

# Looking back and looking forward...

Achievements, challenges and lessons for Denmark

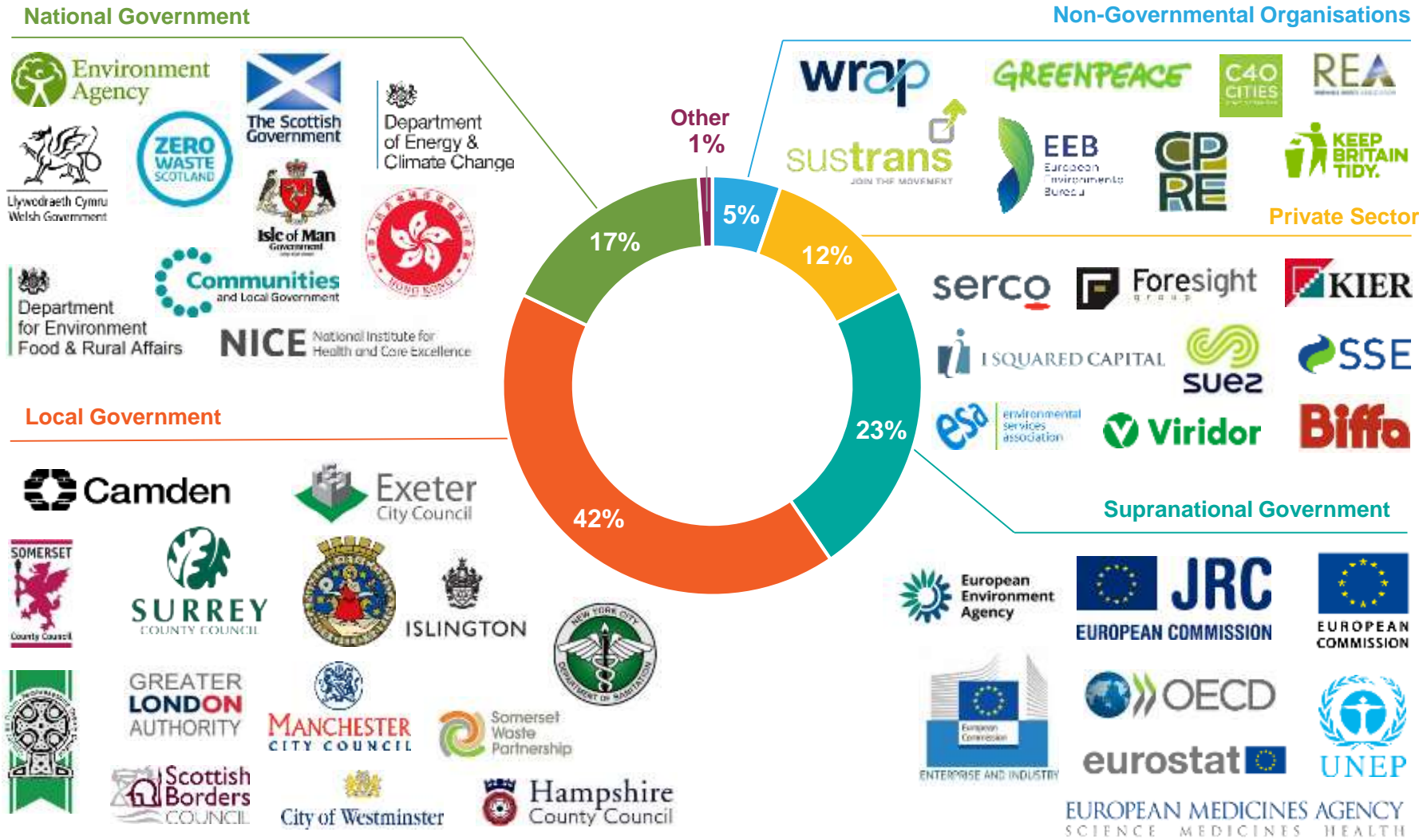
19<sup>th</sup> September 2019

**Joe Papineschi, Director**  
**Eunomia Research & Consulting**

# Topics

- **Eunomia**
- **Nordic Council of Ministers project**
- **Conclusions for Denmark**

# About Eunomia





Bristol West

Thangam Debbonaire MP

Labour

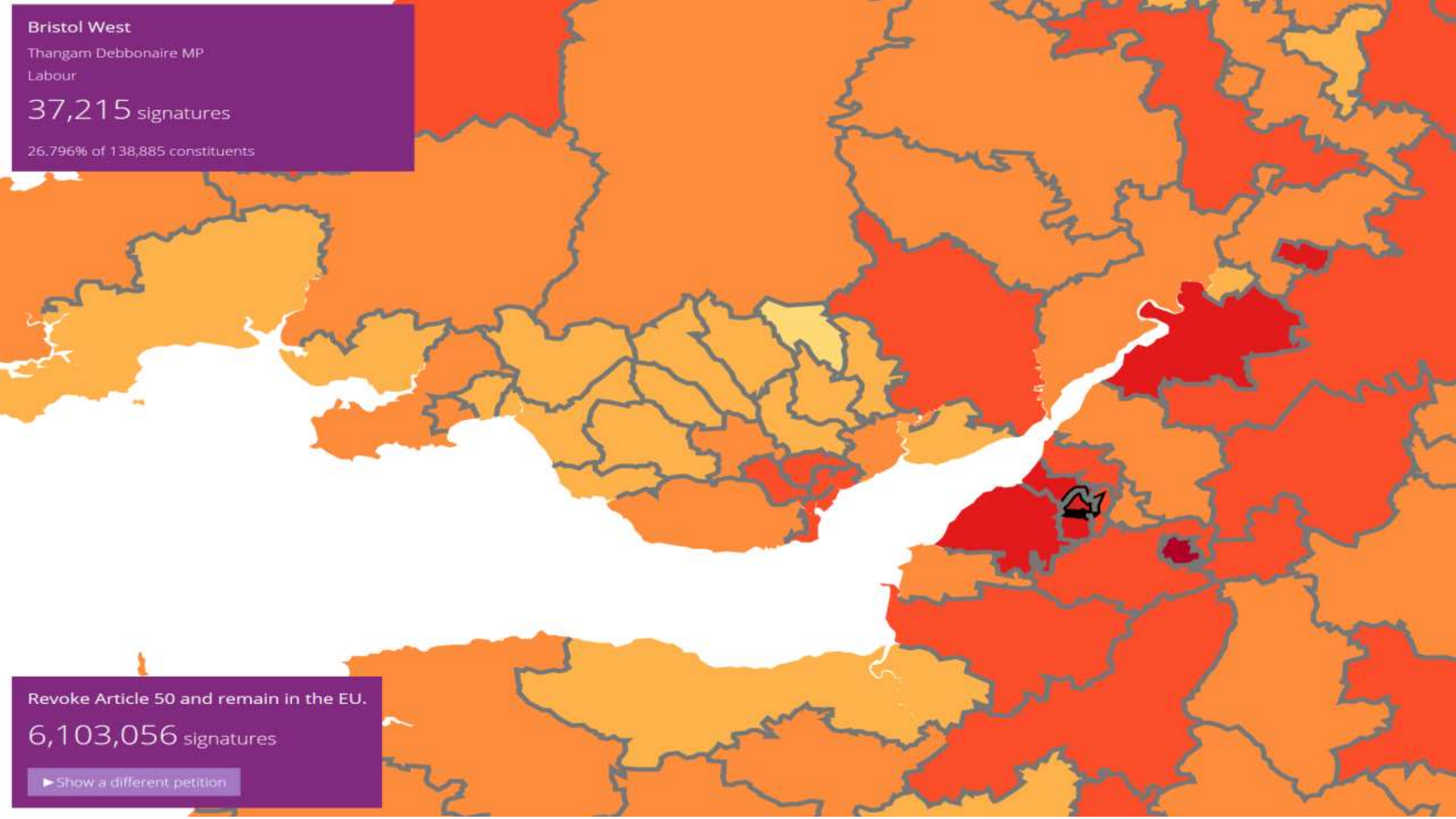
37,215 signatures

26.796% of 138,885 constituents

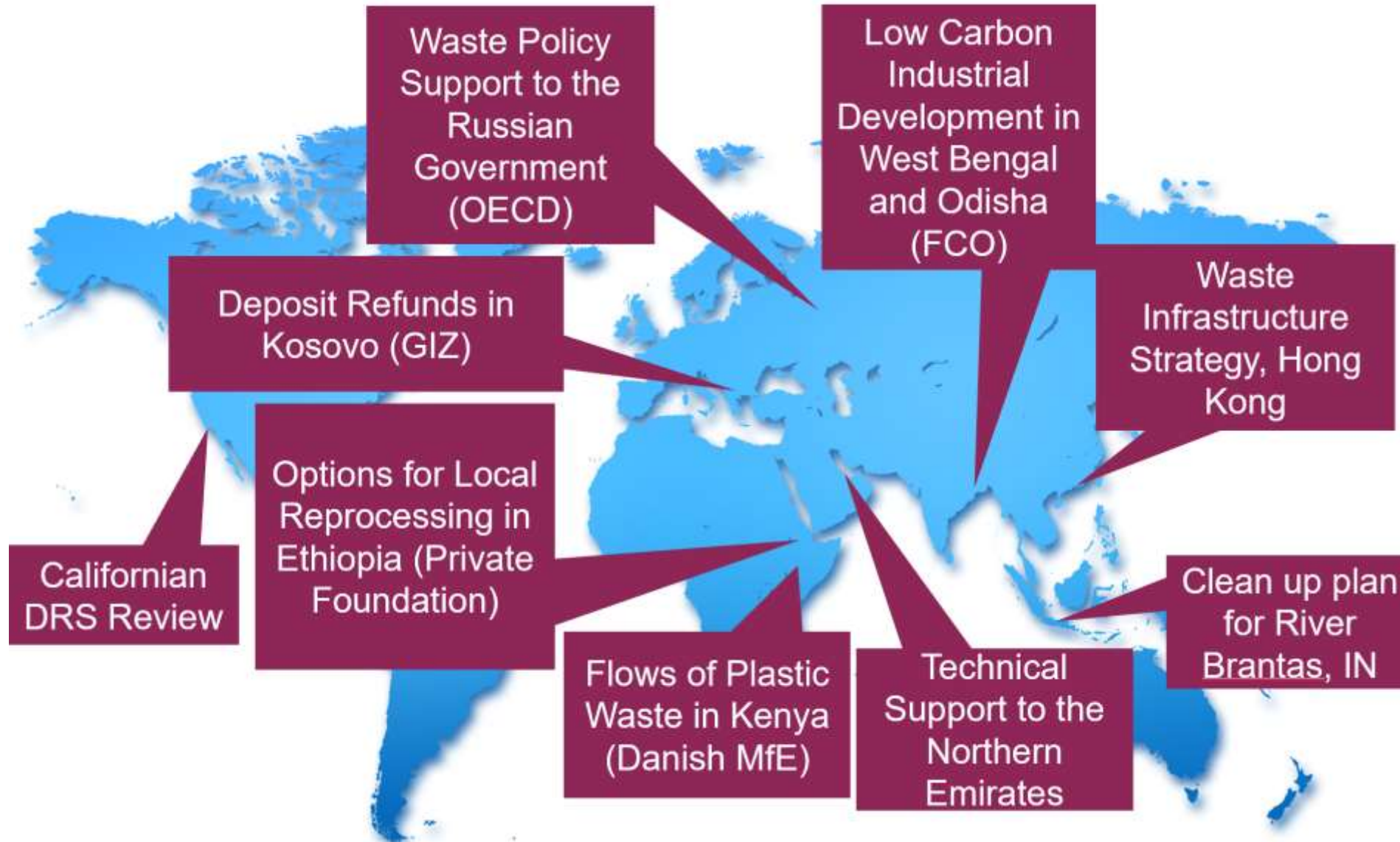
Revoke Article 50 and remain in the EU.

6,103,056 signatures

[► Show a different petition](#)



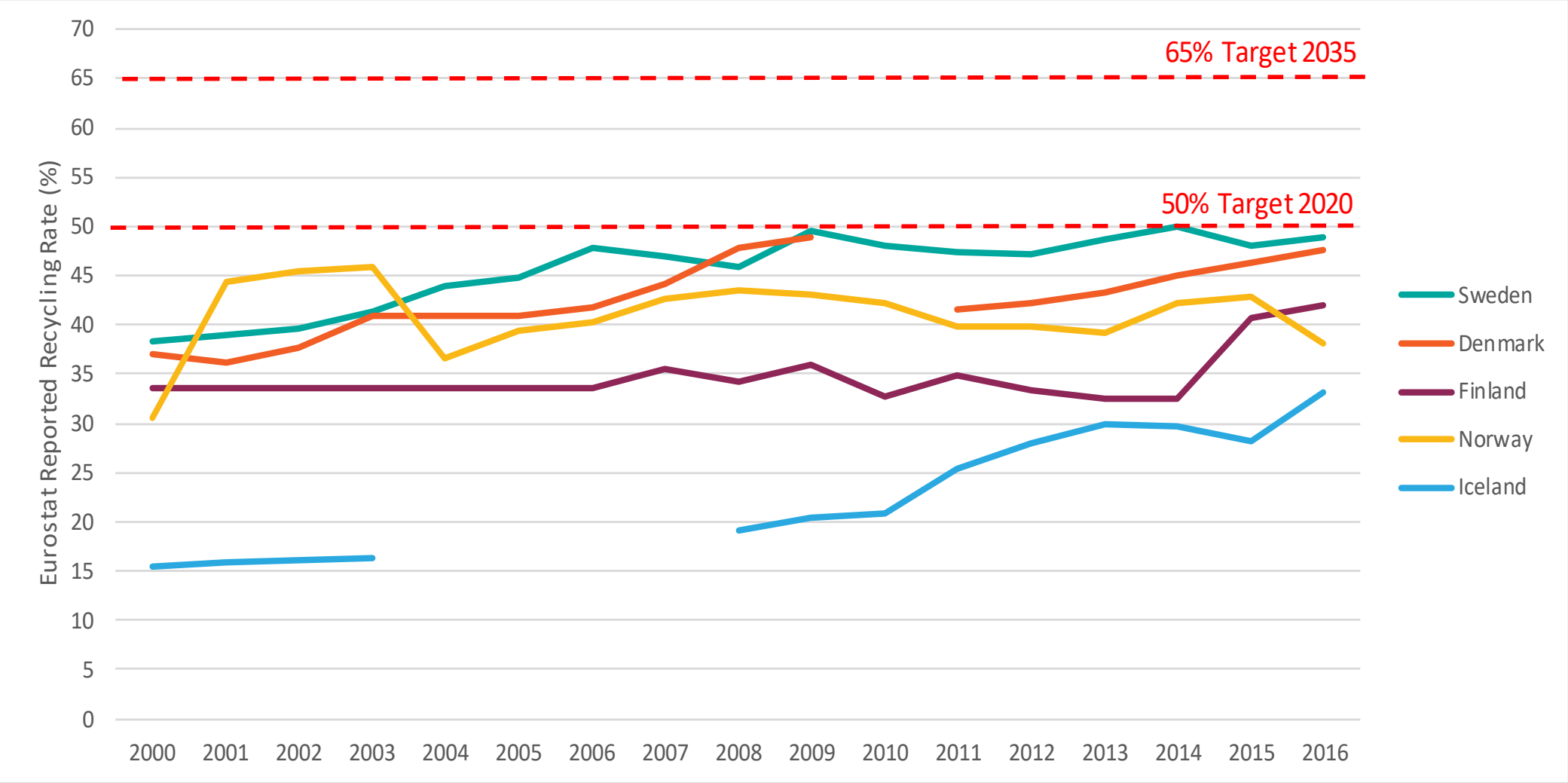
# Global Reach



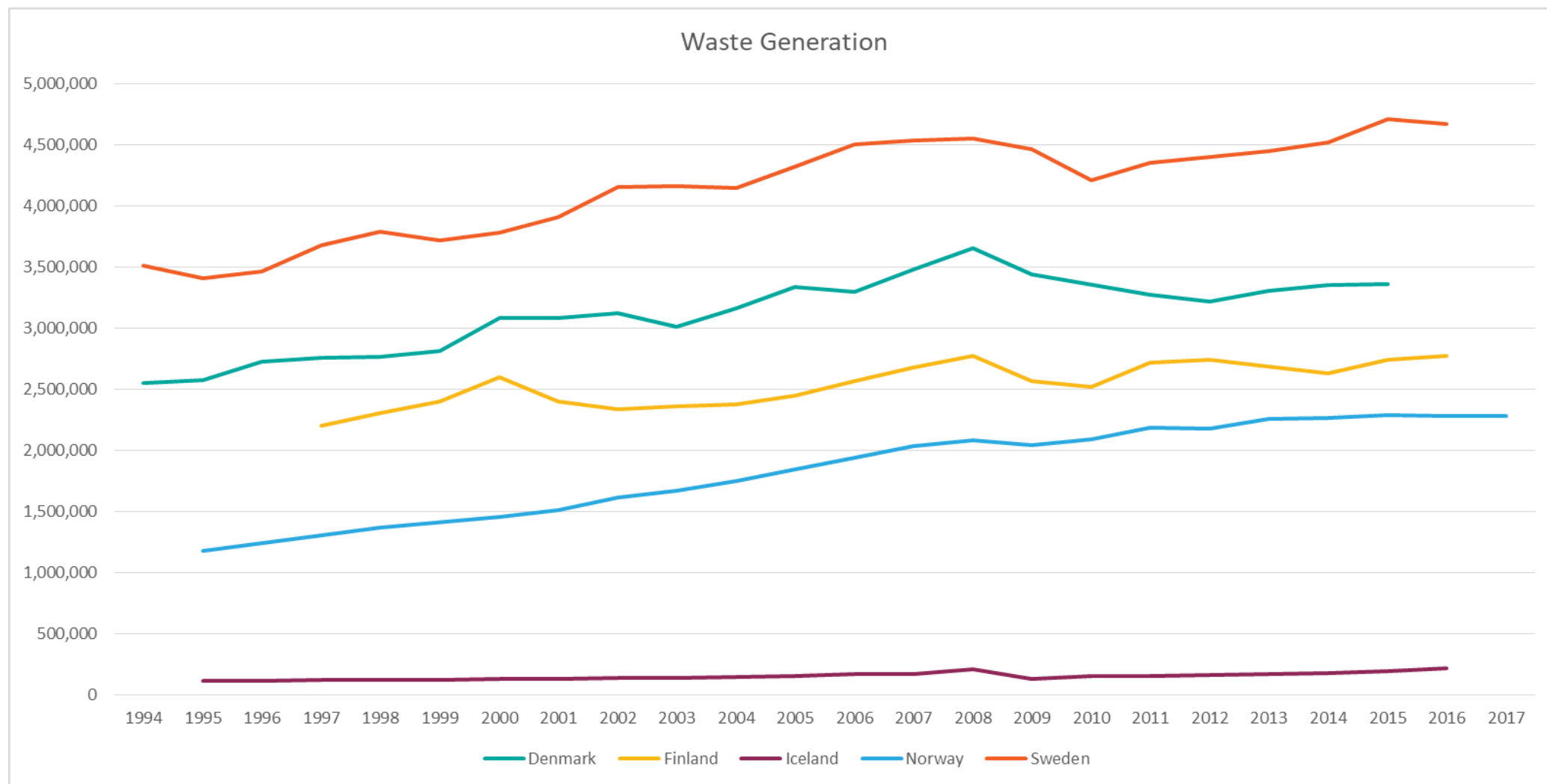
# Nordic Council of Ministers Project Team



