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# New Calculation Method for Measurement of Recycling Rates and Influence on Recycling Quotas

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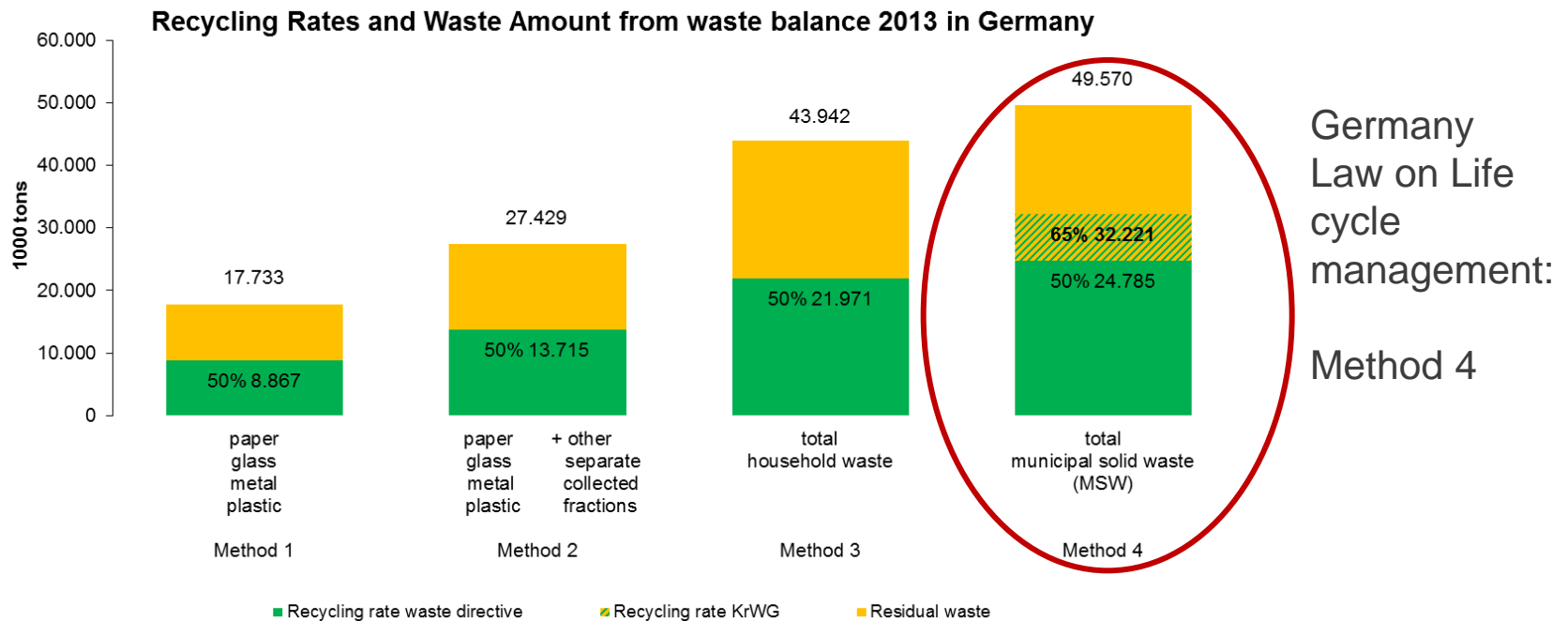
# Legislative Basis



- **Europe**  
Directive 2008/98/EC on waste (Waste Framework Directive)  
  
by 2020 recycling target minimum of **50% by weight for at least paper, metal, plastic and glass**
- **Germany**  
Kreislaufwirtschaftsgesetz (Law on Life-Cycle Management)  
of 24th February 2012  
  
by 2020 recycling target minimum of **65% by weight of total municipal waste (MSW)**

# Calculation Methods

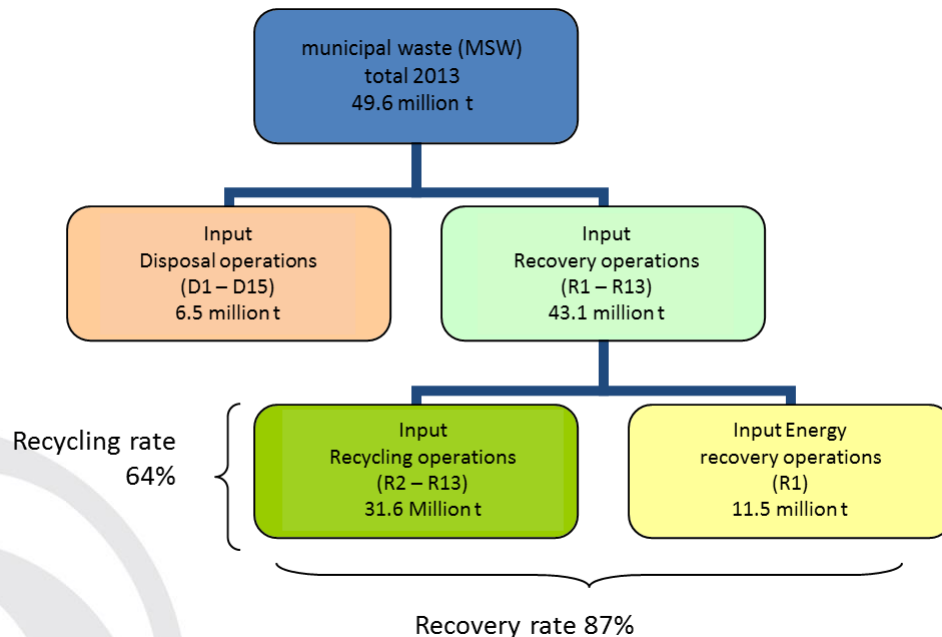
- Directive 2008/98/EC on waste allows 4 methods for calculating the recycling rates<sup>1</sup>



