



# **Towards Zero Waste – How is this achievable?**

Dr Andy Rees  
Head of Waste Strategy Branch  
Welsh Assembly Government

# Wales – some key facts



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- National Government
  - Devolved Government from 1st April 1999
  - Full devolved powers & budget for local government and waste
  - Secondary legislation powers for waste, competence for primary legislation powers being formally sought
- Local Government
  - 22 Unitary Authorities since 1996
  - Av population 136,000 (June 200)
    - lowest Merthyr Tydfil 55,700;
    - highest Cardiff 324,800
  - Av municipal waste 74,800 tonnes (2008-09 provisional)
    - lowest Merthyr Tydfil 32,222 tonnes;
    - highest Cardiff 177,764 tonnes
  - Same recycling targets set for each authority from 2002-03
  - Ring fenced Sustainable Waste Management Grant – SSA formula
  - Landfill Allowances Scheme Wales – no trading, banking borrowing

# The “accepted” definition of Zero Waste?



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- According to the Zero Waste International Alliance 2004, the internationally accepted definition is:
  - ‘Zero Waste is a goal that is both pragmatic and visionary, to guide people to emulate sustainable natural cycles, where all discarded materials are resources for others to use. Zero Waste means designing and managing products and processes to reduce the volume and toxicity of waste and materials, conserve and recover all resources, and not burn or bury them. Implementing Zero Waste will eliminate all discharges to land, water or air that may be a threat to planetary, human, animal or plant health.’

# What drives us towards a “Towards Zero Waste” approach in Wales?



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- Greenhouse gas emissions
  - wasted products have a high carbon footprint / embedded energy
  - recycling reduces GHG emissions
- Unsustainable resource use
  - 3 planet living is unsustainable
  - resource efficiency /security of supply
  - “Peak Oil” imminent
  - Sustainable Consumption and Production
- Energy supply/policy
  - valuable source of renewable energy
- EU Directives & Policies/Strategies
- Public pressure
- Sustainable Development

# Towards Zero Waste Wales



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Helpu Cymru i leihau ei Hôl Troed Carbon  
Help Wales reduce its Carbon Footprint

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**Towards Zero Waste**

One Wales: One Planet  
Summary

Textiles Paper Plastics Metals Electrical  
Paint Household Organics Brown Glass Blue Glass Wood

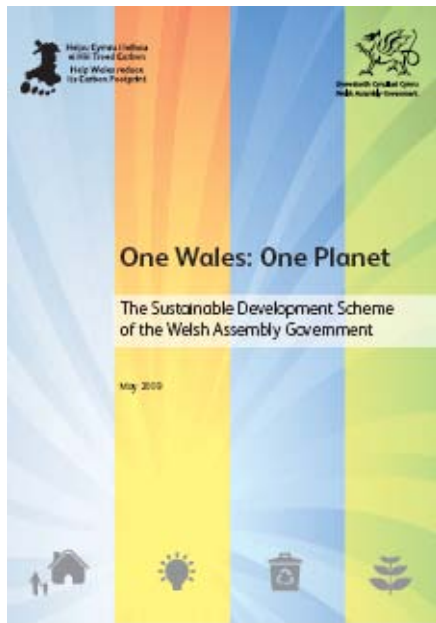
A Consultation on a New  
Waste Strategy for Wales  
April 2009

- Our aim is to:
  - Take a “zero waste” approach, which means we aim to produce no waste in the long term, by designing products and services that reduce or reuse waste as far as possible, and developing a locally and highly skilled economy for waste management and resource efficiency.
- High level framework
  - Long term, outcome focussed plan – certainty for investment
  - Focus on areas of most benefit
- Outcomes sought:
  - Achieving sustainability
  - Reducing ecological-footprint
  - Limiting climate change; and
  - Improving resource efficiency

# New Sustainable Development Scheme – “One Wales, One Planet”



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- “Within the lifetime of a generation, we want to see Wales using only its fair share of the earth’s resources, and where our ecological footprint is reduced to the global average availability of resources - 1.88 global hectares per person – ‘One planet living’ “
- “To achieve this goal over a generation, we will need to **reduce by at least two thirds the total resources we currently use** to sustain our lifestyles. To reduce this must include:
  - a radically different approach to waste management, moving towards becoming a zero waste nation. By this, we mean a society where we focus on eliminating waste, and waste that can’t be eliminated must be recycled in “closed loop” systems that achieve the best reduction in ecological and carbon footprints. This will build on our stated goal of achieving 70% recycling across all sectors, and diverting waste from landfill by 2025.”

# Two-pronged approach in “Towards Zero Waste”



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- **2050: Towards Zero Waste**
  - reduce our share of Wales’ ecological footprint to ‘one Wales: one planet’ levels by 2050.
  - produce no waste in the long term, by designing products and services with waste prevention in mind.
- **2025: A high recycling society**
  - Recycling rate of at least 70%
  - ‘Closed loop recycling’ systems
  - Meet 2012/13 and 2019/20 Landfill Directive targets through source separated recycling/composting/anaerobic digestion
  - Residual waste will be phased out of landfill towards high efficiency energy from waste plants

