

Only available if Asian markets are able to absorb

OR

**Operate MRFs to 99.5% quality**

Up to \$400/t

OR

**On-shore secondary reprocessing**

value-add to product

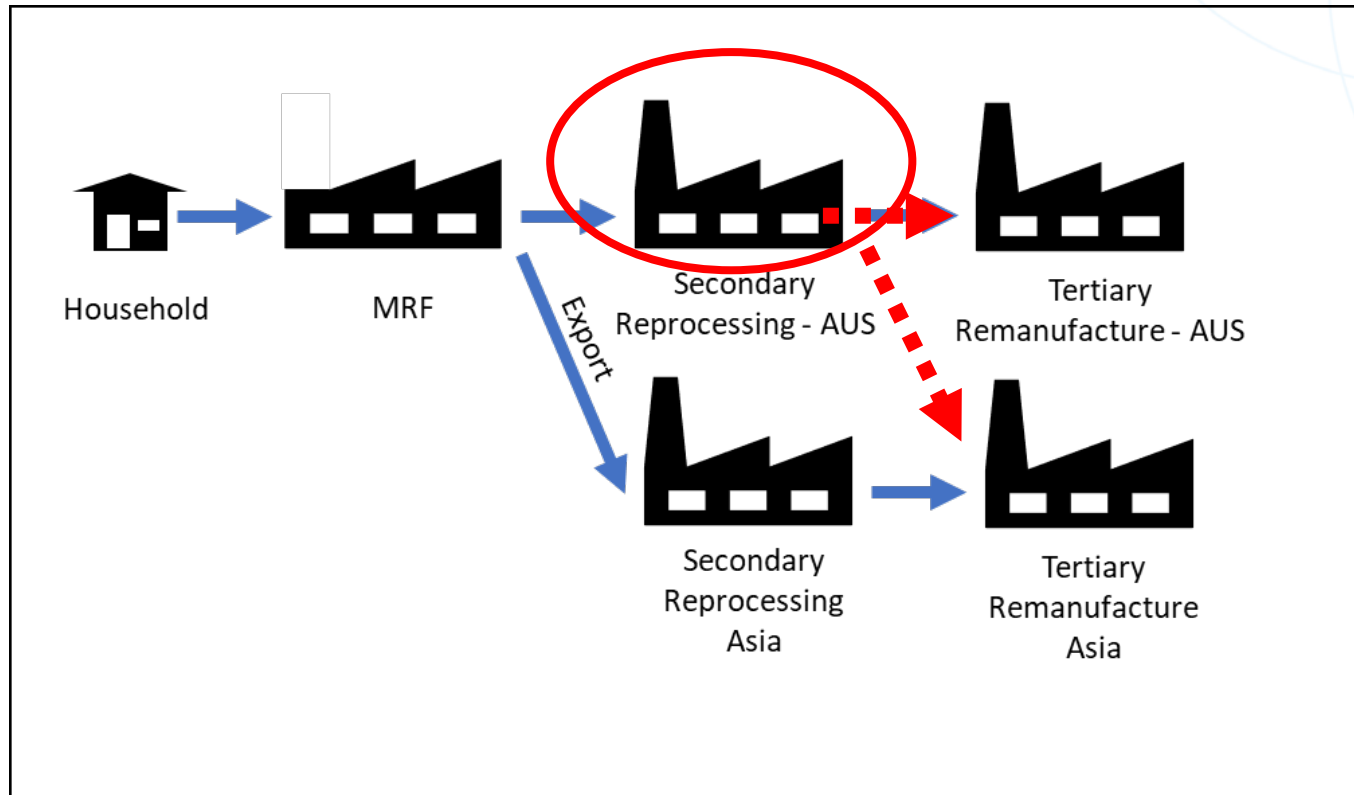
Plastic and Glass most likely

Est \$250/t

Cost benefit has not been done – limited markets for plastic pellets and glass. Unlikely fibre mill will be “on-shored”.