<sup>1</sup> Commission decision: „Establishing rules and calculation methods for verifying compliance with the targets set in Article 11 (2) of Directive 2008/98/EC“, 18.11.2011, 2011/753/EU

# Statistics and Reality

- Calculation of recycling rate with input in recycling plants (R2-R13 operations)
- Recycling Rate 64% (31.6 million t) in 2013, recycling target nearly fulfilled



## R2-R13-operations:

- Material Recovery Facilities (MRF),
- Disassembling facilities,
- Shredder plants,
- Composting and anaerobic digestion plants,
- Mechanical Biological Treatment plants (MBT)

## Calculating with input waste streams overestimates recycling

- When regarding the output from separate collection only the recycling of glass, paper & cardboard and metals reaches 85% - 90%.
- Only 50% (other sources say 20-30%) of the output from MRF's for plastic and lightweight material is recycled, the rest will be incinerated.
- About 60% of biowaste will be used as compost, the rest is water, CO<sub>2</sub> and a small amount of contraries.
- Regarding mixed MSW treated in MBT plants only 6% mostly metals will be recycled.
- On the other hand 9% metals are recycled from bottom ashes from incinerators.

## New Calculation Method for recycling targets<sup>1</sup>

- Only the input in a „final recycling process“ is counted
- The output of any sorting operation can be counted as recycled, when the waste streams for disposal or incineration remain below 10%.
- Metals from bottom ash of incinerators when entering a final recycling process will be counted as recycling when they fulfill certain quality criteria.<sup>2</sup>

<sup>1</sup> Proposal for a Directive of the European Parliament and of the Council amending Directive 2008/98/EG on waste, 02.12.2015

Article 11a. Rules on the calculation of the attainment of the targets laid down in Article 11

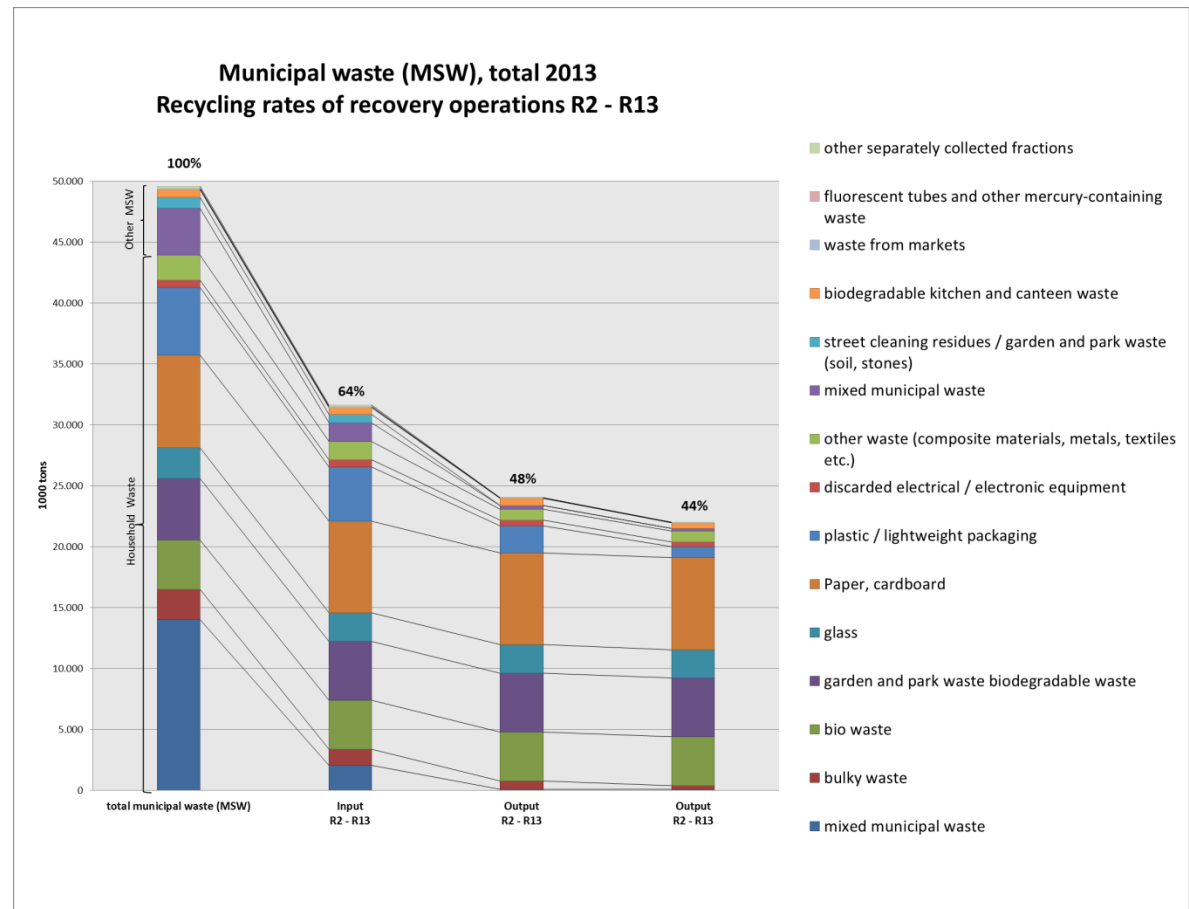
Definition in 17a. "final recycling process" means the recycling process which begins when no further mechanical sorting operation is needed and waste materials enter a production process and are effectively reprocessed into products, materials or substances

