



TOMORROW'S SOLUTIONS. TODAY

Resource Recovery to Green up Industries in Asia

Pavel Cech, November 2016

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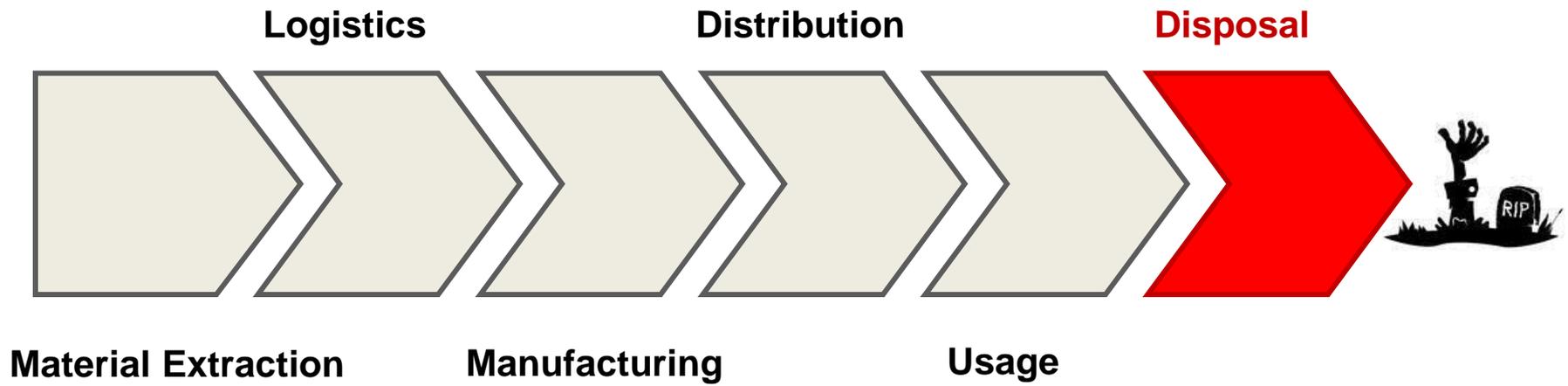
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Snap shot Asia

simplified and polarized views

This is where we are



Developed countries

- Due to land scarcity and its cost, incineration is the preferred waste management method
- Export of the problem without any guaranteed performance on the receiving end
- Attractive disposal fees
- Infrastructure constraints often used to justify a lack of waste segregation
- Low recycling and recovery rate
- Insufficient industrial scale for creation of circular economy
- Suffer from the regulatory fragmentation within ASEAN

Developing countries

- General tolerance to dumping
- Low landfilling cost as a benchmark
- Thousands of dump sites all over Asia without basic sanitary features
- Waste generators not used to paying for waste disposal
- Ignored need for waste segregation
- Easy way principle highly contagious
- Weak enforcement of environmental regulations
- Insufficient MRF infrastructure
- Despite the COP21 commitments no visible drive for actual carbon footprint reducing projects

Developing countries

Status Quo – legal landfills and tolerated semi-legal or illegal dump sites



Developing countries

Daily reality in Asia...



