



Disruptive innovation for CIRCULAR ECONOMY

September 11, 2018

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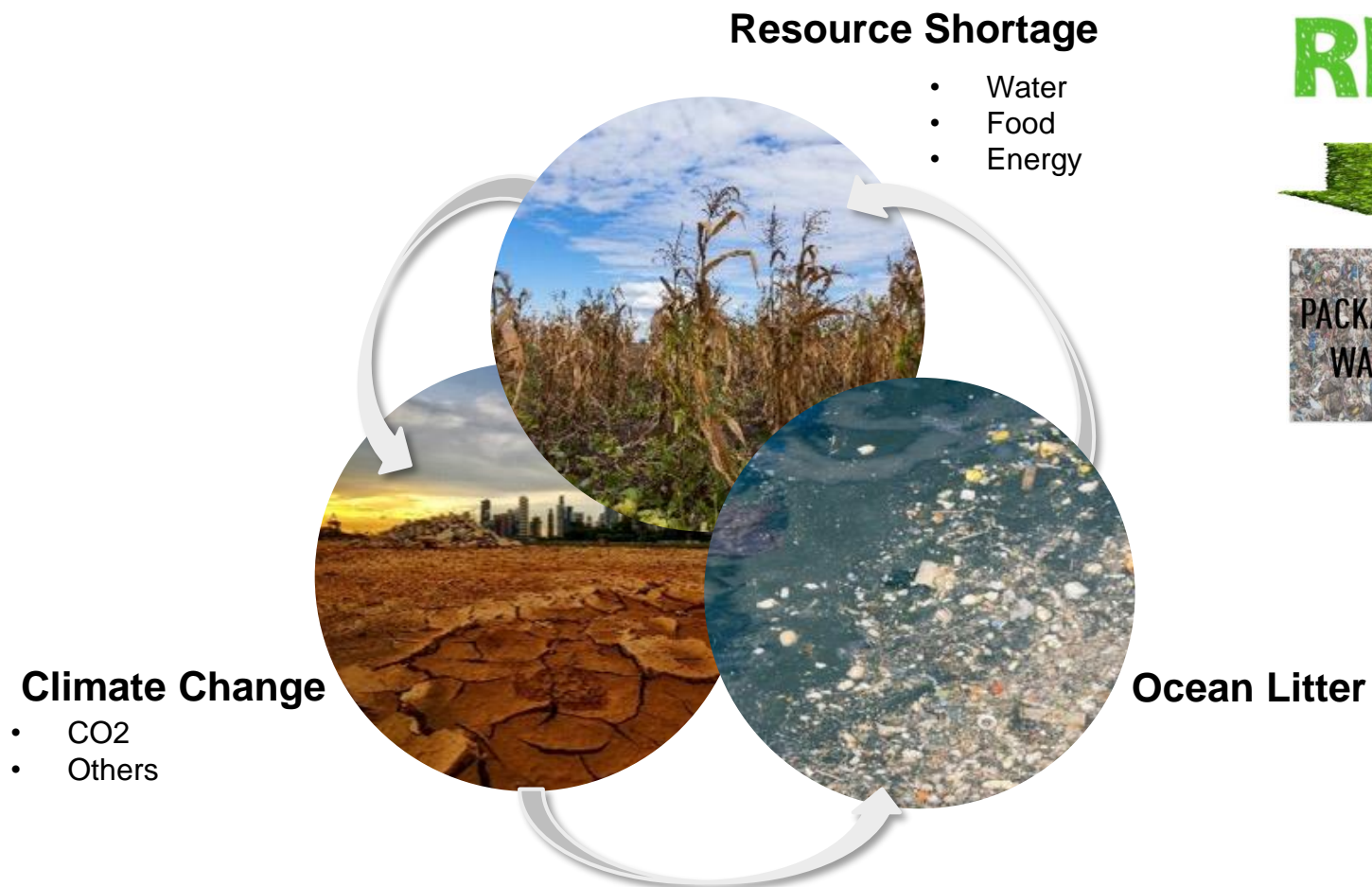
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The World Issues