# Nordic Recycling

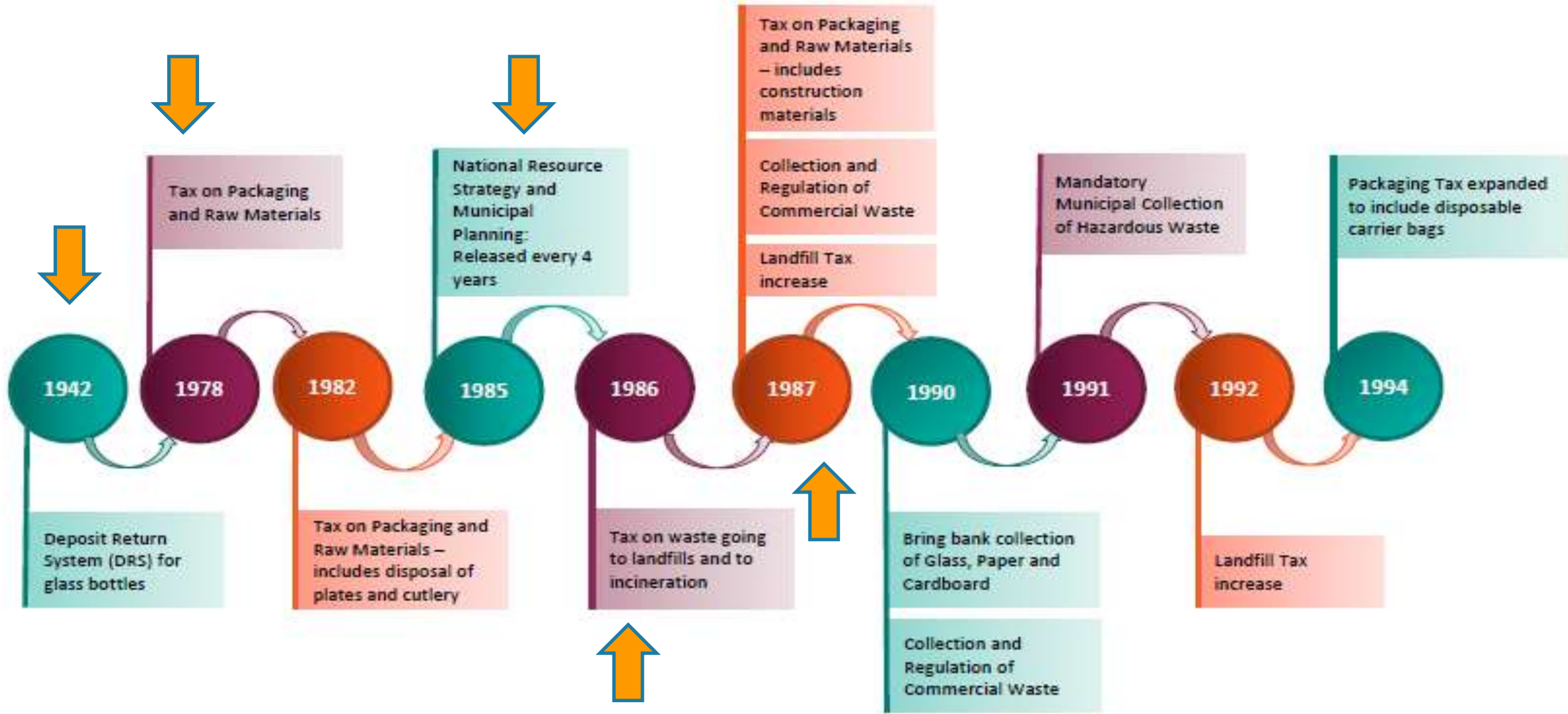


# Nordic Waste Generation

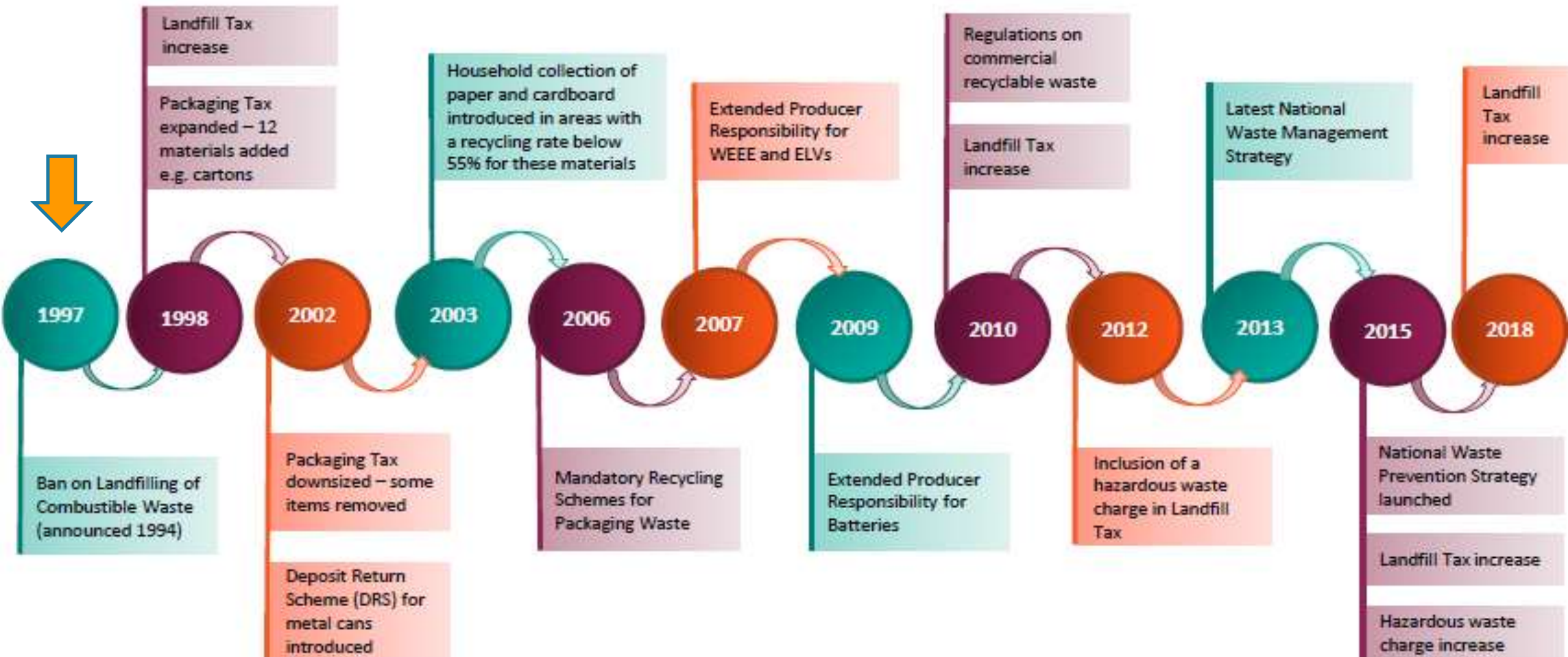




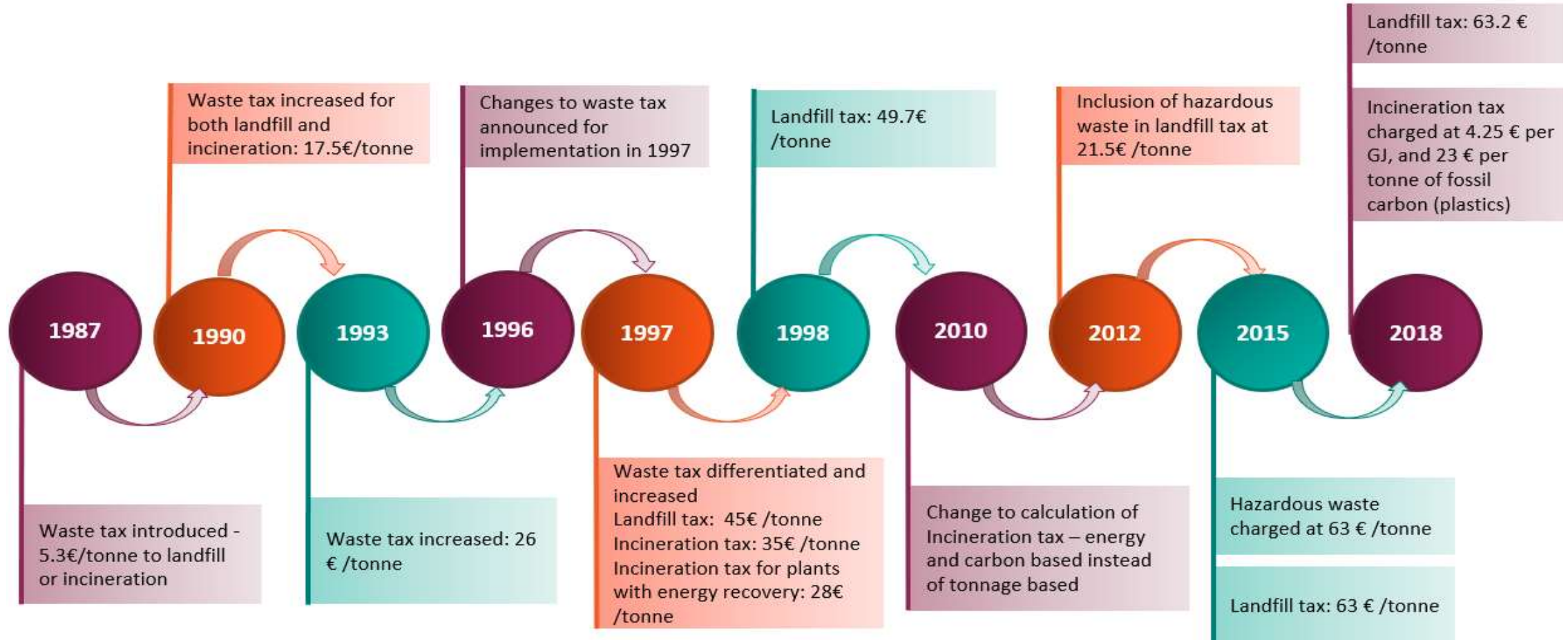
# Danish Policy History



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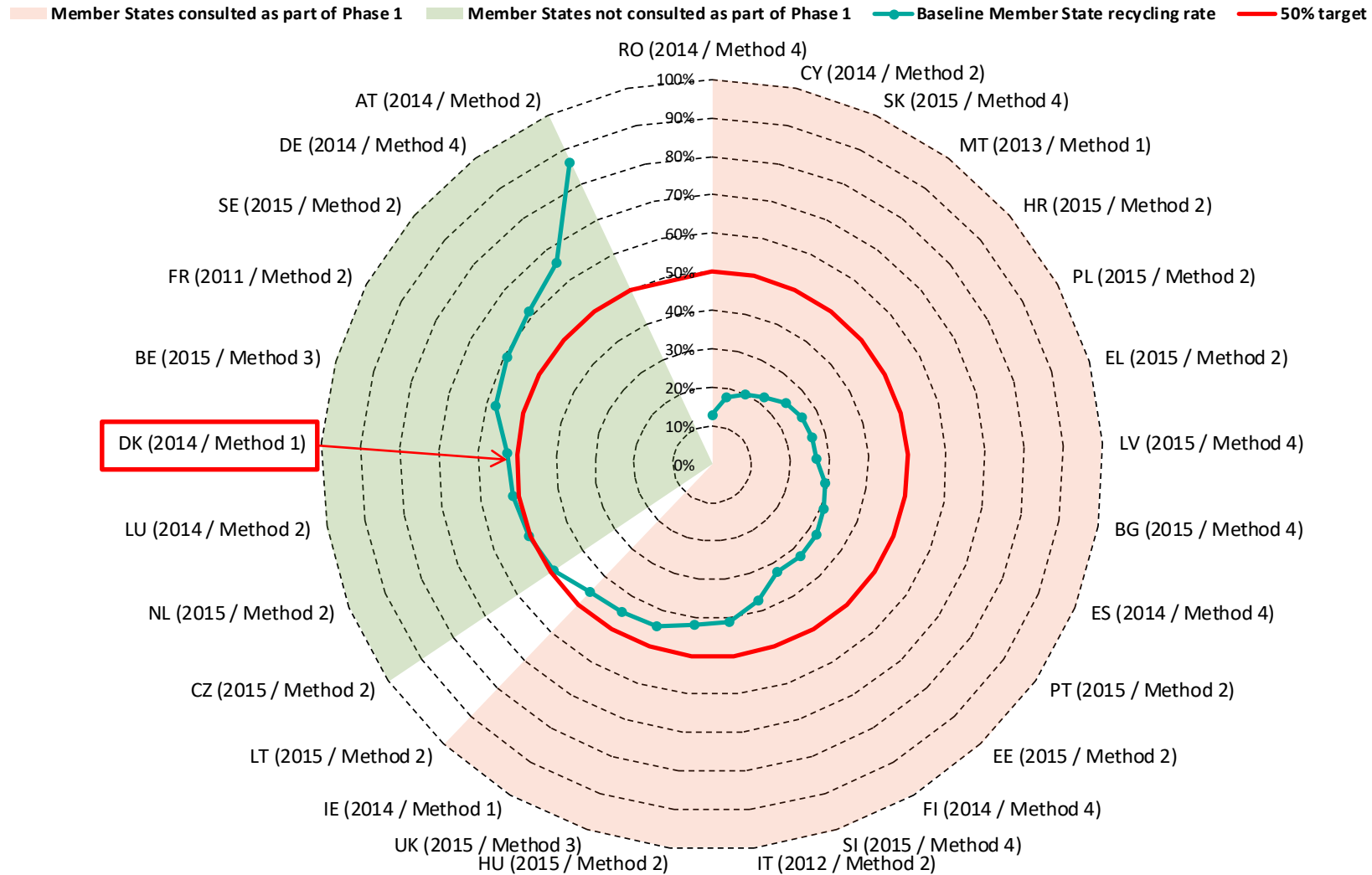


# Evolution of Residual Waste Taxes





# Recycling in Danmark





# Measurement methods...

	Calculation Method	2010	2011	2012	2013	2014
<b>Denmark</b>	Method 1	-	-	51.70%	51.90%	<b>52.70%</b>
<b>Finland</b>	Method 4	32.60%	34.80%	33.30%	32.50%	<b>32.60%</b>
<b>Sweden</b>	Method 2	62.00%	-	62.20%	-	<b>61.40%</b>

# New EU Challenges for Denmark

- **Mandatory recycling targets for municipal waste:**
  - 55% by 2025; 60% by 2030; 65% by 2035
- **75% recycling of packaging waste by 2030**  
*All under new measurement method*
- **Separate collection of Bio-waste by 2024**
- **EPR reform**
  - Full coverage of 'necessary costs'
  - 'Modulation' of EPR fees
  - Addressing 'free riders' (including e-commerce)
- **Single Use Plastics Directive**
  - Includes bans, targets and EPR for plastic packaging in litter

# Conclusions for the future of Danish resource management

























Caroline Lucas MP  
Green Party Westminster Leader

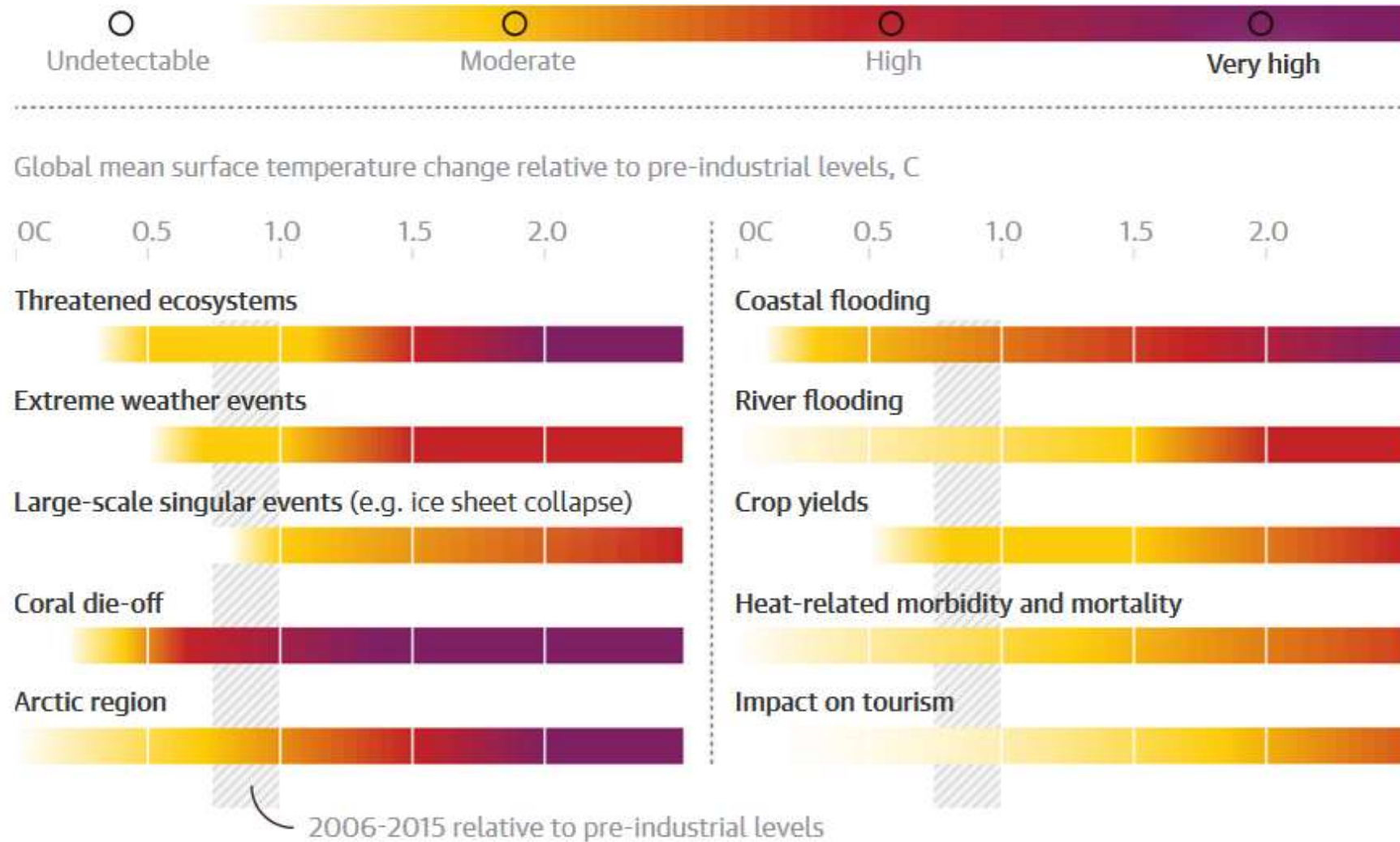
Greta Thunberg  
North Atlantic 22

Jeremy Corbyn  
Leader of the Labour Party

Alex Attwood  
MP for South West Devon

Theresa May MP  
Leader of the Conservative Party

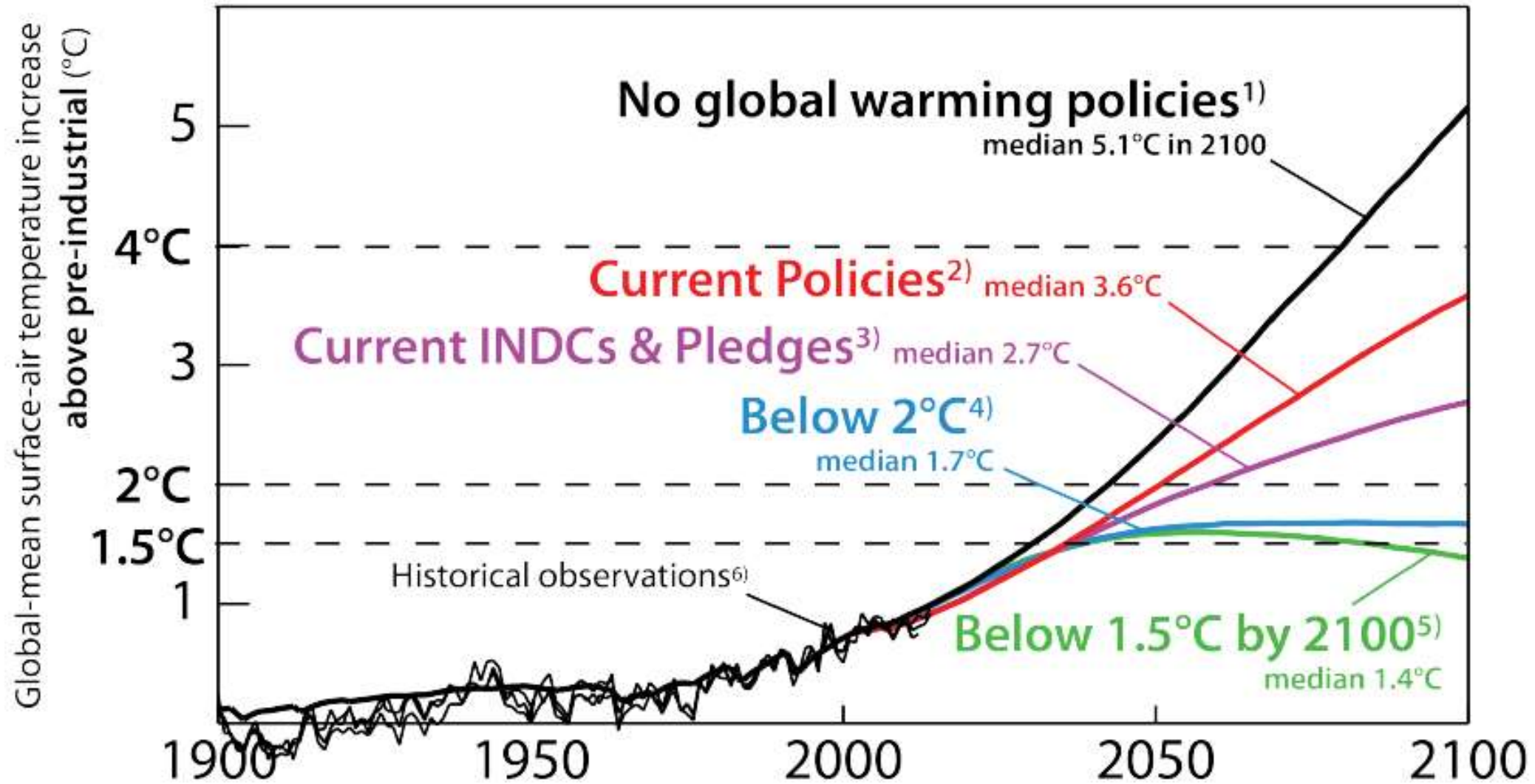
# Global Temperature rise: Risks and impacts



