

Systems Analysis and Life Cycle Waste Assessment

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IERE Background



- Institute for Environmental Research and Education (IERE), a not-for-profit
 - Mission to support fact-based environmental decision-making
 - Headquartered near Seattle
- American Center for Life Cycle Assessment (ACLCA)
 - USA professional society for LCA
 - Goal to promote LCA in decision-making
 - Program of IERE

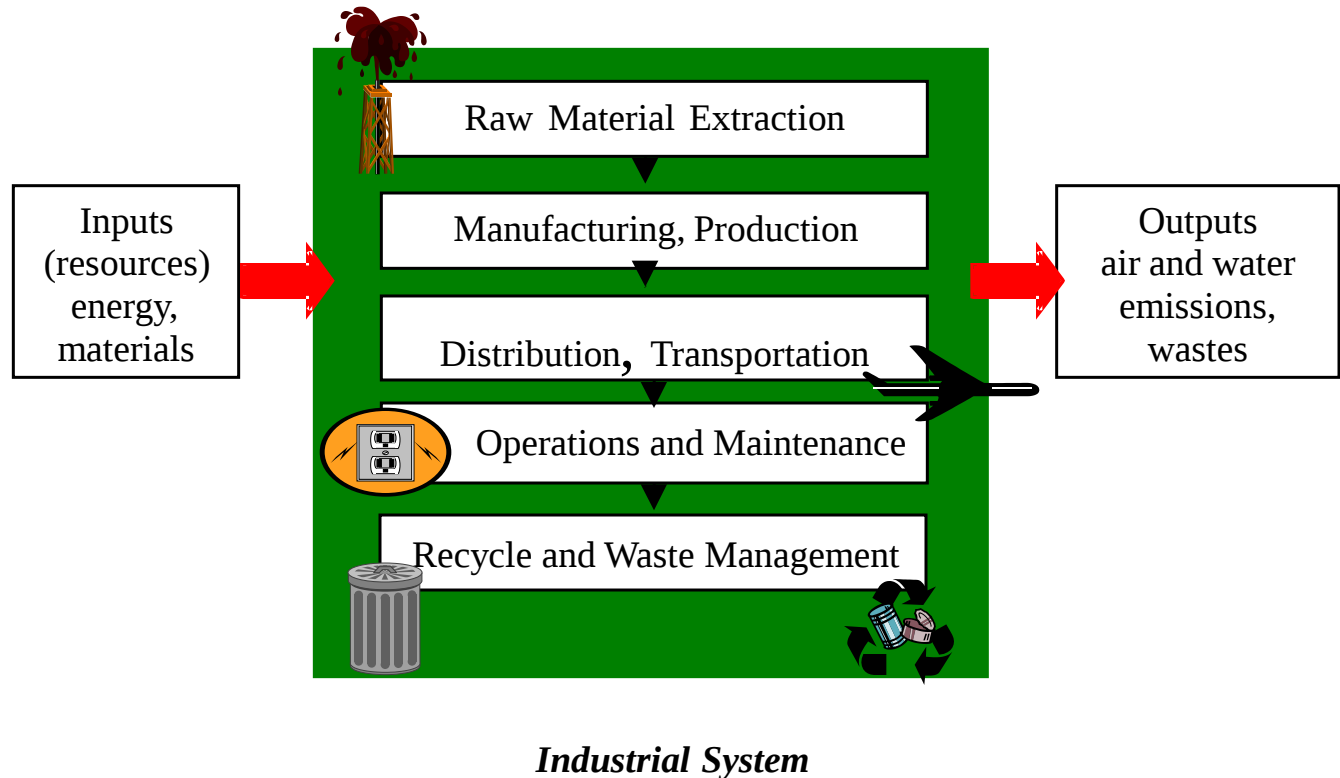


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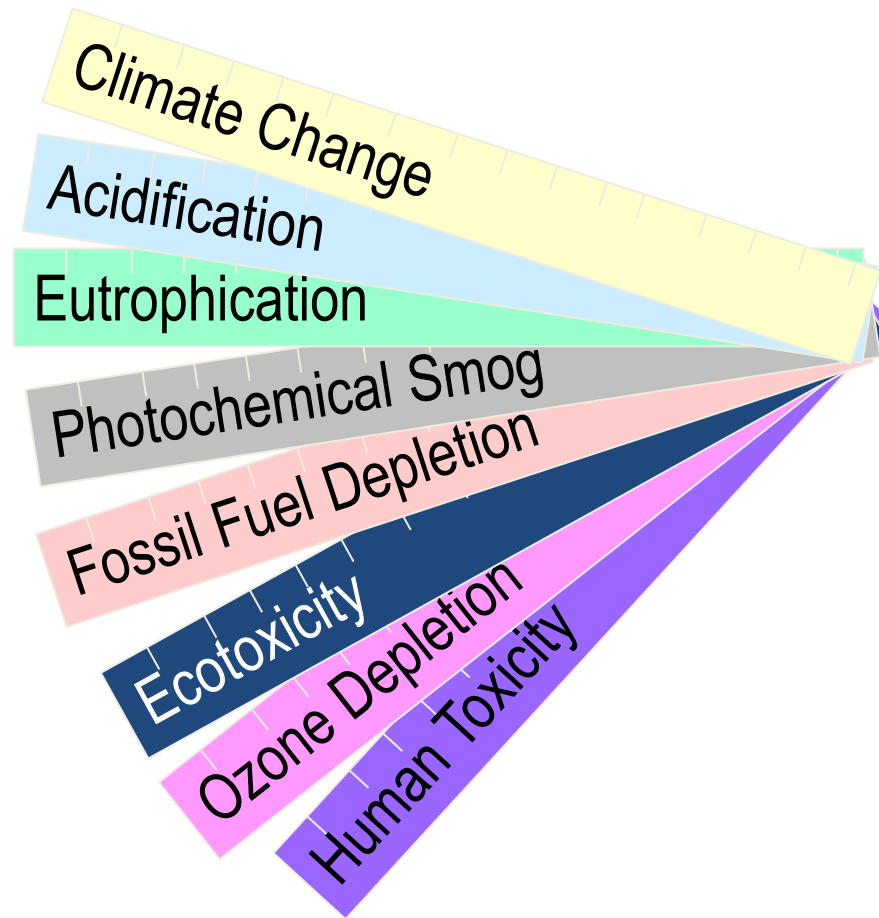
- Founder & Director of IERE
- Oceanographer, specializing in ecotoxicology and biogeochemistry
- Represented the US in negotiation the international LCA standards