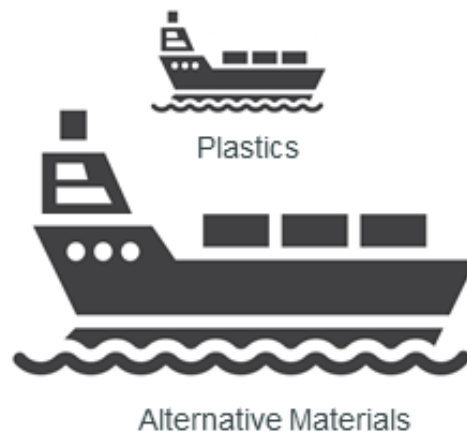
Top Environmental Concerns



Deliver more with less



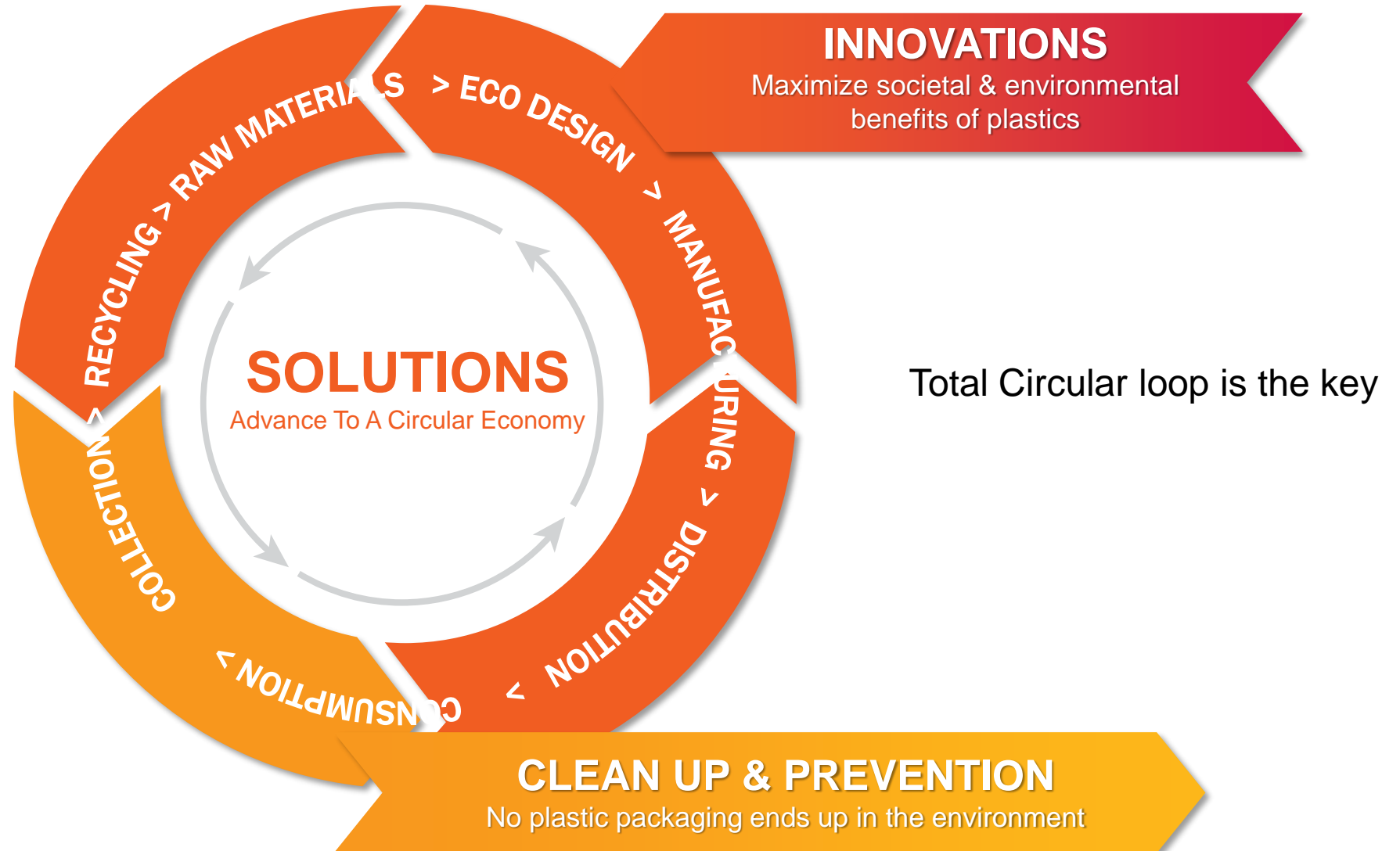
≈ energy from **91 oil tankers**



≈ adding **15.7 million** cars to our roads



Our Sustainability Priority Areas



Driving Sustainability in Flexible Packaging

Fresh to Table: Use less to get more

Enhanced Recyclability



Fresh To table – Food And Packaging Waste Reduction

**Functional
Unit:
1kg of Meat**

Our Contribution:
Surlyn® as Sealant in Vacuum
Packaging

x5 shelf life



Ex-PS tray & cling
film
17g packaging
4 days shelf life



Surlyn®

x10 lighter
x6 shelf life



MAP
30-40g packaging
10 days shelf life



VSP
13-19g packaging
21 days shelf life



Sealant in Vacuum Packaging
3g packaging
35 days shelf life

MAP : Modified atmospheric Packaging

