Minister’s Briefing

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GM Communications SITA

NSW Branch President WMAA

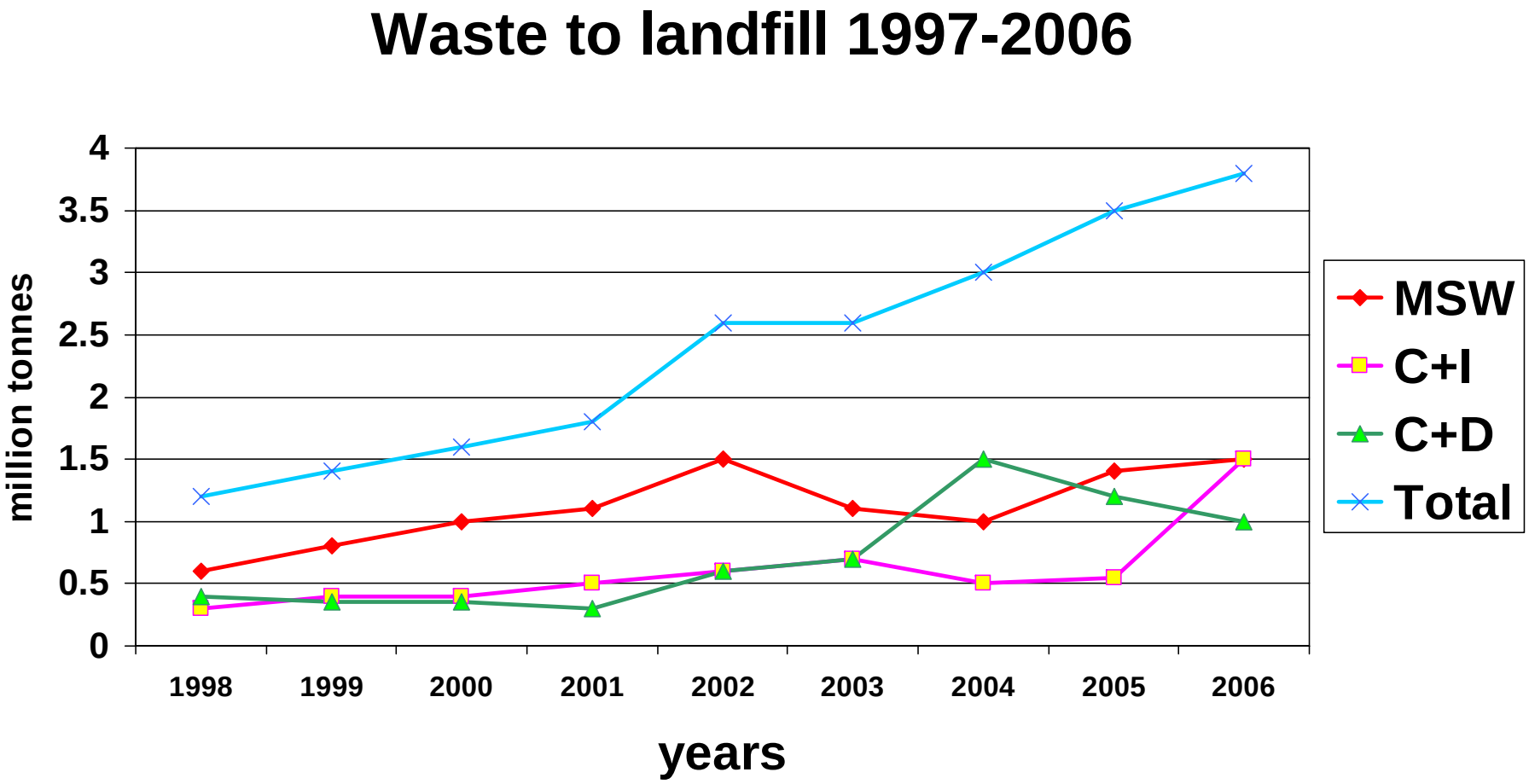
Key Points

1. **Growth in waste to landfill is unsustainable**

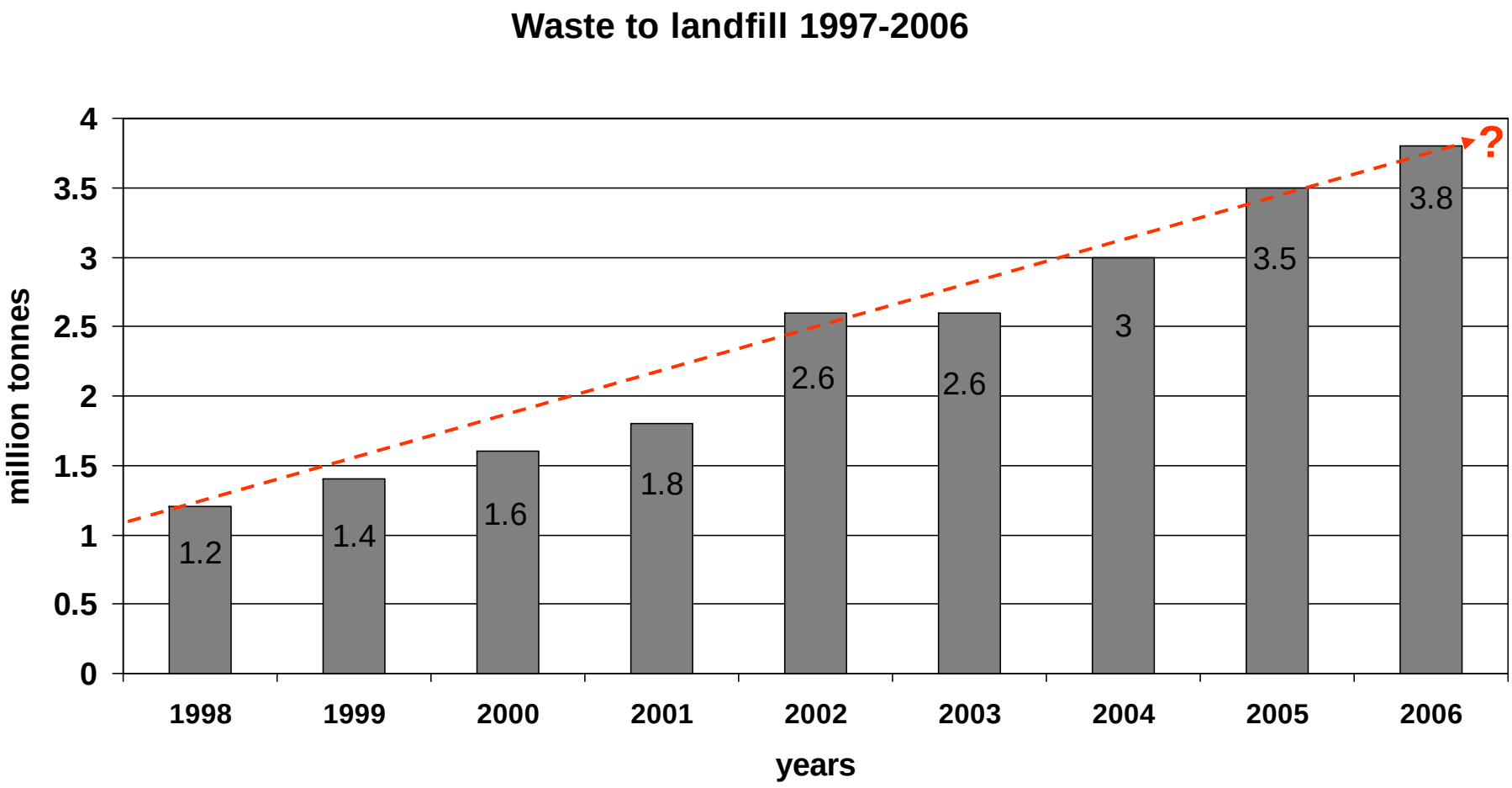
2. Climate change requires leadership

3. The key policy drivers

QLD waste strategy 2007



QLD


Waste to landfill 1997-2006
million tonnes
4
3.5
3
2.5
2
1.5
1
0.5
0
1.2
1.4
1.6
1.8
2.6
2.6
3
3.5
3.8
?
1998
1999
2000
2001
2002
2003
2004
2005
2006
years

Voluntary targets

NSW	**2014**	**66% diversion MSW**
	2014	**63% C+I**
VIC	**2013**	**65% MSW**
	2013	**80% C+I**
WA	**2020**	**100% diversion**
ACT	**2010**	**100%**
SA	**2010**	**75% MSW**
	2010	**30% C+I**
NT		**no target**
QLD		**no target**
TAS		**in development**

Key Points

1. Growth in waste to landfill is unsustainable

2. **Climate change requires leadership**

3. The key policy drivers

Stern report (November 2006)

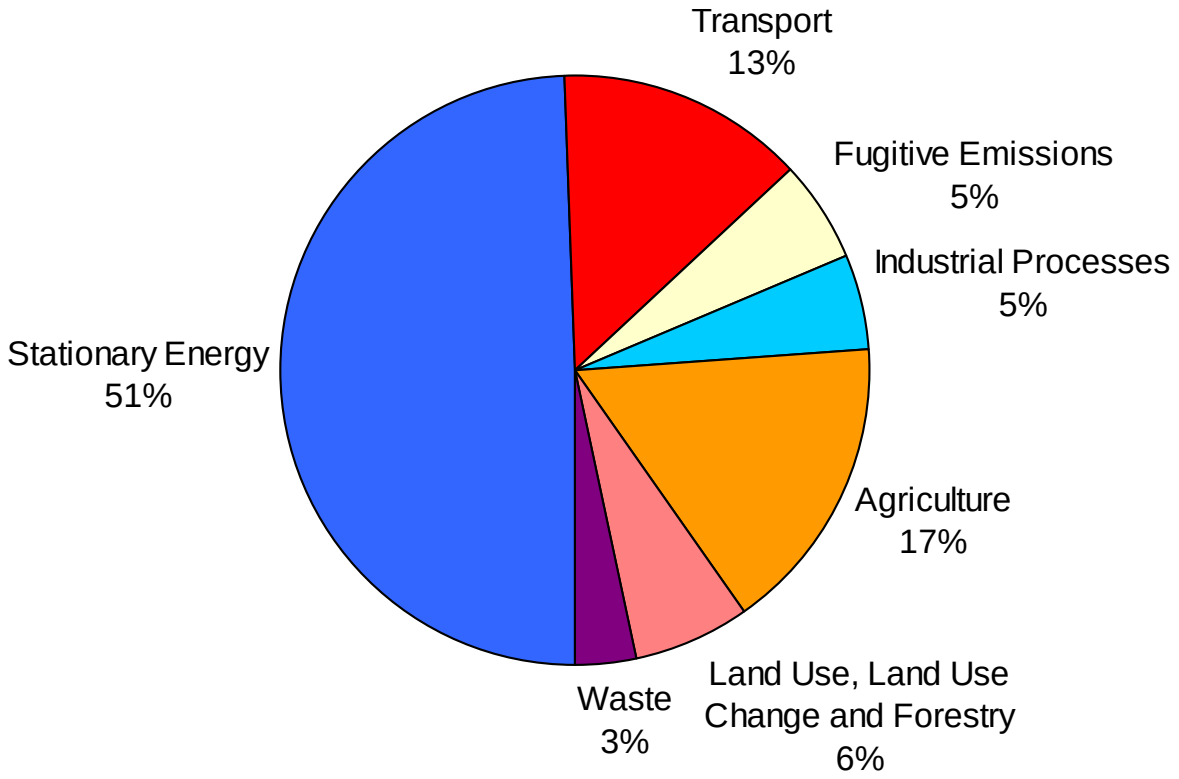
Carbon emissions

- **“Stabilisation at 450ppm CO2e is already almost out of a reach, given that we are likely to reach this level within ten years”**

- **“Ultimately, stabilisation – at whatever level – requires that annual emissions be brought down to more than 80% below current levels.**

Australia's Net Greenhouse Gas Emissions

- Total = 565 $MtCO_2e$
- Waste = 15 $MtCO_2e$ or 2.7%



Stern report (November 2006)

Cost of carbon

- "The social cost of carbon today, if we remain on a BAU trajectory, is of the order of US$85 per tonne of CO2"
  - **or $119/t of MSW into a landfill without gas capture**

- "If the target were between 450-550ppm CO2e, then the social cost of carbon would start in the region of $25-30 per tonne of CO2
  - **or $42/t of MSW into a landfill without gas capture**

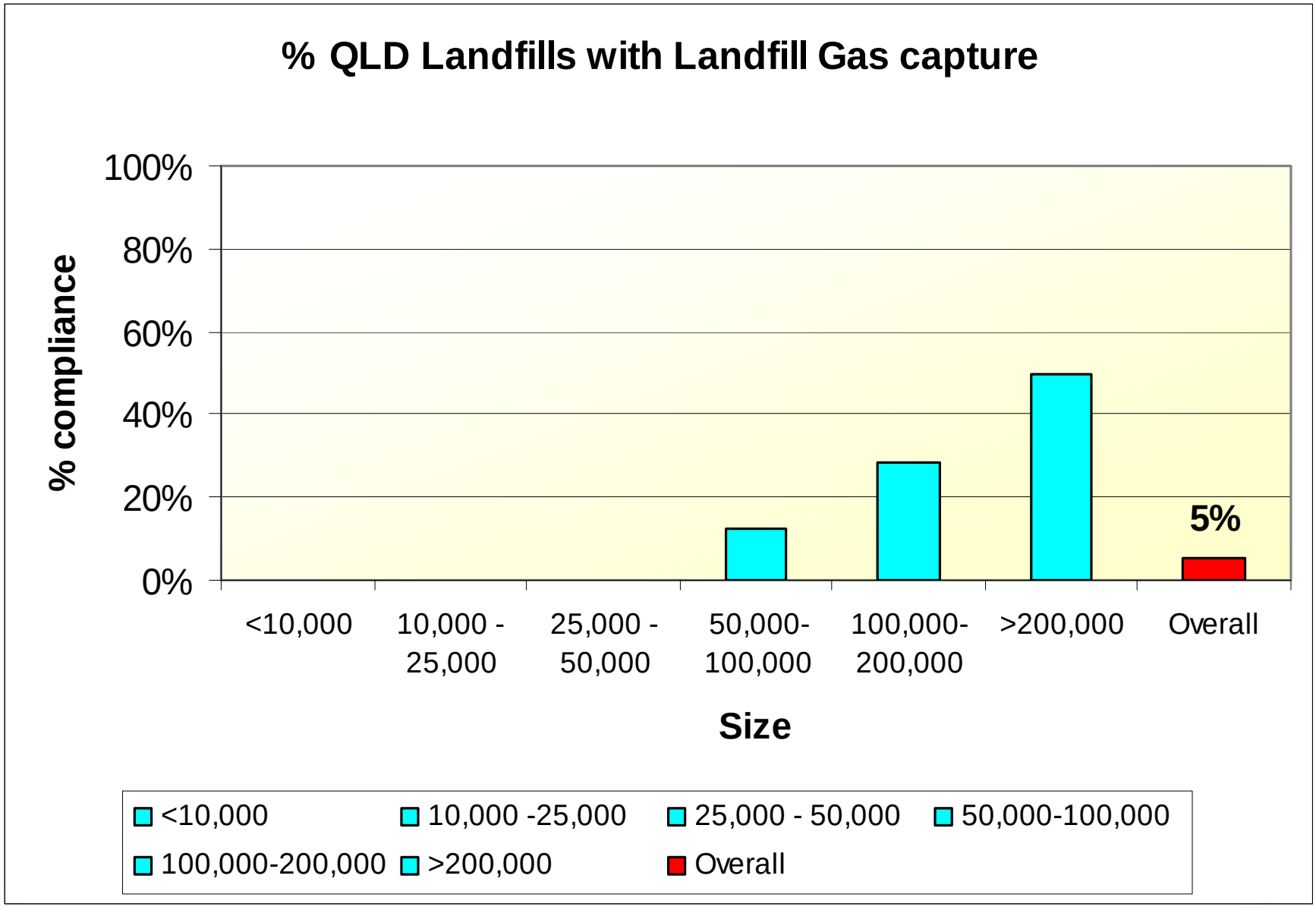
The study

Explore six greenhouse gas reduction opportunities:

1. Fix the legacy of the past - improve landfill gas capture
2. Limit future emissions – avoid landfilling DOC
3. Capture the embodied energy of materials
4. renewable fuels derived from waste
5. converting waste materials to ‘biochar’ for land application
6. using biodiesel for waste vehicles

1. Landfill Gas Capture and Use 8.5 MT/year

- Landfills release 15 Mt CO2e
- Methane = 25 X CO2 warming potential
- Assumed 70% gas capture from well managed landfills


% QLD Landfills with Landfill Gas capture
% compliance
100%
80%
60%
40%
20%
0%
5%
<10,000
10,000 - 25,000
25,000 - 50,000
50,000-100,000
100,000-200,000
>200,000
Overall
Size
<10,000
10,000 -25,000
25,000 - 50,000
50,000-100,000
100,000-200,000
>200,000
Overall

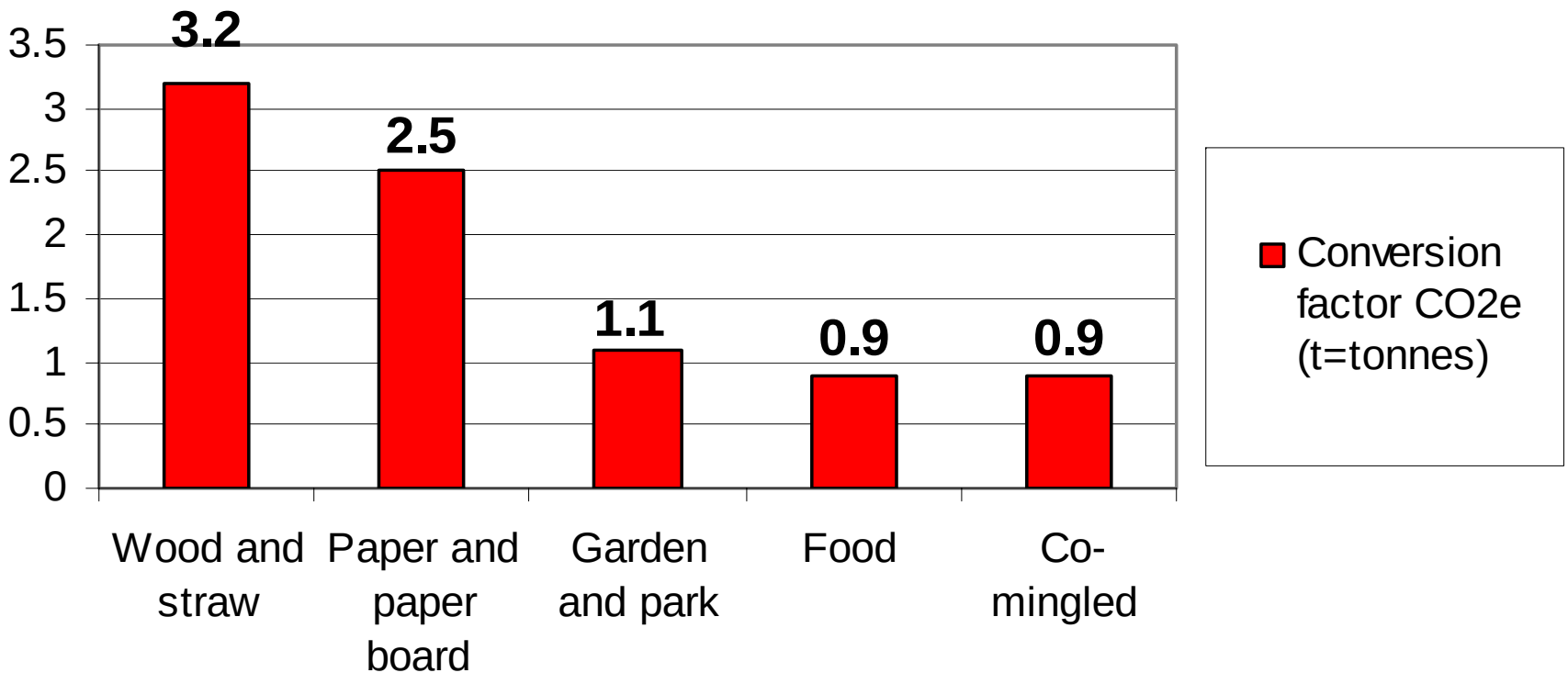
2. Avoid landfilling DOC – 13.6Mt

- Food, paper, garden and wood waste contains degradable organic carbon (DOC) 7.5 mill t diverted