Guardian graphic. Source: IPCC Special Report on Global Warming of 1.5C

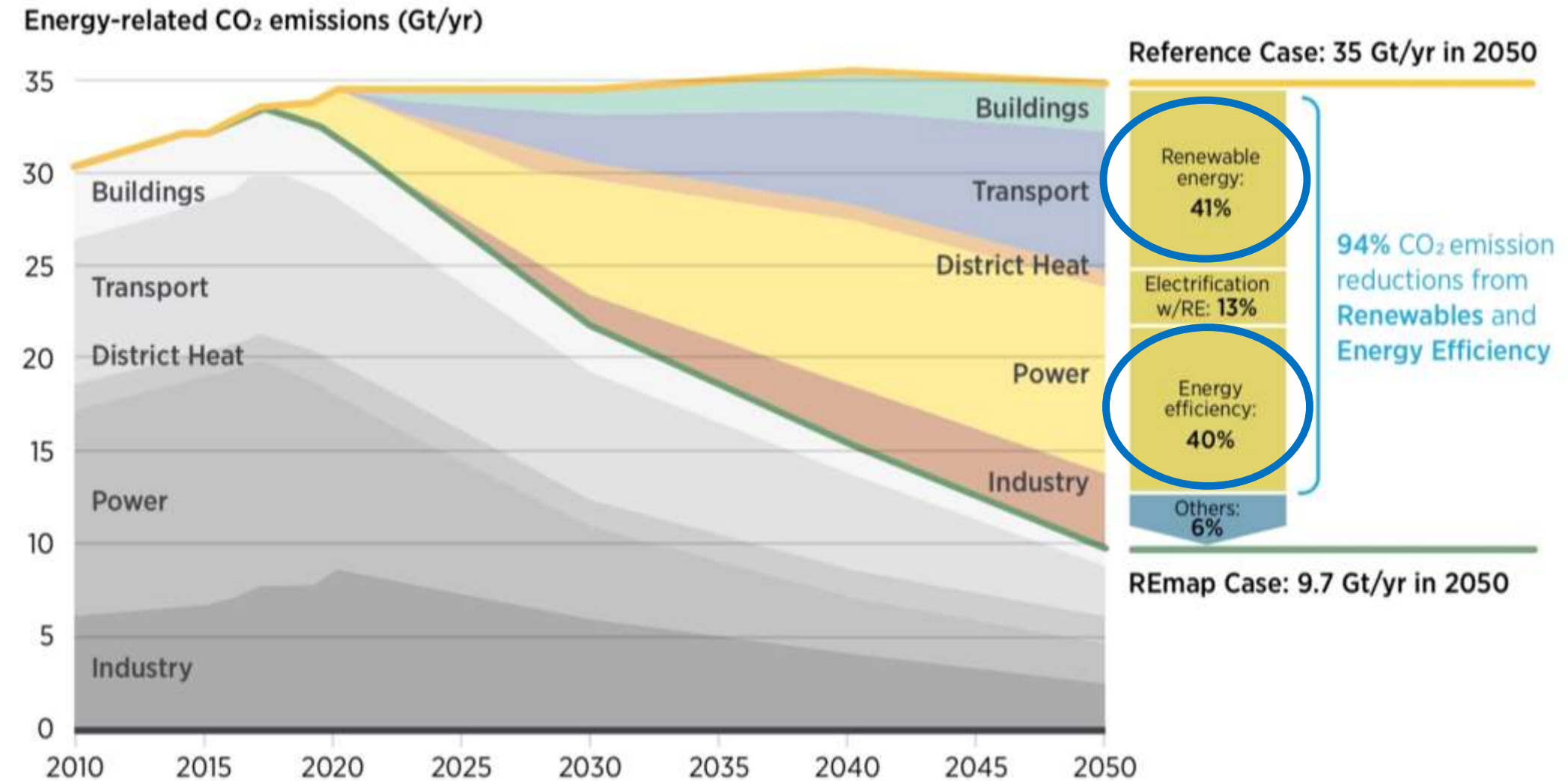


# Climate Scenarios

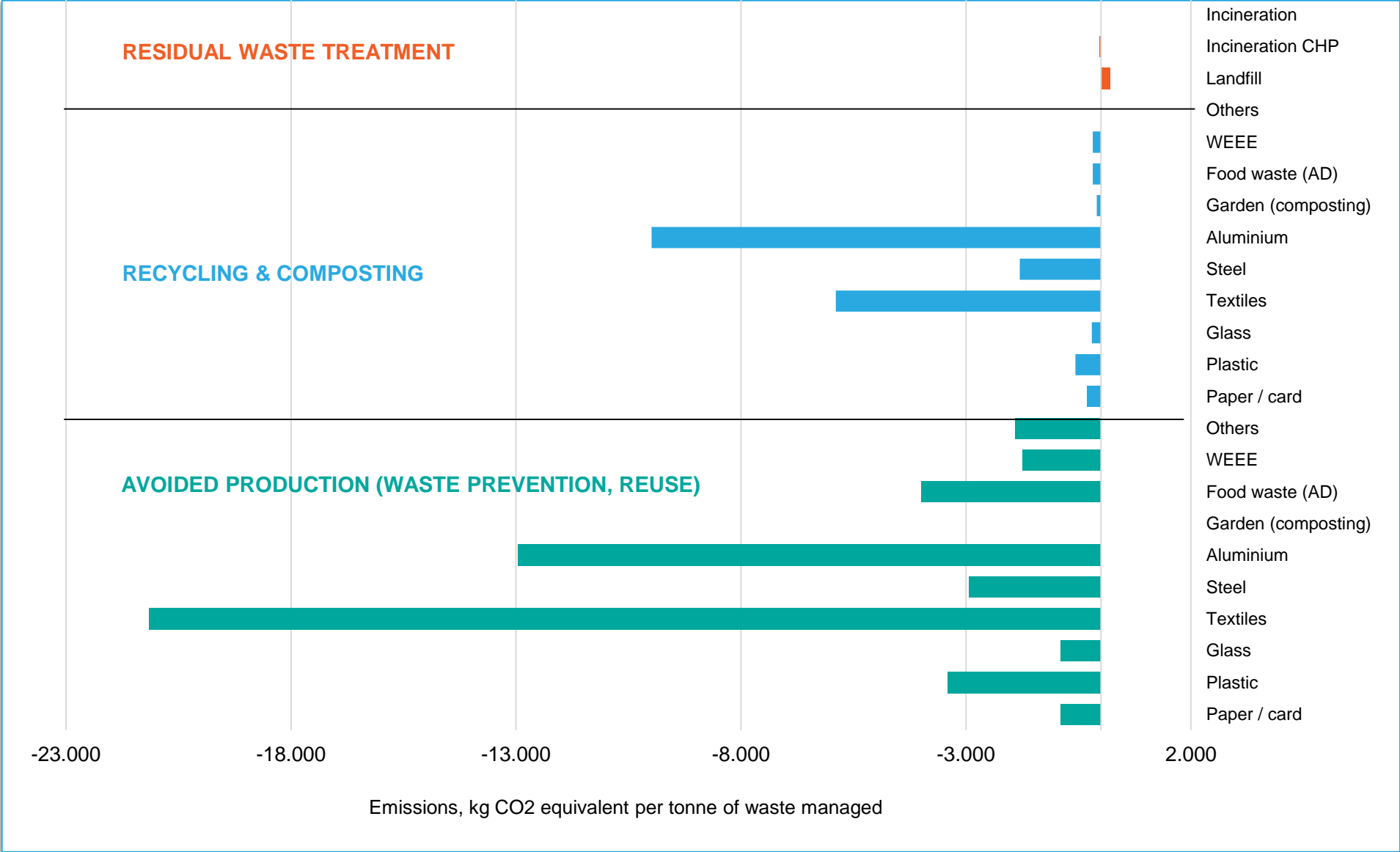


Source: Climate Analytics

# Renewables or Efficiency?

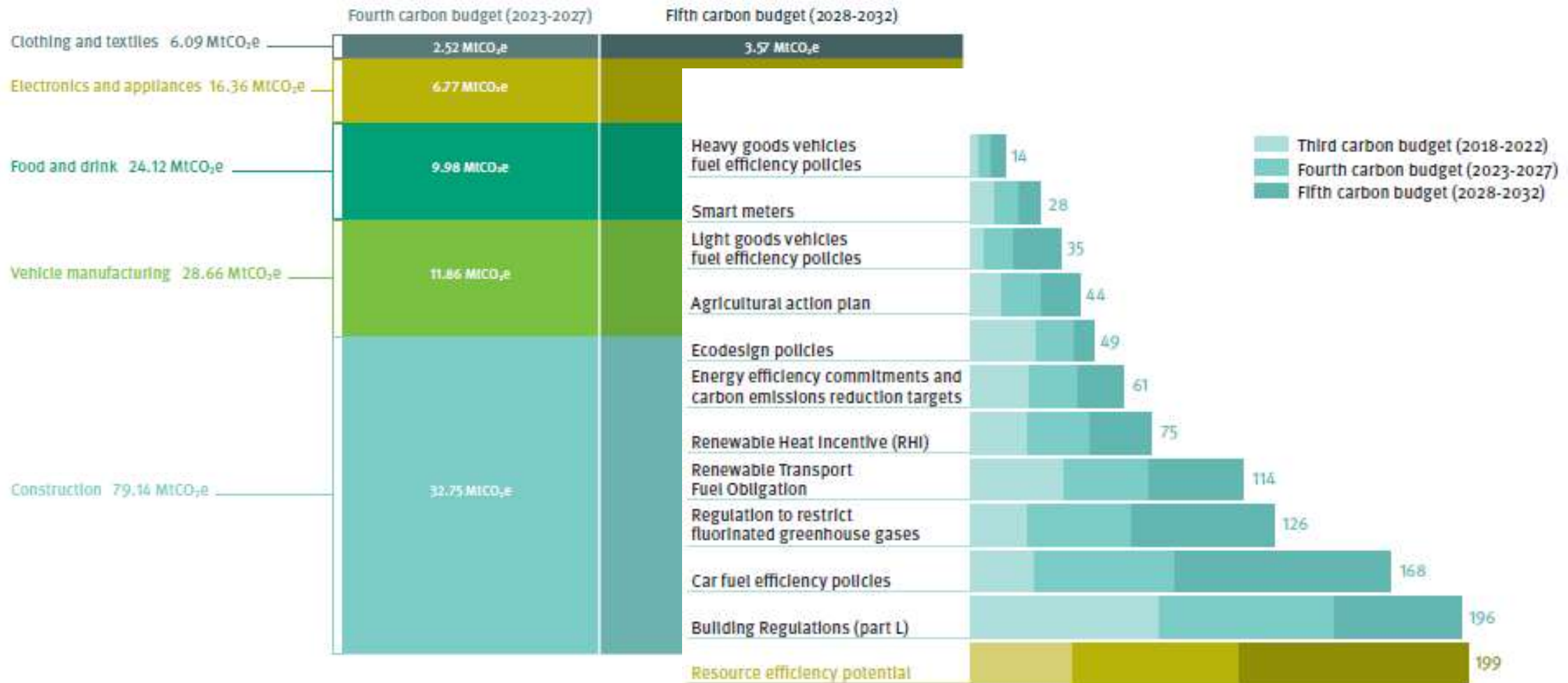


# GHG Impacts of Resource Management

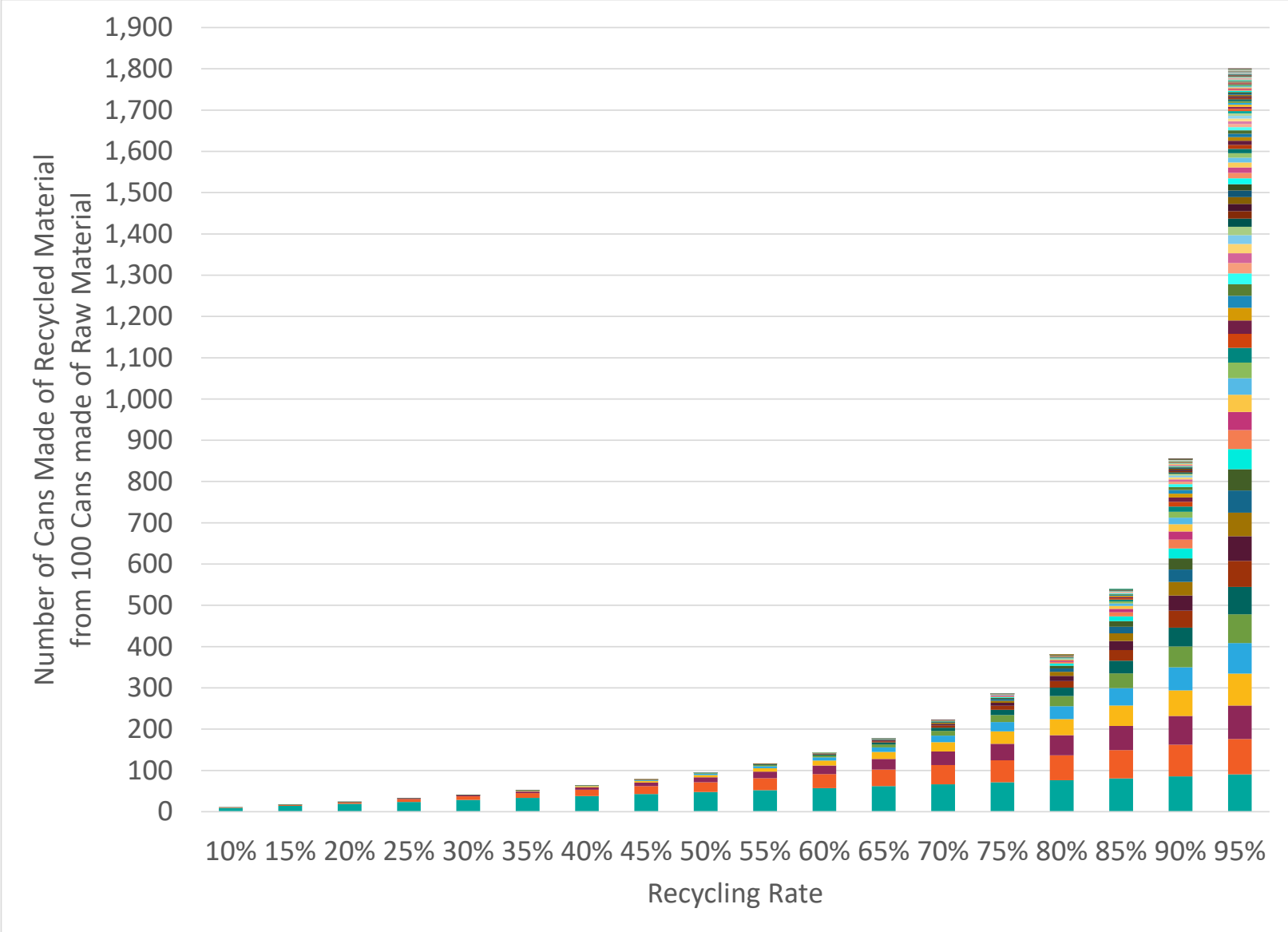




# Resource Efficiency and Climate Change



# Cumulative impact of high recycling rates



# Cumulative impact of high recycling rates

- **Start with 100 'original' cans**