VSP : Vacuum Skin Packaging

x2-3~ lighter
x3 shelf life



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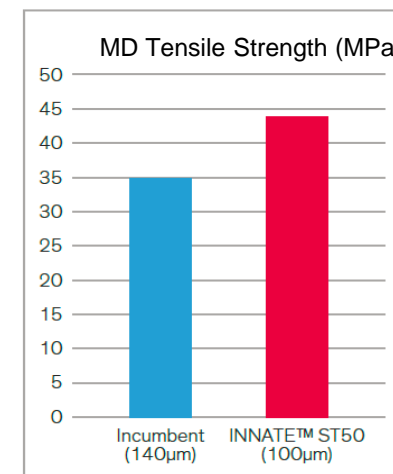
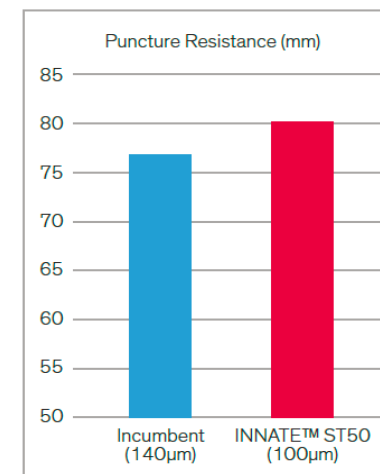
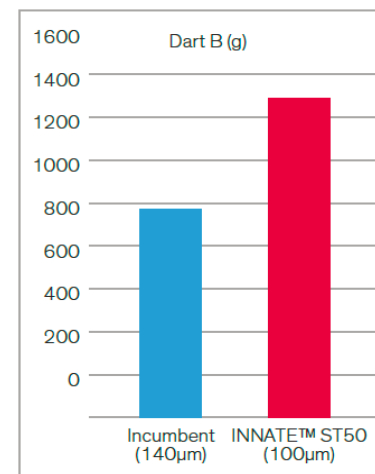
for innovation

INNATE™ Precision Packaging Resins for Heavy-Duty Laminates

Example: 5 Kg Seed bag

Film structure: PET (12 μm)//PE (140 μm)

Unmet need: Downgauging to PE (100 μm) to reduce cost



Mechanical properties for 100 μ PE film for seed packaging against 140 μ incumbent film

Outcome:

- Downgauge PE Film from 140 μm to 100 μm
- Pass Drop test requirements of 12 drops from 1.5m height



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Enhanced Recyclability of Flexible Packaging

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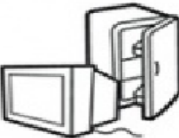


