

# Inter-municipal Network and Cooperation for Recycling, Remanufacturing and Industrial Symbiosis

Plenary Session 6 on Inter-municipal Network and Cooperation for 3R  
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# Risks Associated with Recycling Business

- Uncertainties in the waste supply and changing characteristics/composition of waste
- Price fluctuations in the purchase of waste as well as market of recycled materials
- Difficulties in waste segregation
- High costs of waste transportation
- Environmental issues, health and safety concerns
- Difficulties in working with the informal sector of waste-pickers
- Non-availability of land for expansion (The NIMBY syndrome)

**Strategic Approach Needed!!**

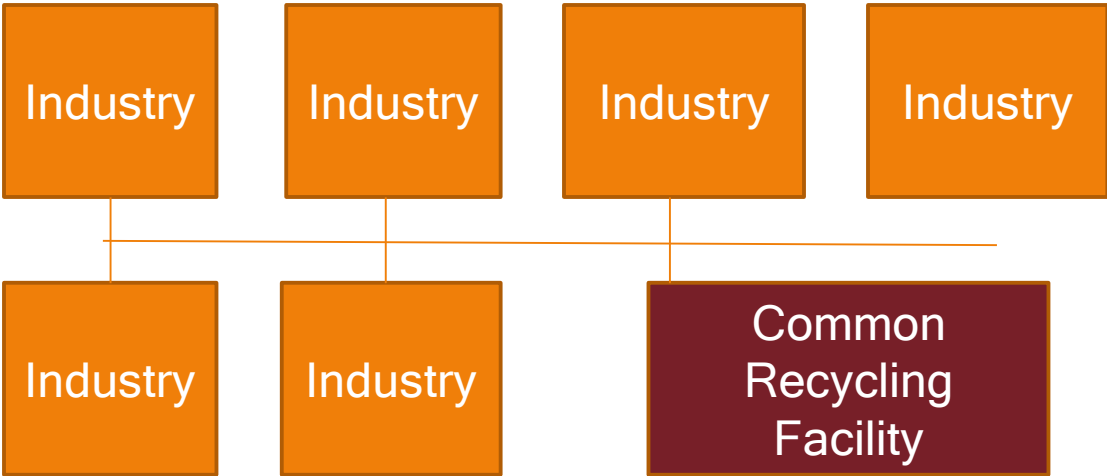
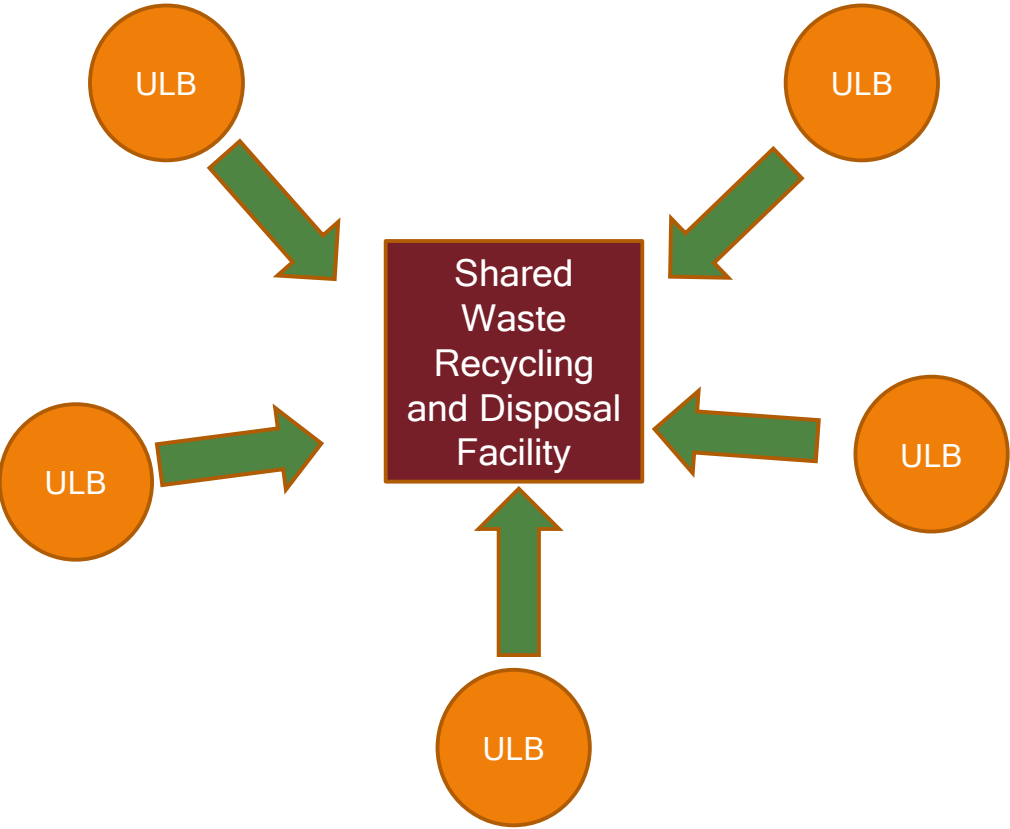
# Opportunities from Urban Local Bodies (ULBs)