- **Collect 70% for recycling**



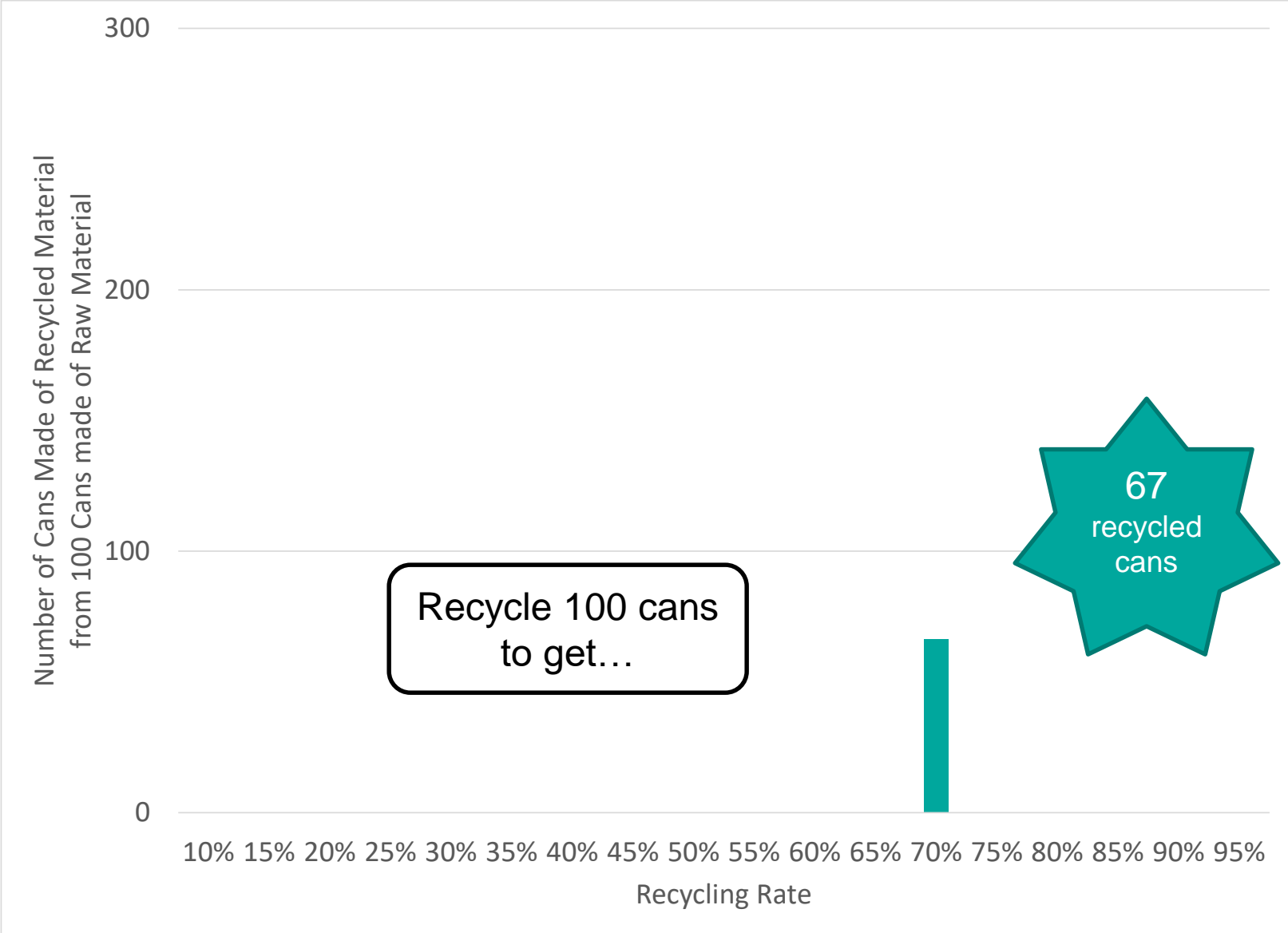
- **Recycling yield 95%**



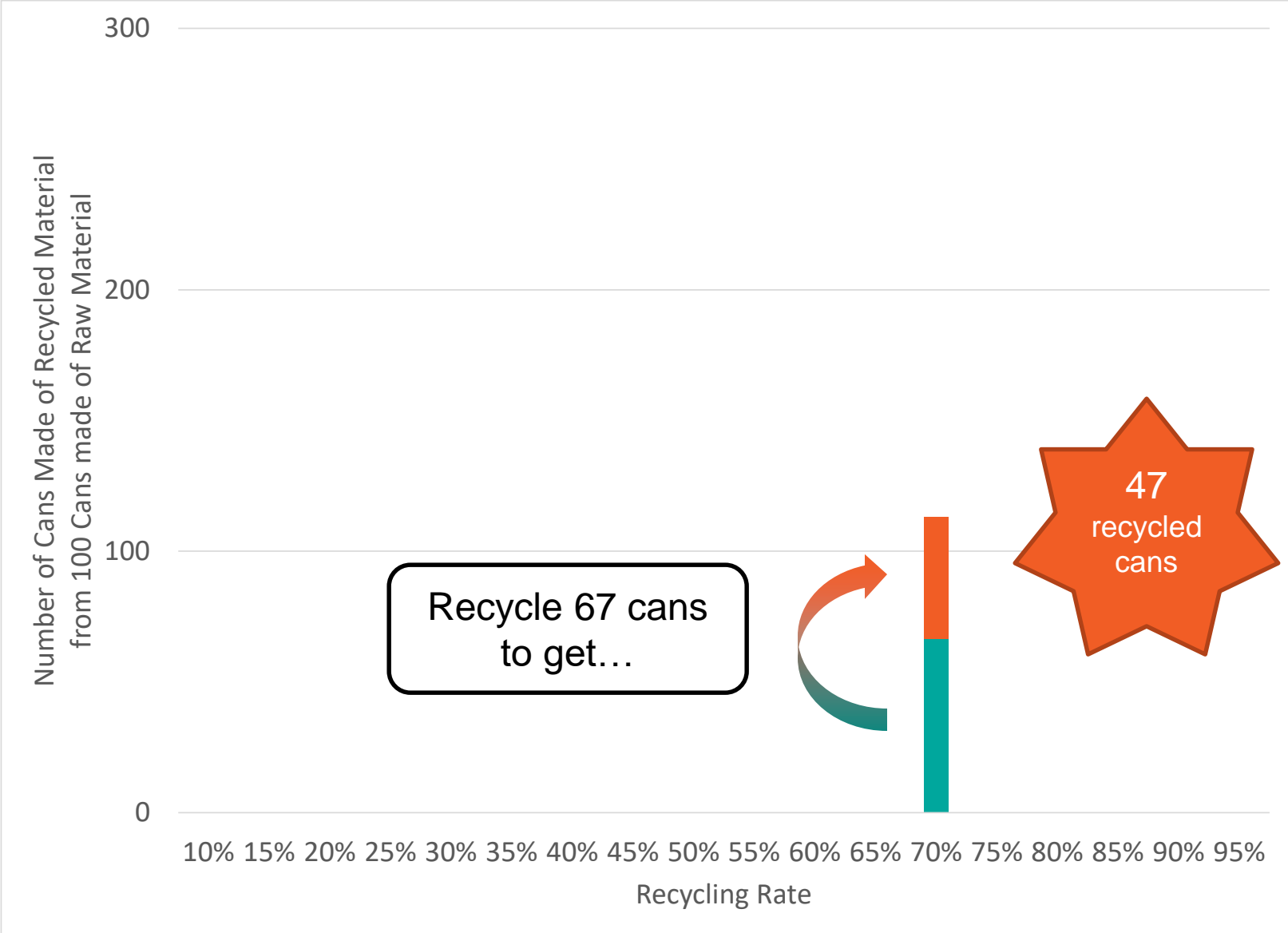
- **Repeat...**



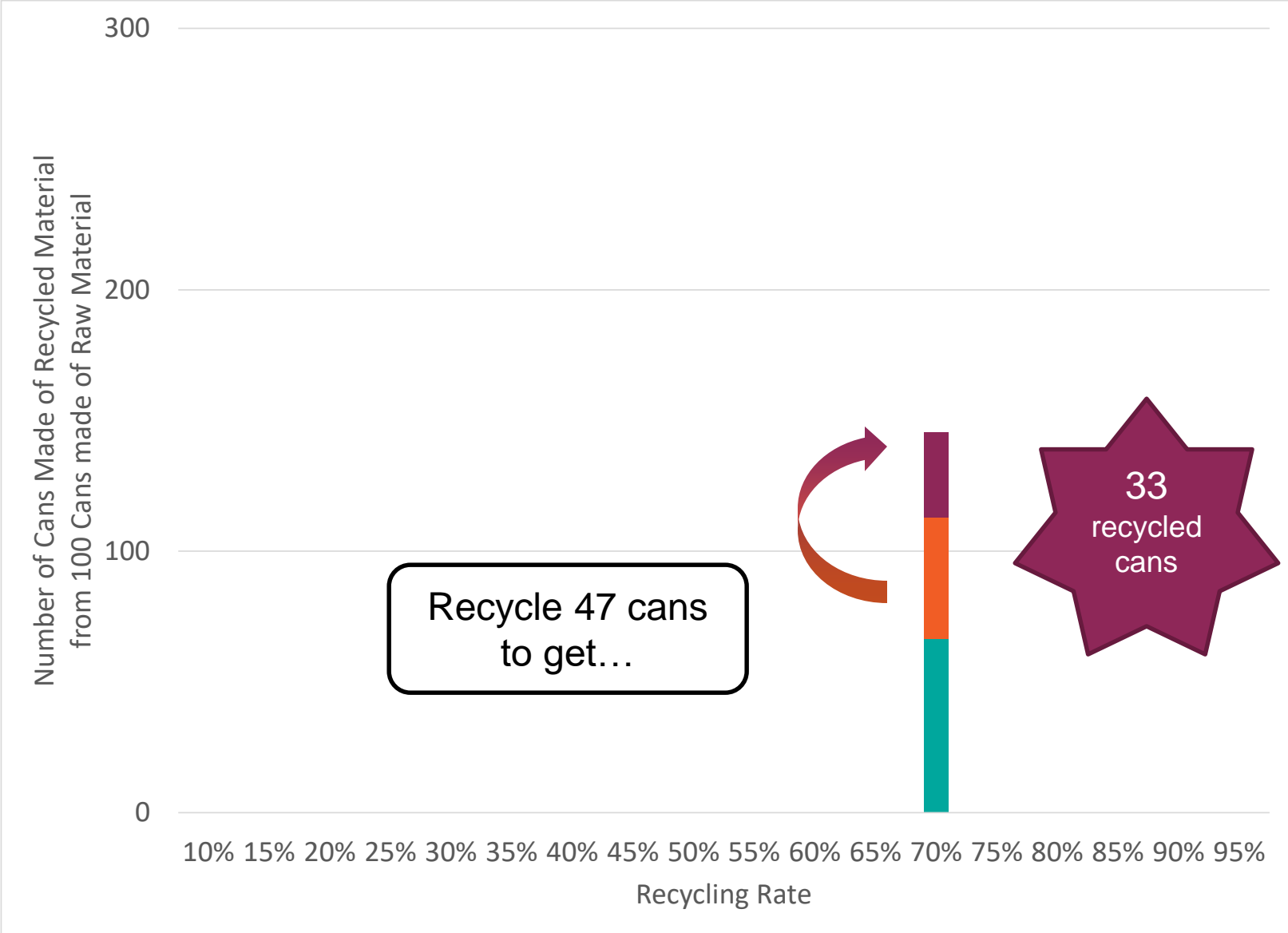
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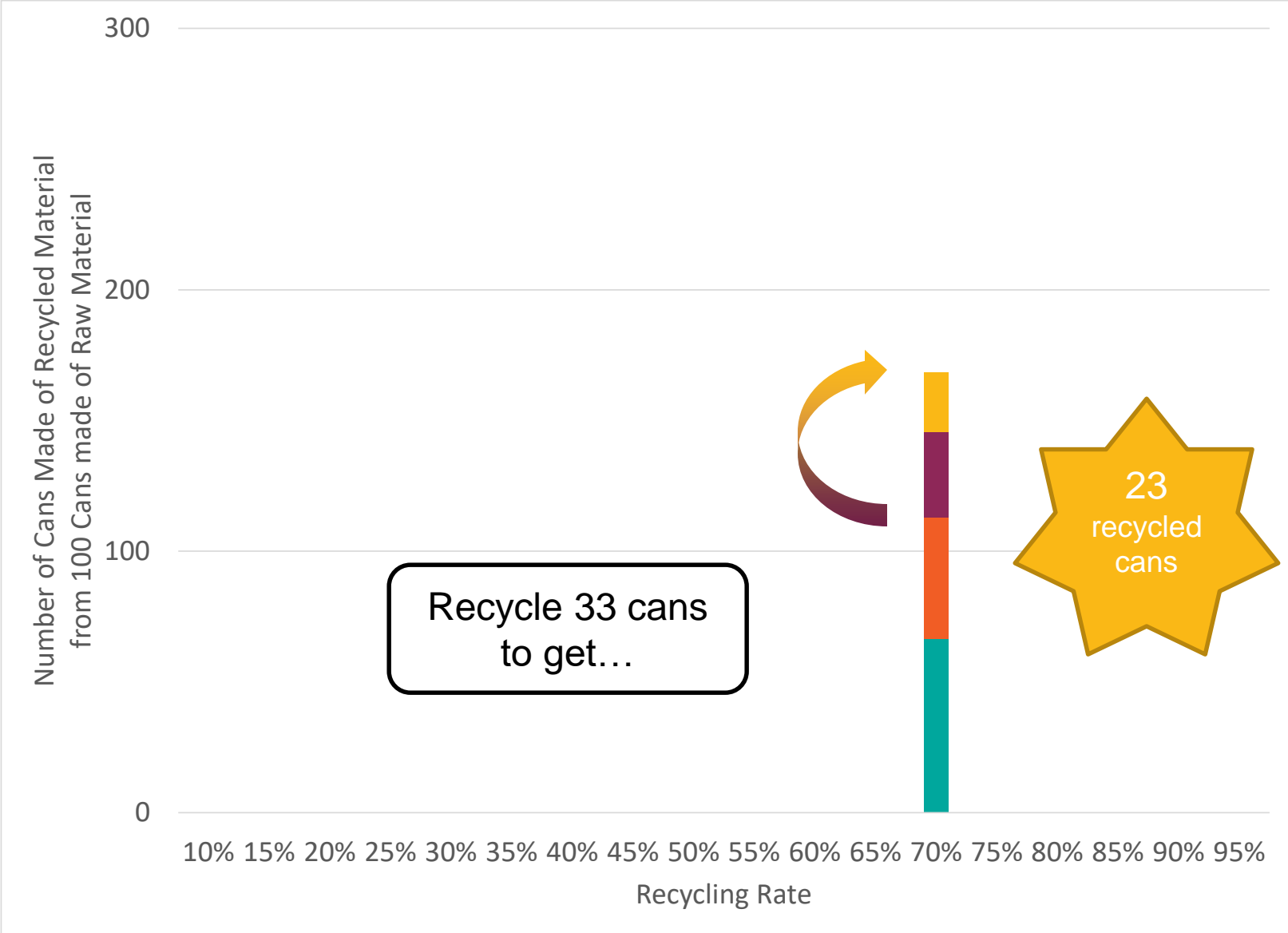


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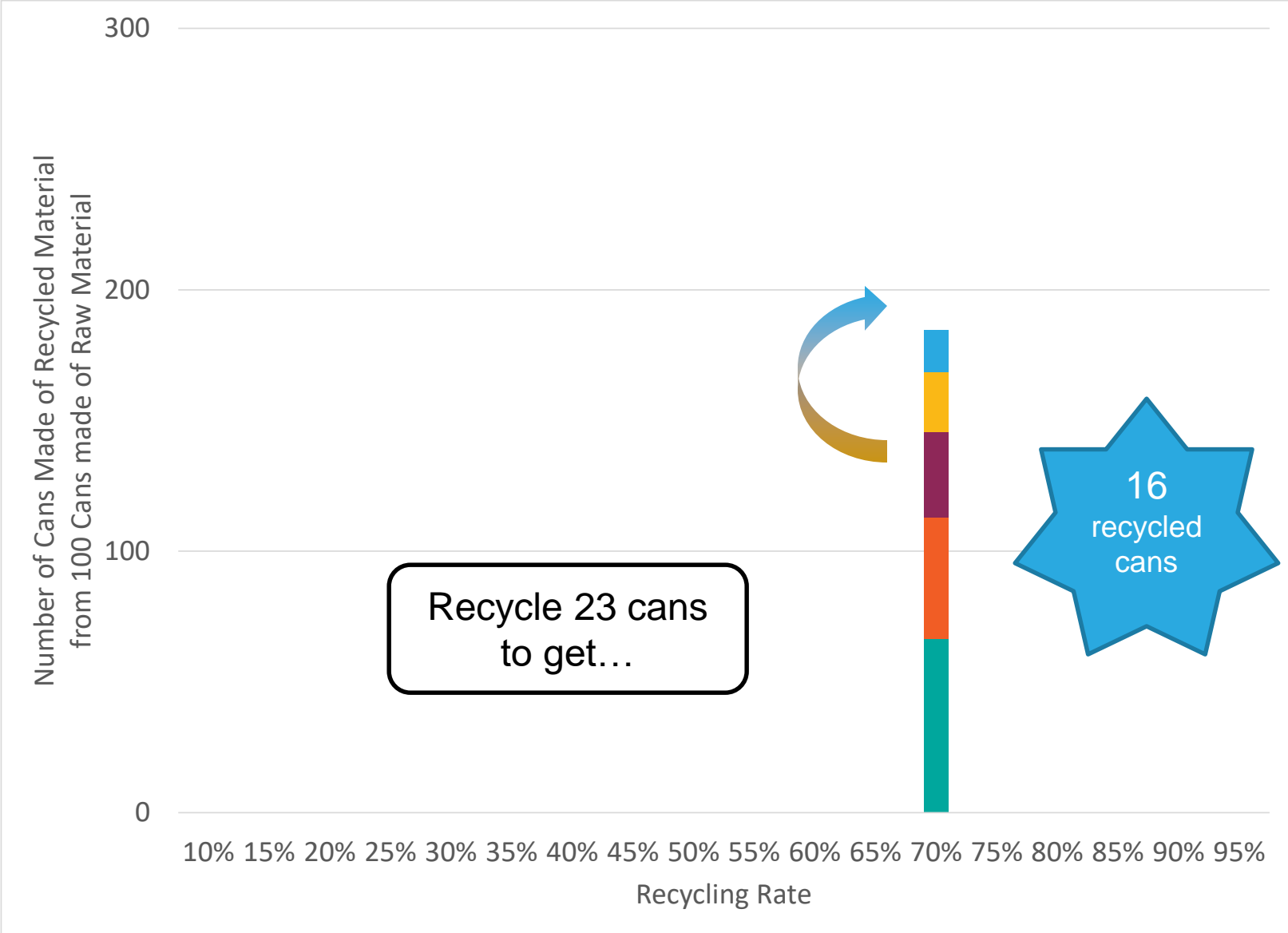




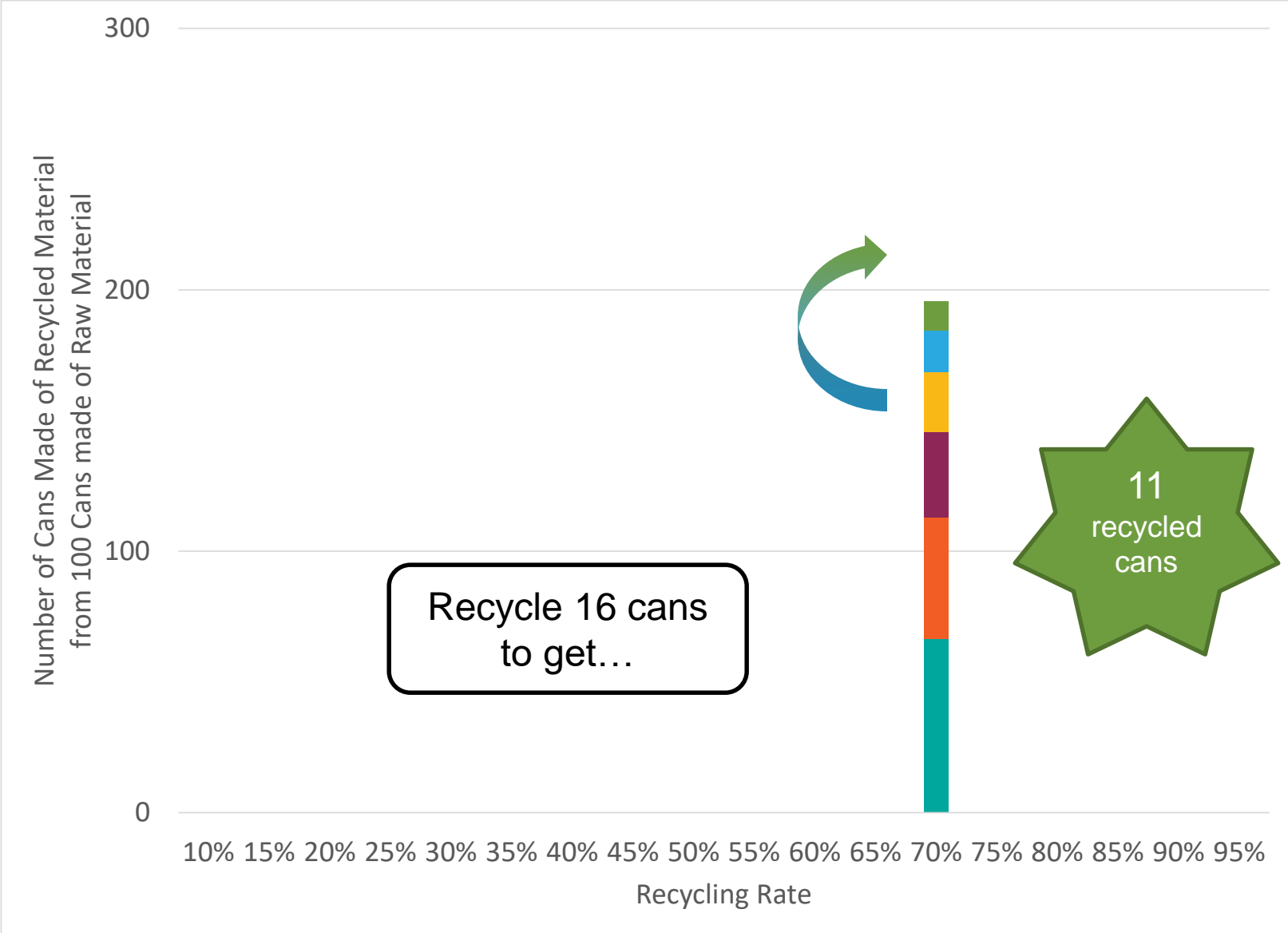
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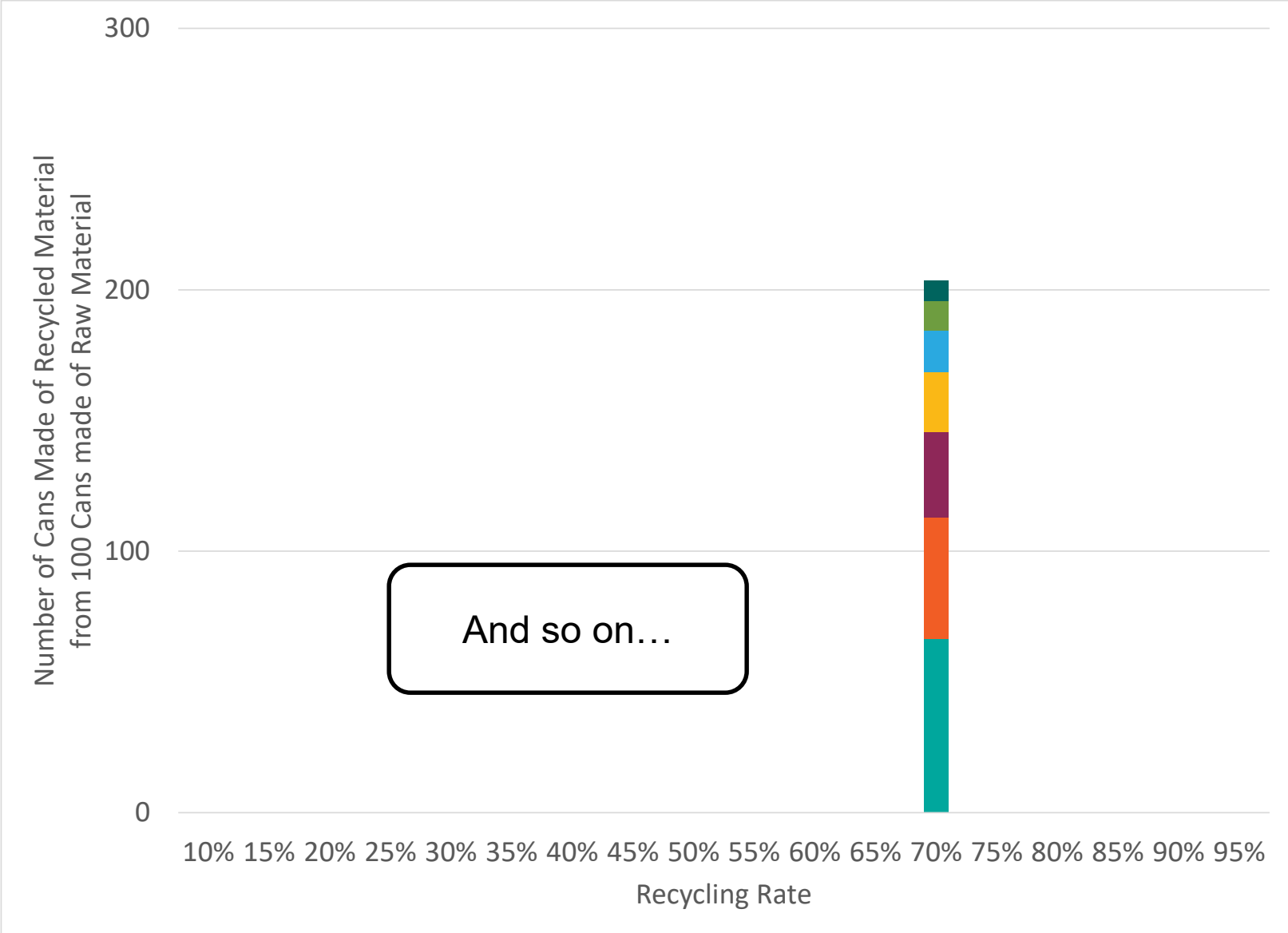