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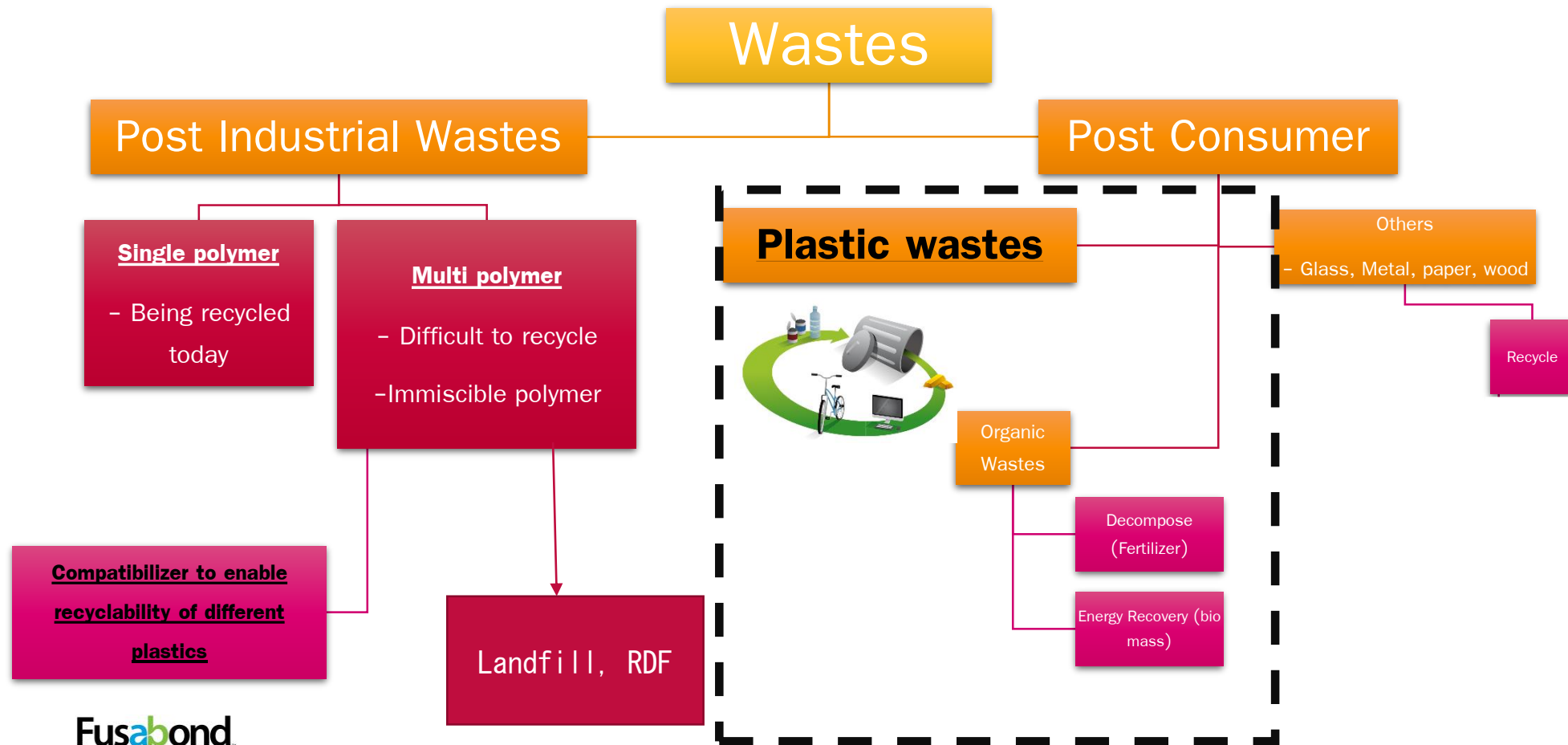
PLASTIC CLASSIFICATION

Mixing different types of plastics together creates challenges in recycle process

1 PETE	2 HDPE	3 PVC	4 LDPE	5 PP	6 PS	7 OTHER	To be determined
Polyethylene terephthalate	High density polyethylene	Polyvinyl chloride	Low-density polyethylene	Polypropylene	Polystyrene	Other plastics Polycarbonate, Polyurethane, Nylon, and acrylic	Compostable PLASTIC ????
To bottles, water, fruit juice, and cooking oil containers 	To milk, cleaning agent containers and bag 	Tray for sweets, fruit, plastic packaging and piping 	Shopping bag, crushed bottle, and the most of wrapping 	Consumers, furniture, bumper liner, and toys 	Food tray, insulator, cup, electronic parts such as TV, Air condition, and refrigerator 	Example of polycarbonate: glass lens, CD production, and baby bottle 	