- DOC dissimilates to methane in anaerobic conditions

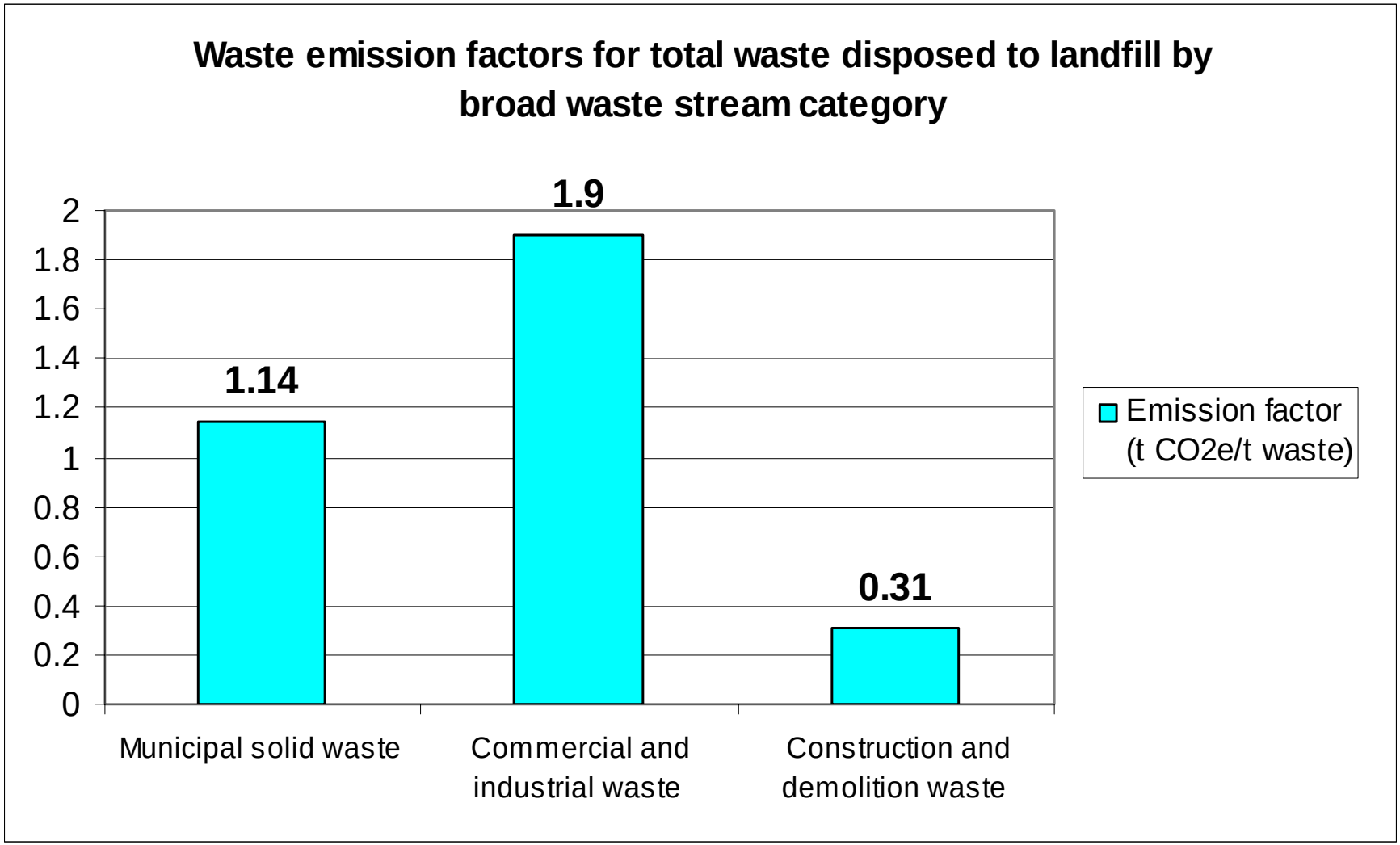
2. Avoid landfilling DOC

Waste mix methane conversion factor



DOC= Degradable Organic Carbon

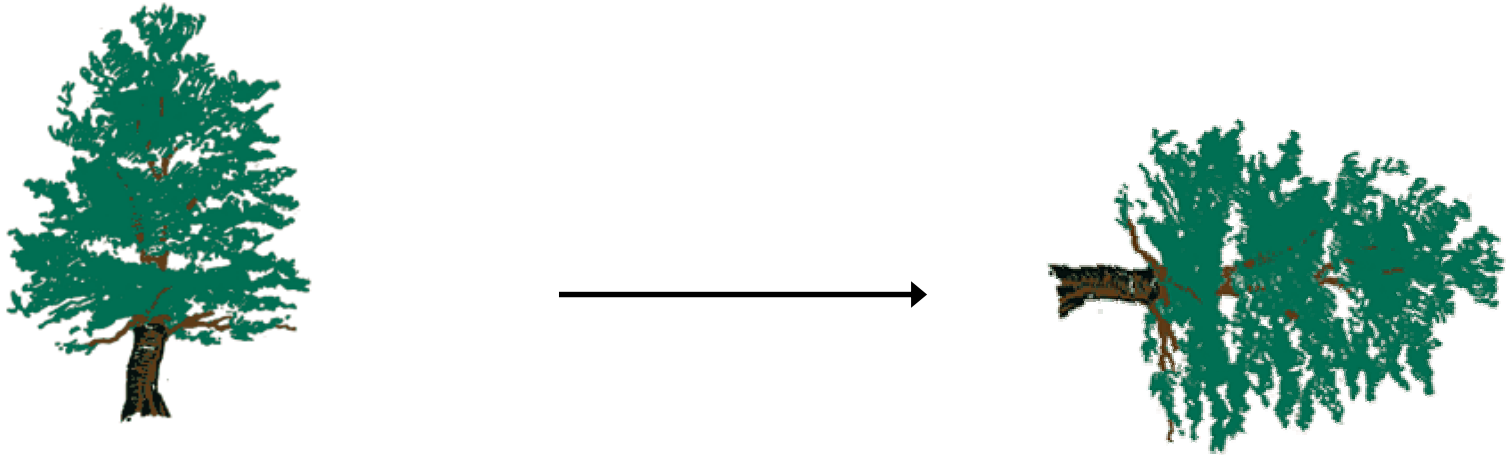
2. Avoid landfilling DOC



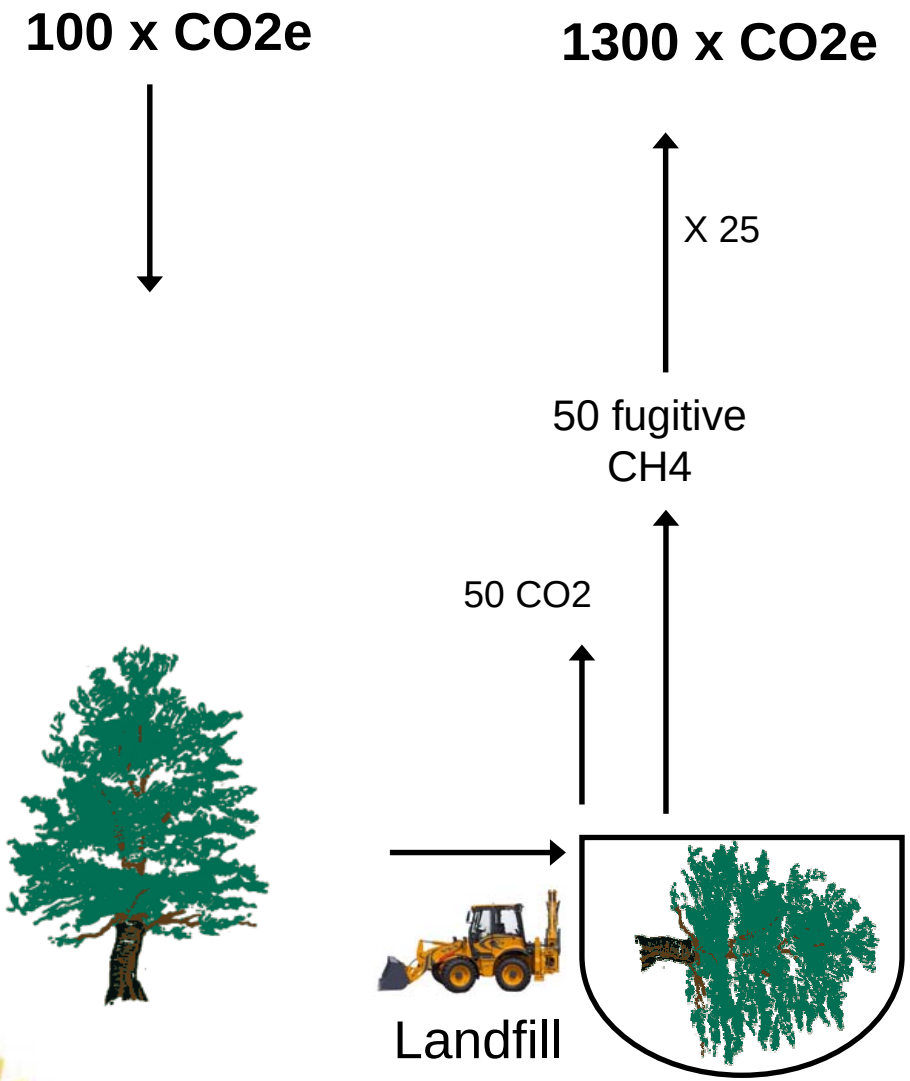
Natural cycle

100 CO2 e = **100 CO2 e**

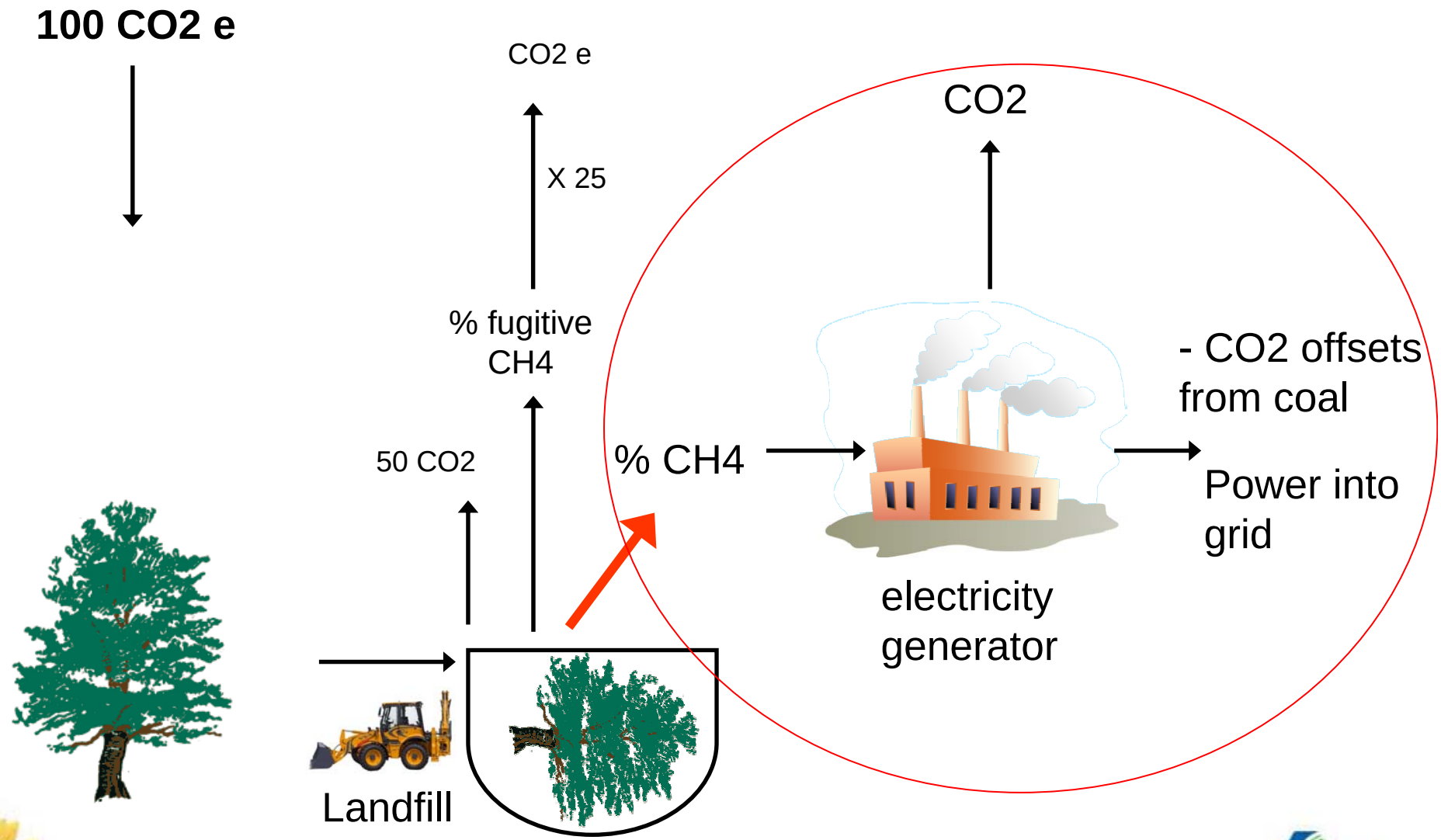
0 GHG effect



Landfill with gas capture

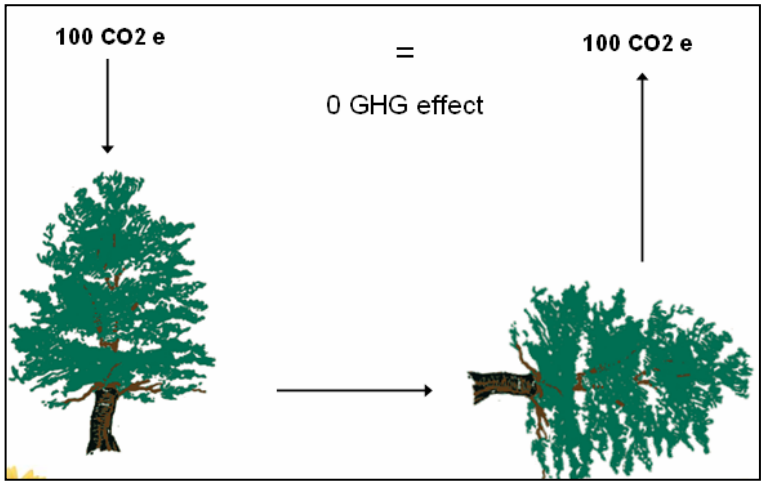


Landfill with gas capture



What % of gas capture do you need for landfill to break even with composting ?

Compost



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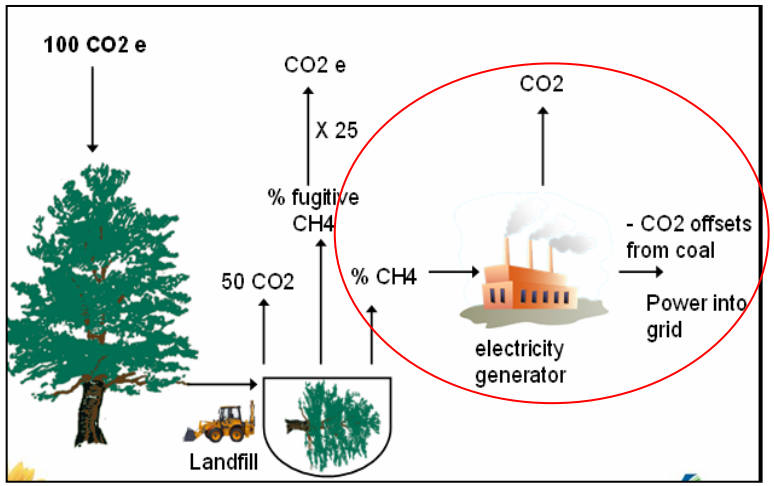
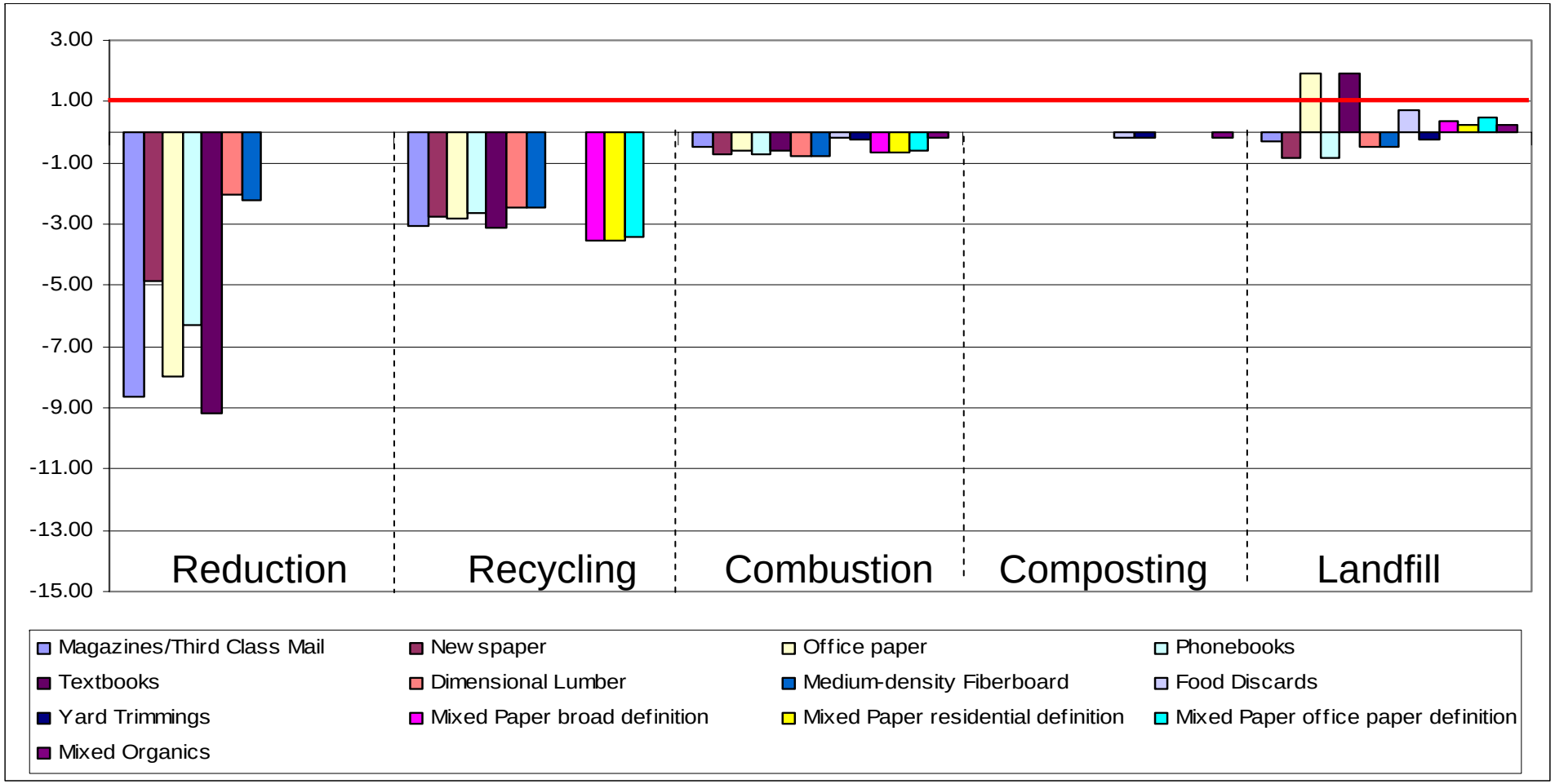
Landfill with gas capture



- Average gas capture over Whole life > 82%
- Average gas capture over Operating life > 90%

DOC options – US EPA net Greenhouse Gas Emissions



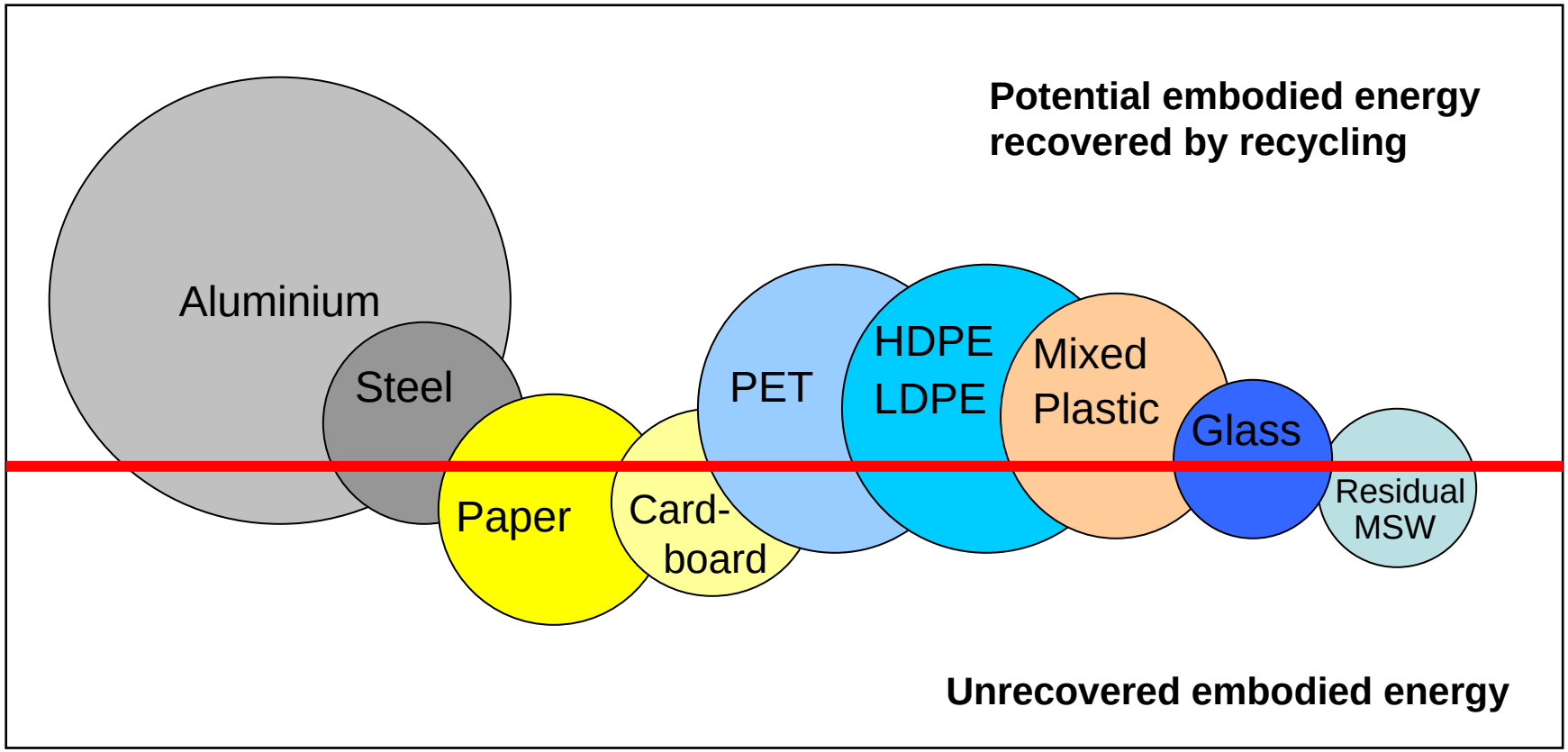
Source: USA EPA, Solid Waste Management & Greenhouse Gases – A life-cycle assessment of emissions & sinks

2. Avoid landfilling DOC

- **Preventing landfill of degradable organic carbon would avoid the release of 13.6 Mt CO2e**

3. Recycling High Embodied Energy Materials – 11 Mt

- **Embodied energy is energy used to transform raw materials into a final product**



The proportions of embodied energy that can be recovered by recycling various waste materials in Australia.