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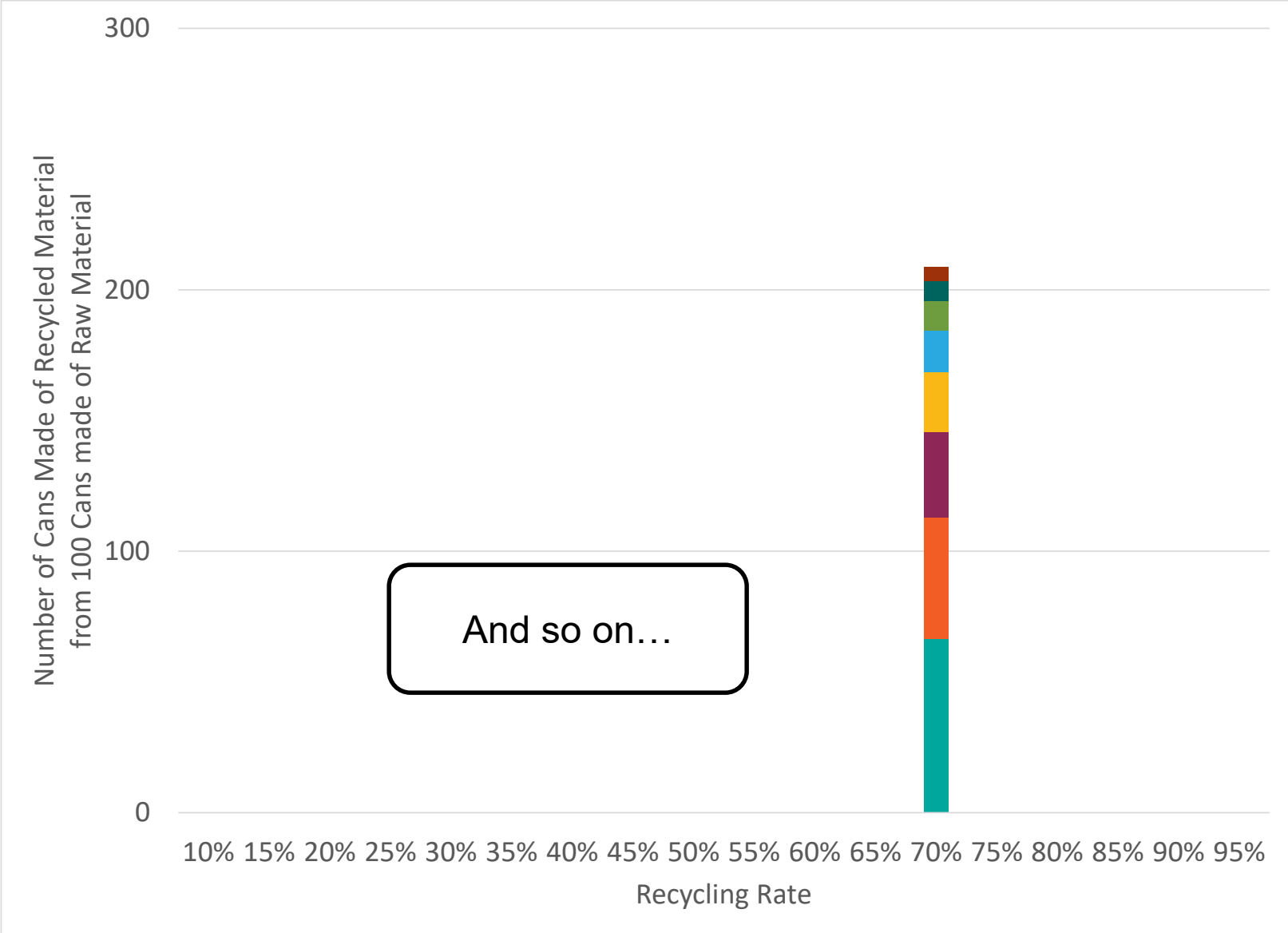




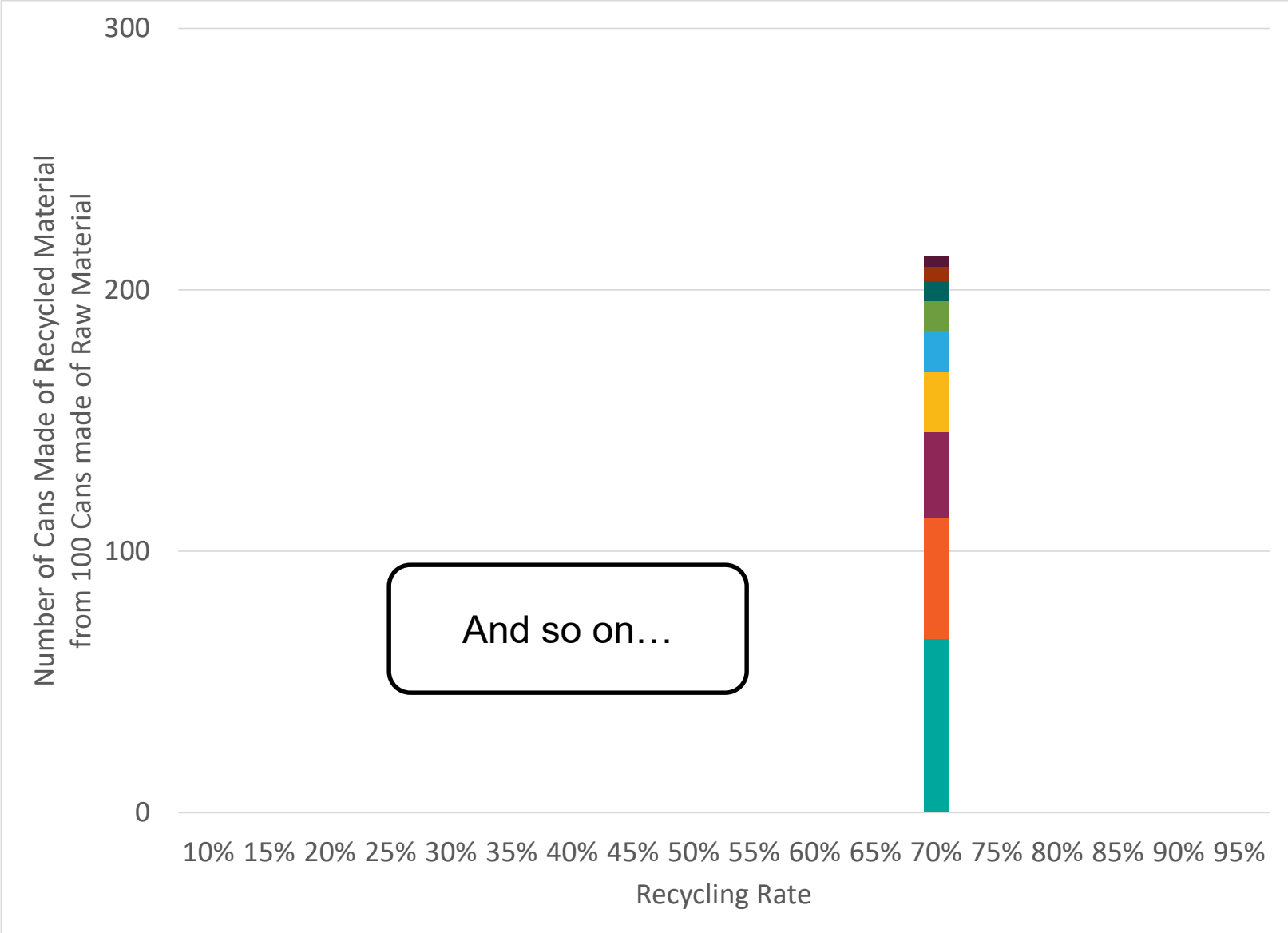
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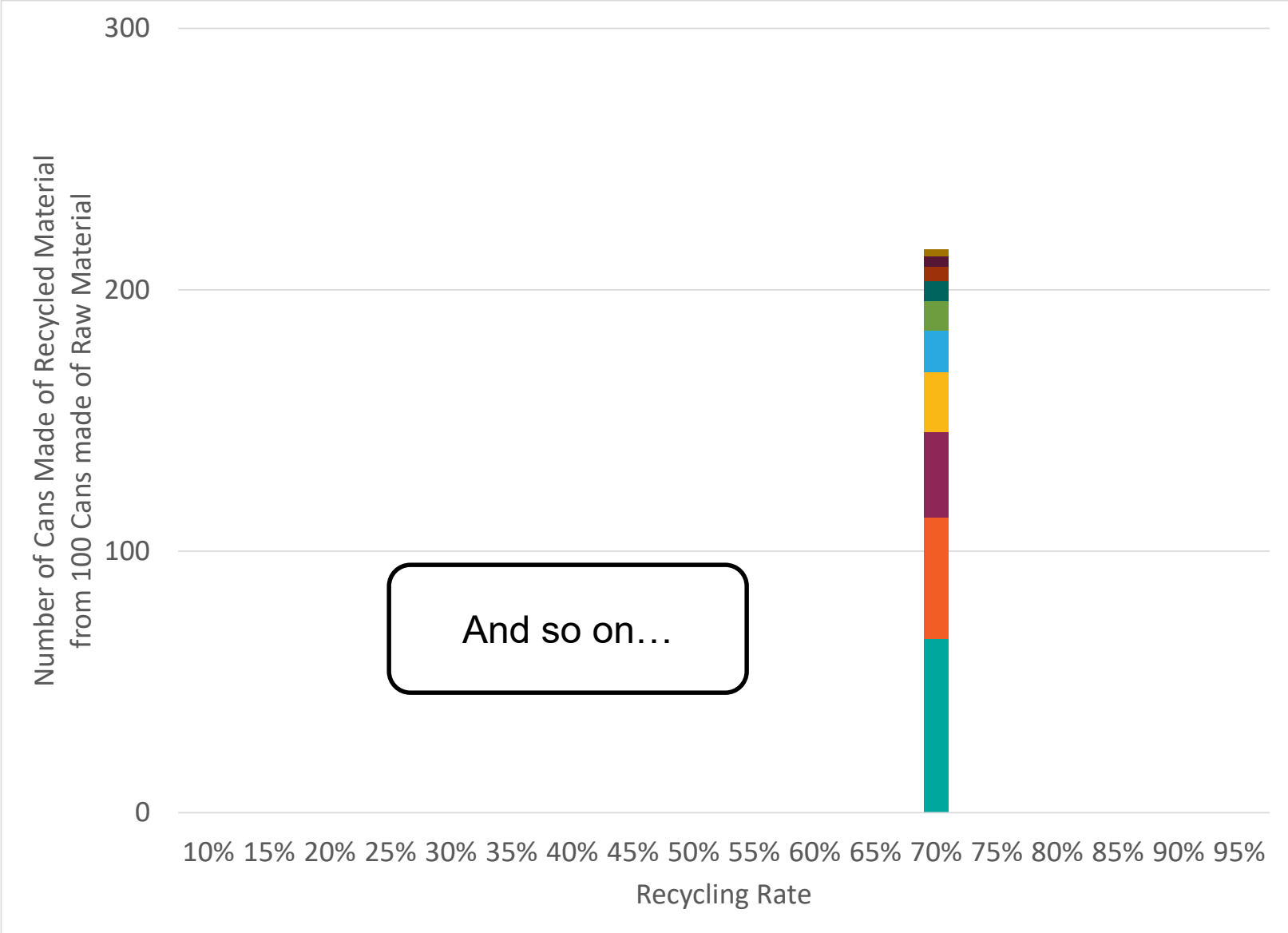


# Cumulative impact of high recycling rates

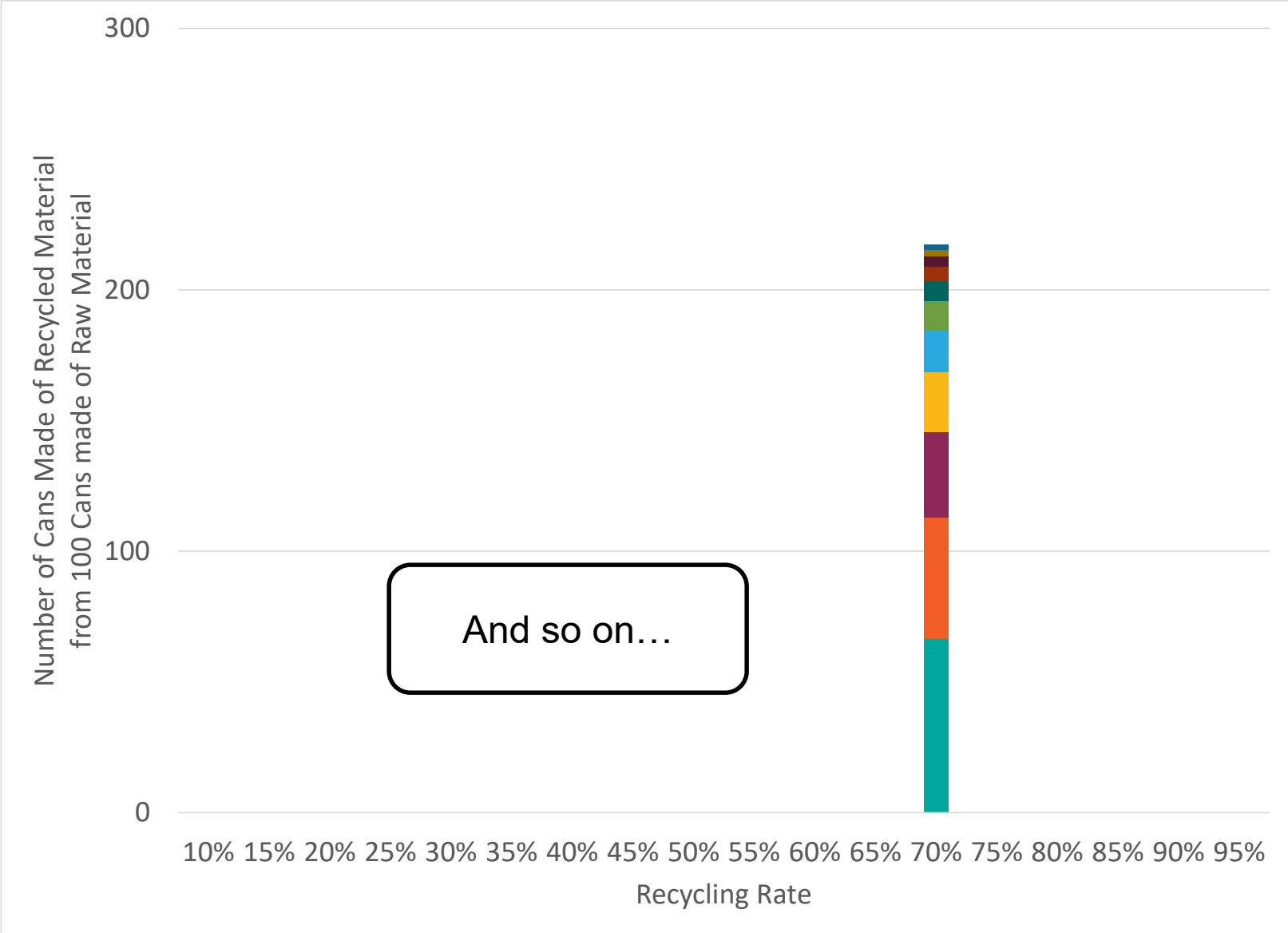




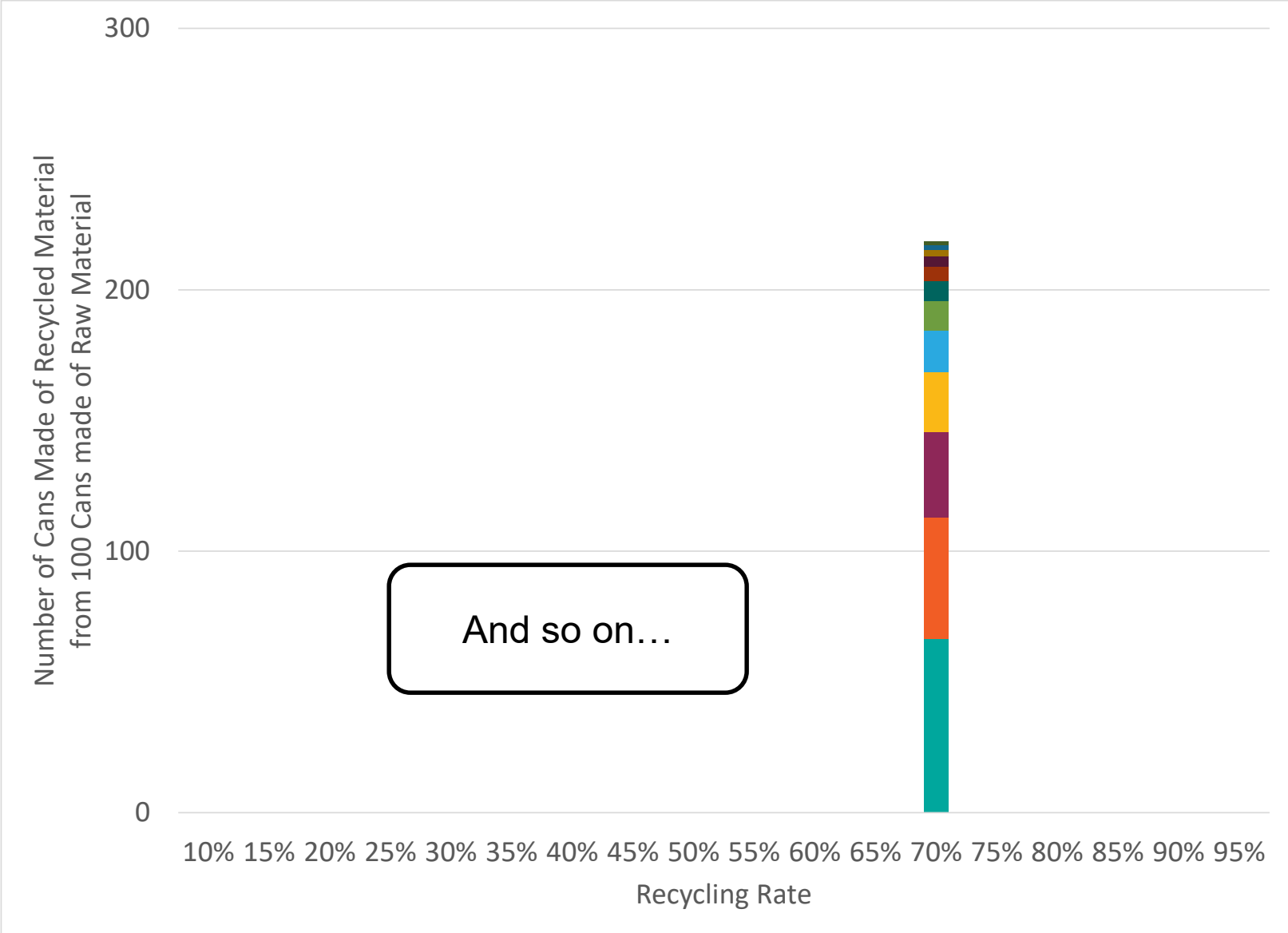
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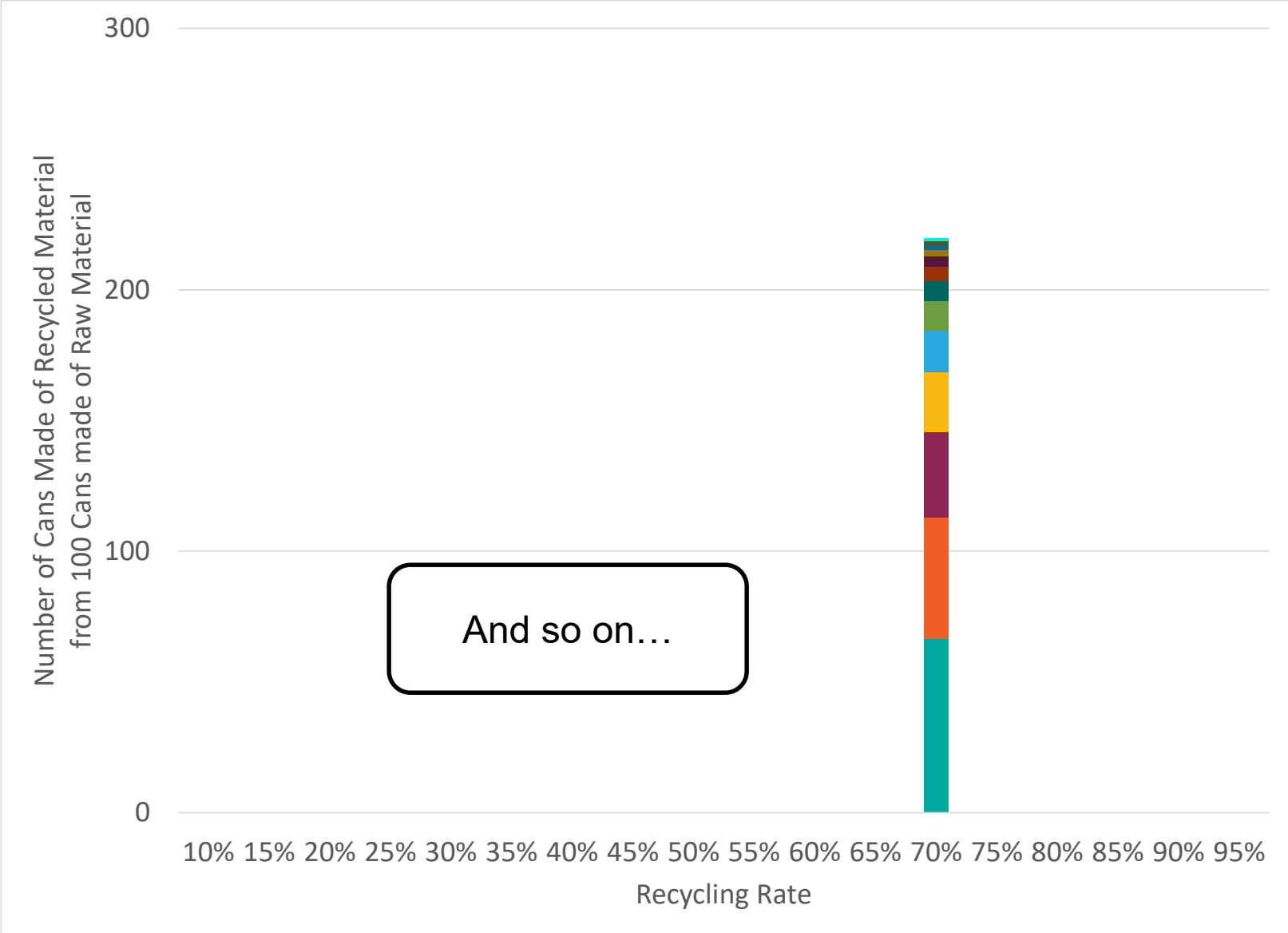