- Municipal Solid Waste - MSW (organic and inorganic fractions)
- Metals (as from MSW, e.g. cans)
- Plastic (as from MSW, e.g. bottles, bags)
- Paper
- Glass
- Construction and Demolition (C&D) waste
- Electronic waste (E-waste)

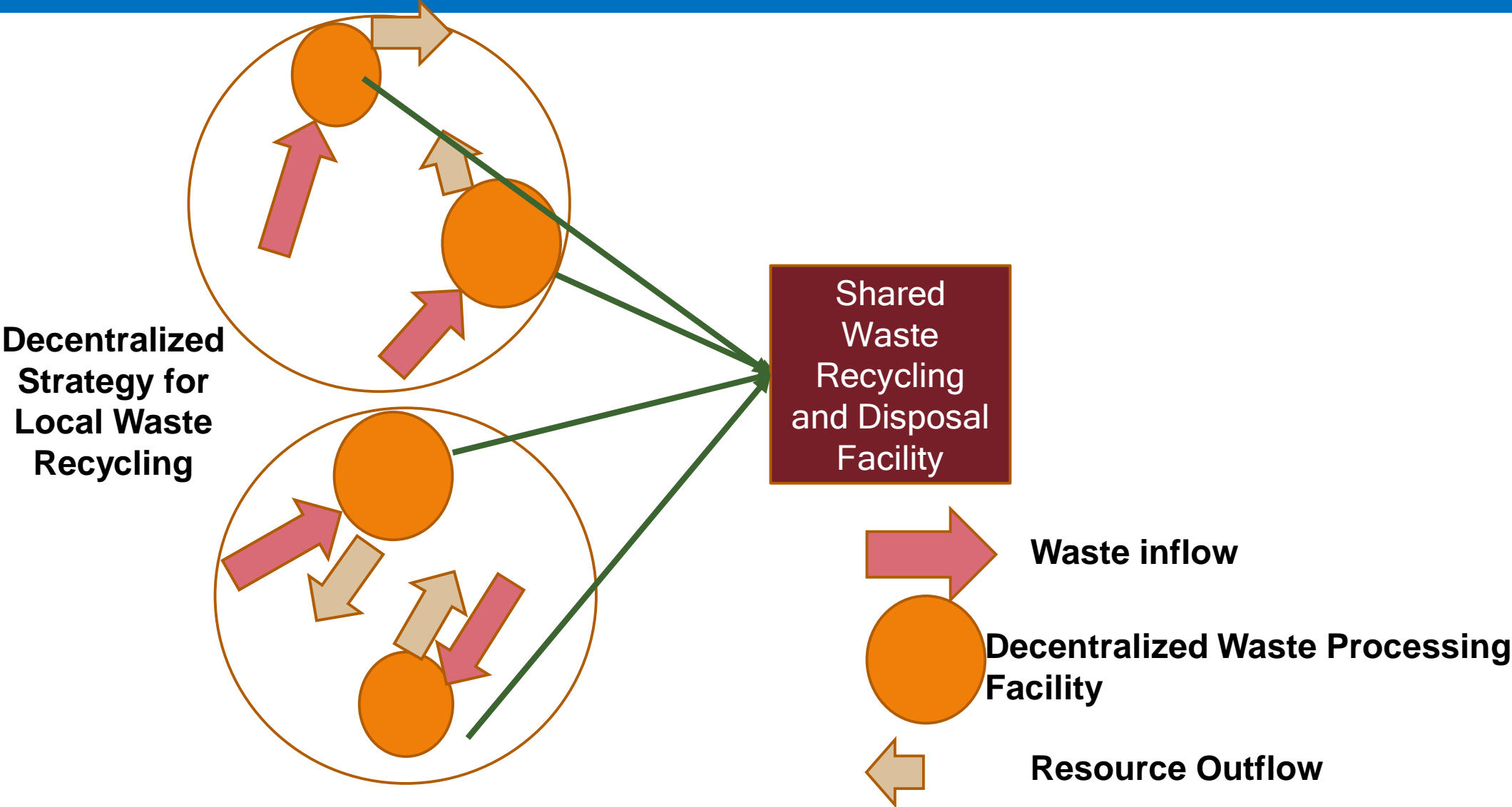
# Opportunities from Industrial Estates

- Packaging waste (bags, cartons, barrels, boards)
- Sludges (arising from tank bottoms, effluent treatment plants)
- Dilute acids/alkali
- Metal scraps
- Reject products