Mid term – Circular Economy - “On-shore” reprocessing

# Recycling supply chain



## Some take away messages:

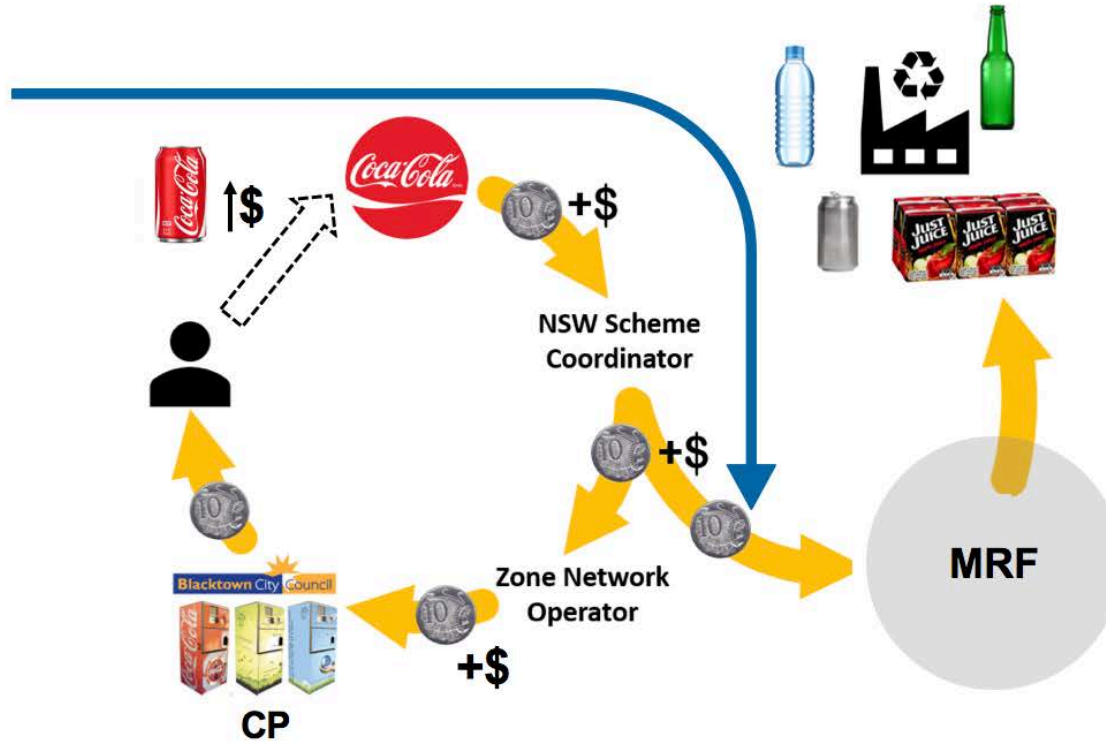
Don't argue to incinerate recyclables

Improve what we have today:

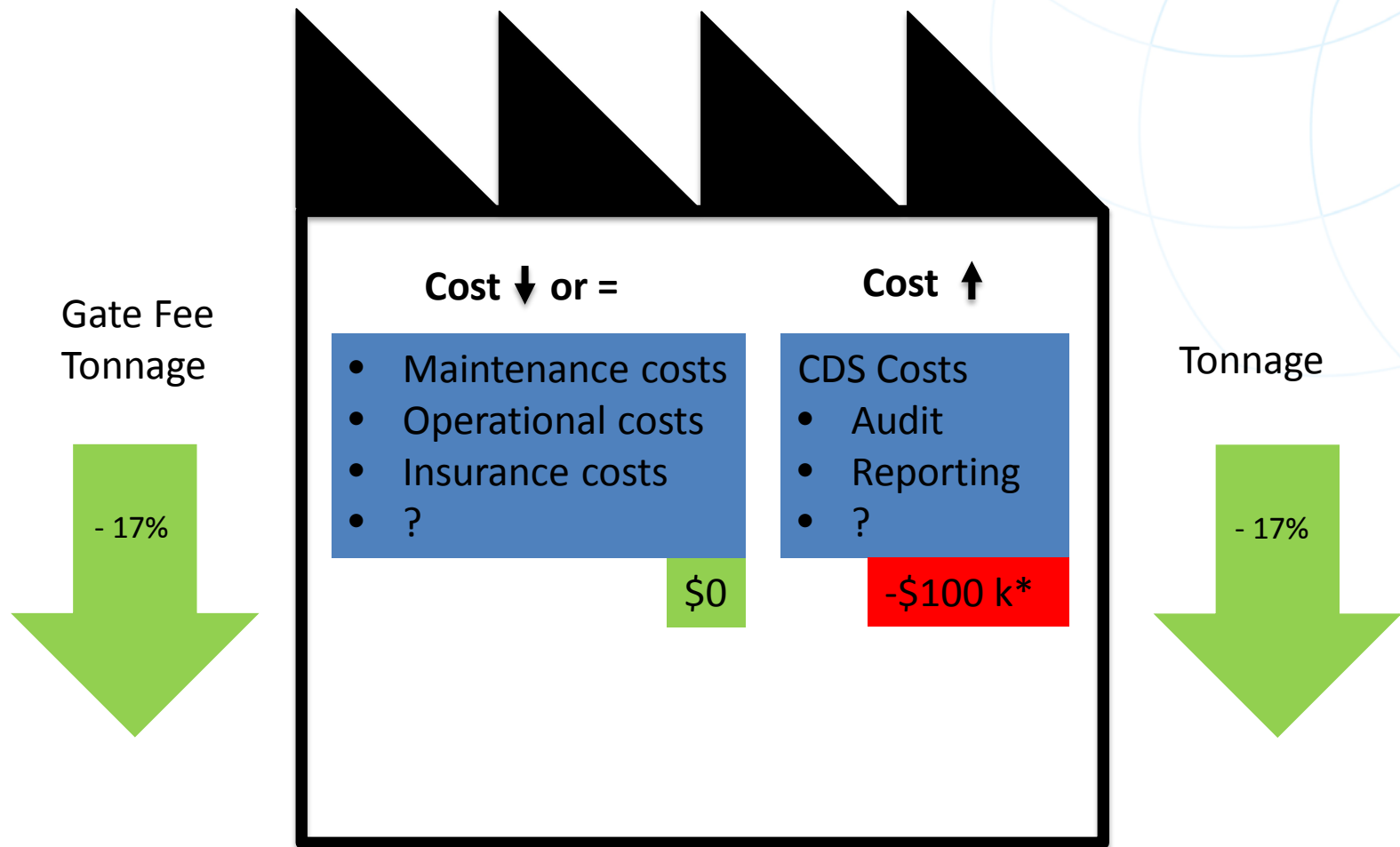
1. Education to reduce contamination
2. Improve MRF efficiency
3. "On-shore" secondary reprocessing
4. Adopt Circular Economy policies

# NSW CDS architecture

- Subject of negotiations between Councils and MRFs



# CDS Impacts - MRF



\* Assuming:

- \$80k/annum for audits
- 1x \$20 k Annual Recycling Statement (per MRF Protocol)



# Climate Change



# Carbon emissions

1. Landfills = 11 MT emissions
2. Capture = 50% of full life emissions
3. ERF - generate ACCU's for capture and destruction of methane = \$10.60
4. Need to register a project under a methodology:
  - Landfill gas destruction
  - Organics diversion from landfill e.g. 3 bin system
  - AWT
  - Energy efficiency – street lighting
  - Truck fuel
  - Energy from waste – energy, ACCU and REC's

# Paper & Cardboard embodied energy

240L bin fortnightly:

**CO<sup>2</sup>e savings = 2.3 t per year**

## Equivalent to:

- 11,414 hours use of an average LCD TV
- 7,000 km travelled by an average car



# Recycled containers embodied energy

FCM 240L bin:

**CO<sub>2</sub>e savings = 0.5 t per year**

Equivalent to :

- 2,470 hours use of an average LCD TV
- 1,500 km travelled by an average car



## Summary – 3 key actions:

1. Capture landfill gas = 8.6 MT
2. Avoid landfilling Organics = 13.6 MT
3. Recycling high embodied energy materials = 11 MT

**= 35 MT per year**

Turnaround is 42.5 MT (35MT + avoided emissions of 7.5MT )

Almost equal to the GHG emissions of all cars in Australia in one year (43 Mt of CO<sup>2</sup>e)

# Typical C+I waste





# Regulations

- Minimum landfill standards – 5% real cost increases/year
- Disposal bans
  - E Waste - Vic
  - Tyres - ACT, NSW, WA, Vic, SA
  - Mattresses - ACT
  - Clinical waste NSW Tas
  - E-waste – NSW, SA, ACT – tyres & clinical wastes
  - Hazardous waste Vic, SA
  - Contaminated Soil - Tas
  - Radioactive waste - Tas
  - Liquid waste - Vic





# Extended Producer Responsibility (EPR)

- **Current:**

- Packaging
- Mobile phones
- Agvet chemicals
- Agvet chemical containers
- Used oils and lubricants
- Tyres
- E-waste
- Mercury-containing lamps
- Paints

- **Proposed:**

- Handheld batteries
- Air conditioners
- Refrigerators

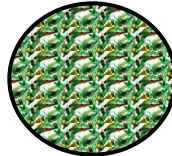


# Priority Streams

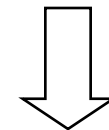
# Organics Priority



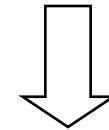
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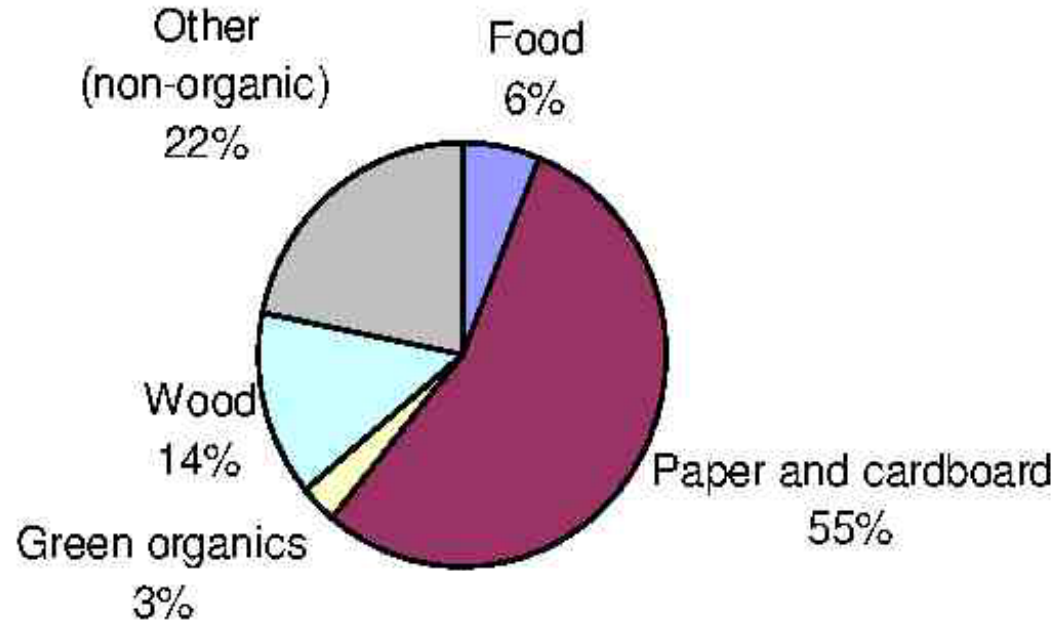
- Plastic bags
- Tyres
- Computers
- Printer Cartridges
- TV
- CDL
- Household paint
- Oil
- Cigarette butts