# Cumulative impact of high recycling rates

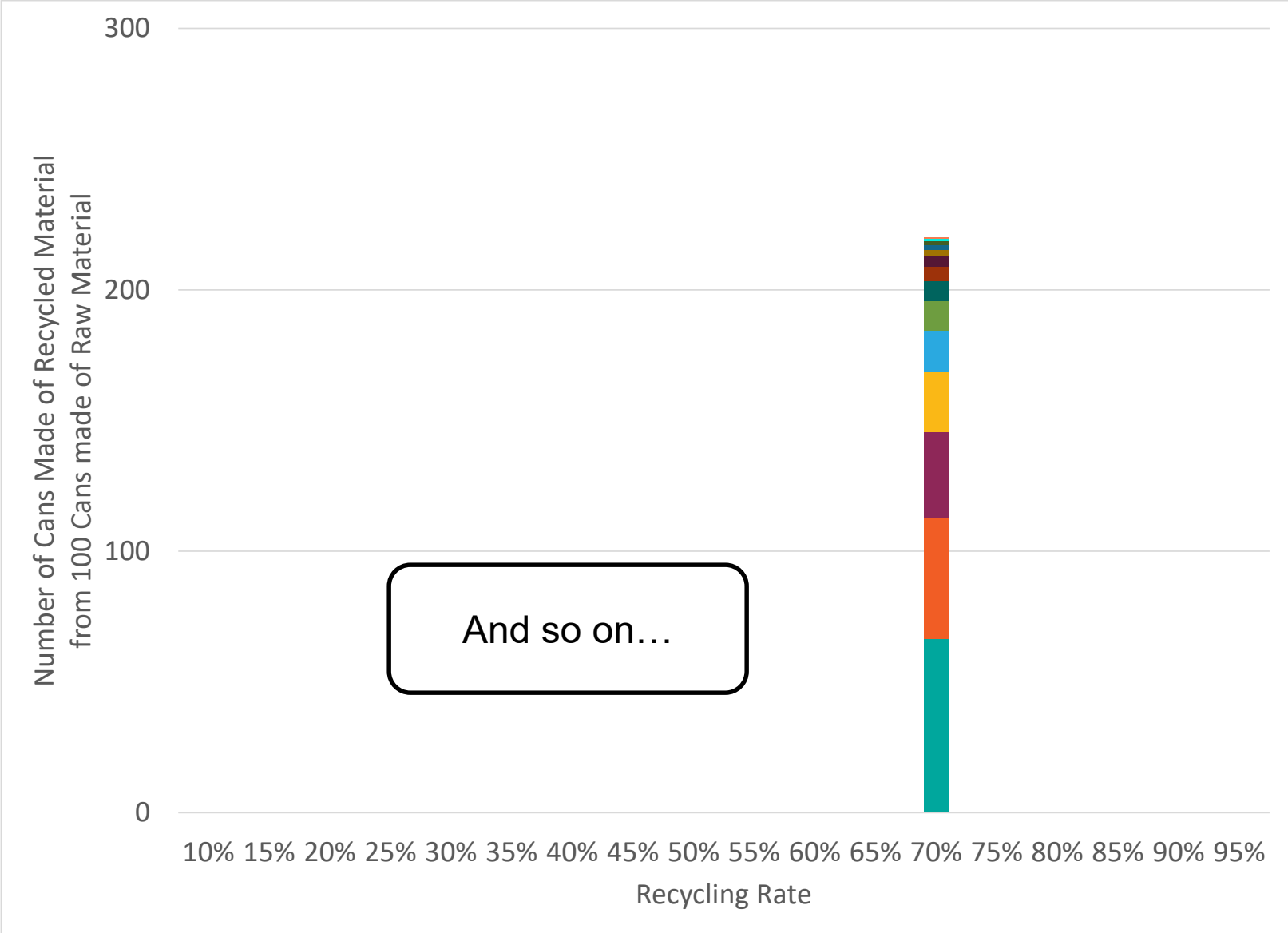




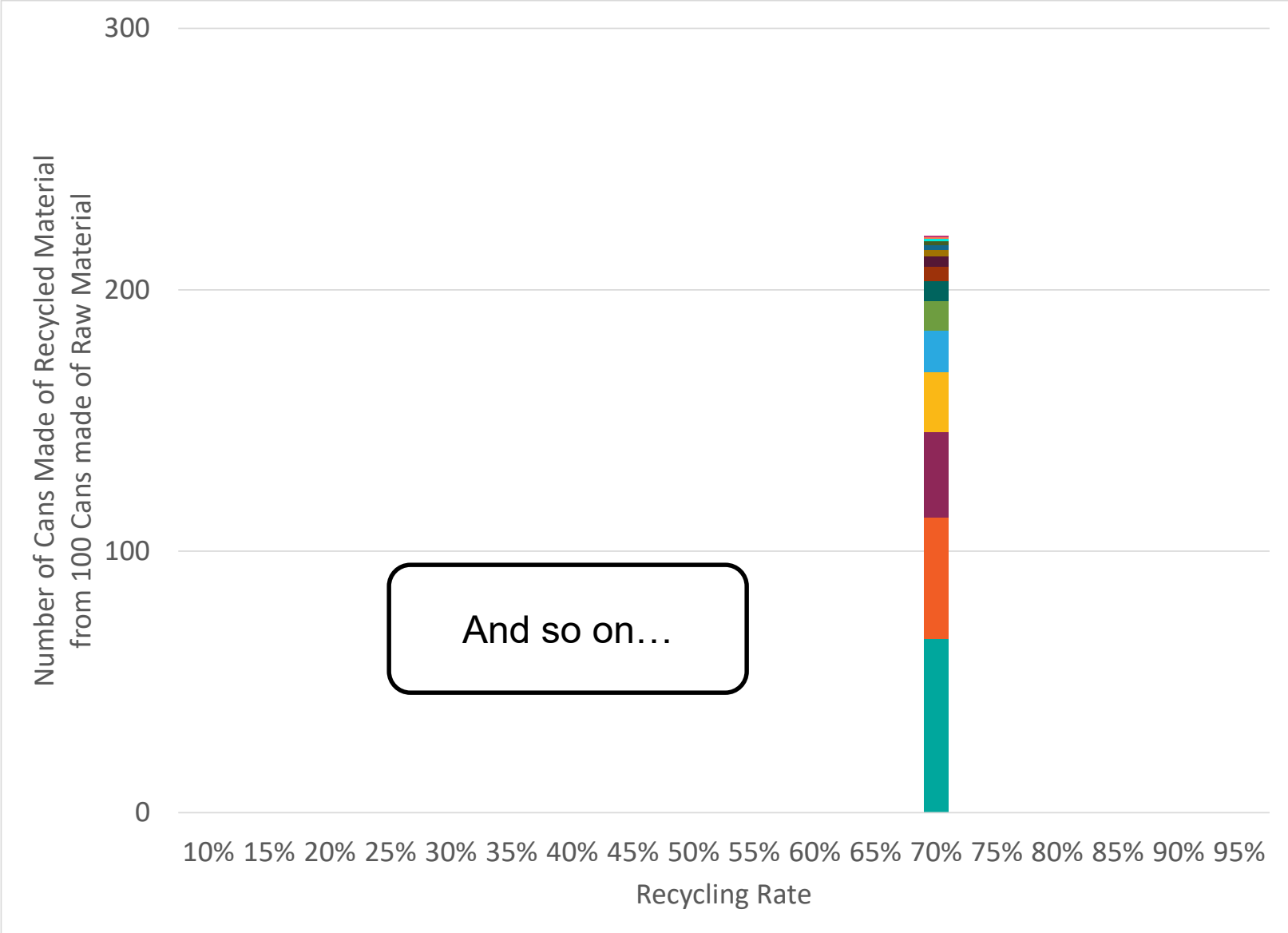
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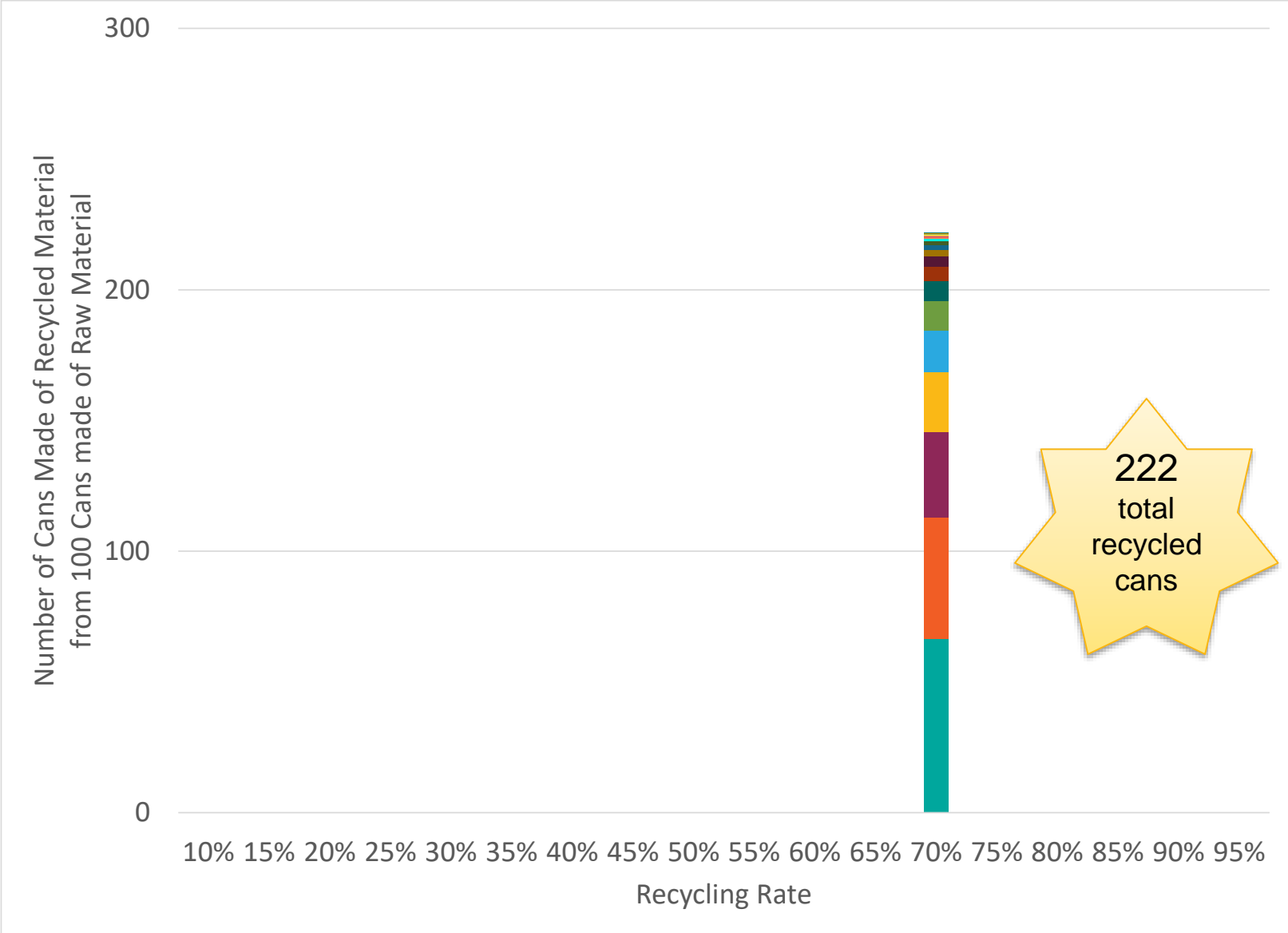