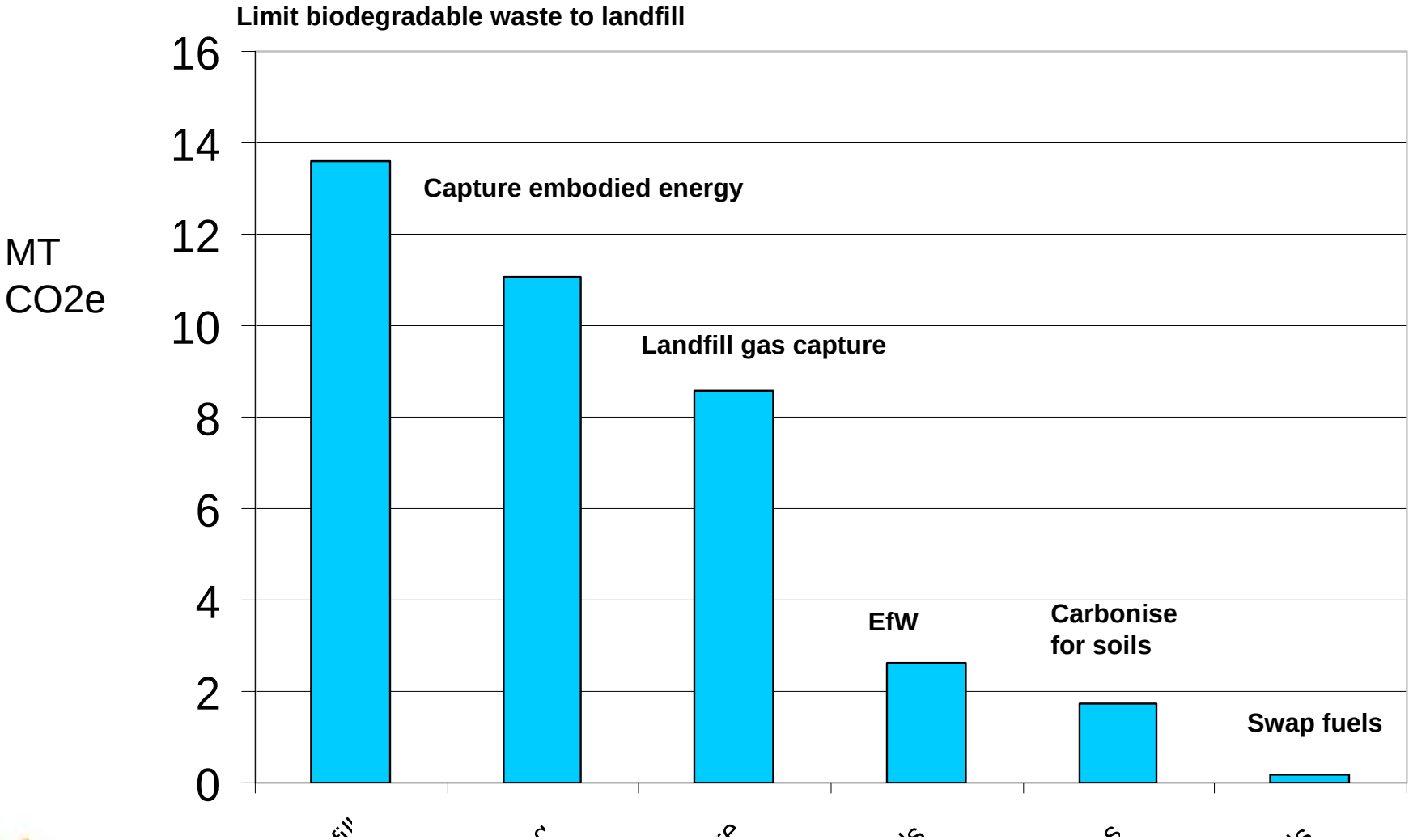
The area of each sphere represents the embodied energy per unit mass; the area above the line represents the potential energy savings by recycling the material; the MSW sphere indicates the embodied energy savings by recycling residual municipal solid waste.

4. Renewable Energy from Waste – 2.6 MT

5. Convert waste to ‘Biochar’ – 1.7 Mt

6. Use biodiesel for waste vehicles – 0.17 Mt

Summary


Limit biodegradable waste to landfill
MT CO2e
16
14
12
10
8
6
4
2
0
Capture embodied energy
Landfill gas capture
EfW
Carbonise for soils
Swap fuels

Summary – 3 key actions:

1. Capture landfill gas – 8.6 MT
2. Avoid landfilling materials with DOC – 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_2e)

Key Points

1. Growth in waste to landfill is unsustainable

2. Climate change requires leadership

3. **The key policy drivers**

The Queensland situation

- **Significant growth in waste to landfill**
- **Climate change demands leadership**
- **AWT and resource recovery cannot compete:**
  - with cheap landfill
  - which do not pay for externalities

Only two real drivers:

1. Regulation – eg ban DOC from landfill

2. Market Based Instruments (MBI)

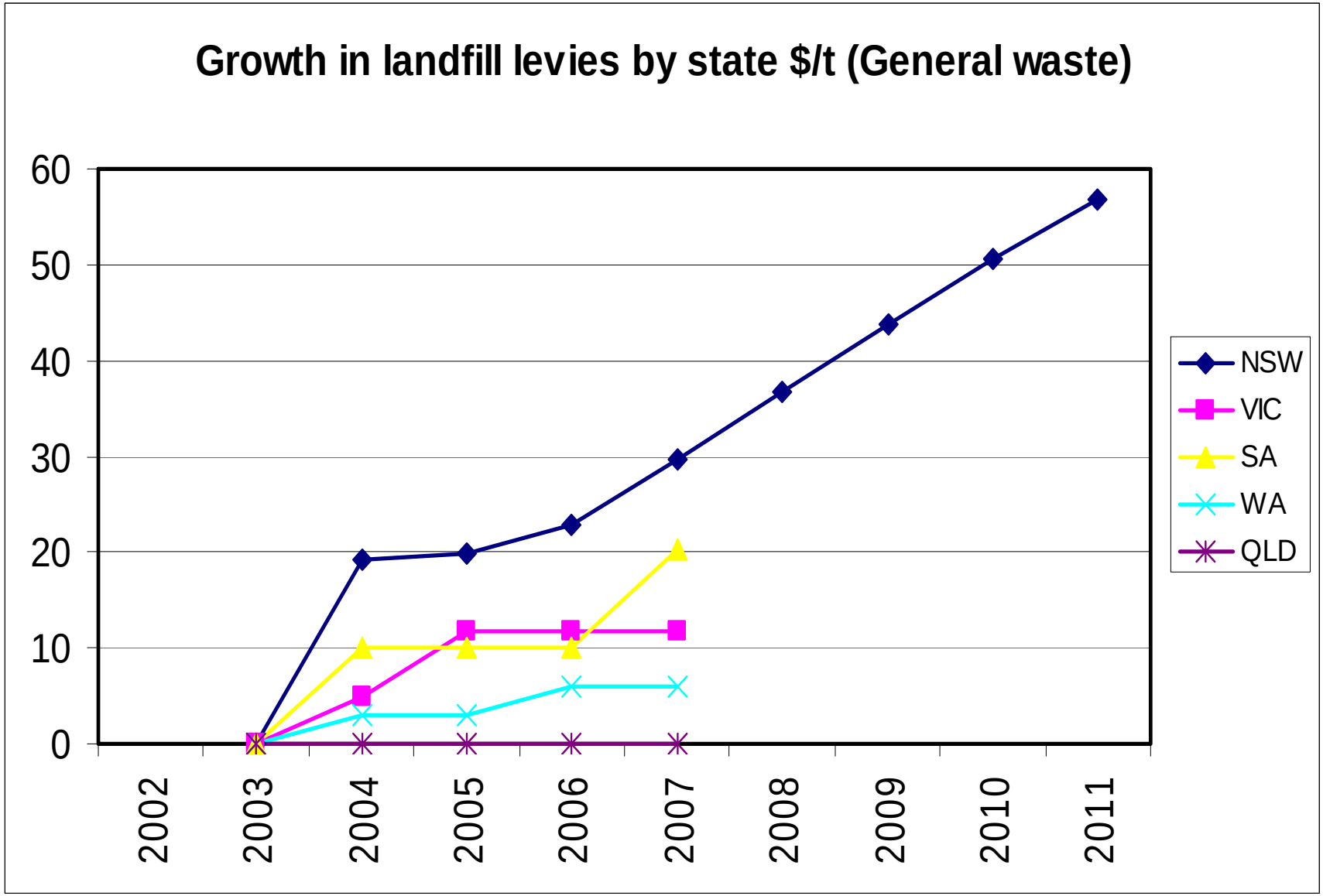
18 April 07, UK Financial Times

"Governments must regulate or change the economics. The UK is doing both"

What are Market Based Instruments

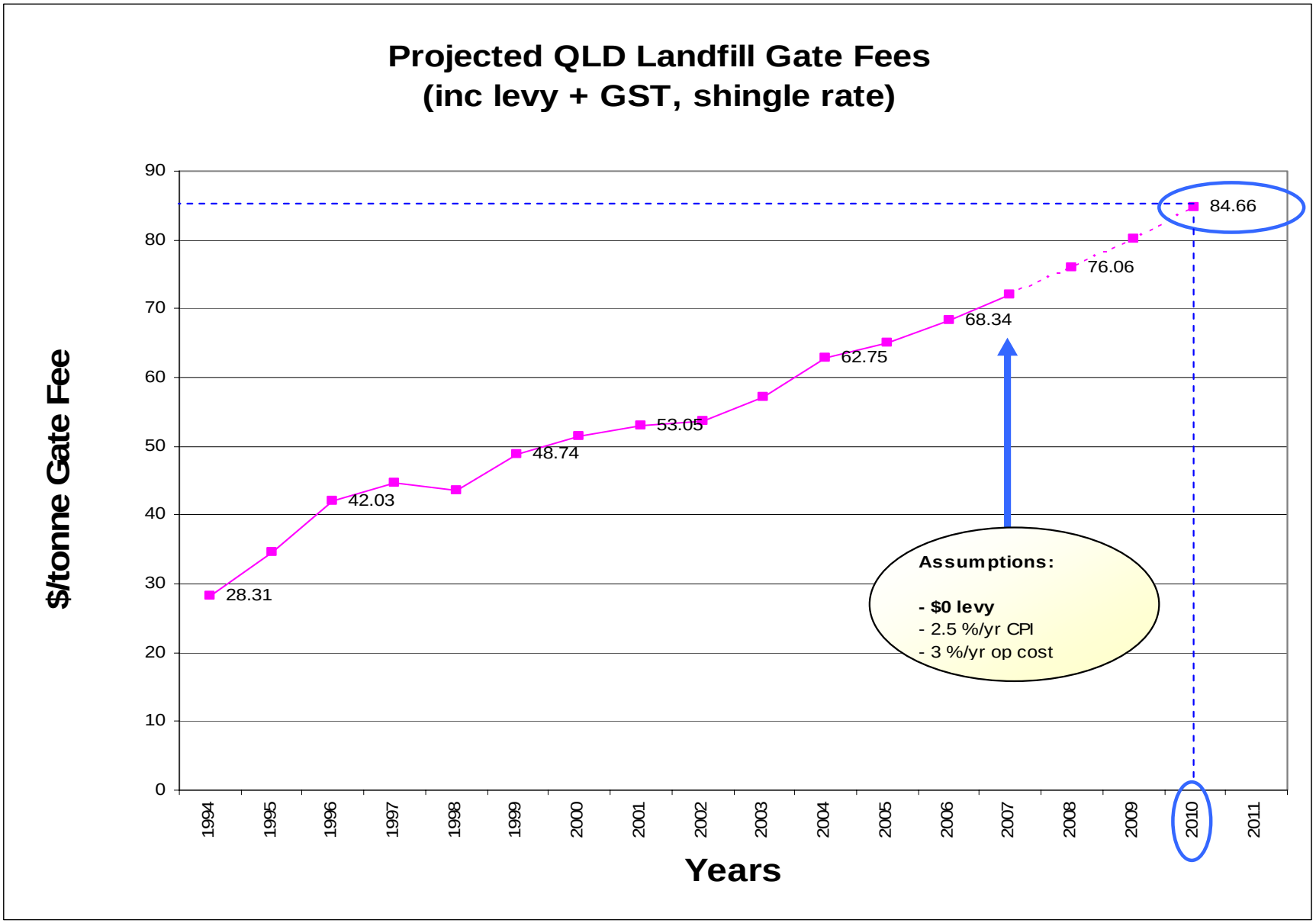
- Charges and levies (e.g. landfill levy)
- Tradable certificates (e.g. cap and trade)
- Subsidies
- Deposit schemes