Systems Analysis; Input-output Life Cycle Inventory

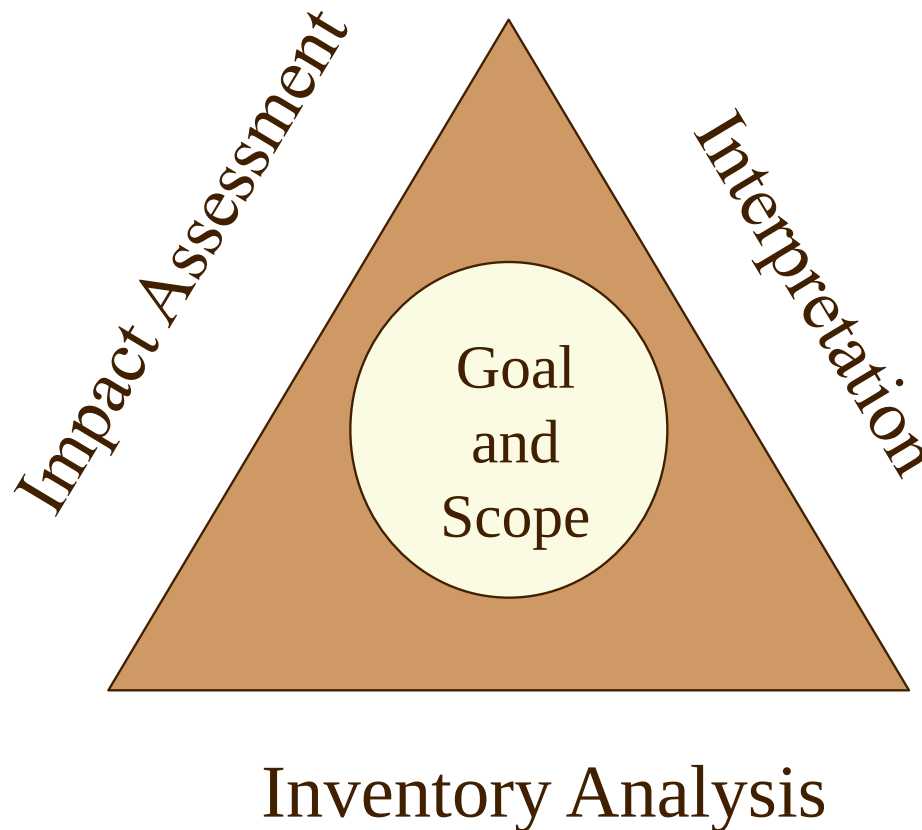


The science of measuring the environmental performance of products & services

Indicators of All Impact Categories

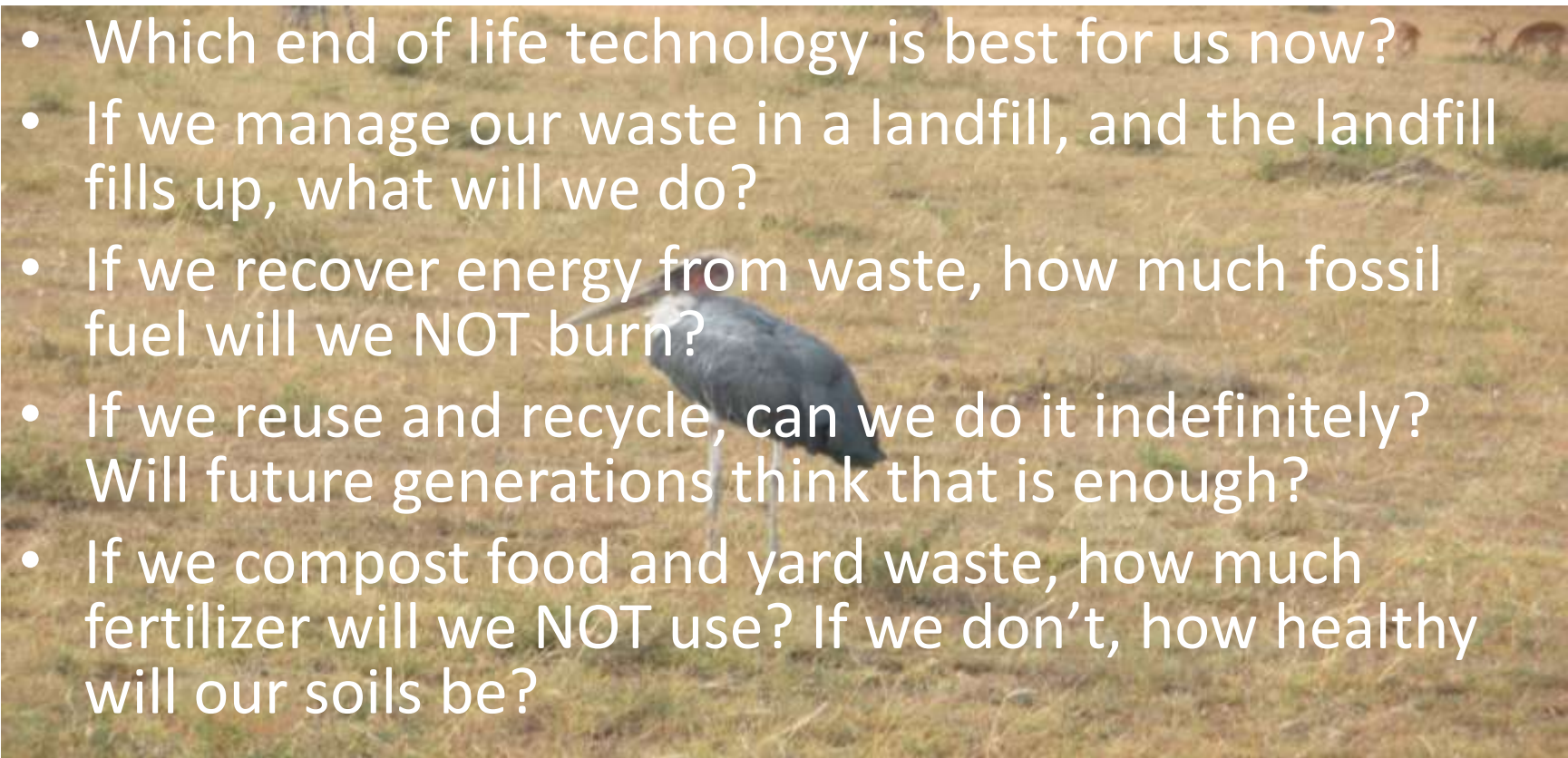


Phases of a Life Cycle Assessment



What if? How will we change?

LCA studies support specific decisions

- 
- A blue heron stands in a field of dry, yellowish-brown grass. The bird is facing left, with its long neck slightly curved. In the background, there are some trees and a fence line under a clear sky.
- Which end of life technology is best for us now?
 - If we manage our waste in a landfill, and the landfill fills up, what will we do?
 - If we recover energy from waste, how much fossil fuel will we NOT burn?
 - If we reuse and recycle, can we do it indefinitely? Will future generations think that is enough?
 - If we compost food and yard waste, how much fertilizer will we NOT use? If we don't, how healthy will our soils be?

How we define the system really matters.

What geography do we care about?



**Map 4.B: Location of MSW Landfills & Energy Recovery Facilities
(as of October 2008)**



King County Disposal?