# Cumulative impact of high recycling rates

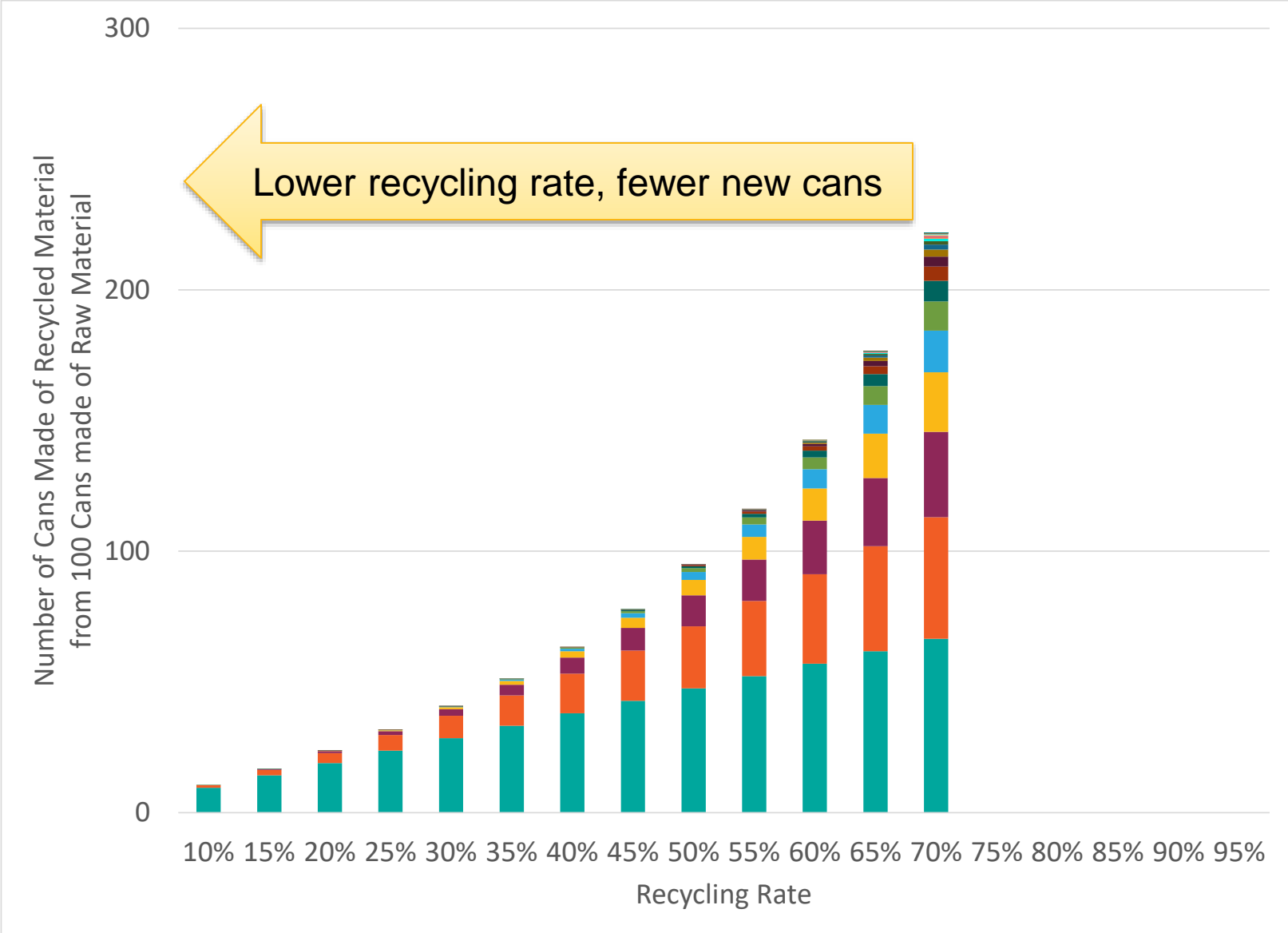




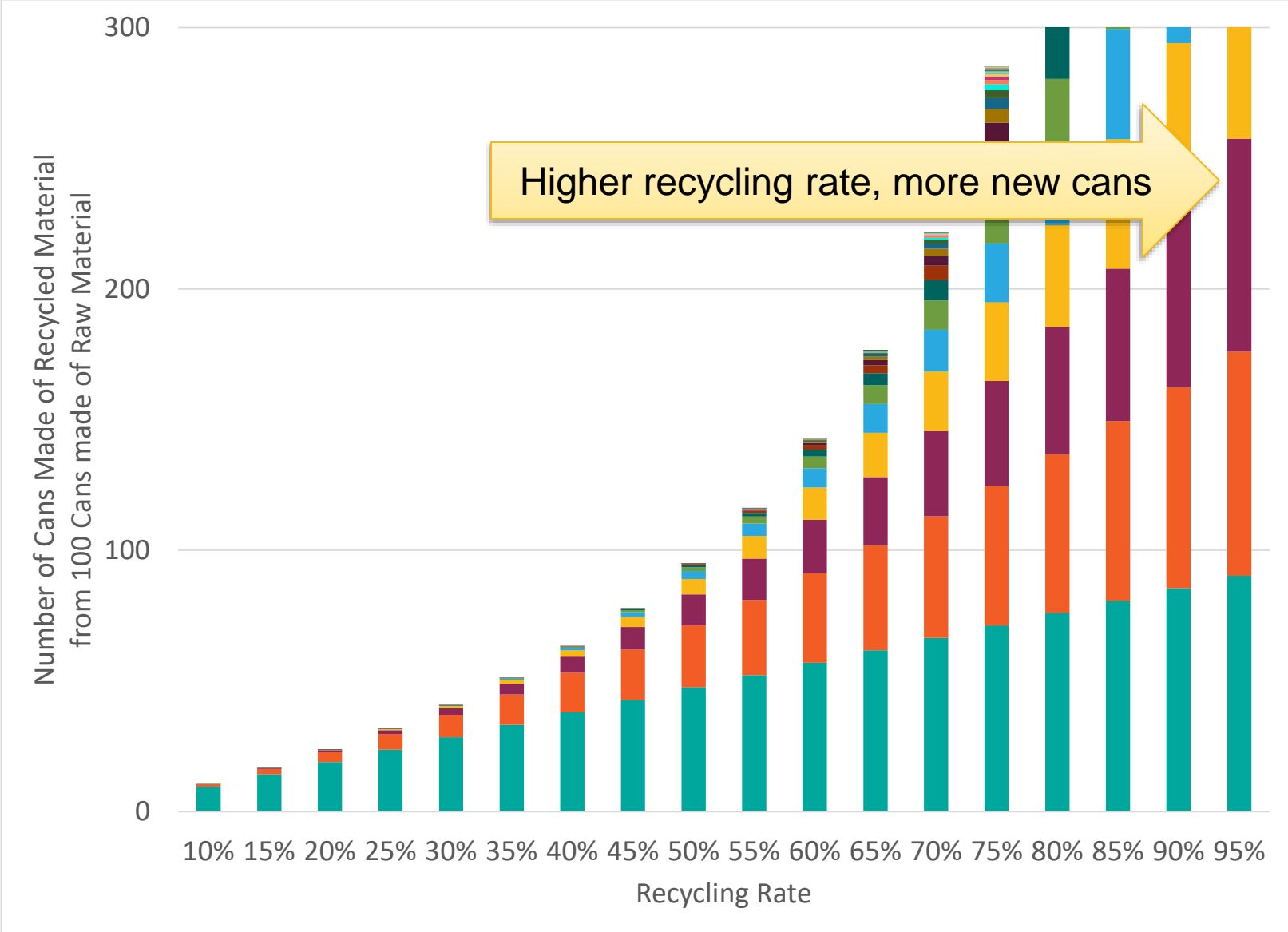
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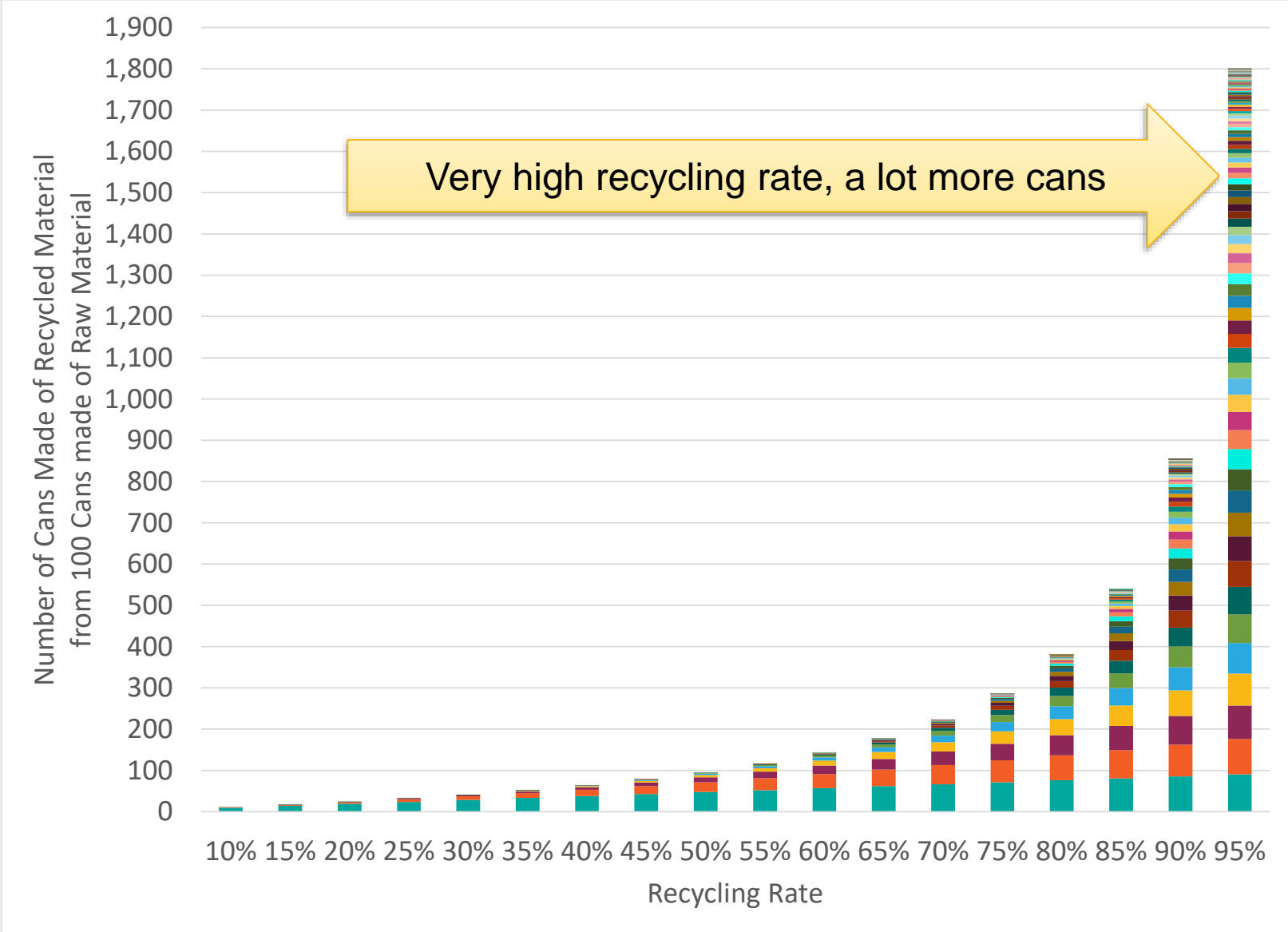
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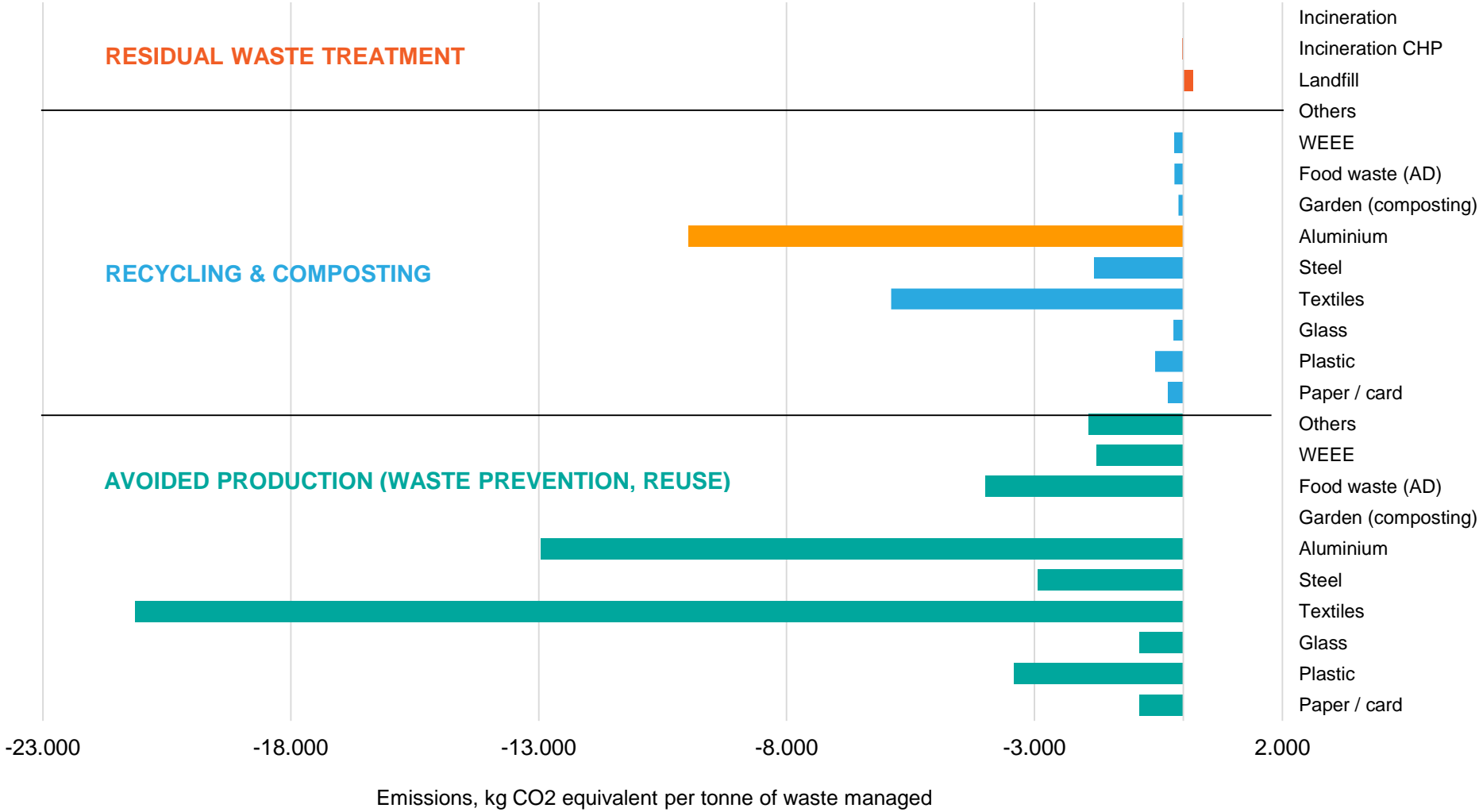


# Cumulative impact of high recycling rates





# Resource Efficiency: Greenhouse Gas Impacts





FOR HARDWORKING PEOPLE















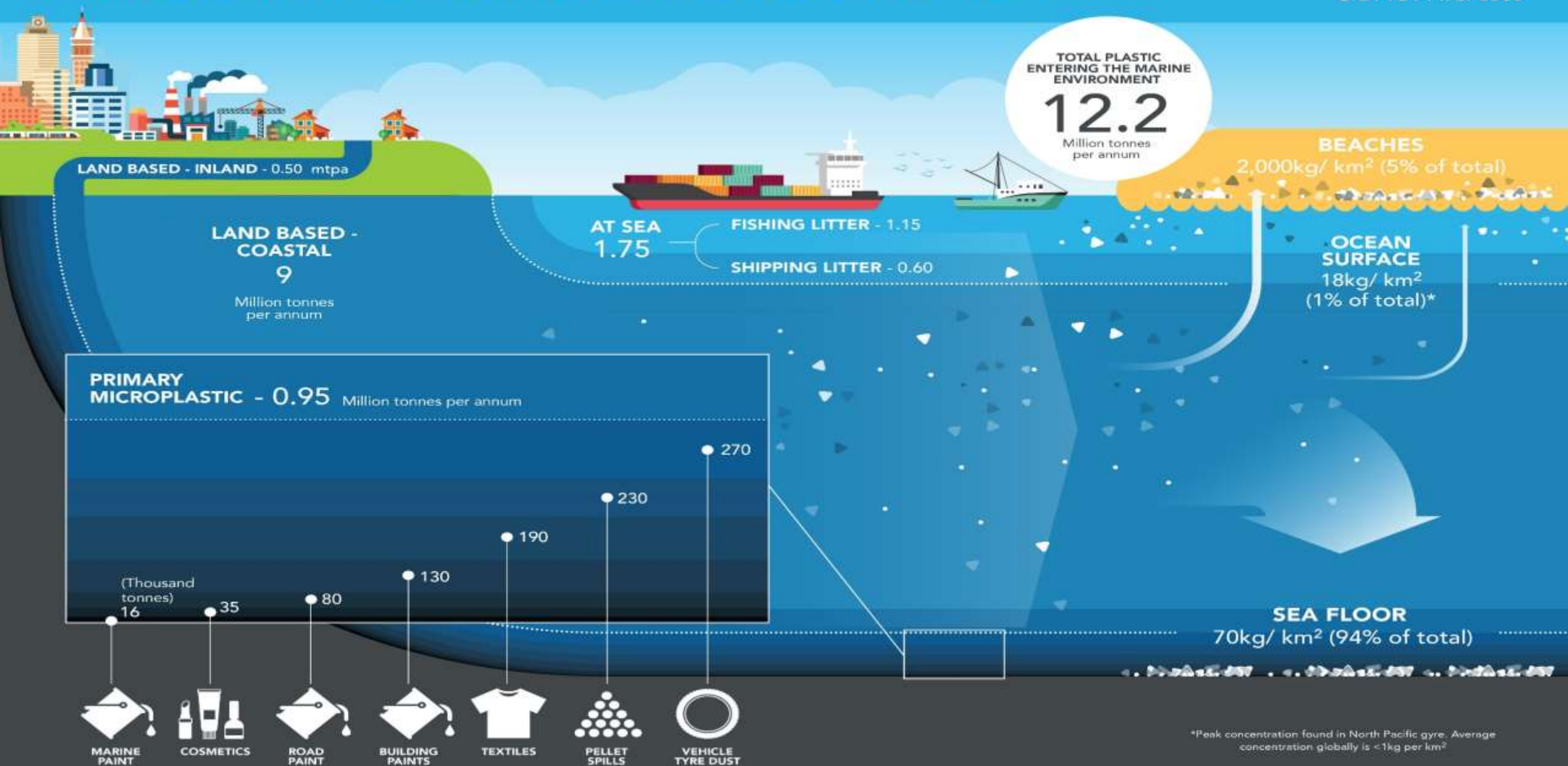






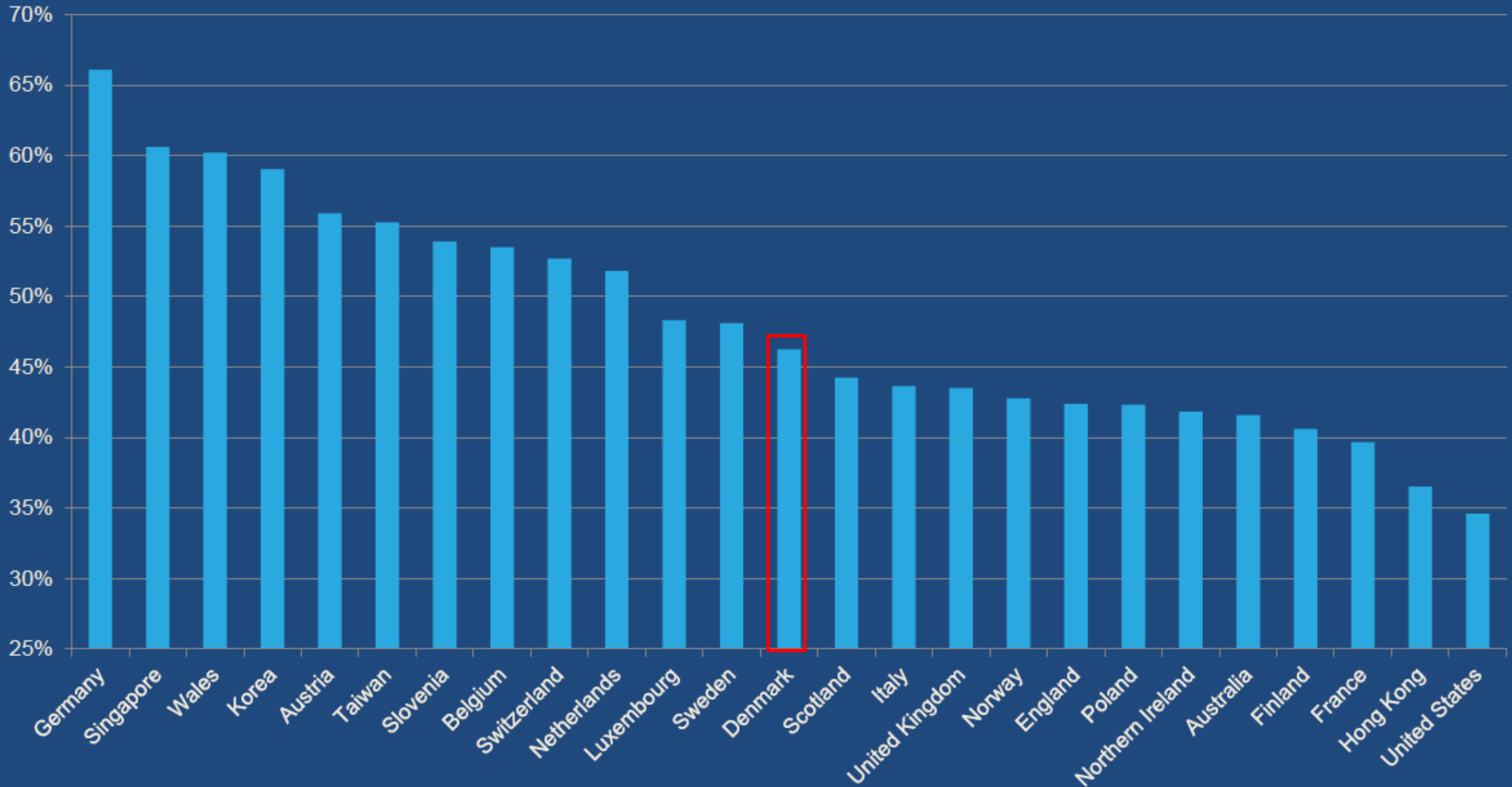
# PLASTICS IN THE MARINE ENVIRONMENT: WHERE DO THEY COME FROM? WHERE DO THEY GO?

eunomia 

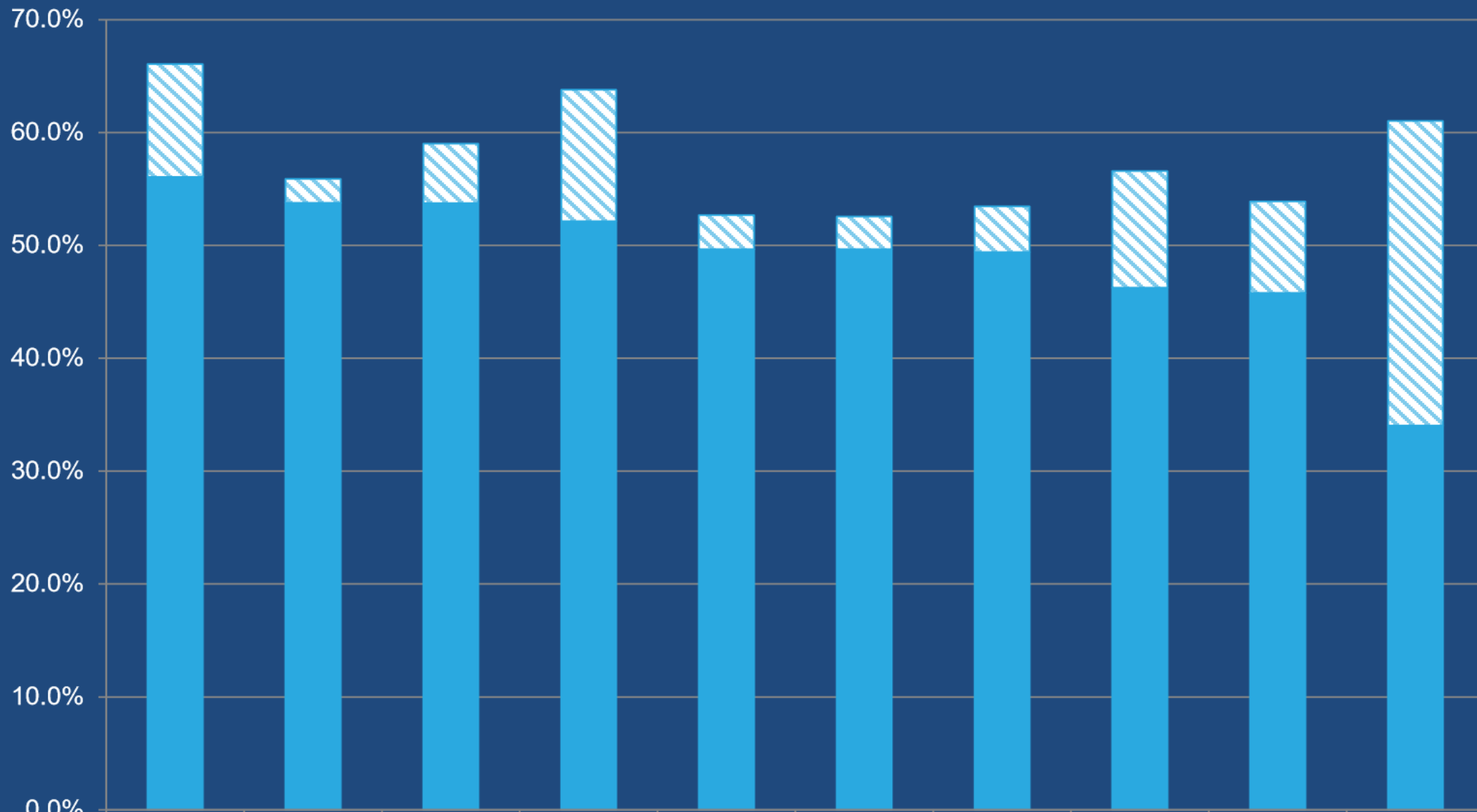




# Top 25 MSW Recyclers - Reported Recycling Rate



■ Adjusted MSW Recycling Rate    ▨ Reduction from Reported MSW Rate

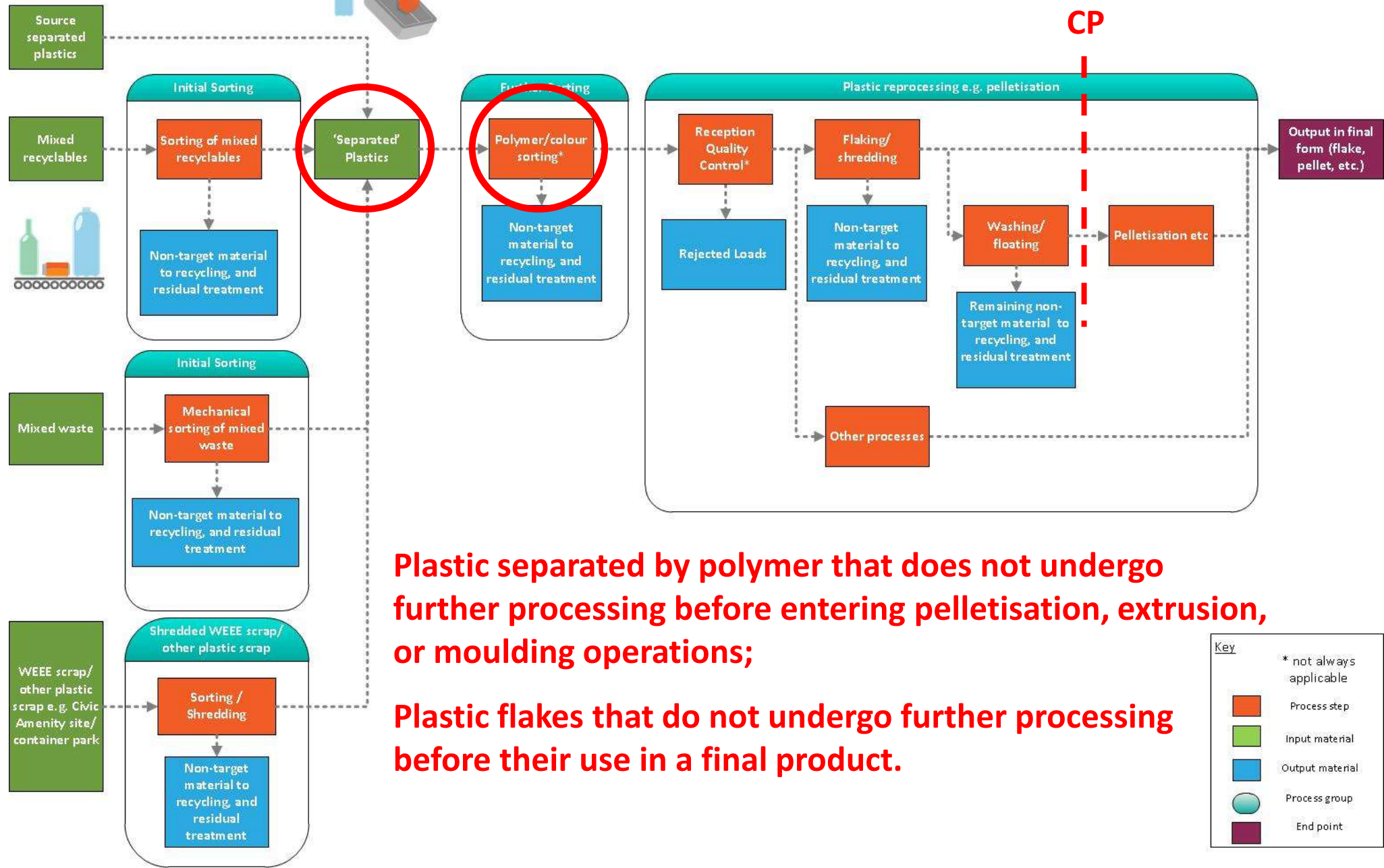


	Germany	Austria	South Korea	Wales	Switzerland	Italy	Belgium	Netherlands	Slovenia	Singapore
Reduction from Reported MSW Rate	10.0%	2.1%	5.3%	11.6%	3.0%	2.9%	4.1%	10.3%	8.1%	27.0%
Adjusted MSW Recycling Rate	56.1%	53.8%	53.7%	52.2%	49.7%	49.7%	49.4%	46.3%	45.8%	34.0%

# Recycling: New Measurement Method

- **Waste Framework Directive Recital 46**
  - ...The calculation of the recycling targets should be based on the weight of municipal waste which enters recycling. As a general rule, the actual measurement of the weight of municipal waste counted as recycled should be at the point where municipal waste enters the recycling operation.... Losses of materials which occur before the waste enters the recycling operation, for instance due to sorting or other preliminary operations, should not be included in the waste amounts reported as recycled
- **Waste Framework Directive Article 11a (1) (c)**
  - ...the weight of the municipal waste recycled shall be calculated as the weight of waste which, having undergone all necessary checking, sorting and other preliminary operations to remove waste materials that are not targeted by the subsequent reprocessing and to ensure high-quality recycling, enters the recycling operation whereby waste materials are actually reprocessed into products, materials or substances

# Plastics Flow Chart





# Is WTE 'too cheap' in Denmark?



# Mandatory Targets for Municipalities



MINISTERSTWO  
ŚRODOWISKA

## System of fines

The municipality which does not reach the following targets is subject to a fine:

- recycling, preparing for reuse and recovery
- reducing the weight of biodegradable municipal waste to be landfilled

Fines calculated individually per each tonne of waste to „missing” to achieve the target.