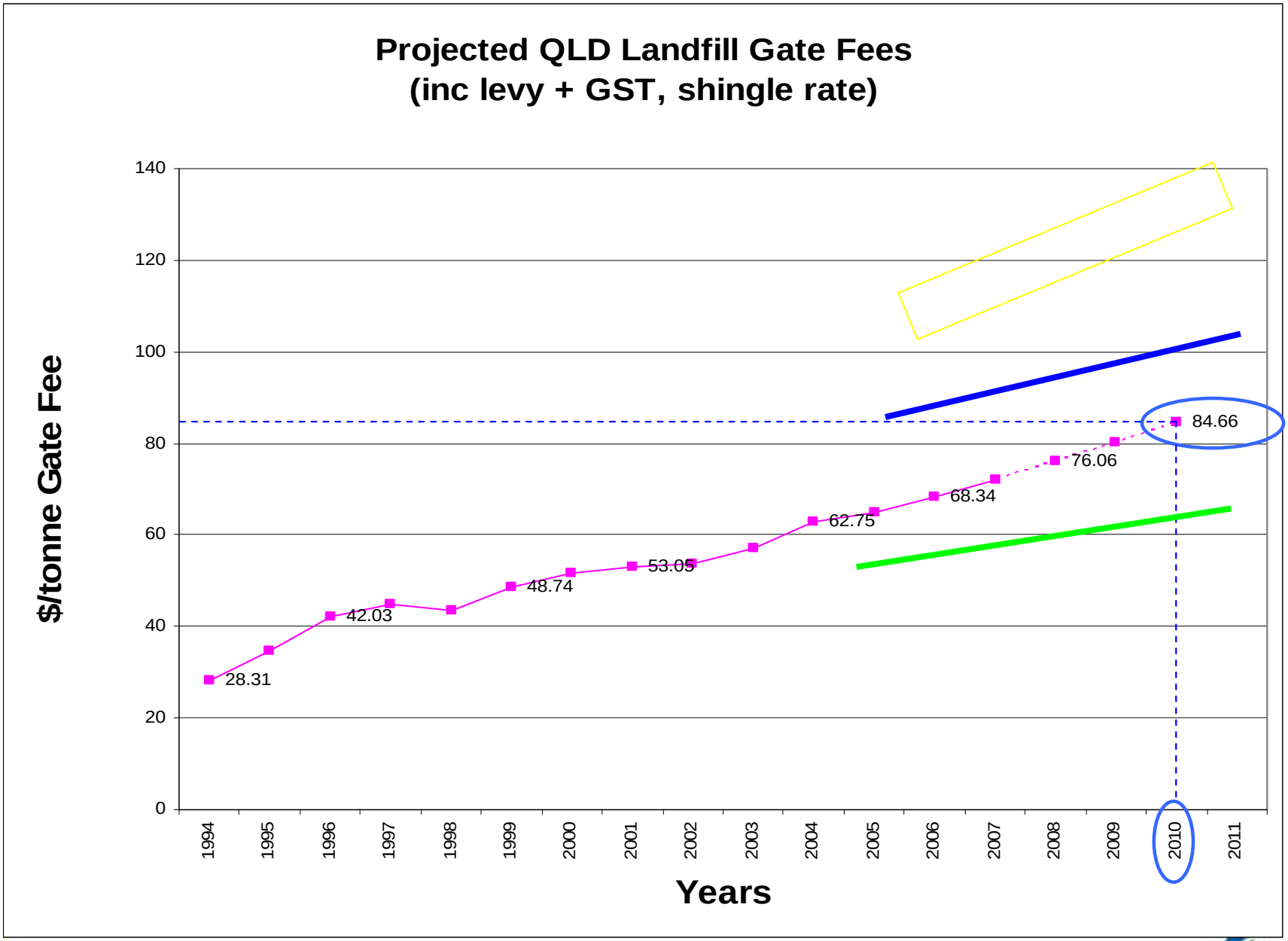
- The simplest and most easily implemented MBI in QLD is a landfill levy


Growth in landfill levies by state $/t (General waste)
60
50
40
30
20
10
0
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
NSW
VIC
SA
WA
QLD

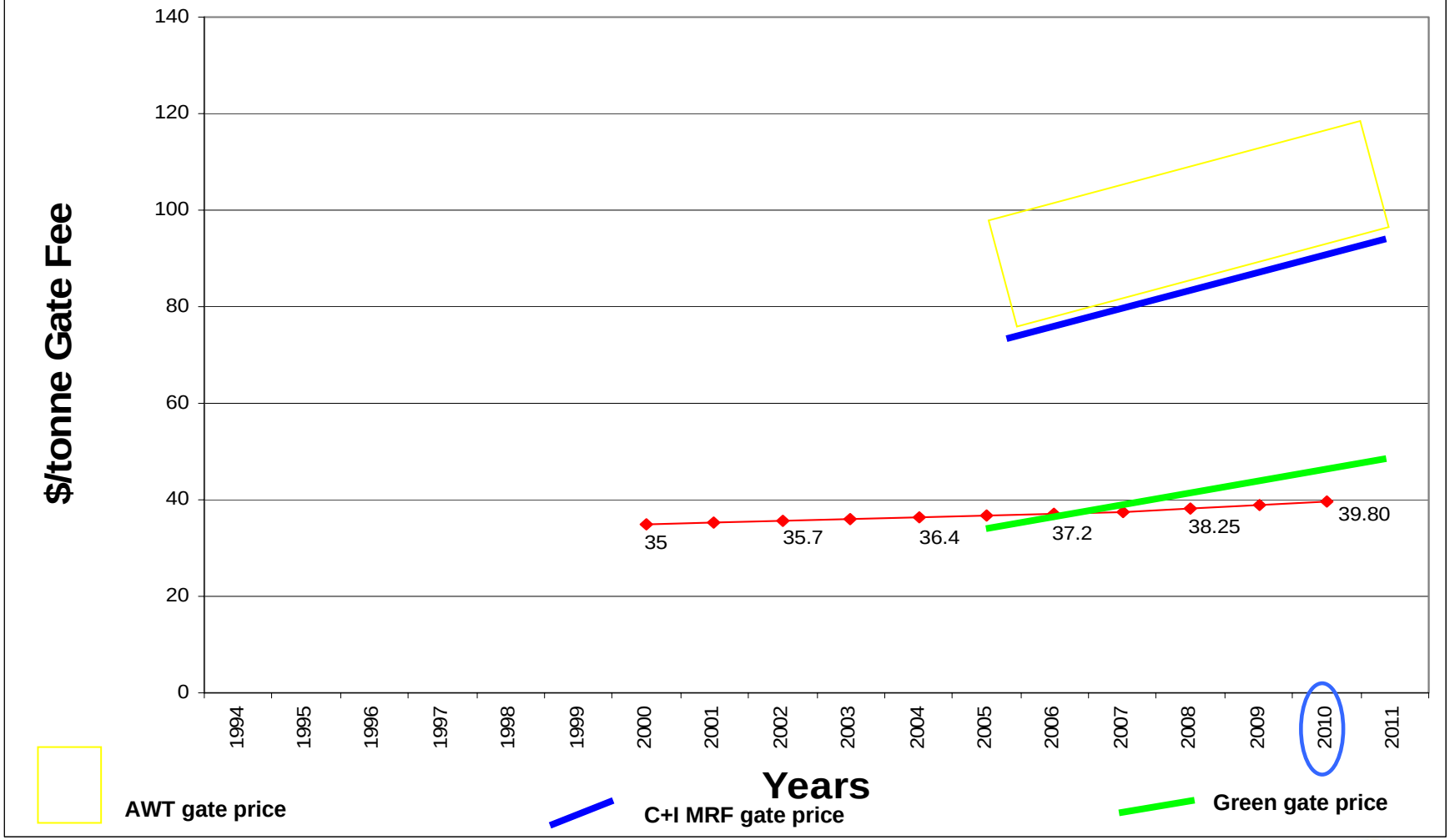
Justification for a levy

1. Account for the externalities of landfills (PC)
   - Stern - A$119/t for MSW to landfill without gas capture
2. Alter the economic balance of recycling and landfill
   - (SA and NSW)
3. Raise funds for recycling initiatives (WA)
4. Drive specific wastes from landfill
   - Prescribed Industrial Waste (Vic)

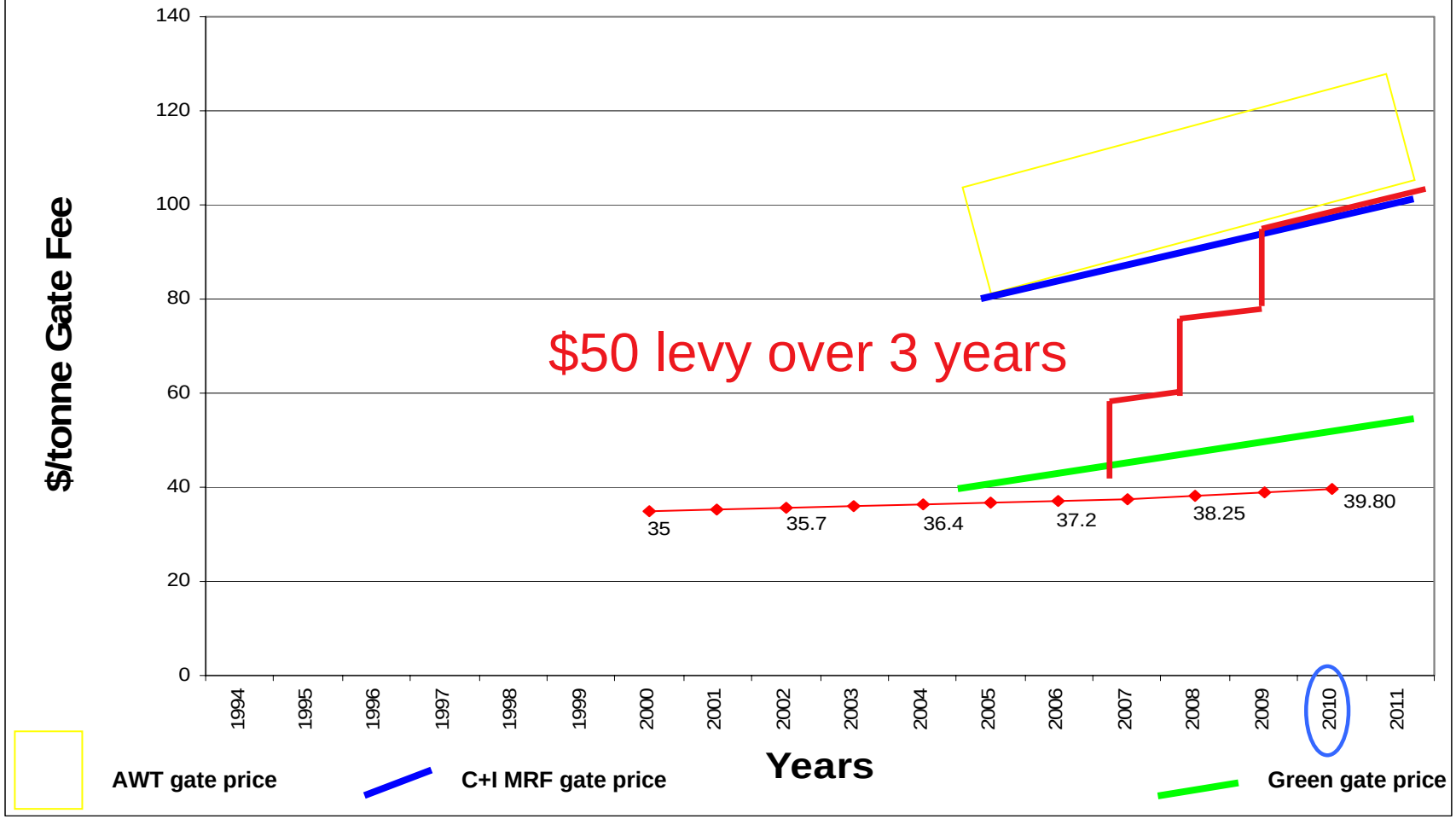

Projected QLD Landfill Gate Fees
(inc levy + GST, shingle rate)
$/tonne Gate Fee
90
80
70
60
50
40
30
20
10
0
28.31
42.03
48.74
53.05
62.75
68.34
76.06
84.66
Assumptions:
- $0 levy
- 2.5 %/yr CPI
- 3 %/yr op cost
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
Years


Projected QLD Landfill Gate Fees
(inc levy + GST, shingle rate)
$/tonne Gate Fee
140
120
100
80
60
40
20
0
28.31
42.03
48.74
53.05
62.75
68.34
76.06
84.66
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
Years

Projected QLD Landfill Gate Fees - ACTUAL (inc levy + GST)



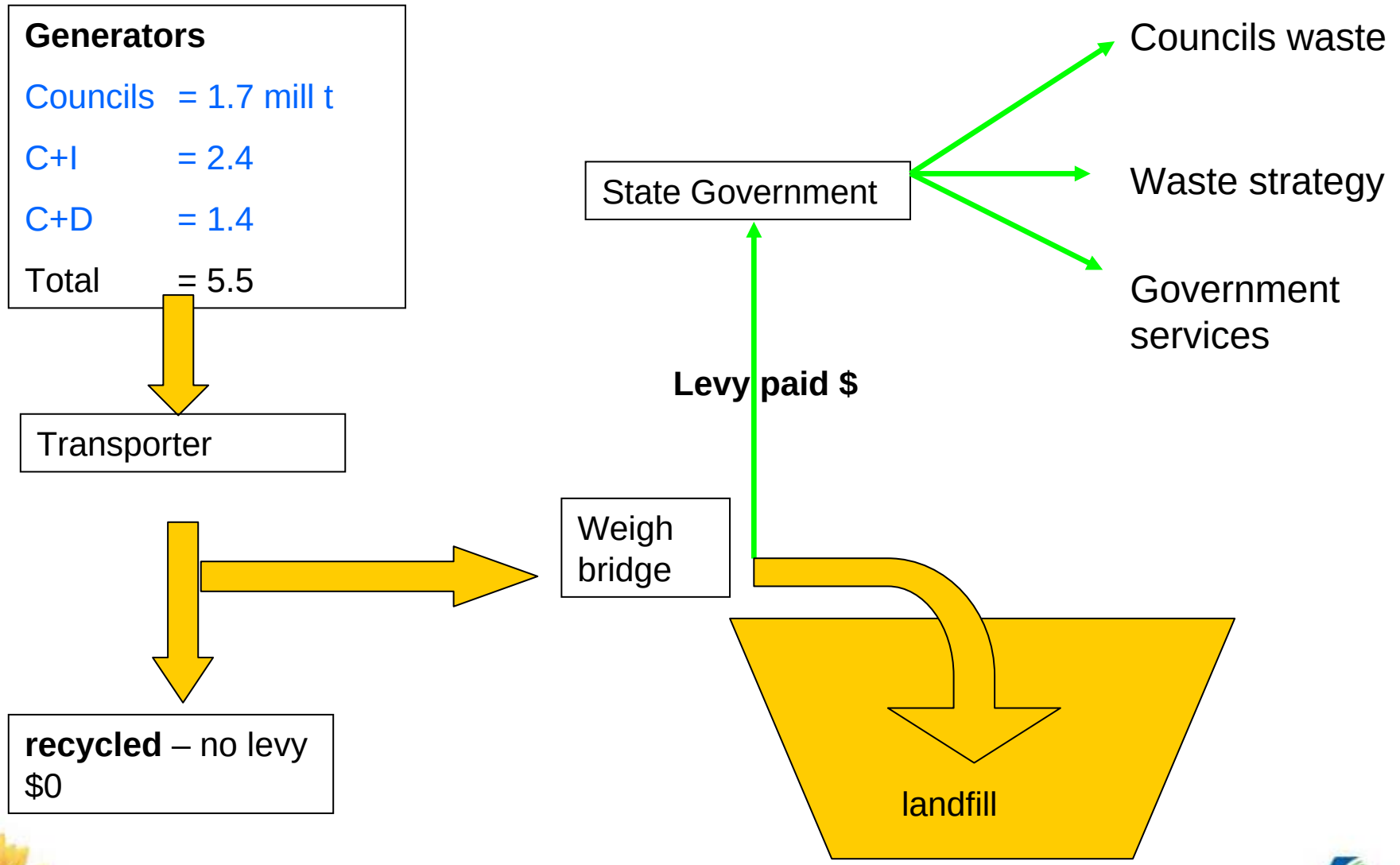
Projected QLD Landfill Gate Fees - ACTUAL (inc levy + GST)