Especially Compostable//degradable plastic cannot be mixed with conventional plastic at all

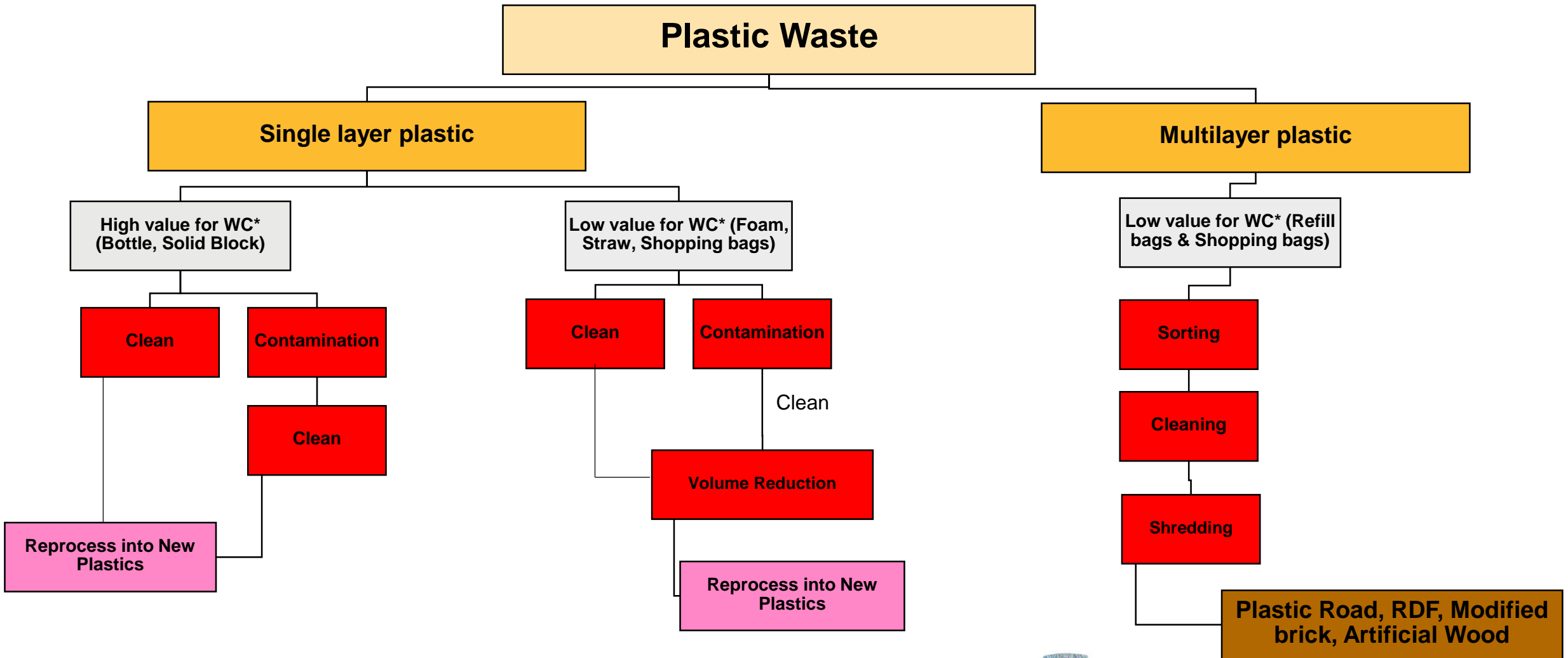
WASTES CLASSIFICATION



RDF : Refuse-derived Fuel



CLASSIFICATION OF PLASTIC WASTES (post consumer)



Note : WC* = Waste Collection



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Summary

- Using plastic properly comparing to other materials reduces:
 - Food or natural resource waste
 - Energy consumption
 - Greenhouse gas
- Select the right partner to match the innovative solution to your problems:
 - Reduce your cost and save environment
- Managing plastic waste to achieve the true Circular Economy needs commitment from:
 - All organizations
 - Government
 - Everyone, starting from ourselves today





Thank you



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