Rawang 2016

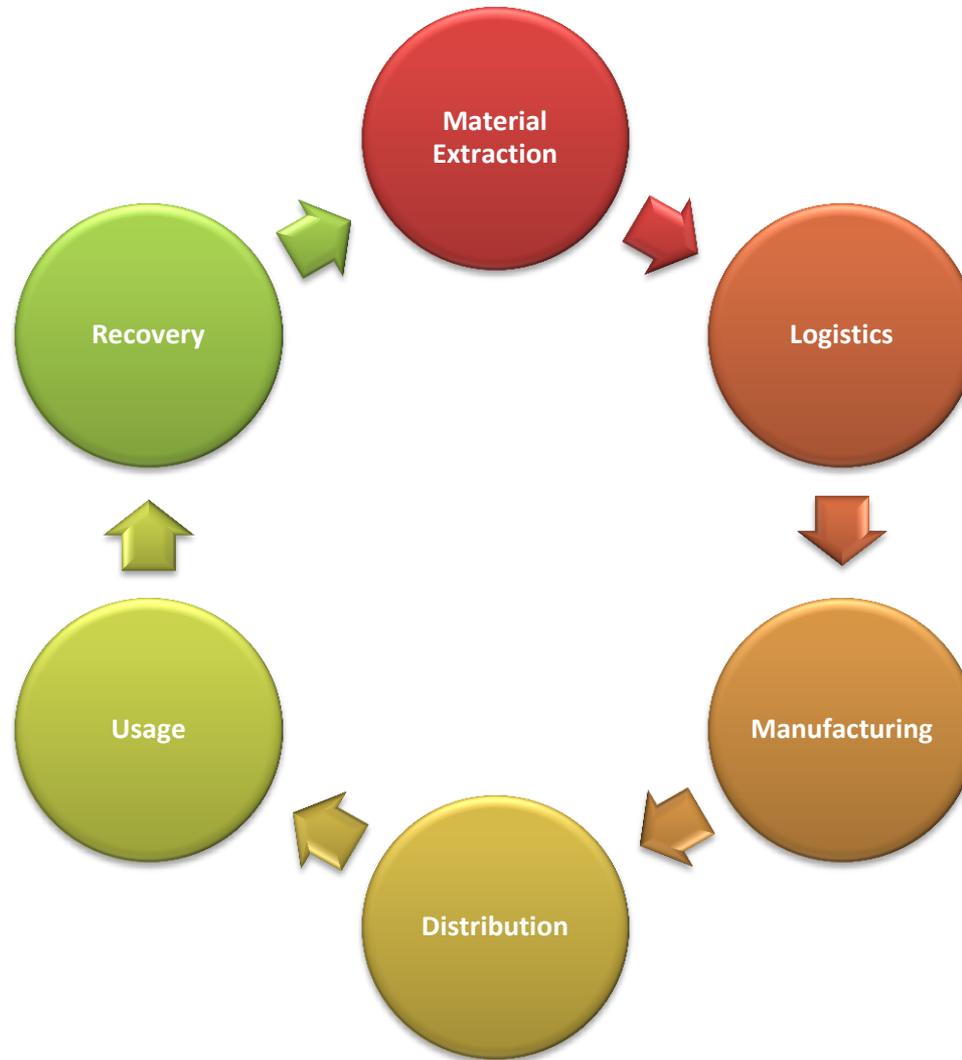
Developing countries

What goes round must come round...