**Methane**



**Climate change**



**Organics in Commercial stream = 78%**

# FOGO

## Bin Systems

- 67 councils GO NSW
- 11 councils FOGO NSW
- 25 councils implementing FOGO NSW
  
- 30 metro Melbourne FOGO
- Approx 8 rural VIC
  
- 12 metro Adelaide FOGO
- 4 metro Perth FOGO



# Preferred State Govt Household Bin systems

Put food into the GREEN bin  
Collect it weekly  
Push garbage to fortnightly



Green /Food  
Weekly

FN



140 L

FN



240 L

FN



240 L

FN



360 L



240 L

# Preferred C&I bin system



Food



P&C



Garbage

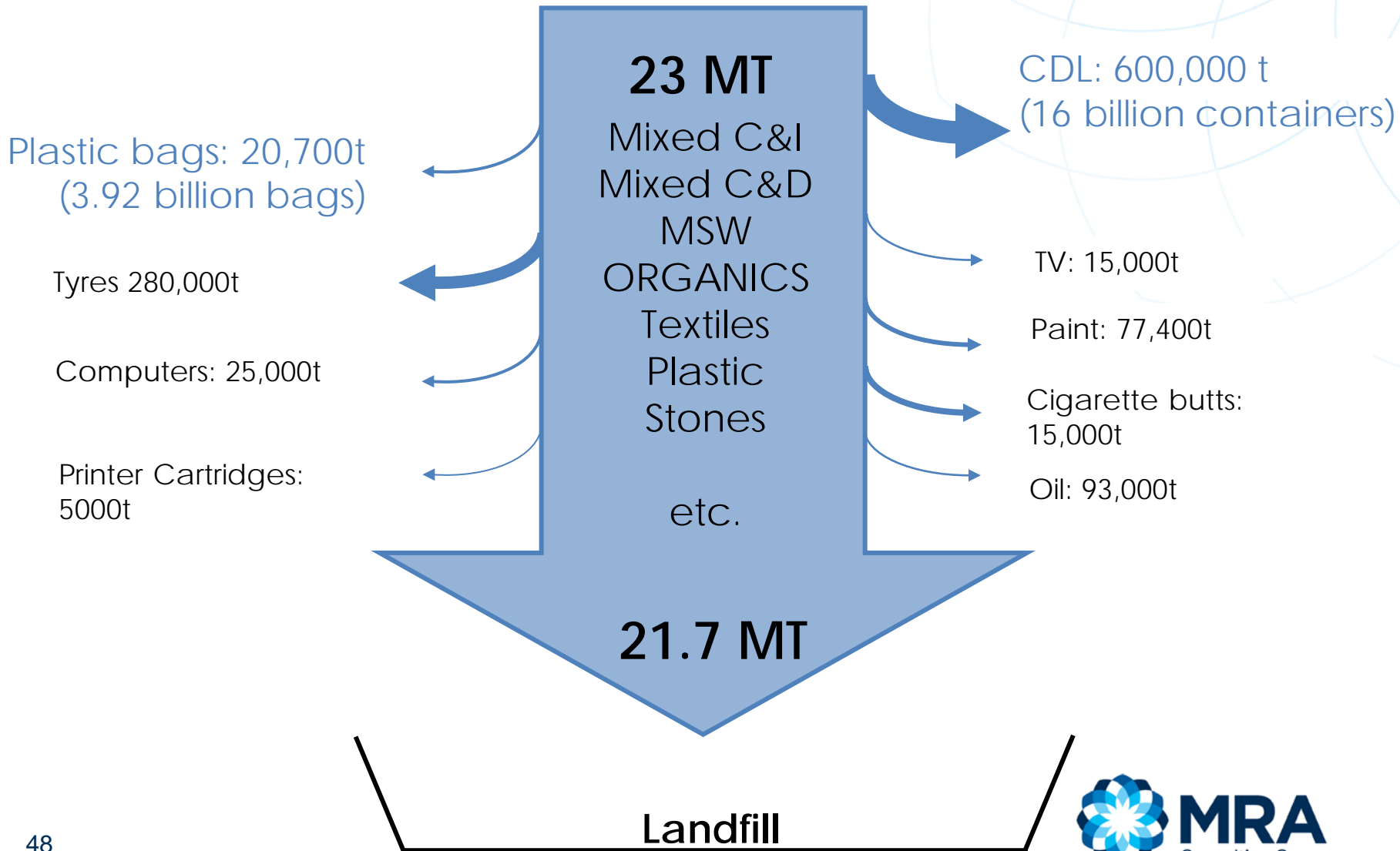


Metal



Plastic

# Focus on the right waste streams...





# Commercial Considerations

# Grants



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Landfill consolidation and environmental improvements	Litter Prevention and Enforcement Fund	\$4.5 million	\$14.5 million	\$9 million		\$5 million
\$5 million	\$30 million	Local government organics collection grants	Weighbridges	Education training and support		Heads of Asbestos Coordination Authorities programs
Waste management in Aboriginal communities	Local government litter programs	\$10 million	\$0.5 million	\$8 million		\$4 million
\$4 million	\$4 million					
Education campaign and support	Litter prevention programs, including the Hey Tossert! campaign					
\$9.5 million	\$24.5 million					
	Community Litter Grants					
	\$1.5 million					

For more information on the initiative and how to apply for grants through the NSW Environment Protection Authority visit [www.epa.nsw.gov.au](http://www.epa.nsw.gov.au)

## Grants for bins - NSW

- Up to 50% funding, capped at \$50,000 per site



# Grants for food - NSW

Up to 50% funding, capped at \$50,000 per site

## ORCA

- Rapid composting organic material
- Offers 30 Day Free Trial

## Closed Loop

- Rapid Composting organic material
- Reduces waste volume by up to 90% in 24 hours

## Pulp Master

- Pulps food waste to produce organic fertilizer



**OG25**



# Bin Trim

- Waste less recycle more gran
- Increase recycling
- Divert waste from landfill
- 22,000 businesses
- Limited to businesses with 400 FT employees
- Reduce costs