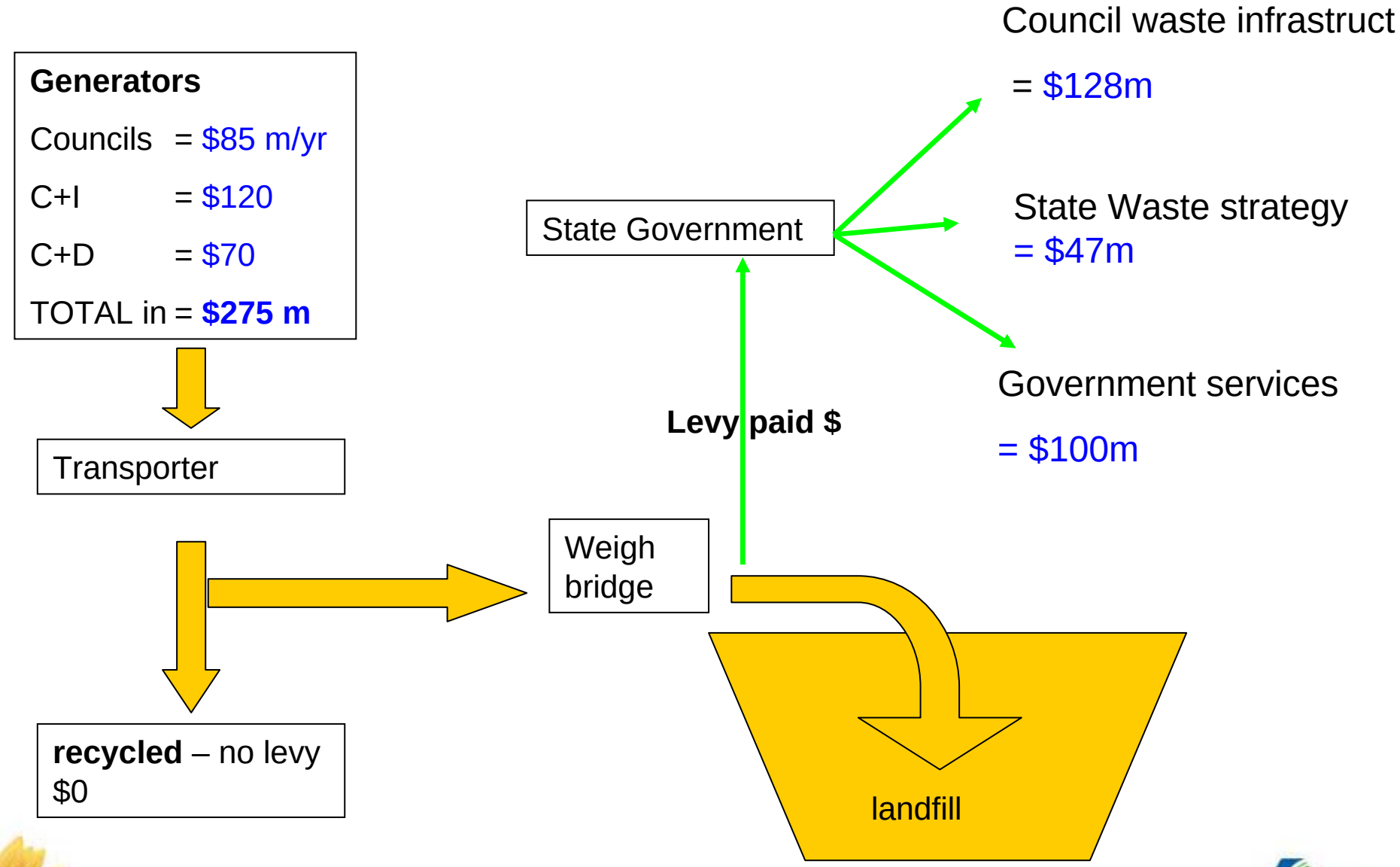
$50 levy

- **C+I dirty MRF's become viable**
- **Some AWT's become viable**
- **Green waste recycling is viable**

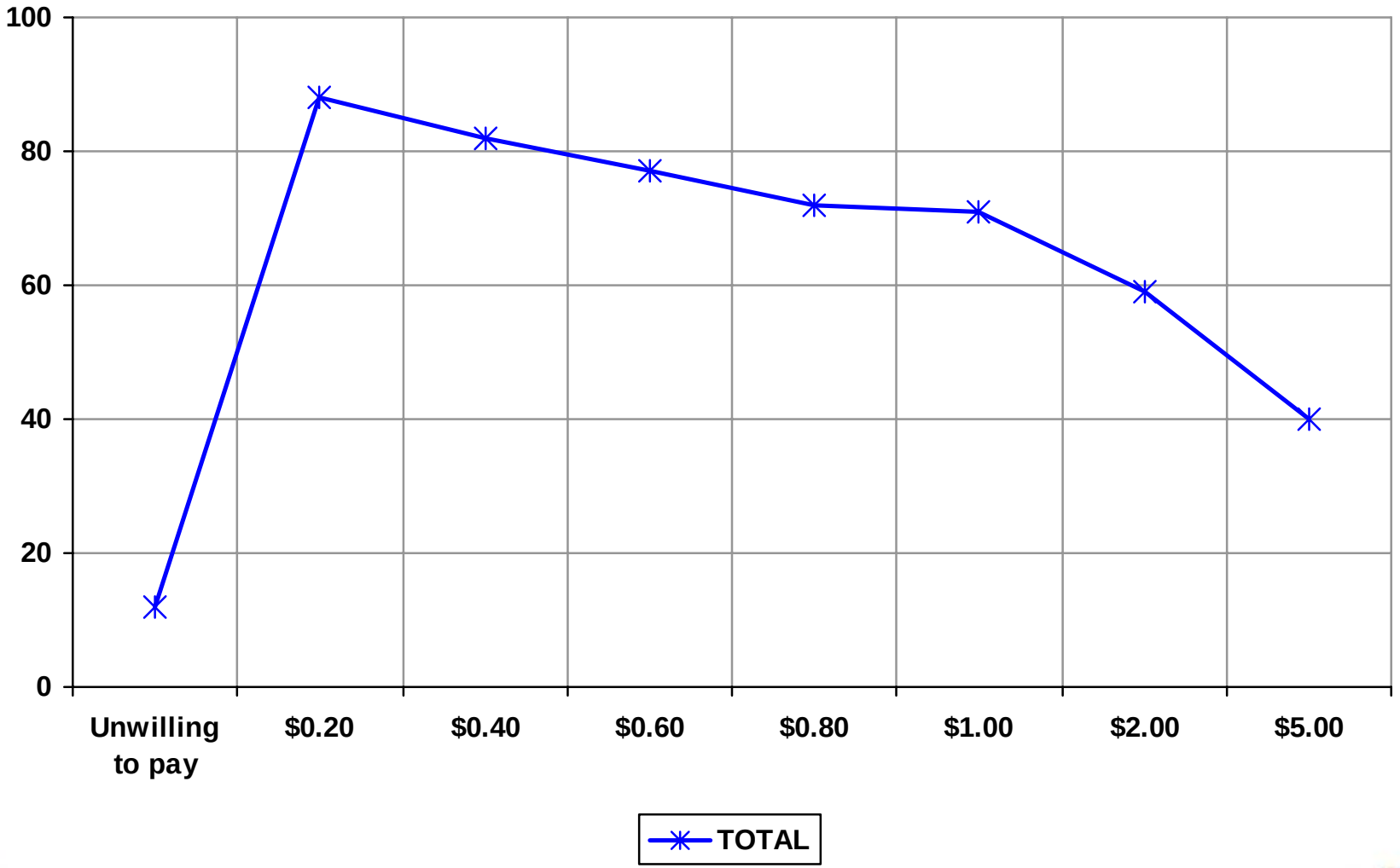
Levy mechanics



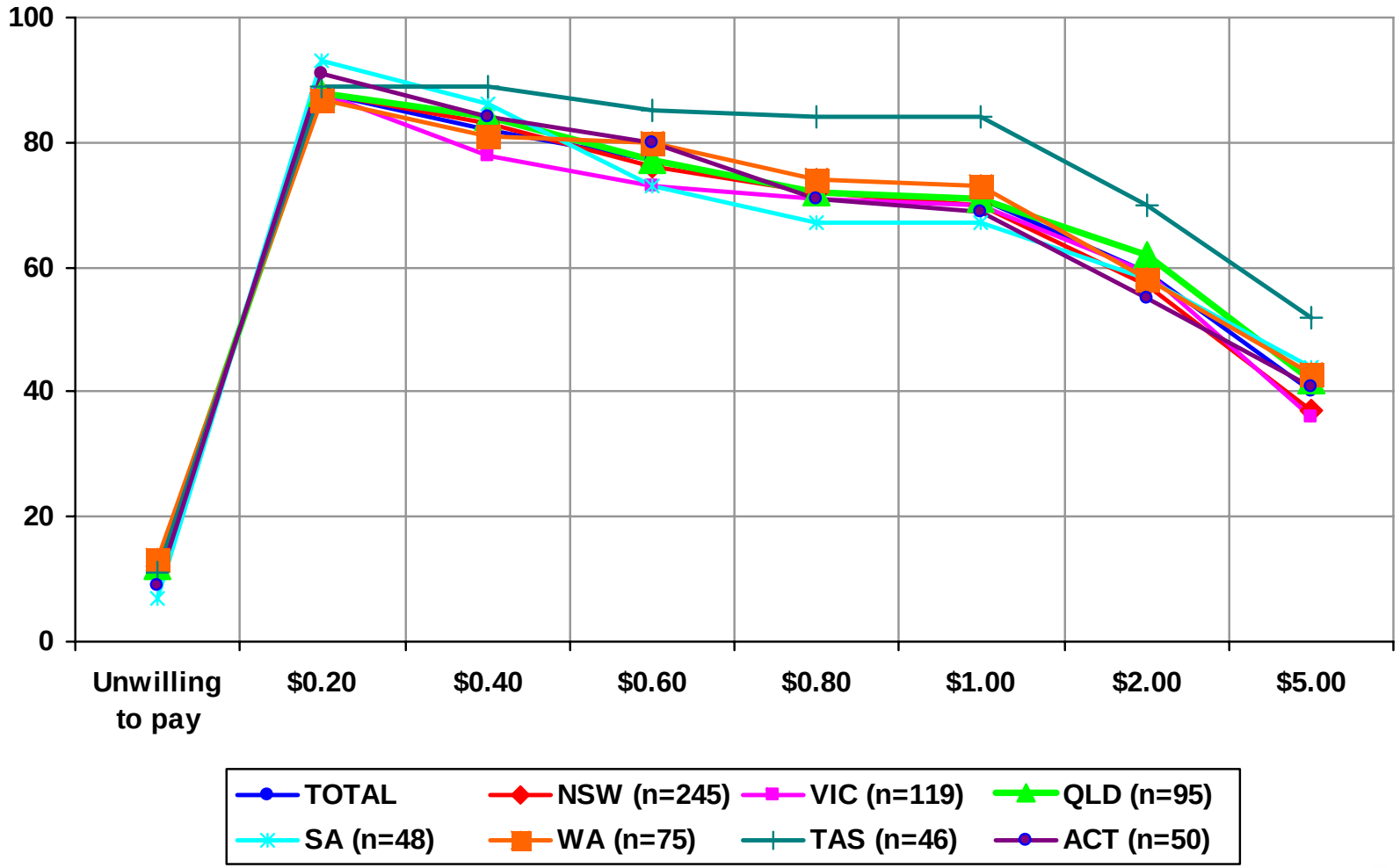
Possible QLD model = $50/t



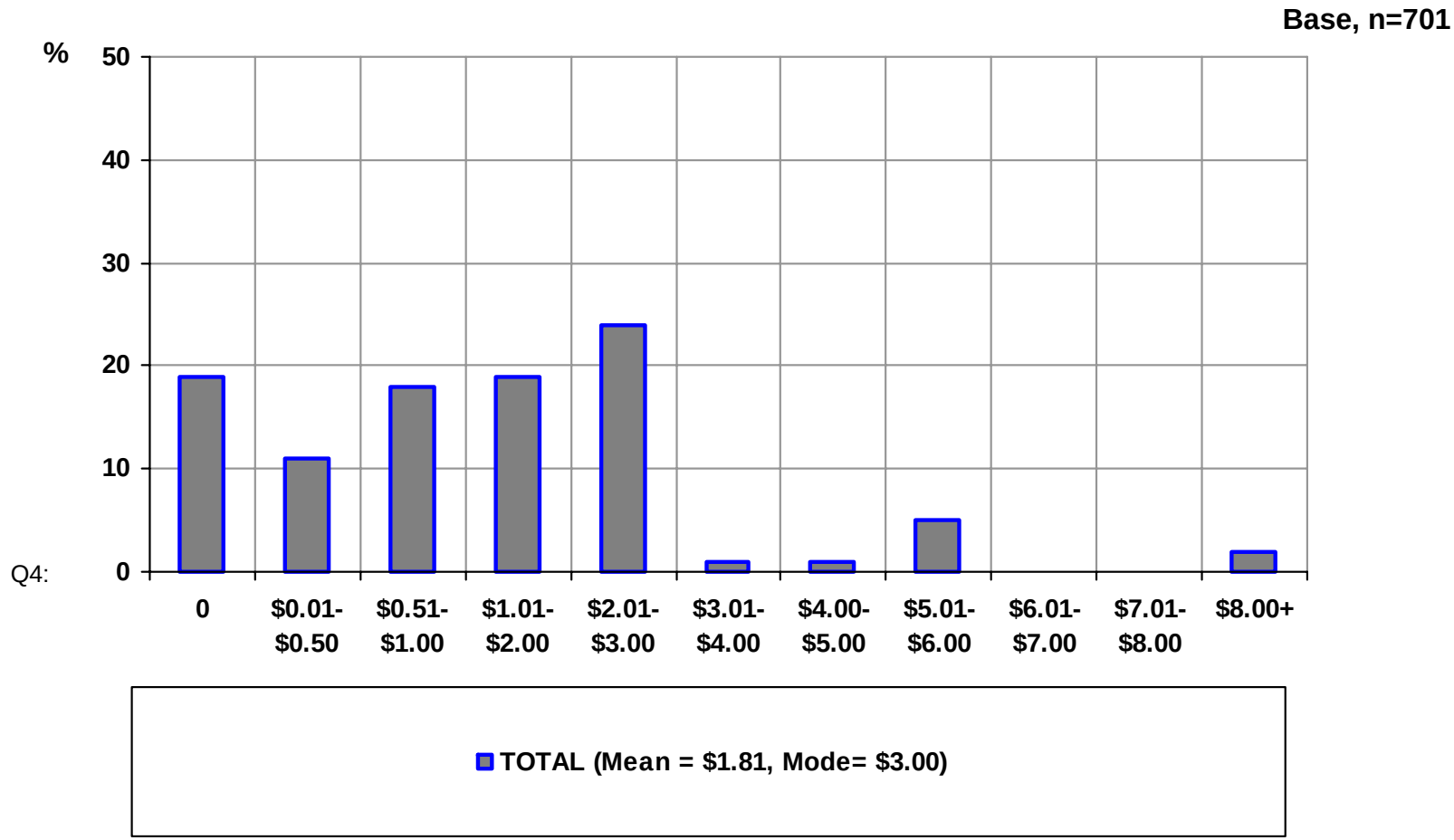
Willingness to pay additional waste collection weekly fee (prompted)