# What evidence is there to justify the approach?



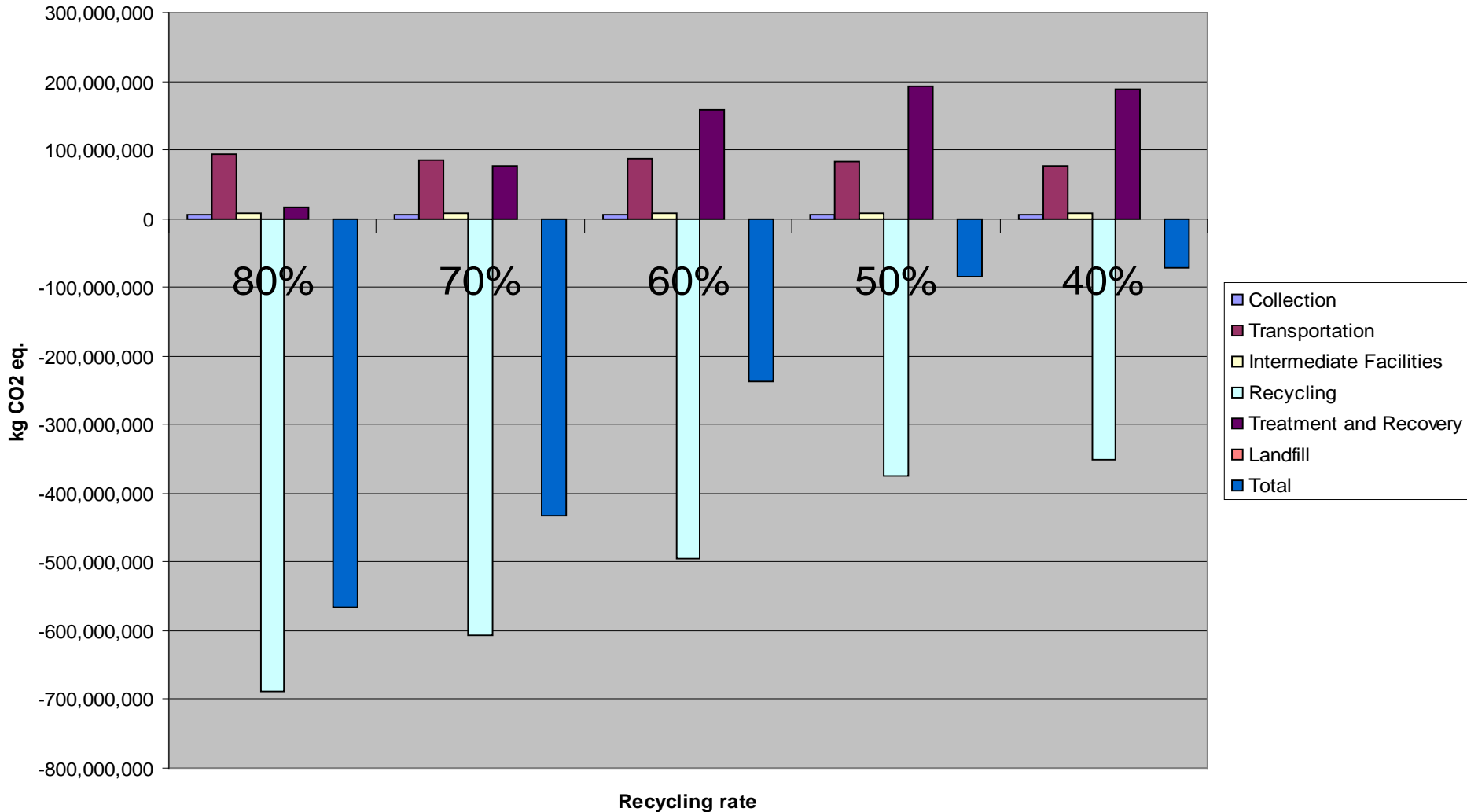
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- Extensive evidence gathering commissioned in respect of:
  - Ecological footprint modelling of waste “switches”
  - Life Cycle Assessment modelling of global warming potential of options
  - Financial modelling of municipal waste options
  - Marginal abatement curve modelling of waste options (cost per tonne carbon abated)
  - Practicalities of meeting 70% municipal waste recycling target
  - Energy efficiency and LCA carbon modelling of residual waste treatment options
  - Health Impact Assessment
  - Strategic Environmental Assessment
  - Sustainability Appraisal