## Bin Trim - Round 3

- MRA aims to help 900 businesses to divert 3000 tonnes

### “Rebate Program”

- \$1,000 - \$50,000 worth for recycling equipment
- Rebate up to 50% of capital costs



# Weight Based Billing

- The problem – volume based charging
- WBC allows waste generators to:
  - be more aware of the true cost of landfilling waste
  - adjust their behaviour
- Proven results
  - - 45% reduction in waste to landfill in parts of the UK
  - - 31% decrease in waste generation in Sweden HHs
- MUST use NMI approved scales



# Weight Based Billing

Small C&I generator (e.g. a café)



\$/m



\$/m



\$/m

Large C&I generator (e.g. Bunnings)



\$/m



\$/t

C&D generator (e.g. multi unit development)



\$/t

\$/t



Waste stream	Volume mechanism	Weight mechanism
MSW	✓ \$/bin lift	✓ \$/t at facility per truck
C&I	✓ \$/skip bin size	✗ No price transparency
C&D	✗ Unneeded due to job size	✓ \$/t at facility per truck



# C+I sorting and PEF



# C+I Sorting facilities

SITA

Bingo

Remondis – Taren Pt

Veolia

Doyle Bros

All small



# Tendering and Contracts

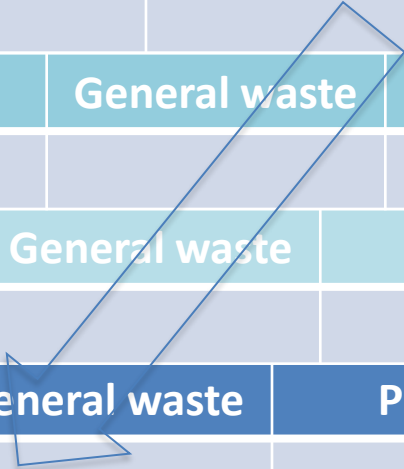
- Prices rising
- Landfill levy
- MRA standard Collection Contract
- Waste Specifications



# Tender Assessment Macro (TAM)

- 1. Costs
- 2. Service
- 3. Reporting

	etc	Services	General waste	Plastic	Fibre etc
Sites					
	Cleanaway	Services	General waste	Plastic	Fibre etc
Sites					
	Suez	Services	General waste	Plastic	Fibre etc
Sites					
	Veolia	Services	General waste	Plastic	Fibre etc
Sites					
	<b>Total</b>	<b>Services</b>	<b>General waste</b>	<b>Plastic</b>	<b>Fibre etc</b>
Sites					
1					
2					
3					
4					