Rate per tonne = landfill fee of mixed municipal waste

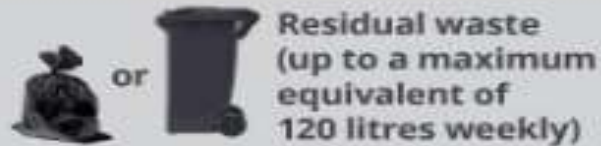
35 € (140 PLN) in 2018,

43 € (170 PLN) in 2019,

68 € (270 PLN) in 2020

# Consistent or Minimum Collection Standards

## Multi-stream with separate food



Minimum of 120 litres collected weekly



Plastics, metals  
and cartons



Glass and card\*



Paper

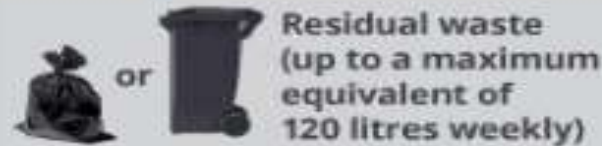


Food



Plastics, metals,  
cartons, glass,  
card, paper  
and food

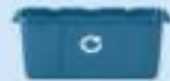
## Two-stream (fibres separate) with separate food



Minimum equivalent of 120 litres weekly



Plastics, metals,  
cartons and glass



Paper and card



Food

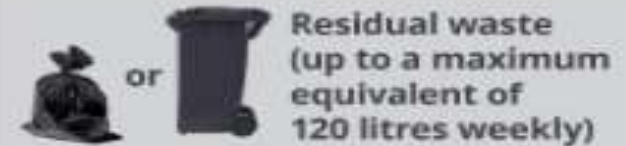


Plastics, metals,  
cartons, glass,  
card and paper



Food

## Co-mingled with separate food



Minimum equivalent of 120 litres weekly



Plastics, metals,  
cartons, glass,  
paper and card\*\*



Food



Plastics, metals,  
cartons, glass,  
card and paper



Food

\*Glass and card would be presented in the same box but separated into different compartments on the vehicle. In flatted properties card and paper could be collected together. Glass would be collected as a separate stream.

\*\* The advice from reprocessors is that glass and paper are collected separately to maintain material quality.



# EPR Fee Modulation: French Bonus/Malus

On-pack sorting instructions



Weight reduction



Volume reduction



Mono-material packaging



Recycling disruptors



Non-recoverable packaging

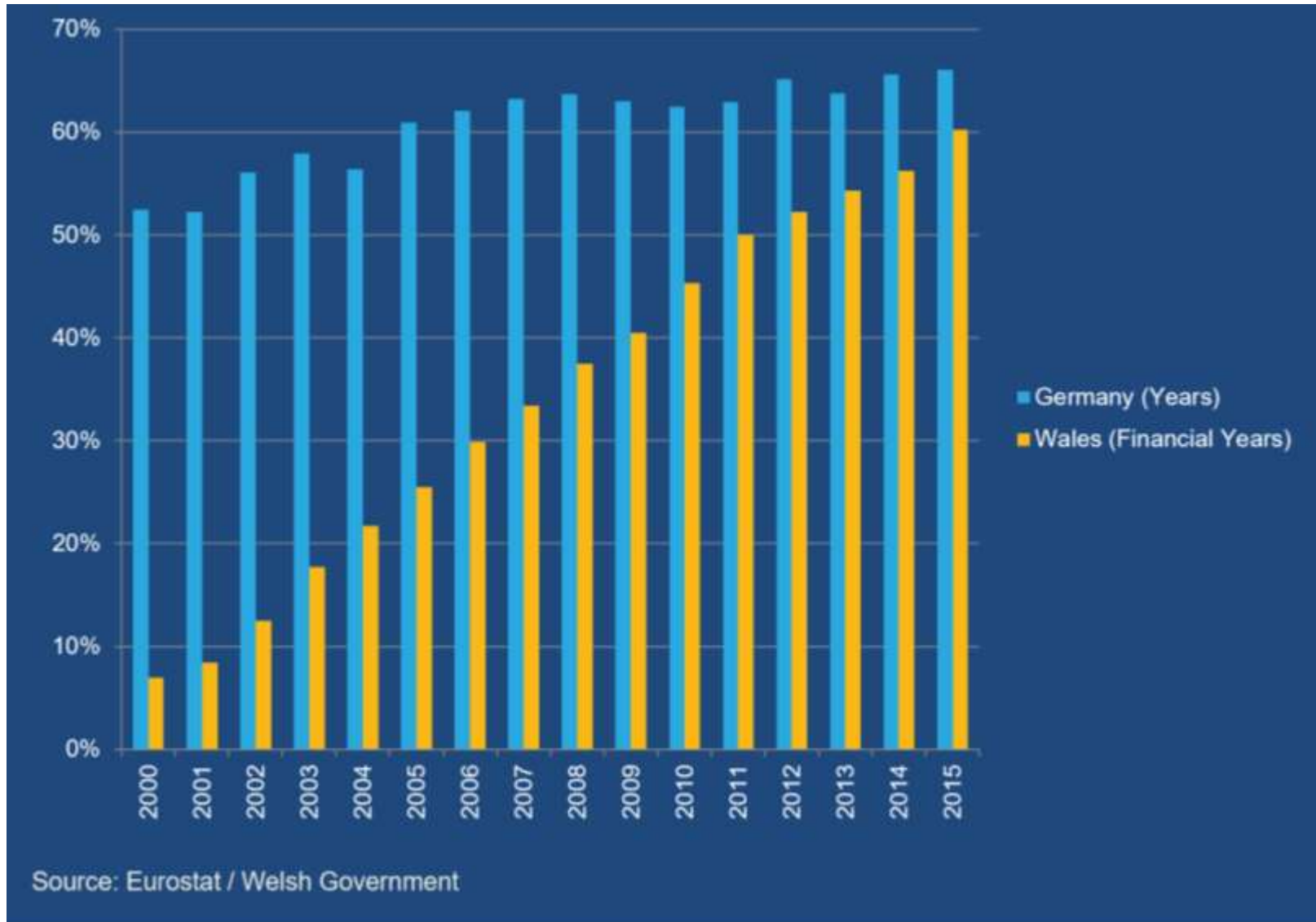


# EPR Fee Modulation: Italian 4-level System

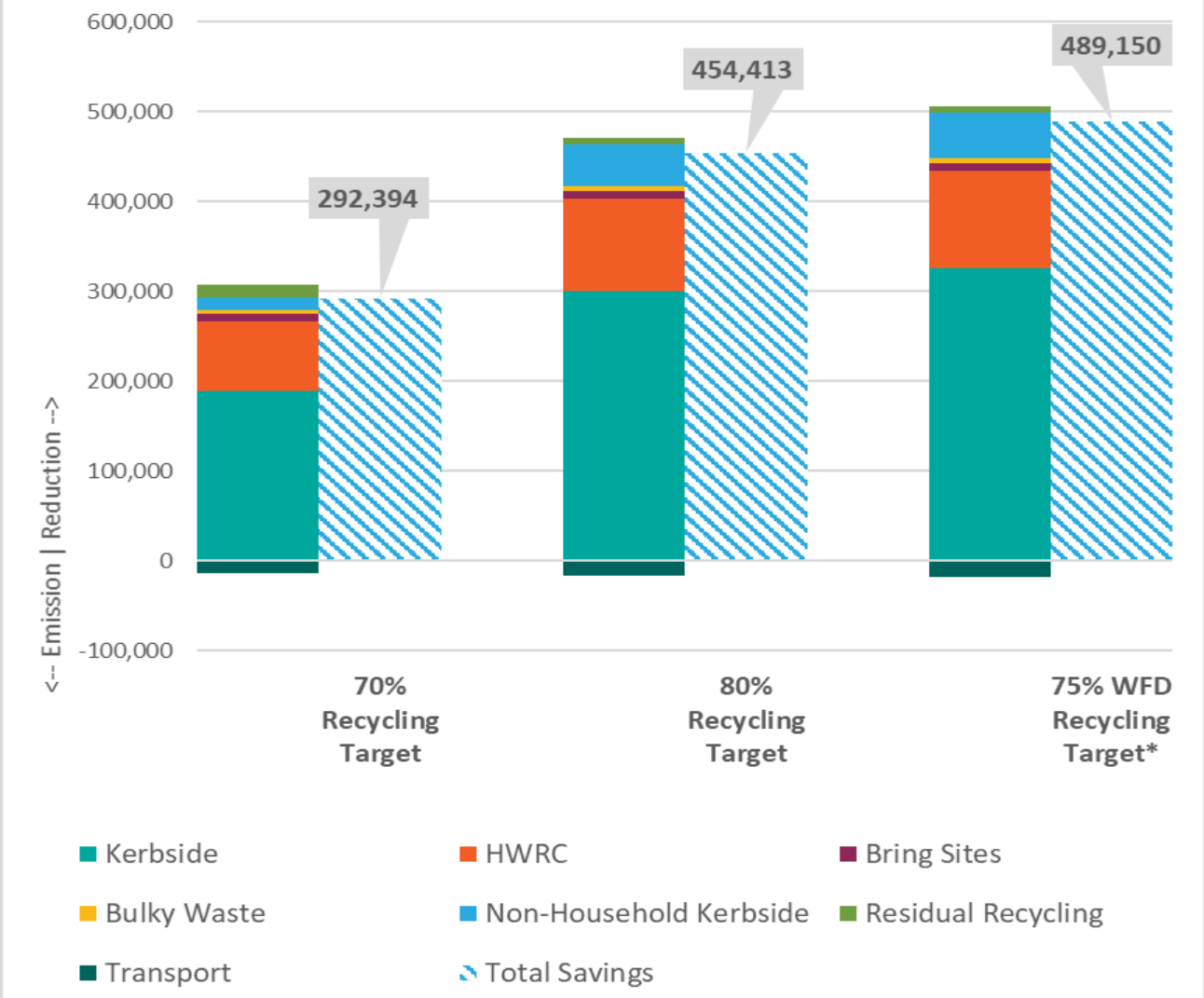
2017	2018	2019
<b>Single fee</b> 188 €/ton	<ol style="list-style-type: none"><li>1) Level A - <b>Sortable and recyclable packaging</b> from the <b>C&amp;I</b> circuit <b>179 €/ton</b></li><li>2) Level B - <b>Sortable and recyclable packaging</b> from the <b>Household</b> circuit <b>208 €/ton</b></li><li>3) Level C - <b>Packaging not sortable/recyclable</b> with current technologies <b>228 €/ton</b></li></ol>	<ol style="list-style-type: none"><li>1) Level A - <b>Sortable and recyclable packaging</b> from the <b>C&amp;I</b> circuit <b>150 €/ton</b></li><li>2) Level B1 - <b>Sortable and recyclable packaging</b> from the <b>Household</b> circuit with an efficient/consolidated recycle process <b>208 €/ton</b></li><li>3) Level B2 – <b>Other sortable and recyclable packaging</b> from the <b>Household</b> circuit based <b>263 €/ton</b></li><li>4) Level C - <b>Packaging not sortable/recyclable</b> with current technologies <b>369 €/ton</b></li></ol>



# Recycling Rate Trajectory – Germany and Wales

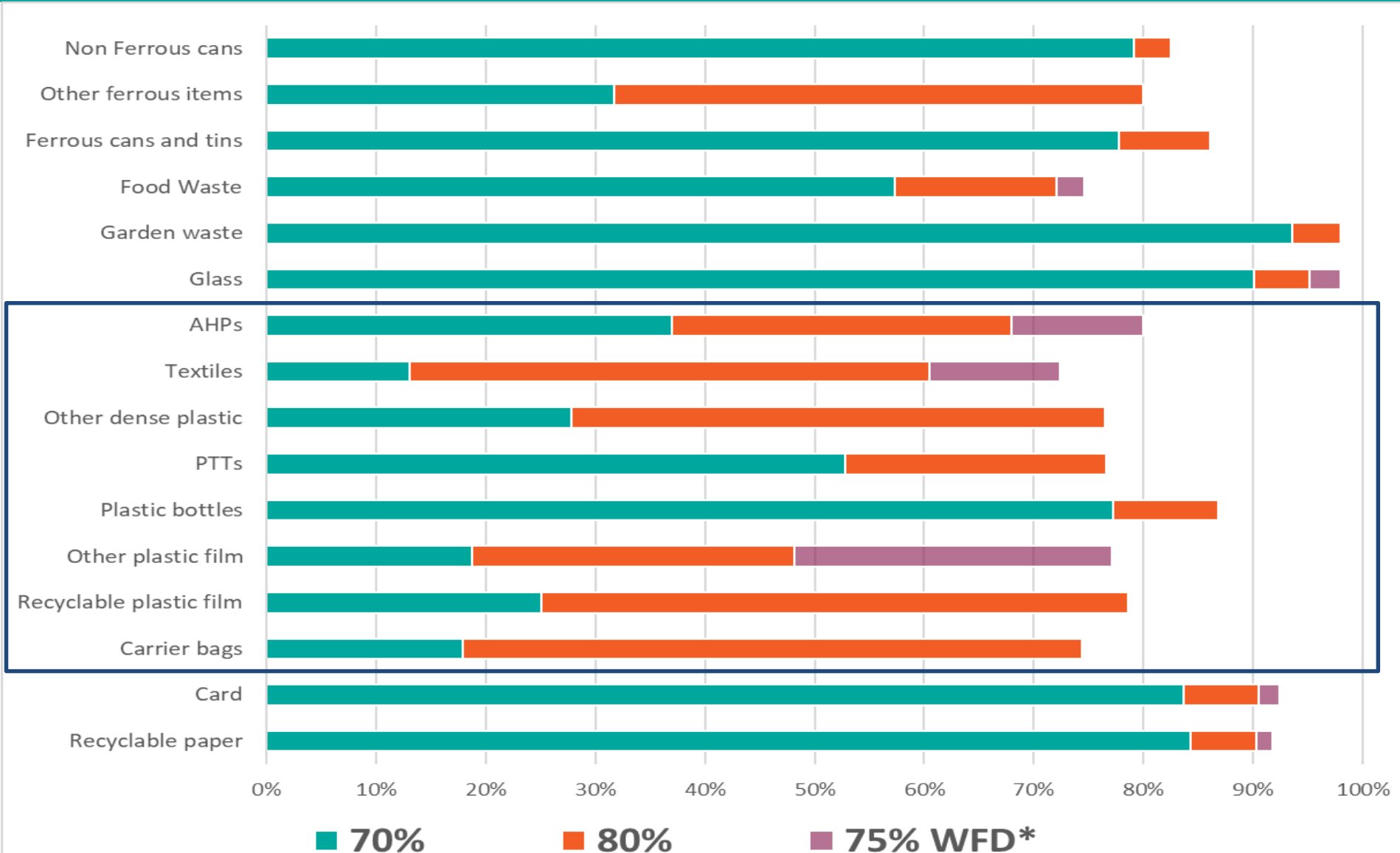


# GHG Emissions Savings (t CO<sub>2</sub>e )



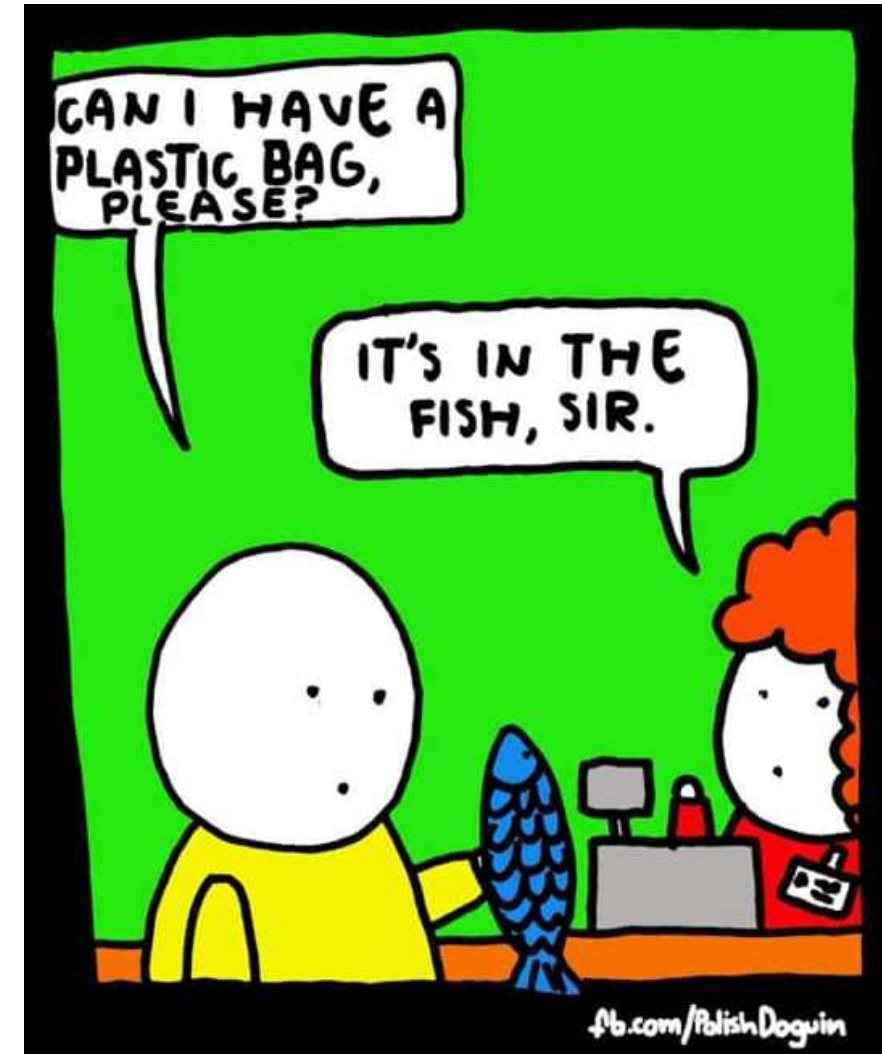
\* equivalent of 84% (under the current definition) for comparison to the other targets

# Material Recycling Rates Required



# Last words...

- **Big challenges for Denmark...**
- **But also huge opportunities**
  - Getting EPR right
  - Leveraging emerging technologies
  - Making most of existing situation
    - Role as provider of super-efficient WTE
    - Taking DRS to next level
    - Building on tradition of public infrastructure
  - Make the right decisions – based on the evidence!





[www.eunomia.co.uk](http://www.eunomia.co.uk)

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