# Global warming potential for different recycling:EfW levels – 80:20% to 40:60%



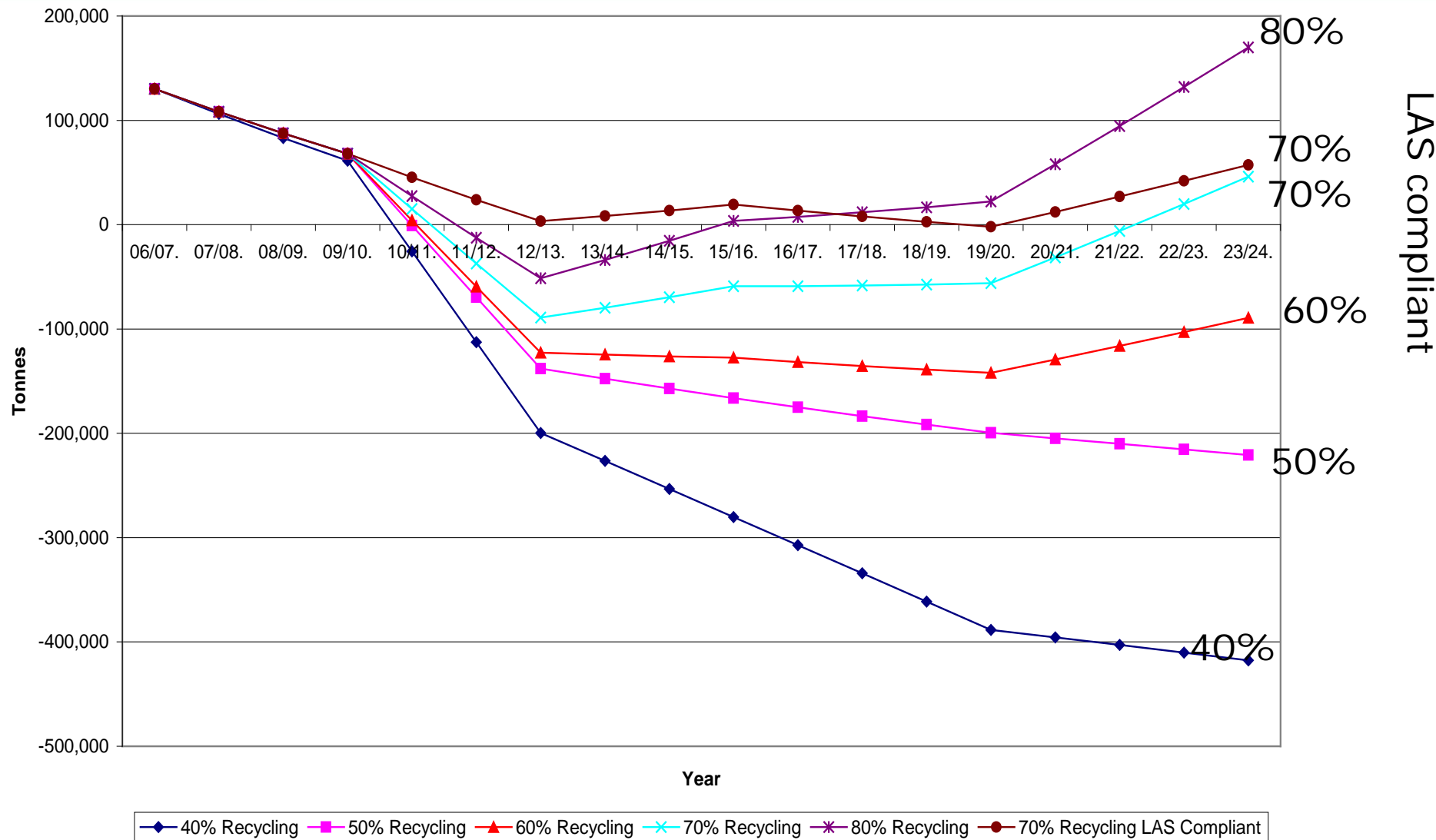
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# Balance of Landfill Allowances, All Recycling Scenarios (+ve means targets exceeded, negative means targets not being met)



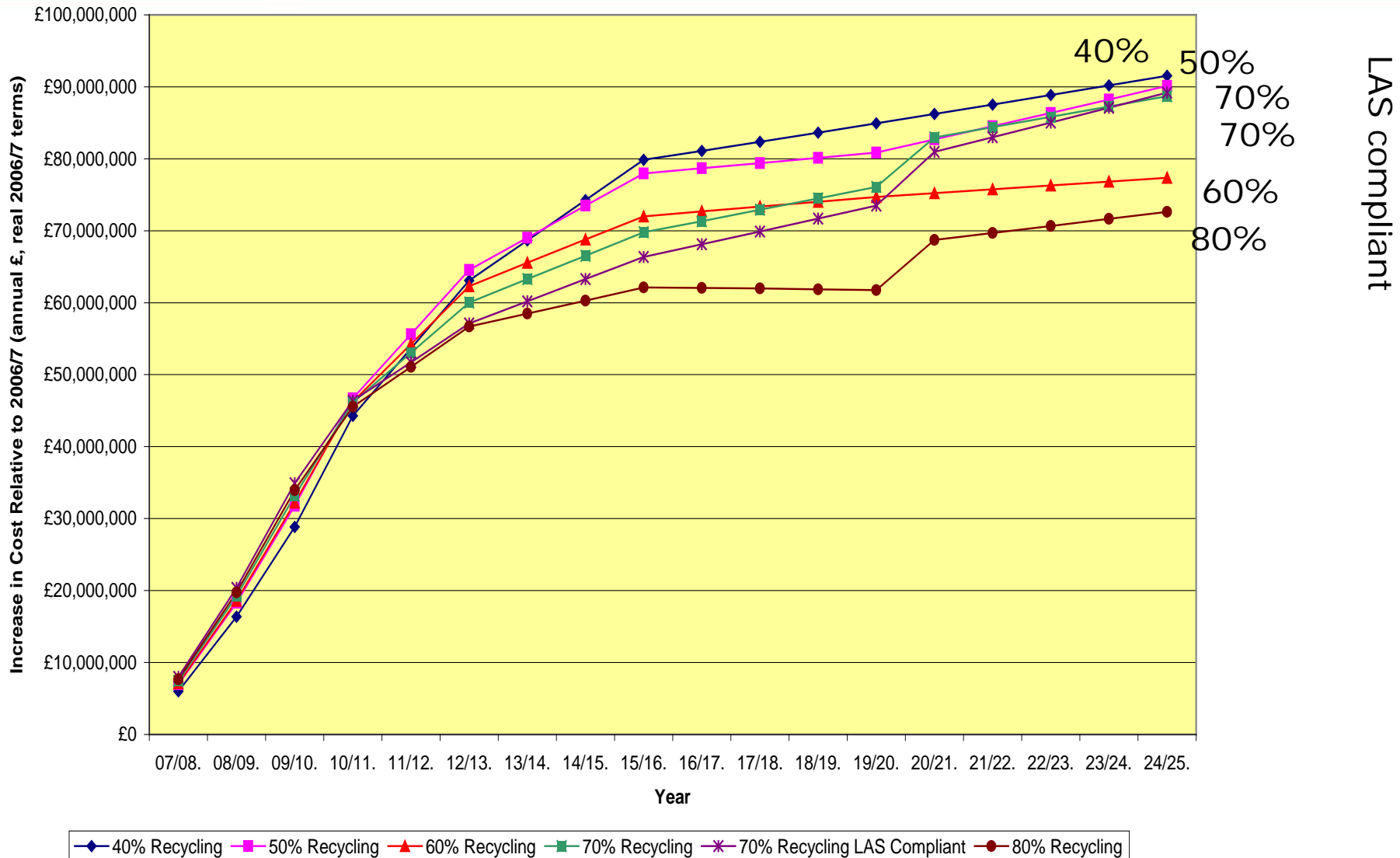
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# Predicted annual increases in cost relative to 2006/7 for each recycling target option