# Education

Build engagement  
Reduce contamination  
Maximise diversion

## Recycling Right

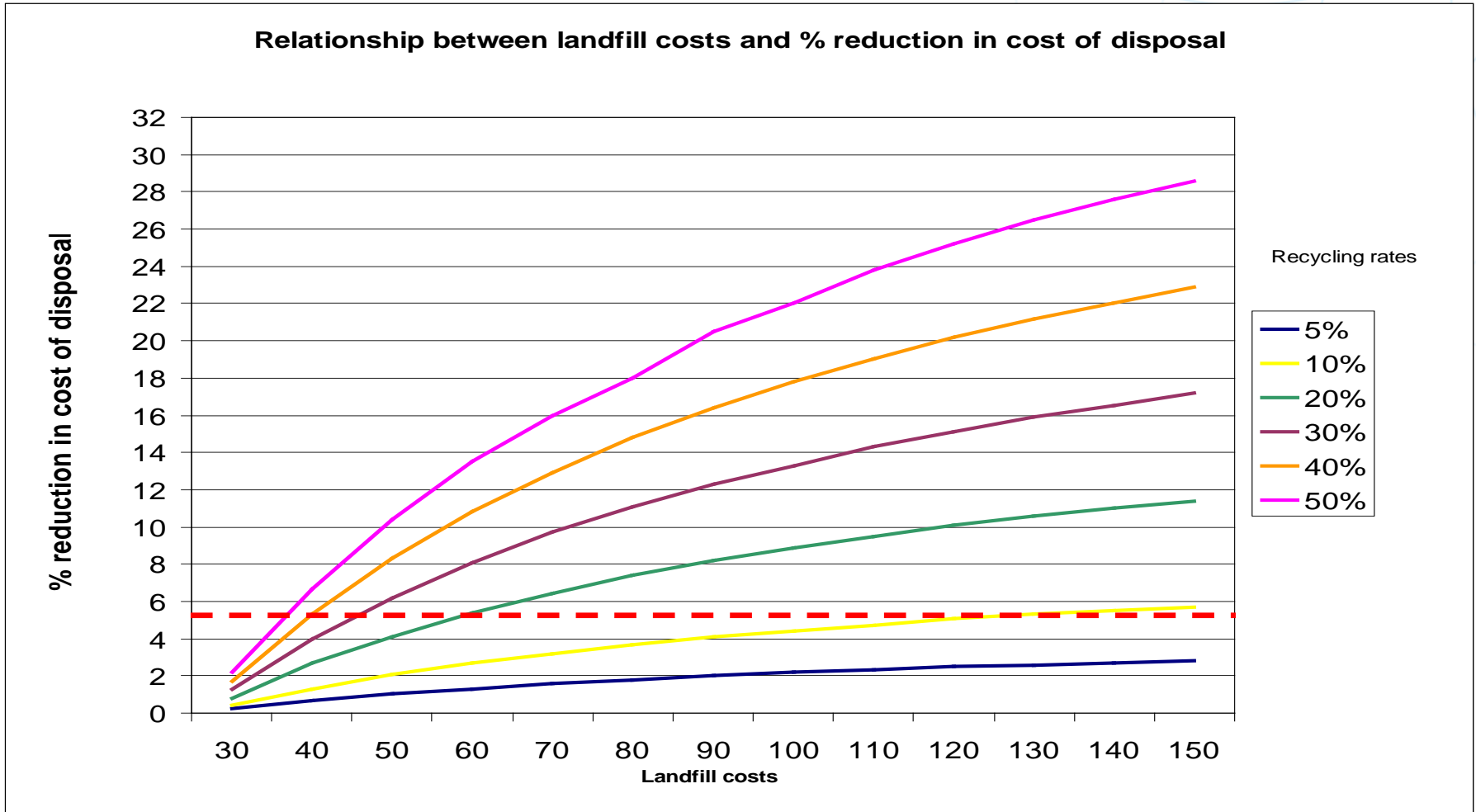


Call 13 13 35  
Leaders in Recycling and Waste Management

[sita.com.au](http://sita.com.au)



# Education and Training pays dividends



# Paper & Cardboard embodied energy

240L bin fortnightly:

**CO<sup>2</sup>e savings = 2.3 t per year**

Equivalent to:

- 11,414 hours use of an average LCD TV
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# Recycled containers embodied energy

FCM 240L bin:

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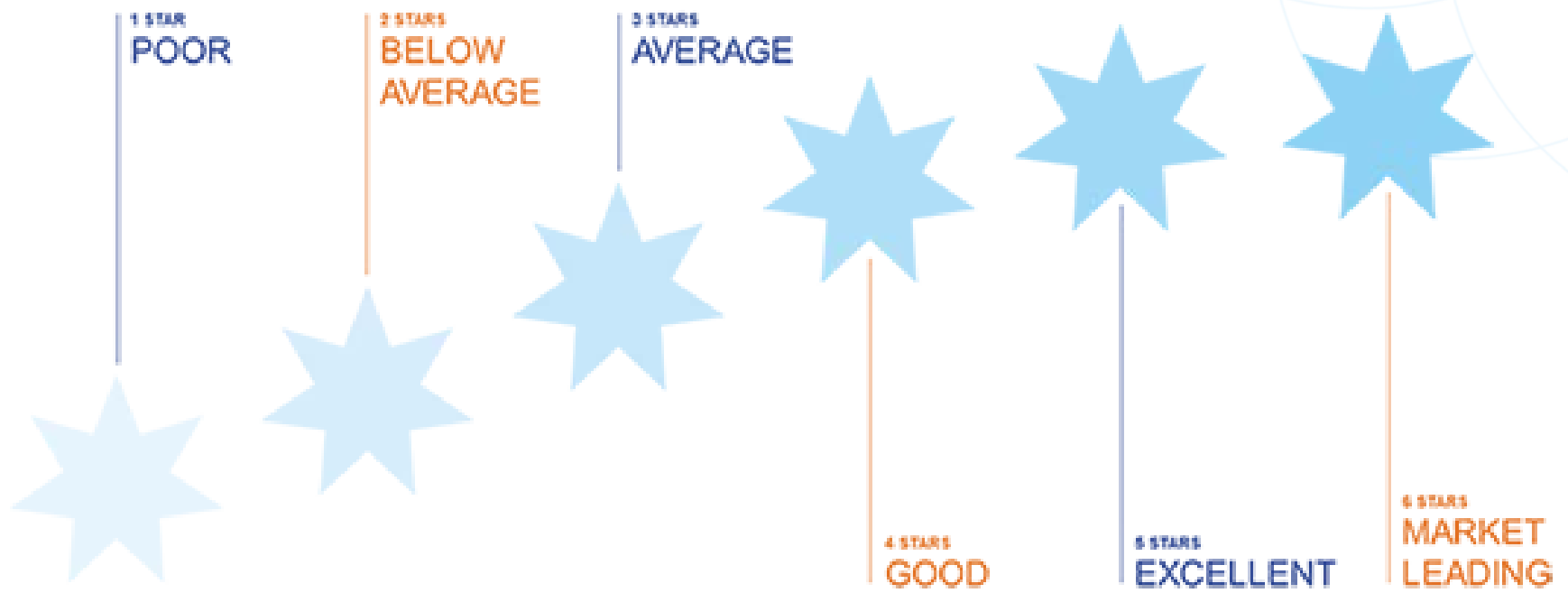
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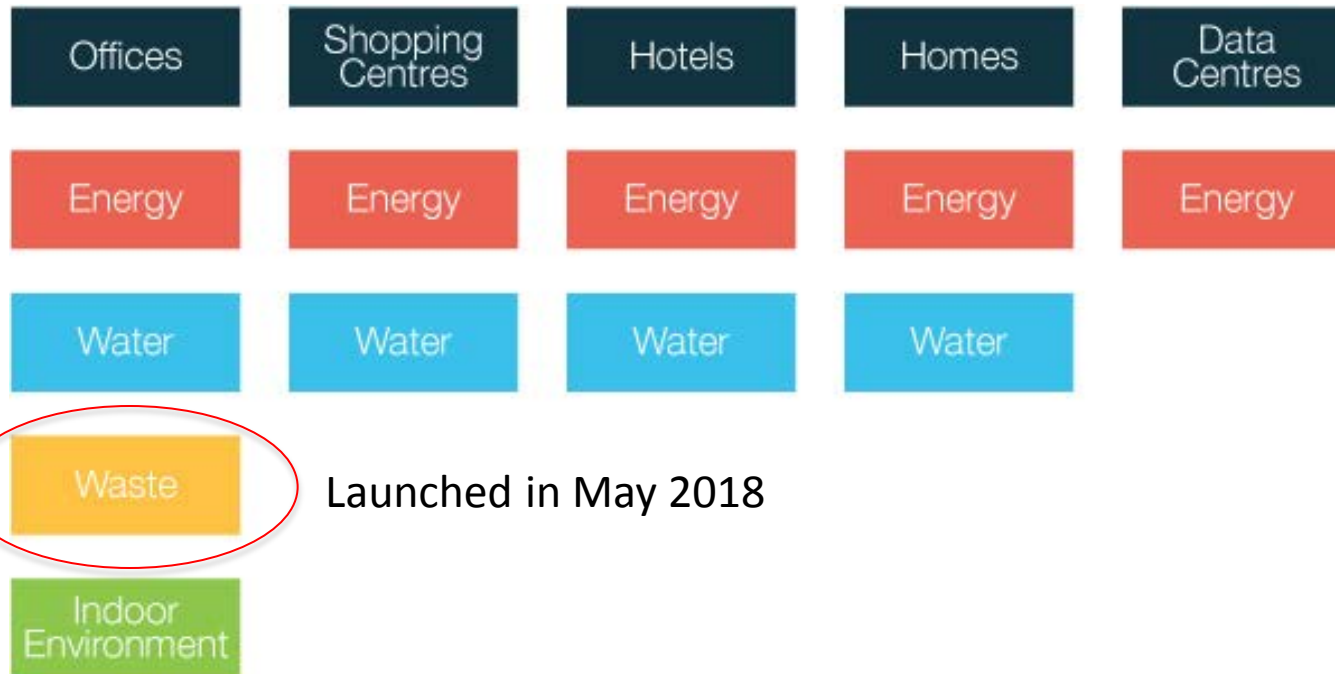