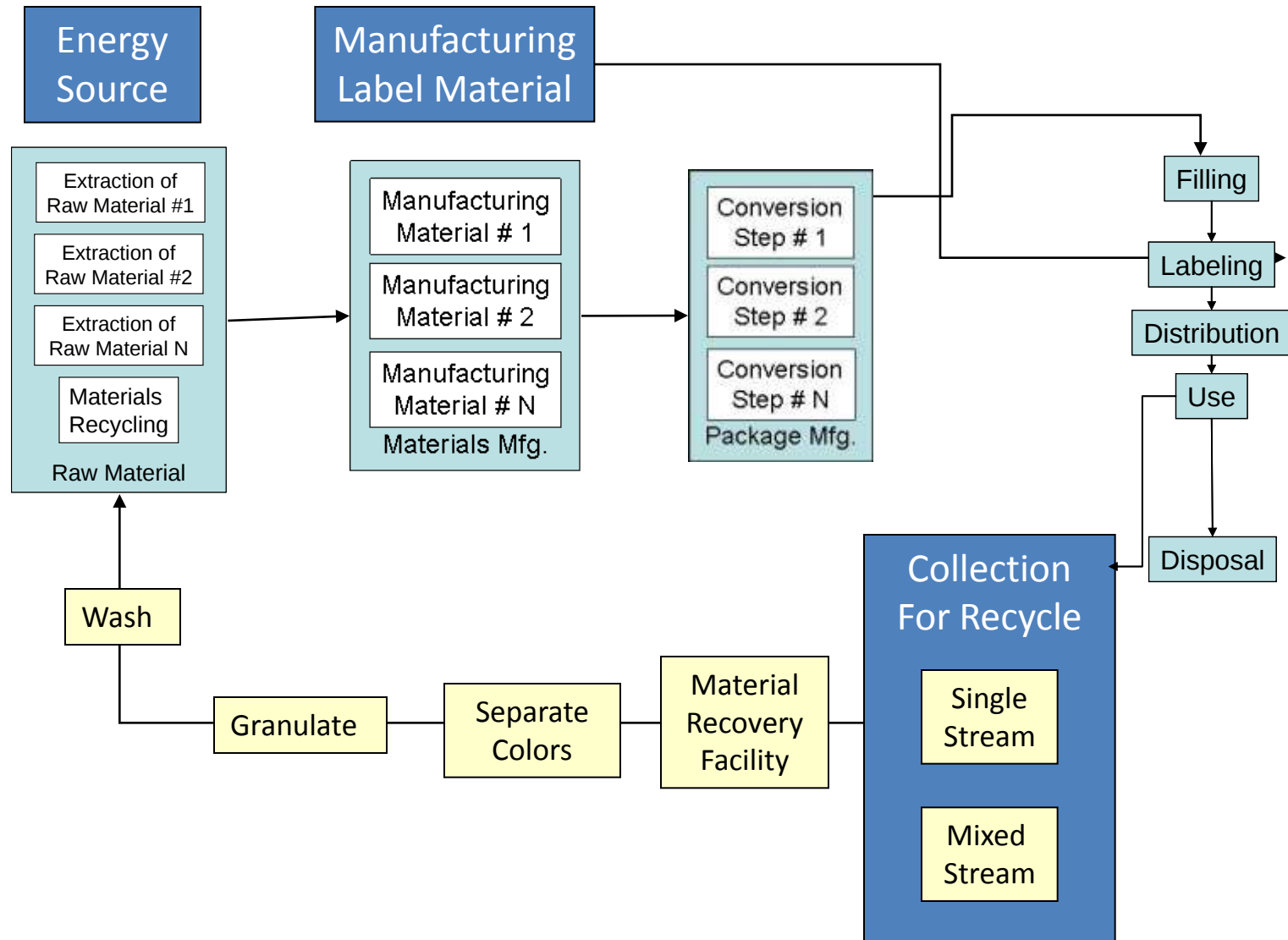
From www.mynorthwest.com



From Q13Fox.com



Recycled PET Food Container Flow Chart



All kinds of end of life techniques?



What is the question we are asking?

How about what waste management displaces?