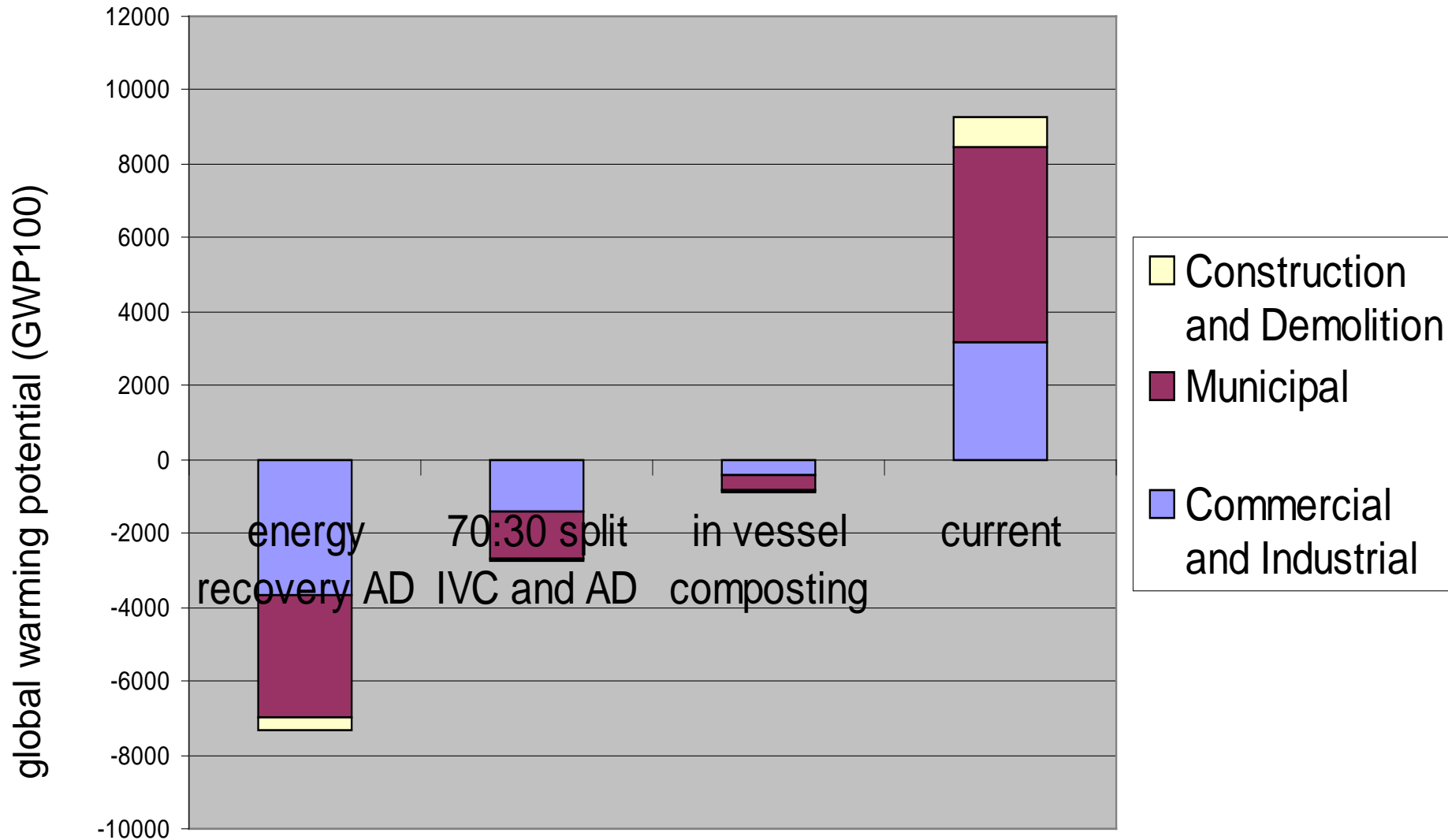


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# Anaerobic digestion (AD) v in-vessel composting (IVC)