# THE NABERS RATING SCALE



# Rating categories

- National rating system that measures the environmental performance of Australian buildings, tenancies, and homes

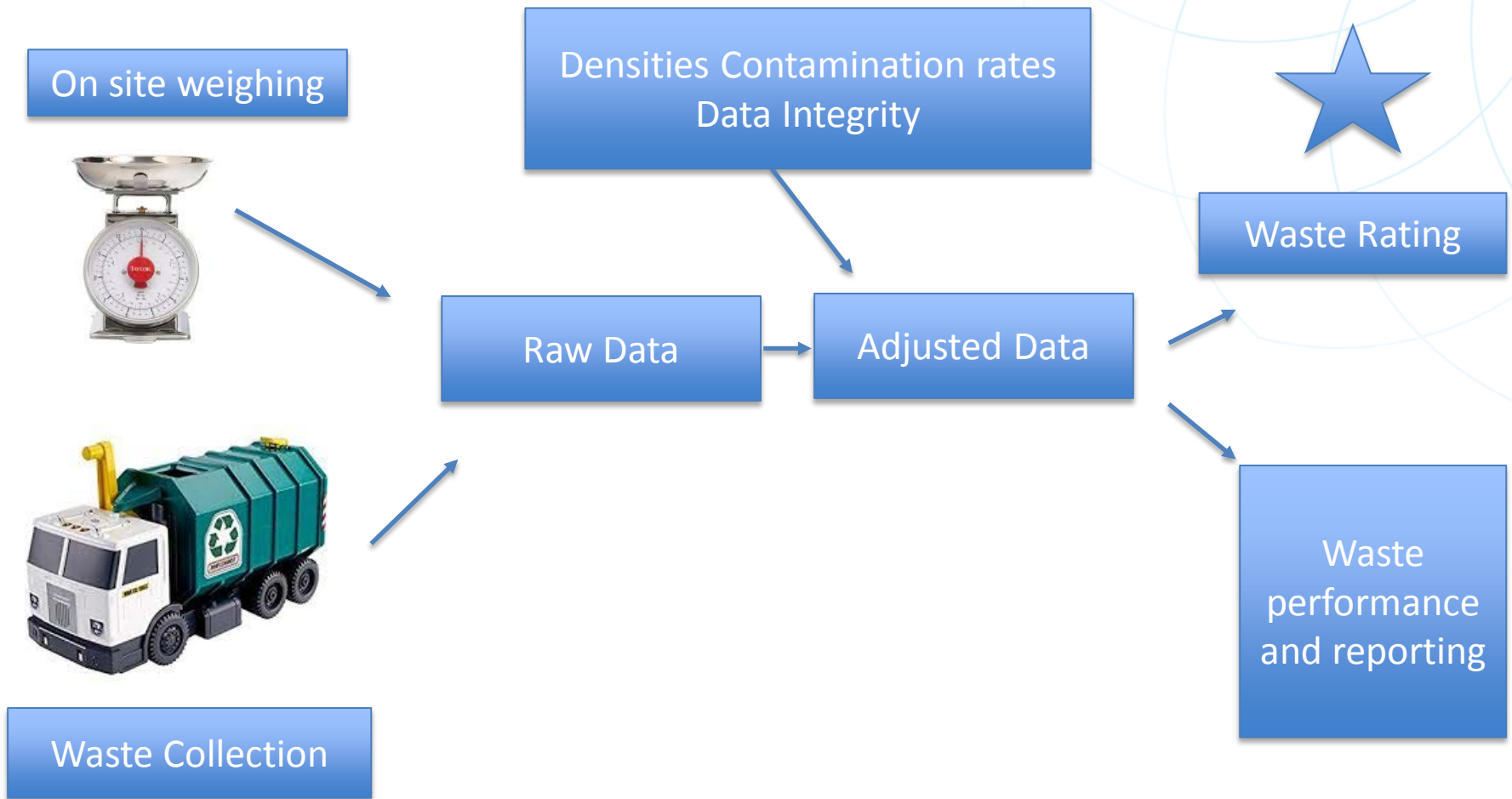


Launched in May 2018

# Waste Sorting

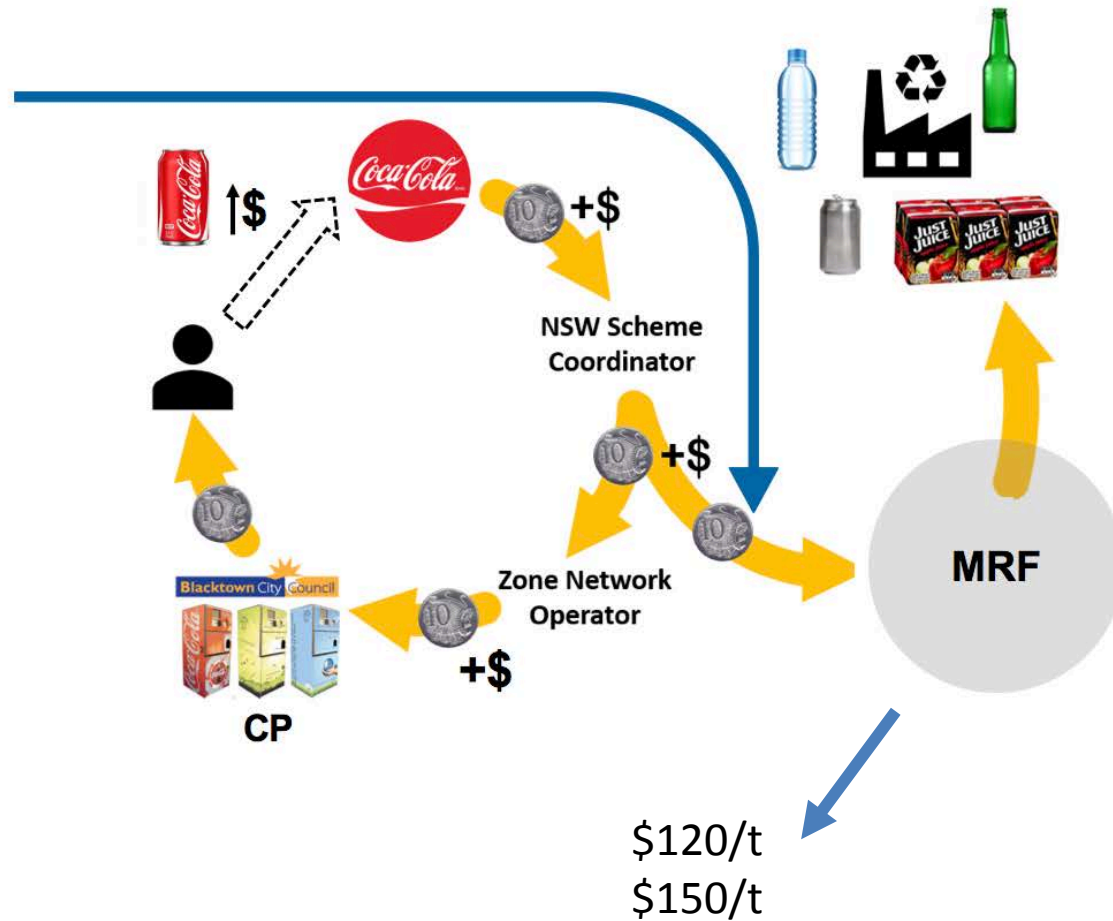
Mandatory	Optional
General waste	Green waste
Dry waste	Soft plastic
Mixed recycling	Secure paper
Cardboard	E-waste
Paper	Batteries
Organics	Light globe/tubes
Glass	Polystyrene

# Waste rating methodology



# NSW Container Deposit architecture

- Subject of negotiations between Councils and MRFs



# Eligible Beverage Containers

**IN**

**Size: 150 ml – 3L**



**OUT**

**Size: >3L, wine and milk**



# Recommendations

1. Maximise source separation
  - Cardboard
  - Food
  - Plastic
  - RVM's
  - Metal
2. Introduce WBB and invoicing
3. Require reporting
4. Tender regularly and at scale
  - Using a proper waste contract ('Unfair Terms')
5. Staff training, Signage and Education
6. Use C+I sorting facilities
7. Apply for grants – Bin Trim etc

# thank you

- Commercial
- Strategy
- Planning
- Auditing
- Education
- Modelling
- Engineering
- Due diligence

**MRA Consulting Group**

Suite 409 Henry Lawson Building  
19 Roseby Street Drummoyne NSW 2047

P 02 8541 6169

E [info@mraconsulting.com.au](mailto:info@mraconsulting.com.au)

[mraconsulting.com.au](http://mraconsulting.com.au)