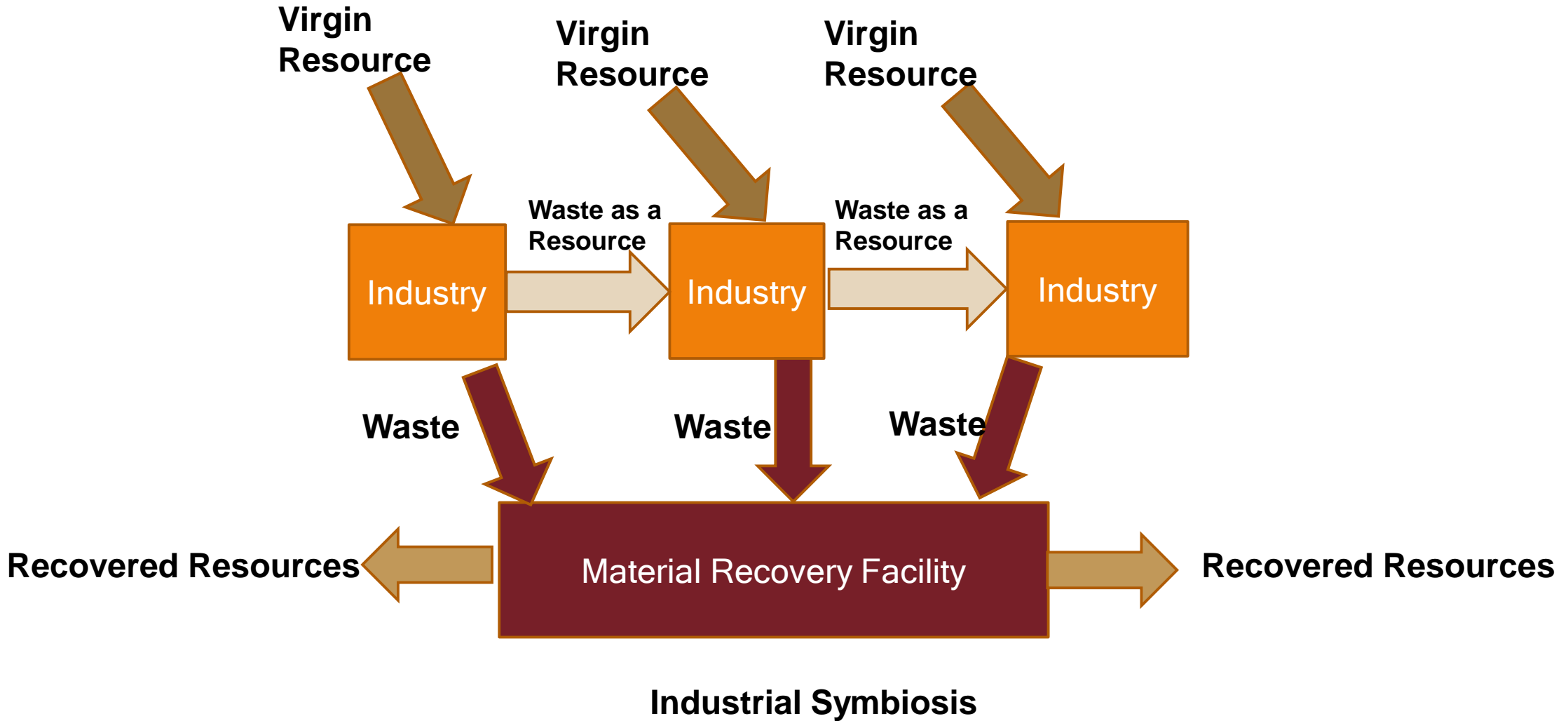
# Achieve Economies of Scale – Regional Approach



# Minimise Waste Transportation – Decentralised and Centralised Hybrid Approach



# Minimise Waste Transportation – Industrial Symbiosis with MRF



# More Strategic Approaches

- ULBs and Industries Cooperation for Waste Recycling (high calorific value inert fraction in MSW can be used as alternative fuel in industry kilns and furnaces)
- Increase Involvement of Private Sector and Cooperatives (private sector and cooperatives working together to increase efficiency and effectiveness of recycling)
- Create an Enabling Framework (incentives, information sharing, investments)



# Case Studies

- 1) **National Industrial Symbiosis Programme (NISP) in UK** Since the launch of NISP in 2005, the programme has diverted more than 5.2 million tons of industrial waste from landfill, eliminated 357,000 tons of hazardous waste, prevented the use of 7.9 million tons of raw materials and 9.4 million tons of industrial water. Members of NISP were benefited by cost savings of £131 million
- 1) **Industrial and Urban Symbiosis in the Recycling sector: Case of Eco-Towns in Japan** (*Kitakyushu Eco-town* and *Kawasaki Eco-town*)

# Way Forward

- Reverse logistics based on PRO (Producer Responsibility Organization) and
- Refurbishing using reverse logistics

# Hardware of ISWM

- Public Health (Collection)
- Environmental Protection (Waste Treatment and Disposal)
- Resource Management (Resource Recovery through Recycling and Composting)



# Software of ISWM

- Social Support (Participatory and Inclusive Planning)
- Financial Viability (Recover cost of SWM)
- Institutional Development (Strong and Transparent)



**Thank You!**