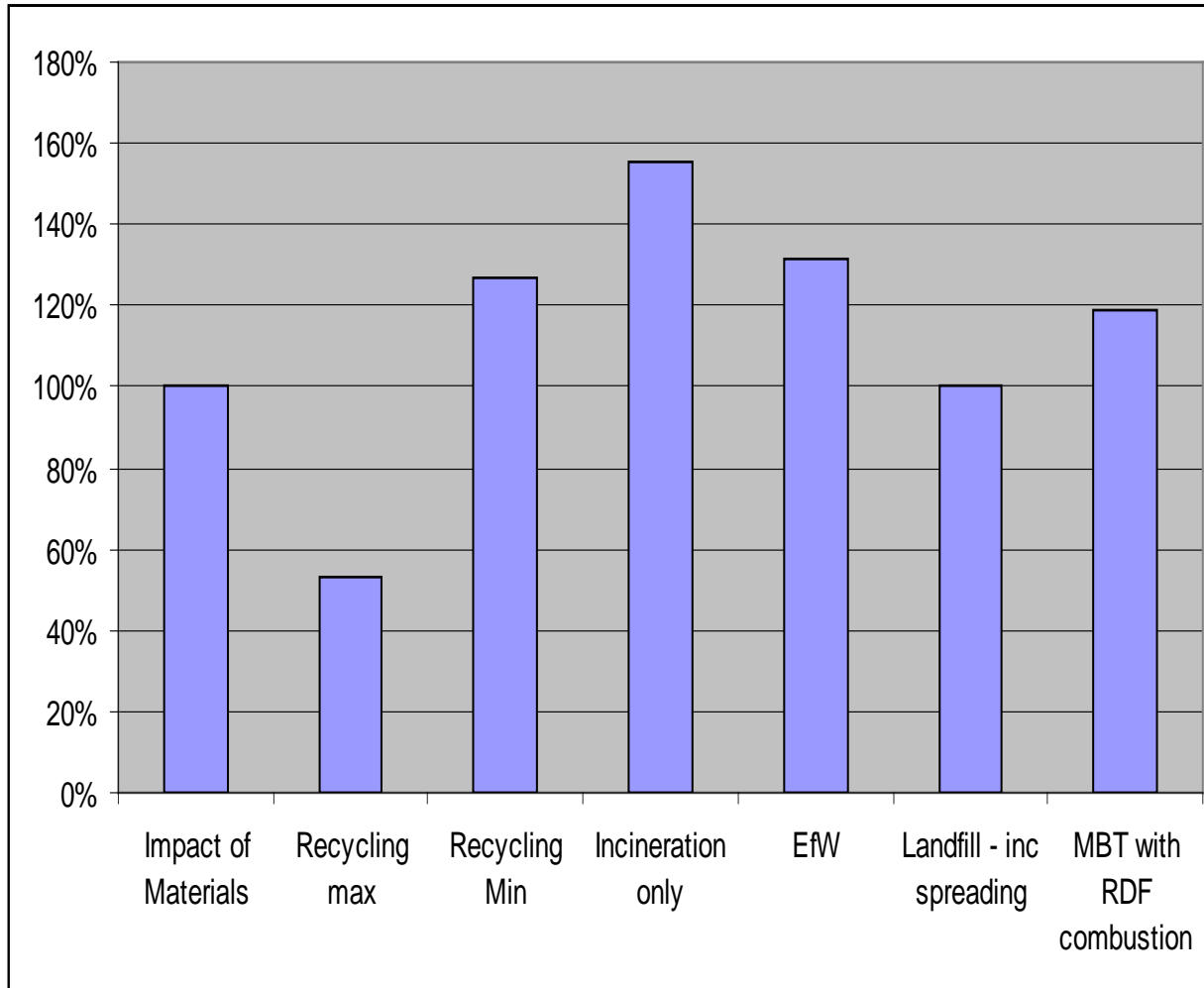
## – Differences in Global warming potential



# Ecological footprint (EF) for plastic waste



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- **EF reduction through recycling but should be closed loop**
- **Incineration increases EF due to GHG emissions**

# Proposed municipal waste reduction targets



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Target	2013	2016	2020	2025	2050
<b><i>Option 1 – linear reduction of -1.8% of baseline p.a.</i></b>					
Percentage reduction in ecological footprint terms	0%	0%	1%	9%	52%
Indicative reduction in tonnage of waste terms	Stabilise	Stabilise	20,934	198,021	1,467,259
<b><i>Option 2 – exponential reduction of -3.2% of previous year p.a.</i></b>					
Percentage reduction in ecological footprint terms	5%	6%	13%	21%	52%
Indicative reduction in tonnage of waste terms	97,630	120,706	272,148	462,049	1,467,259