<sup>2</sup> Article 11a, 6.

# Influence on Recycling Quotas

Calculating with input waste streams overestimates recycling (64%)

Calculating with output waste streams only a recycling rate of 44-48% can be reached.





# Influence on Recycling Quotas



- Results for recycling quotas with new calculation method

Type of waste	Waste amount 2013 [million t]	Recycling plants R2-R13	Recycling Input R2 - R13 [million t]	Calculation Recycling rates Variant 1	Recycling Variant 1 Output R2 - R13 [million t]	Calculation Recycling rates Variant 2	Recycling Variant 2 Output R2 - R13 [million t]
<b>Household Waste</b>							
mixed municipal waste	14,0	MBT / MPS	2,1	6%	0,1	6%	0,1
bulky waste	2,5	MRF	1,3	20-50%	0,3-0,7	20-50%	0,3-0,7
bio waste	4,1	Composting/ anaerobic digestion	4,0	56%	2,3	100%	4,0
garden and park waste biodegradable waste	5,0	Composting/ anaerobic digestion	4,8	58%	2,8	100%	4,8
glass	2,5	MRF	2,3	100%	2,3	100%	2,3
Paper, cardboard	7,6	MRF	7,5	100%	7,5	100%	7,5
plastic / lightweight packaging	5,5	MRF	4,5	20-50%	0,9-2,2	20-50%	0,9-2,2
discarded electrical / electronic equipment	0,6	MRF	0,6	70-80%	0,4-0,5	70-80%	0,4-0,5
other waste (composite materials, metals, textiles etc.)	2,1	MRF	1,5	60%	0,9	60%	0,9
<b>Other MSW</b>							
mixed municipal waste	3,8	MRF	1,6	13-20%	0,2-0,3	13-20%	0,2-0,3
street cleaning residues / garden and park waste (soil, stones)	0,9	no information	0,7	0%	0,0	0%	0,0
biodegradable kitchen and canteen waste	0,6	Anaerobic digestion	0,6	78%	0,5	100%	0,5
waste from markets	0,07	Composting/ anaerobic digestion	0,06	56%	0,03	56%	0,03
fluorescent tubes and other mercury- containing waste	0,01	MRF	0,01	70-80%	0,00	70-80%	0,00
other separately collected fractions	0,2	MRF	0,1	10%	0,01	10%	0,01
<b>MSW, total</b>							
	Waste amount 2013 [million t]	Recycling rate	Input R2 - R13 [million t]	real Recycling rate	Output R2 - R13 [million t]	real Recycling rate	Output R2 - R13 [million t]
	50	64%	32	37-41%	18,2-20,1	44-48%	22,0-24,0
<b>Metals from thermal treatment</b>	<b>Min10</b>	<b>Max11</b>		<b>with metal recycling from thermal treatment</b>			
<b>Output R1 [million t]</b>	<b>0,1</b>	<b>0,4</b>		<b>37-41%</b>	<b>18,3-20,5</b>	<b>45-49%</b>	<b>22,1-24,4</b>

# Conclusion



## EU Circular economy package

- 2025 Recycling target 60% of total municipal waste amount,
- 2030 Recycling target 65% of total municipal waste amount
  
- With the new calculation method Germany faces major challenges to reach the new targets.
- Representatives from Sweden and Austria came to the same conclusions<sup>1</sup>.

<sup>1</sup> Energy from waste meeting, 24-25 February Royal College of Surgeons, Lincoln's Inn Field, London



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1 Energy from waste meeting, 24-25 February Royal College of Surgeons, Lincoln's Inn Field, London