Willingness to pay additional waste collection weekly fee by State (prompted)



Additional weekly fee considered acceptable to householders (spontaneous)



Residents are:

- willing to pay
- $94 / year or $1.81/week
- $50/t levy would add $1/week

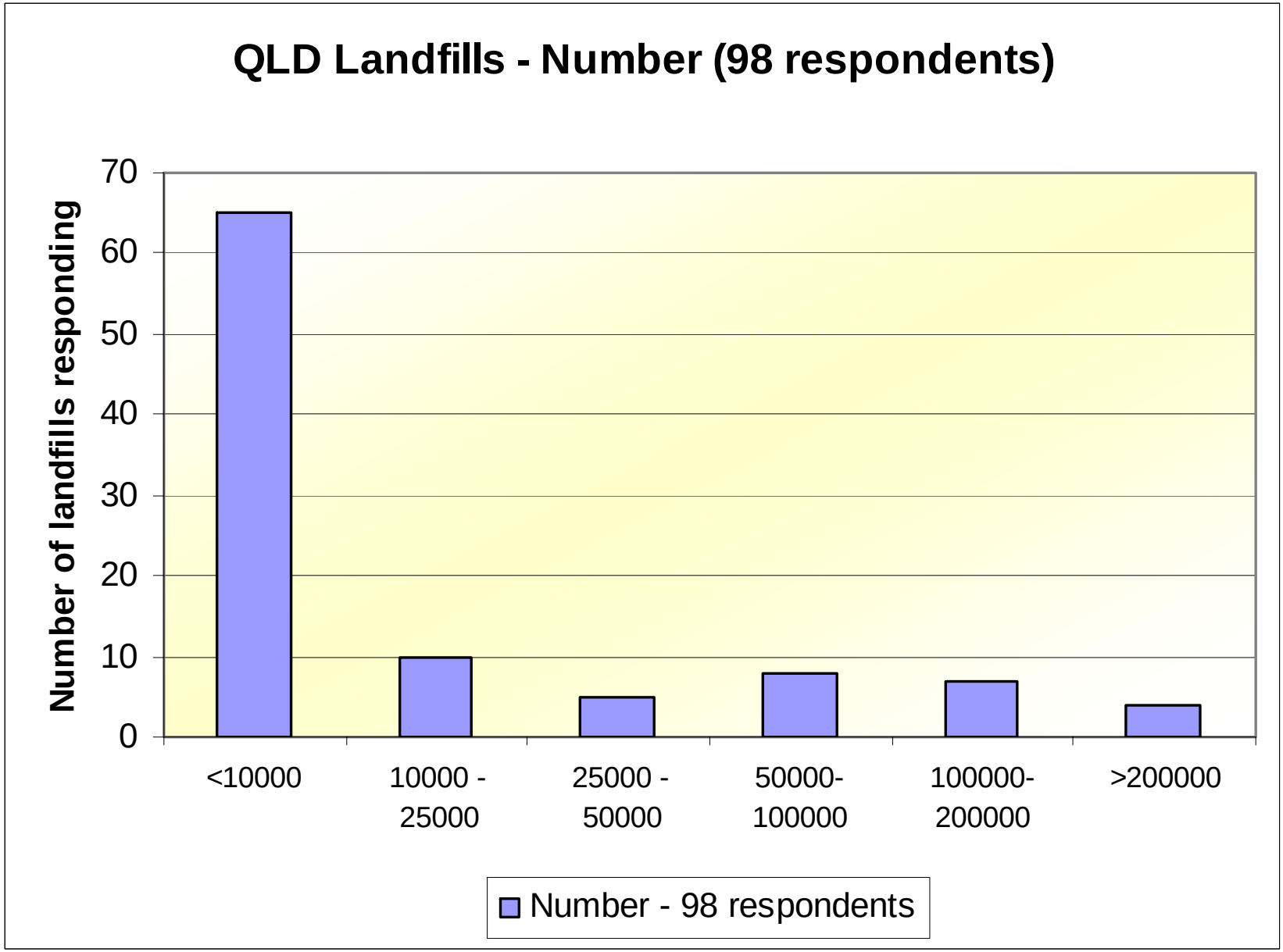
QLD waste strategy 2007

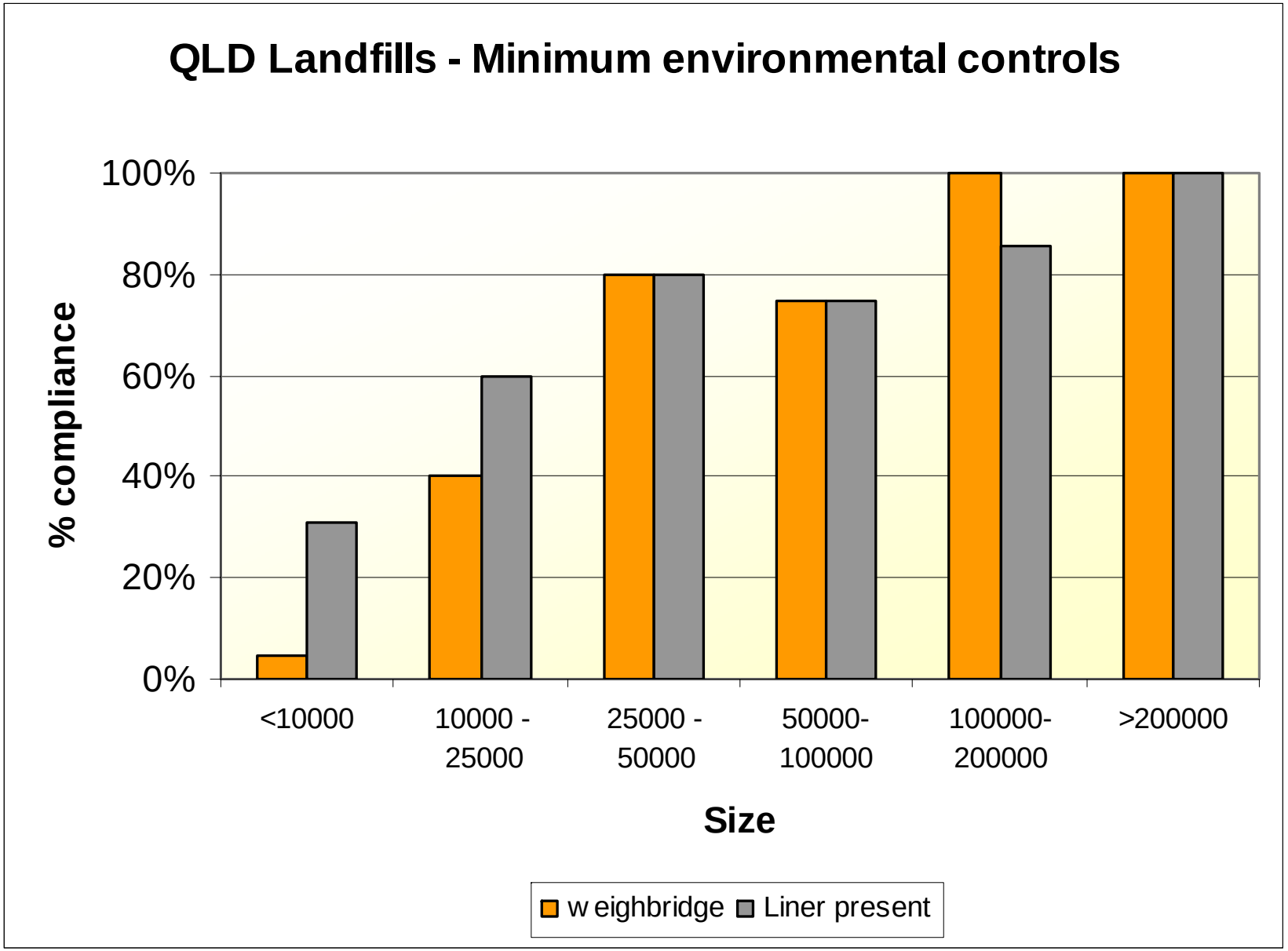
- *"Without change it could be expected that:*
  - *Waste generation and GHG emissions will continue to increase*
  - *Resource recovery will be limited*
  - *Limited capacity for infrastructure*
  - *Limited investment in new technologies"*