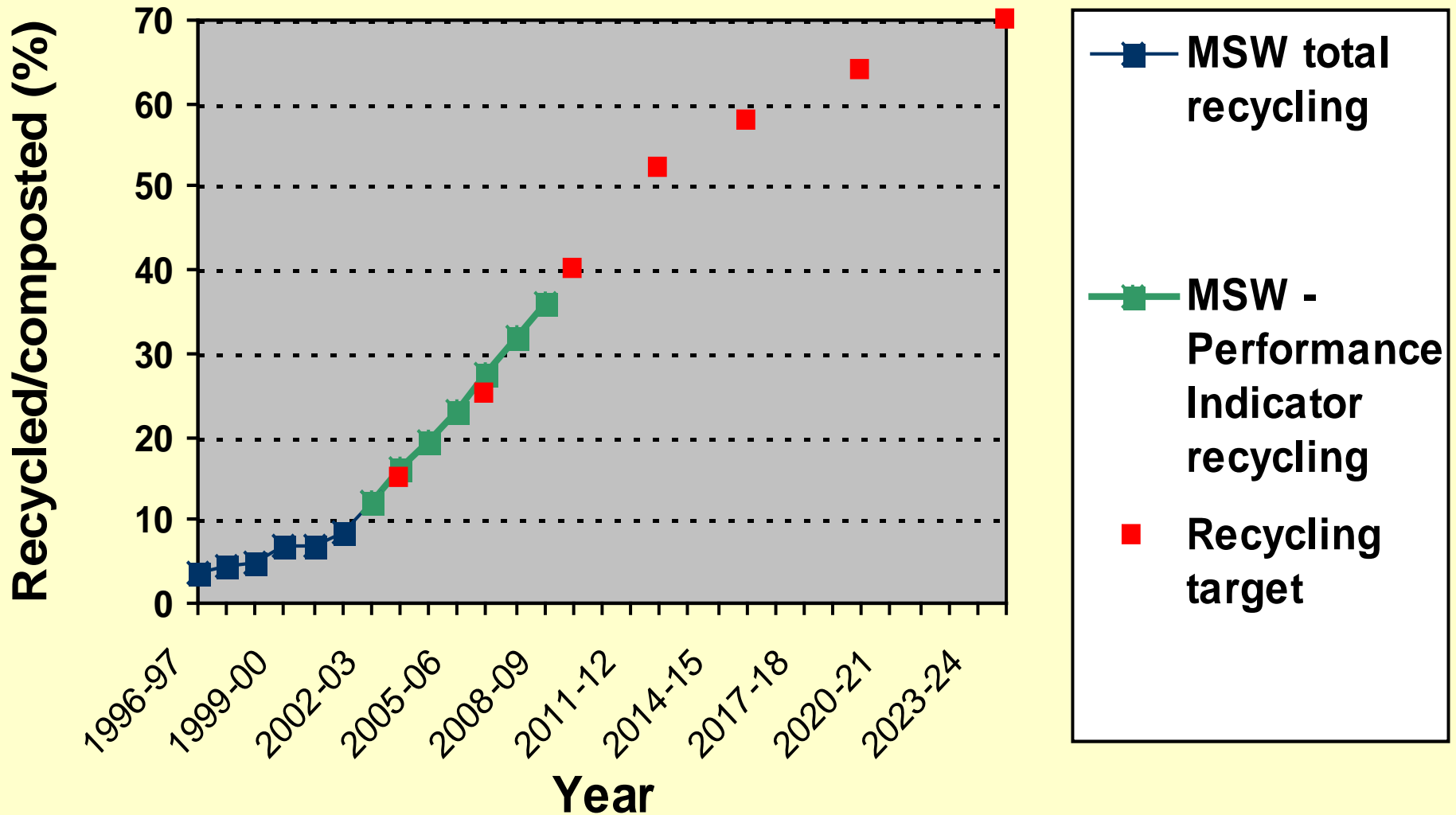
# Target proposals for municipal waste

<b>Each Authority</b>	<b>09-10</b>	<b>12-13</b>	<b>15-16</b>	<b>19-20</b>	<b>24-25</b>
Recycling/comp/ AD (statutory min)	40%	52%	58%	64%	70%
Min proportion from source separation	80%	80%	80%	80%	80%
Food waste (min) – out of total MSW	-	12%	14%	16%	16%
EfW (max)	-	-	42%	36%	30%
Landfill (max)	-	-	-	10%	5%
Residual/person / annum (max)	-	295kg	258kg	210kg	150kg

# Municipal Waste Recycling/ Composting targets to 2024-25 and progress so far!



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# Meeting EU targets limiting the landfilling of biodegradable municipal waste in Wales