plastic



steel



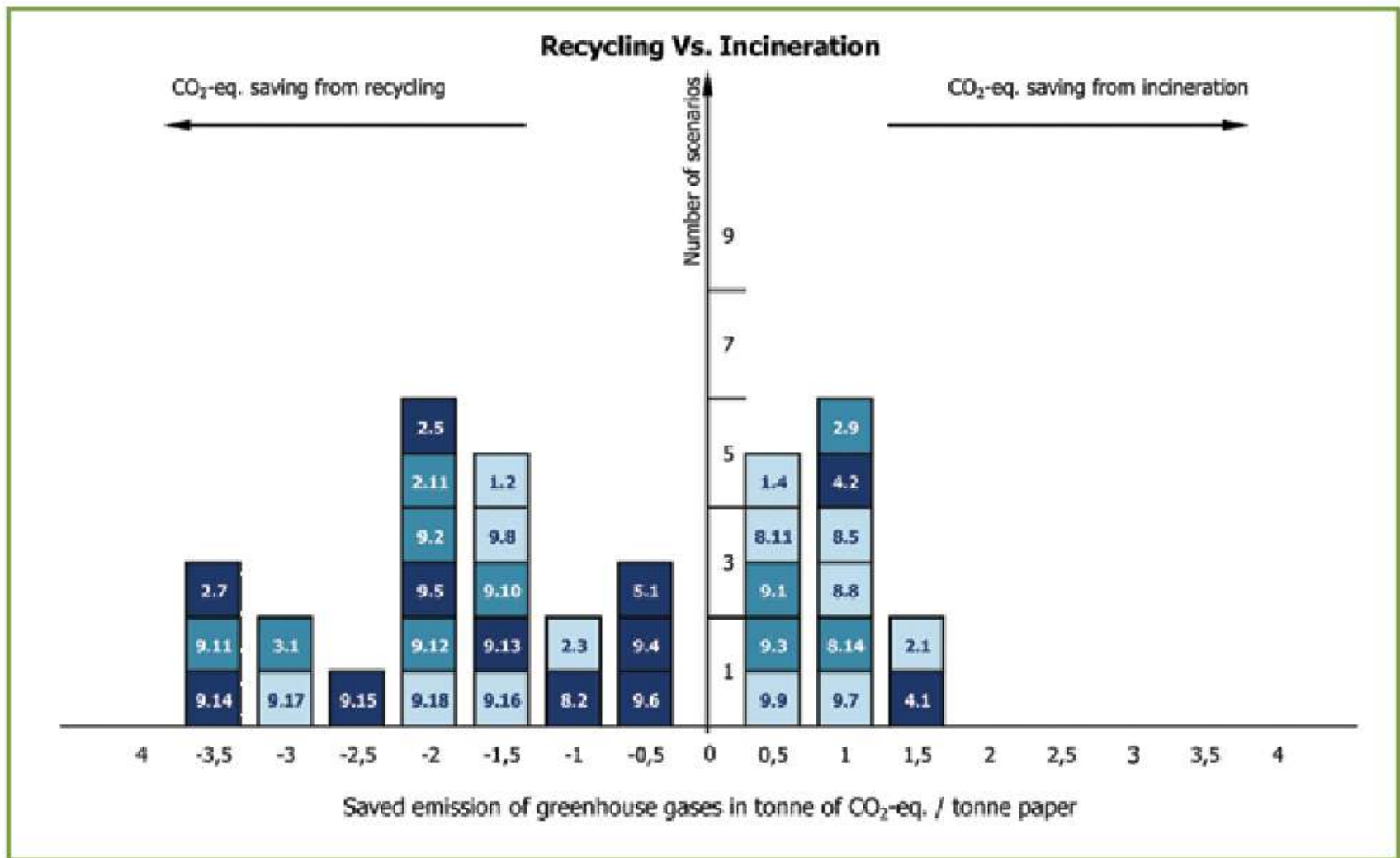
coal



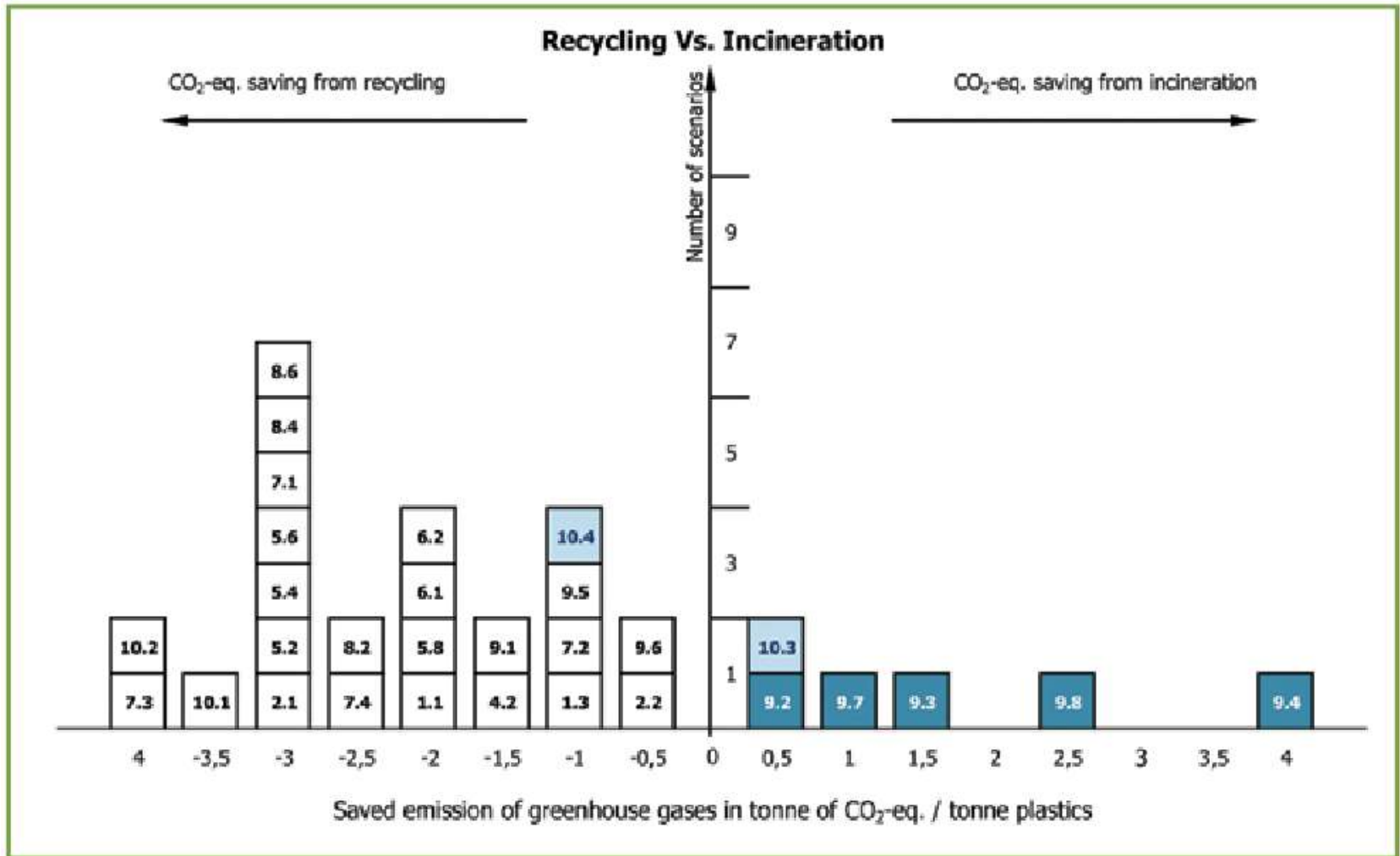
Power generation



Posing different questions gets you different answers



Meta-analysis commissioned by WRAP, an environmental NGO in the U.K., and performed by the Technical University of Denmark and the Danish Topic Centre on Waste



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	Recycling v Incineration			Recycling v Landfill		
Material	Recycling	Incineration	No preference	Recycling	Landfill	No preference
Paper	22	6	9	12	0	1
Glass	8	0	1	14	2	0
Plastics	32	8	2	15	0	0
Aluminium	10	1	0	7	0	0
Steel	8	1	0	11	0	0
Wood						
Aggregates				6	0	0
Totals	80	16	12	65	2	1

	Incineration v Landfill			Recycling v Mixed			Grand Total
Material	Incineration	Landfill	No preference	Recycling	Mixed	No preference	
Paper	1	0	0	12	0	0	63
Glass							25
Plastics	2	0	1				60
Aluminium	2	0	0				20
Steel							
Wood	7	0	0				7
Aggregates							6
Totals	12	0	1	12	0	0	201

Meta-analysis commissioned by WRAP, an environmental NGO in the U.K., and performed by the Technical University of Denmark and the Danish Topic Centre on Waste

What LCA's of Waste Management Say

- Recycling (materials recovery) is almost always the best
- Energy recovery is usually second best– sometimes better for paper and plastic
- Landfills are almost always the worst. The one exception is for glass.
- The best waste solutions combine materials and energy recovery with tight pollution control.
- Using less stuff to begin with is always the most sustainable option.