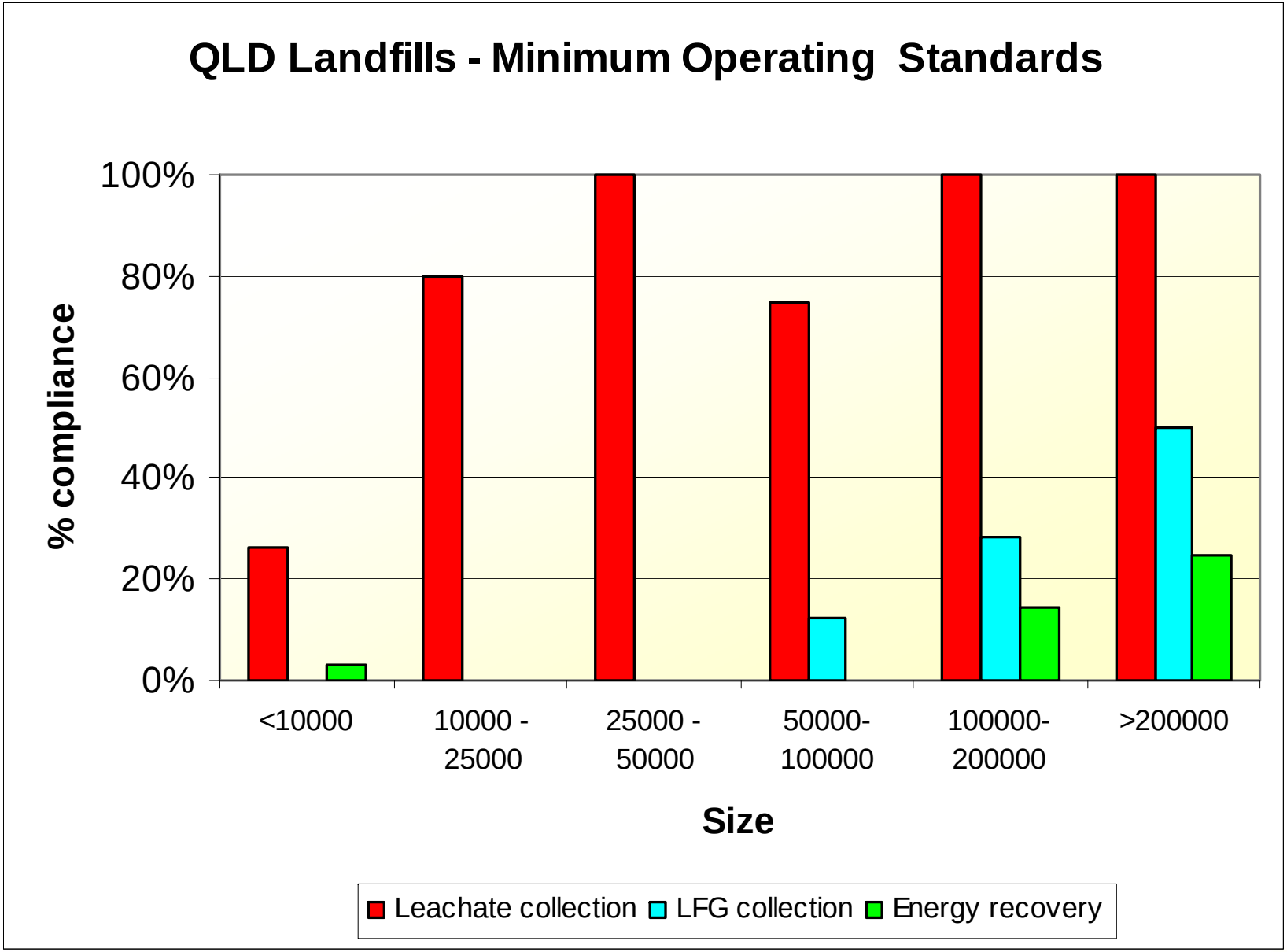
Conclusions

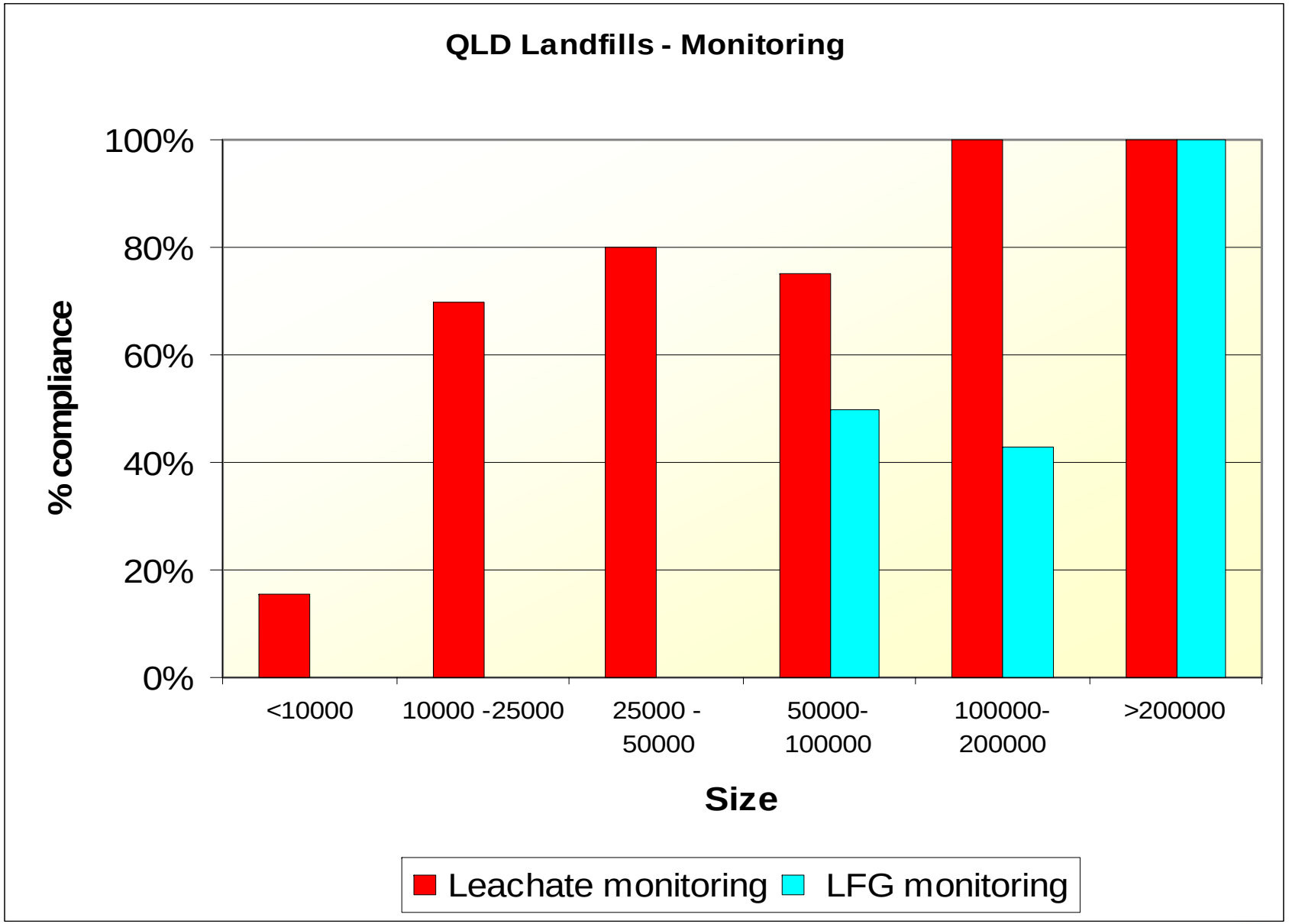
1. Growth in waste to landfill is unsustainable
2. Climate change demands action now:
    1. Require gas capture
    2. Limit DOC in landfill
    3. Improve recycling rates
3. The community is willing to pay and wants leadership
4. $50/t levy raises $275m per year for waste reform
    1. Australian and international experience
5. The industry is ready to invest billions – it needs the right pricing and policy settings

Thank you for your attention


QLD Landfills - Number (98 respondents)
Number of landfills responding
70
60
50
40
30
20
10
0
<10000
10000 - 25000
25000 - 50000
50000- 100000
100000- 200000
>200000
Number - 98 respondents


QLD Landfills - Minimum environmental controls
% compliance
100%
80%
60%
40%
20%
0%
<10000
10000 - 25000
25000 - 50000
50000- 100000
100000- 200000
>200000
Size
w eighbridge
Liner present


QLD Landfills - Minimum Operating Standards
% compliance
100%
80%
60%
40%
20%
0%
<10000
10000 - 25000
25000 - 50000
50000- 100000
100000- 200000
>200000
Size
Leachate collection
LFG collection
Energy recovery


QLD Landfills - Monitoring
100%
80%
60%
40%
20%
0%
% compliance
<10000
10000 -25000
25000 - 50000
50000- 100000
100000- 200000
>200000
Size
Leachate monitoring
LFG monitoring

Major landfills in South-East Queensland with gas capture

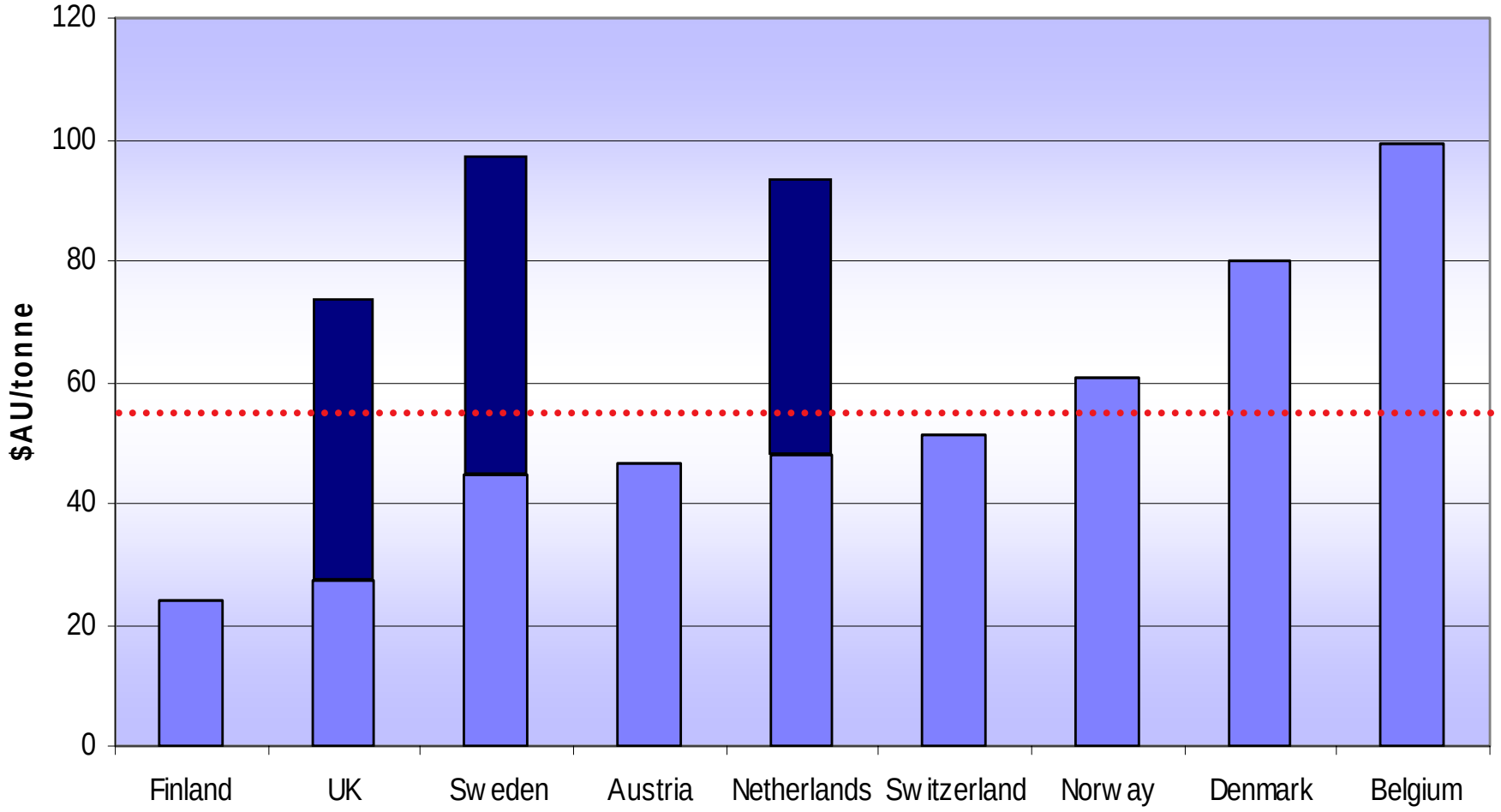
Name of landfill	Area	Gas capture
Rockdale	Brisbane	√
T Tree Gully	Brisbane	√
Swanbank	Brisbane	√
Molendinar	Gold Coast	√
Suntown	Gold Coast	√
Tugun	Gold Coast	-
Reedy Creek	Gold Coast	-
Stapylton	Gold Coast	-
Noosaville	Noosa	-
Buderim	Maroochy	-

Landfill gate fees

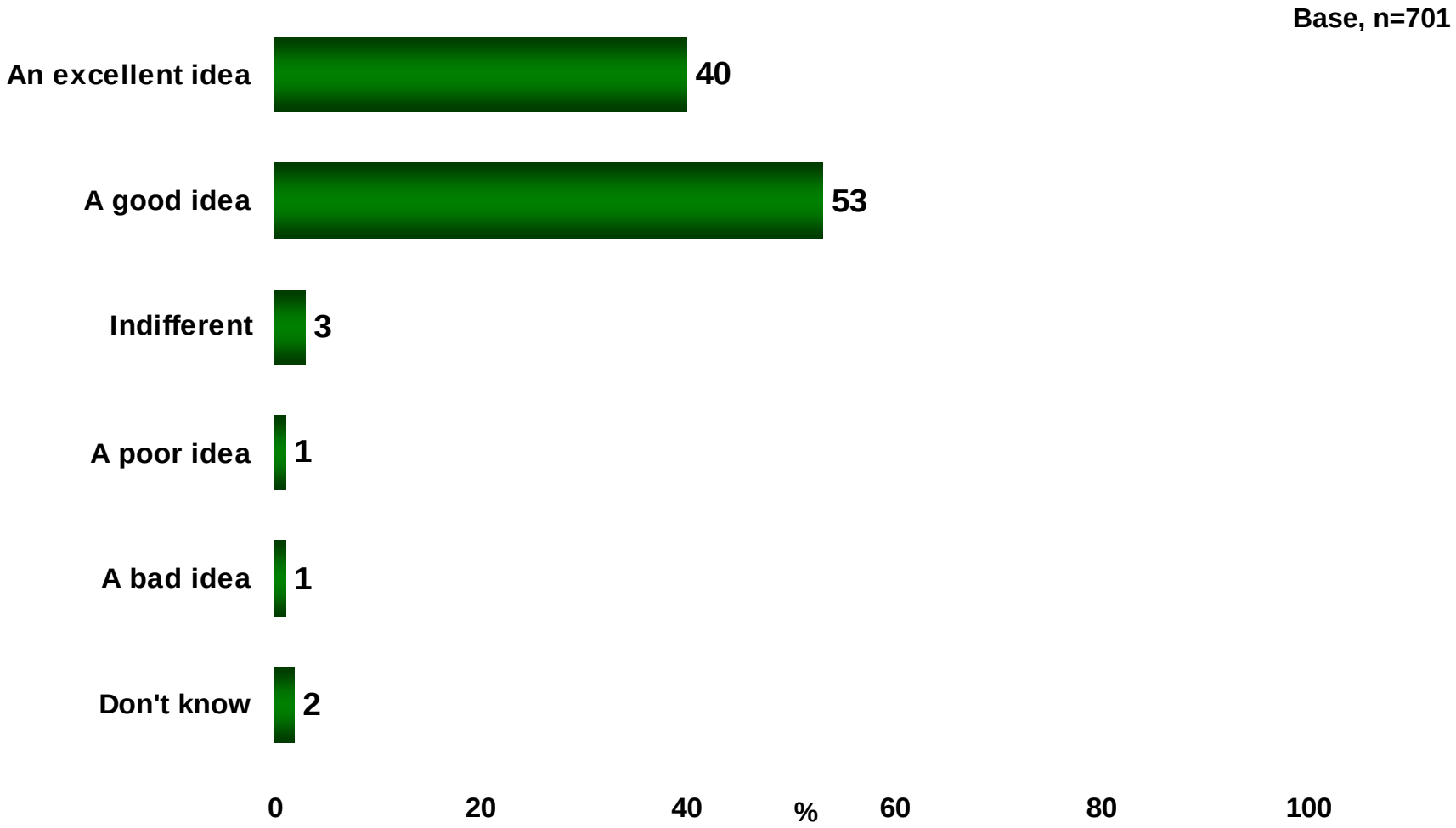
Disposal site	Customer charge/tonne excl GST
BCC Transfer Station – Nudgee	$63.6
BCC Transfer Station	$80.7
Caboolture SC-Commercial	$62
Collex – Gold Coast	$50.50
Collex Transfer Stn, Northgate	$44
Murrarie Landfill (Front lift Trucks)	$44.6
Logan Waste Services	$55.8
Pine Rivers, Strathpine (Dakabin)	69.8
Thiess - Swanbank	$69
Tweed Shire Council	$58.5

Policy for MSW	United Kingdom	Australia
Putrescible MSW to landfill	Mandated 2010 – 25% reduction 2013 – 50% reduction 2020 – 65% reduction	No mandated targets Voluntary targets: • **NSW 2014 66% MSW** • **VIC 2013 65% MSW** • **WA 2020 100%** • **ACT 2010 100%** • **SA 2010 75%** • **NT no date 0%** • **QLD no date 0%** • **TAS no target**
Landfill levy	$A86/t	• **NSW $30 to $58 in 2010** • **VIC $11/t** • **WA $6/t** • **ACT $80/t** • **SA $20/t** • **NT $0/t** • **QLD $0/t** • **TAS $0/t**
LATS disposal penalty	$500/t + tipping	Tipping: • **NSW $90/t** • **VIC $40** • **WA $44** • **ACT $80** • **SA $65** • **NT $40** • **QLD $35** • **TAS $30**
Recycling Targets	2006 – 23% 2010 – 30%	No regulated targets But recycling rates 40-72%

Landfill tax in European countries ($AU/tonne):
the escalador system



Waste generators are willing to pay



MEAN RATING: 4.3 out of 5

Q1:

Recycled containers embodied energy

FCM 240L bin:

CO2e 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

Paper & cardboard embodied energy

240L bin fortnightly:

CO2e 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