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**BMW PRODUCED**

**BMW LANDFILLED**

↑  
TARGET

**BMW DIVERTED**

**LANDFILL ALLOWANCE**

↑  
TARGET

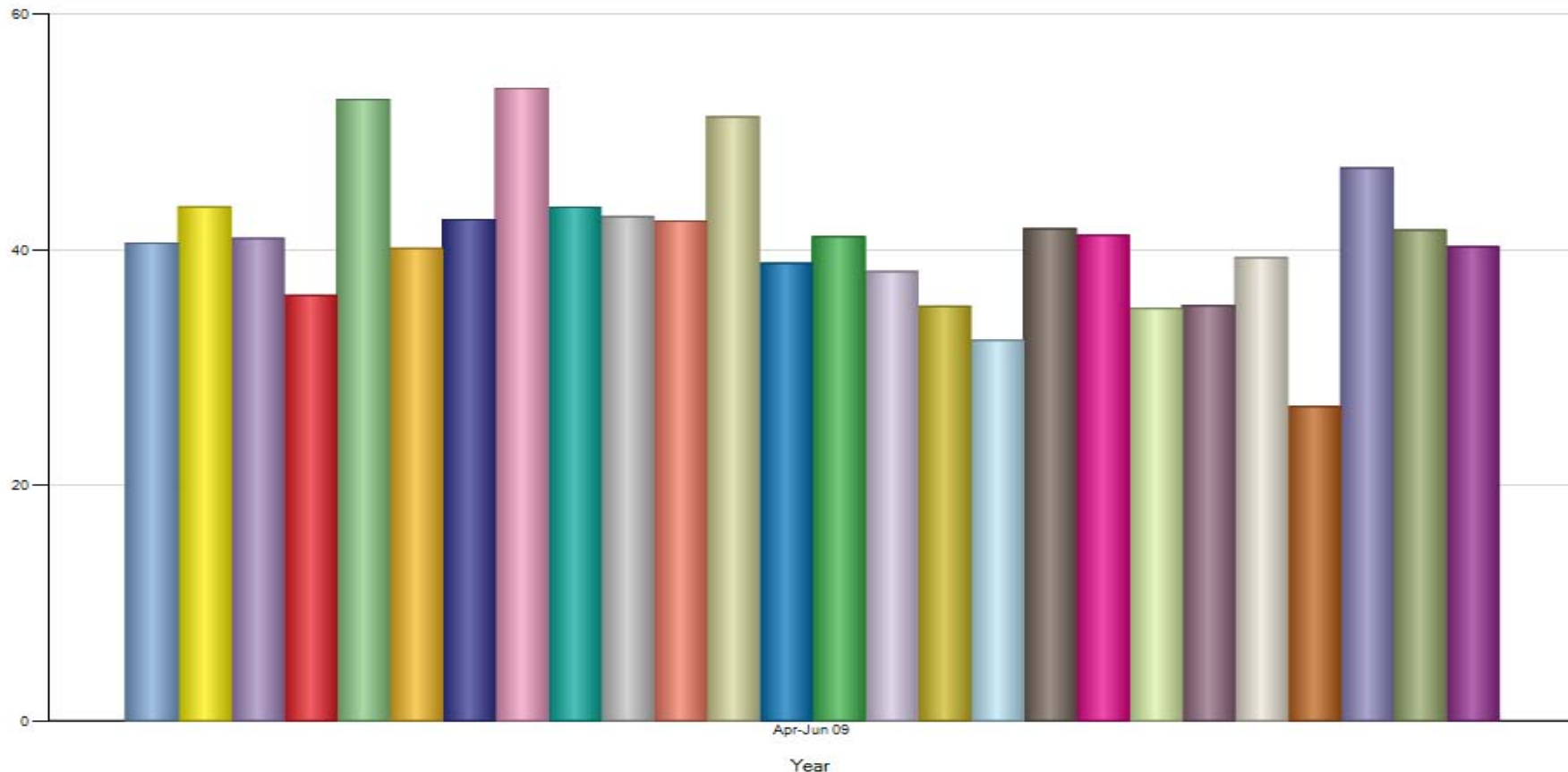
↑  
TARGET

# Recycling rate by local authority

## April – June 2009-10 (Q1)



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Wales  
Rural  
Urban  
Valley  
Isle of Anglesey

Gwynedd  
Conwy  
Denbighshire  
Flintshire  
Wrexham

Powys  
Ceredigion  
Pembrokeshire  
Carmarthenshire  
Swansea

Area

Neath Port Talbot  
Bridgend  
Vale of Glamorgan  
Cardiff  
Rhondda Cynon Taff

Merthyr Tydfil  
Caerphilly  
Blaenau Gwent  
Torfaen  
Monmouthshire

Newport



# Why will the municipal waste service need to be flexible and future proofed?

- Some personal predictions for the future:
  - Major changes in product composition and material chemistry
  - Major change in waste composition
  - More biodegradable polymers
  - Fossil fuel polymers continually recycled not destroyed through burning
  - Energy recovery from renewable waste only
  - Quality / standards paramount
  - **What ever route is chosen will have to be flexible and adaptable in order to accommodate the likely changes over the next 20-30 years**
    - Are current technologies in the market sufficiently flexible?

# Reducing municipal waste – how?



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- Government working with retailers through WRAP to:
  - reduce packaging
  - reduce food waste
  - promote eco-design in supply chain
- Central & local government to work together (including with retailers) to persuade the public to:
  - buy smarter, re-use more, waste less food
- Local government to consider merits of:
  - Fortnightly residual collections (alongside weekly recyclables and food waste collections)
- Financial incentive?
  - Honest & informed debate about the merits of charging for residual waste collection?
- And, to meet the scale of waste reduction necessary..
  - Society needs to radically rethink present patterns of consumption and resource use

# Practicalities of meeting 70% municipal waste recycling target



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- Improved services
  - Targeting more materials & streams
  - Greater quality
  - Greater consistency in quality and type of materials collected
- Increasing householder participation
  - Persuasion
  - Obligation
- Working with major retailers to make packaging more recyclable
- Enhancing markets for recyclate
- Supporting infrastructure development

# Improved services



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- Invest greater effort in recycle capture
  - CA/HWRC sites – at least 80% recycling
  - **MUST develop weekly door-to-door food waste collections for households (separate to green waste strongly advisable)**
  - Weekly dry recycle collection (consistency in quality and type collected)
  - Expand range of materials collected
  - Change to fortnightly residual
  - **90% plus participation required!**
  - Enhance the re-use and recycling of bulky waste (eg. WEEE)
  - Enhance & extend recycling of **trade waste** (especially food waste)
  - Separate recycling bins for litter (or very dense bring networks)
  - Extracting materials from street sweepings
- Increase in Sustainable Waste Management Grant

# Greater consistency?



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- “it is clear from the evidence taken that the presence of 354 local authorities which collect refuse may well mean there are in place up to **354 collection systems of widely differing method, frequency and scope.**”
- “It is true that most people need only know the system that prevails for their household, but we all move from time to time and from area to area, and the fact that our families and friends may be able to recycle entirely different materials in entirely different ways or that the authority next door might collect, say, newspapers in green boxes while our council collects in brown boxes can create uncertainty. **If simplicity is the key to recycling success, this is one area for obvious attention.**”
- “We recommend that the Government commission research to evaluate the best local collection, recycling, re-use and reduction schemes operated by local authorities and to **develop a strategy to encourage their widespread adoption.**”
- House of Commons, Communities and Local Government Committee - Refuse Collection Fifth Report of Session 2006–07

# Increasing householder participation



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- Persuasion
  - education and awareness raising
  - better sell benefits
  - change behaviour
  - enhancement of Waste Awareness Wales
- Obligation?
  - Requirement to recycle?
- Financial incentive?
  - Honest & informed debate about the merits of charging for residual waste collection?

# Valuable resources, not waste!



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- Enhancing local markets for recyclate & AD digestate
  - Increased supply and consistency of materials will help !
  - Quality (are MRFs up to it?)
  - Niche high value local markets
  - Rationalisation, re-focussing and re-energising of recyclate business support – WRAP Cymru
  - WRAP standards work
  - WRAP /EA Quality Protocols
  - Major market for renewable energy / fuel (e.g. from AD)
  - Impending world fertiliser crisis
- New Wales “Sector Plan for Collection, Infrastructure and Market Development”

# Technology solutions for residual



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- Pre-treatment (eg. MBT) may introduce an unnecessary additional cost
- Many touted technologies are unproven
- Most sustainable approach / BPEO means:
  - as low a proportion of EfW as possible (<30%)
  - High energy efficiency (>60%)/CHP
- CHP easier on smaller scale EfW plants (and income from CHP can offset economies of scale issues)
- Engage public / good design
- Beware reliance on an inflexible and unpopular potential white elephant!

# Support for AD and residual waste facility procurement



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- WAG Waste Procurement Programme Office
  - PUK transactor & “critical friend” support
- Local Government collaboration
  - “**AD procurement hubs**” – 200,000 t.p.a capacity required by 2012/13
  - 6 “**Residual municipal waste consortia**” – 800,000 t.p.a. capacity by 2015/16
- WAG procurement funding support
  - Rigorous process to be followed by local authorities
- WAG revenue and capital grant support
  - AD: revenue (25%) & capital (£20 million)
  - Residual: Revenue – 25% of gate fee



# Food waste – progress so far

- Collection
  - 18 local authorities collecting in 2009
  - All 22 plan to collect by 2010
  - Benchmark: Rhondda Cynon Taff obtaining 5kg/person/week from participating households
- Treatment procurement programme
  - Central WAG Waste Procurement Programme Office set up in Jan 08
  - 5 hubs set up involving 15 local authorities who have yet to start procurement of a full solution
  - All OBCs submitted to deadline
  - Successful bidder day held in March 2009
  - Prior Information Notice (PIN) issued centrally on 18 June 2009.
  - Single OJEU contract tender notice issued in August 2009
  - Single prequalification exercise, centrally co-ordinated by the Waste Procurement Programme Office (WPPO). The responses to this will then be evaluated as a single exercise in close conjunction with the Hubs.
  - The Hubs to then lead on procurement, with support from the designated WPPO Transactor.
- Revised compositional analysis for MSW
  - Food waste 19% in June 2009 sample

# Food waste Treatment Procurement Programme - Timescale and Milestones



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Achieved  
Target

Jun-Dec 2008	Memoranda of Understanding
Dec 2008	Funding secured
Feb 2009	Approval of Project Initiation Documents and Strategic Outline Cases
Jul 2009	Evaluation of Outline Business Cases
Aug 2009	OJEU contracts tender notice published
Nov 2009	Commencement of Dialogue
Oct 2010	Contract award
Nov 2010	Financial close
May 2011	Construction start
Apr 2012	Commissioning
Oct 2012	Full service commencement

# And finally - what sort of citizen are we aiming to serve in relation to household waste collection?



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- **Either Citizen A who wants:**
  - Rubbish taken away regularly with no inconvenience to him/herself
- **Or Citizen B, who wants:**
  - all of the recyclate that s/he has separated out to be actually recycled and not landfilled
  - the effort they have applied to recycle to make a meaningful difference to Wales' ecological and carbon footprints
  - as much recyclate as possible to be used in Wales, creating new Welsh jobs
  - greater social benefit from the municipal waste service - delivering enhanced social cohesion and a greater community wellbeing (both through job creation/training and closer engagement of the household waste collection workforce with individuals and communities, and use of community enterprise as much as possible)
  - exactly the same recyclable materials collected across Wales to eliminate the current “post code lottery” and confusion that exists when people move and/or help friends and relatives
  - a recyclate collection service that is flexible enough to be “future proof”
  - to be able to challenge him/herself on the amount of waste that they produce or do not recycle, and then to be able to do something about it, and clearly see the results of their actions
  - a value for money service delivering the best outcomes for the lowest cost that maximises economies of scale through joint contracts for vehicles, bins, bags etc and which utilises the most cost effective workforce for collection
  - **And who would be prepared to “go the extra mile” to achieve all these outcomes**



# Meeting Citizen As needs?

- Solution
  - All rubbish collected in one bag/bin once a week
  - Recycling achieved via a dirty MRF
- Does this meet the SD Scheme or the outcomes required?
  - No

# Meeting Citizen B's needs?



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- Potential solution 1
  - All residual rubbish collected in one bag/bin once a week
  - Recyclate collected co-mingled in a bag or wheelie bin once a week
  - Recyclate sorted at a MRF
  - Each authority collecting differently
- Does this meet the SD Scheme or the outcomes identified, or all of the needs of Citizen B?
  - No/poorly, because:
    - Greater level of contamination, more landfilled
    - Less close loop recycling because of poorer quality
    - More exported because of poorer quality / lower tonnages
    - Reduced opportunity for enhanced social benefit
    - Probably not the cheapest way of providing the recyclate collection service
    - Insufficiently flexible enough to be “future proof”



# Meeting Citizen B's needs?

- Potential solution 2
  - All residual rubbish collected in one bag/bin once a fortnight
  - Containers collected co-mingled in a box / transparent bag (ideally glass collected via dense bring site)
  - Containers sorted at kerbside and/or at a MRF
  - Paper/card collected in a separate receptacle
  - Food waste collected separately
  - Community enterprise used for collection
  - Consistent approach across Wales to materials collected
- Does this meet the SD Scheme or the outcomes identified?
  - Yes, on every count!

# Welsh Assembly Government working in partnership with local government



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- Ministerial Programme Board for municipal waste
  - Local Government representation from Leaders, Cabinet Members, and Directors / Heads of Service
- Waste procurement consortia management group
  - WAG & local government reps
- WLGA
  - WAG funding for Peer Review / Improvement Programme
  - WAG funding for Waste Awareness Wales

# Concluding remarks – Major opportunities



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- Central and local government to work together:
  - Fit for purpose and future proofed service
  - Public sector leads by example
- Local authorities to work together:
  - greater consistency in provision of recyclates to the market
  - greater value for money
- Individual local authorities:
  - sustainable citizen centred service
  - local jobs



Helpu Cymru i leihau  
ei Hôl Troed Carbon

Help Wales reduce  
its Carbon Footprint



**reduce** arbed  
**reuse** ailddefnyddio  
**recycle** ailgylchu