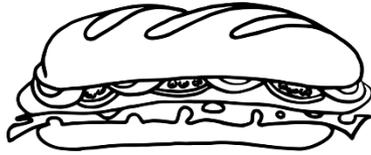
Pangkor 2015

This is where we want to be



Game changers

New paradigm



Sandwich analogy

– healthy value for money, if well made and complete

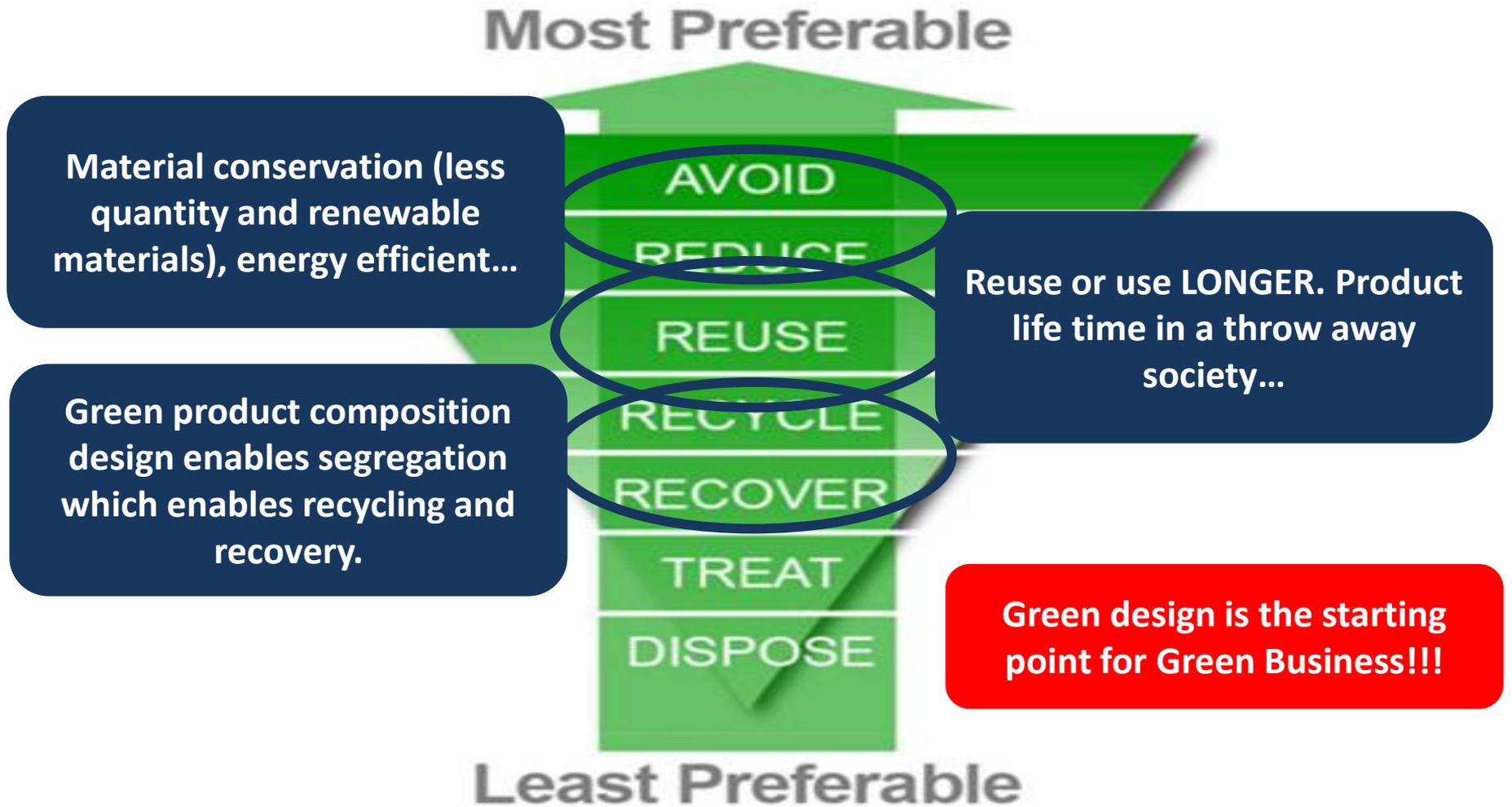


Paradigm shift

Fragmented piece-meal solutions into a system:



Green design



Applicable technology

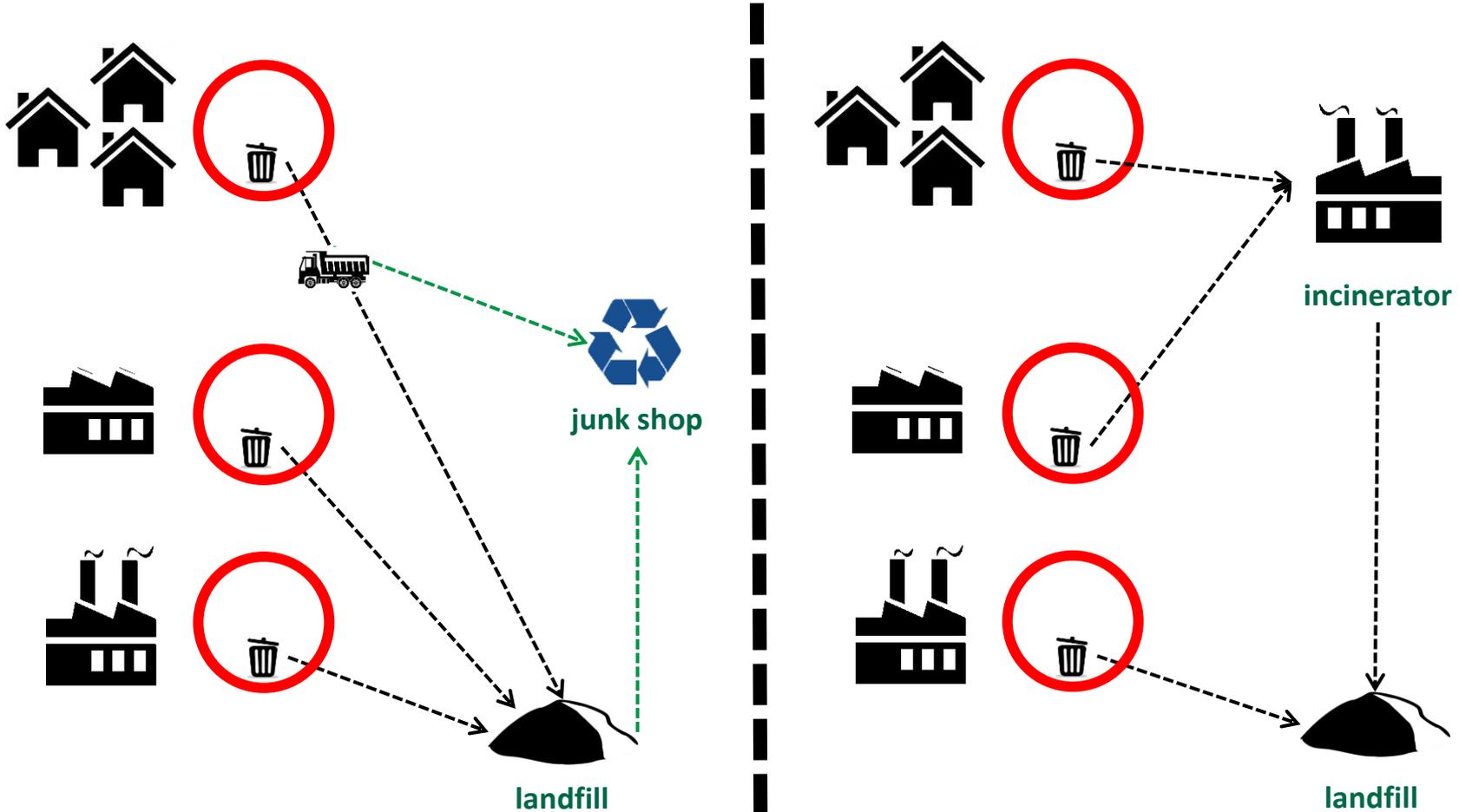
Many proven concepts are at our fingertips. Almost all WM issues can be addressed.

Every set of conditions requires systemic solutions.
All elements are available.

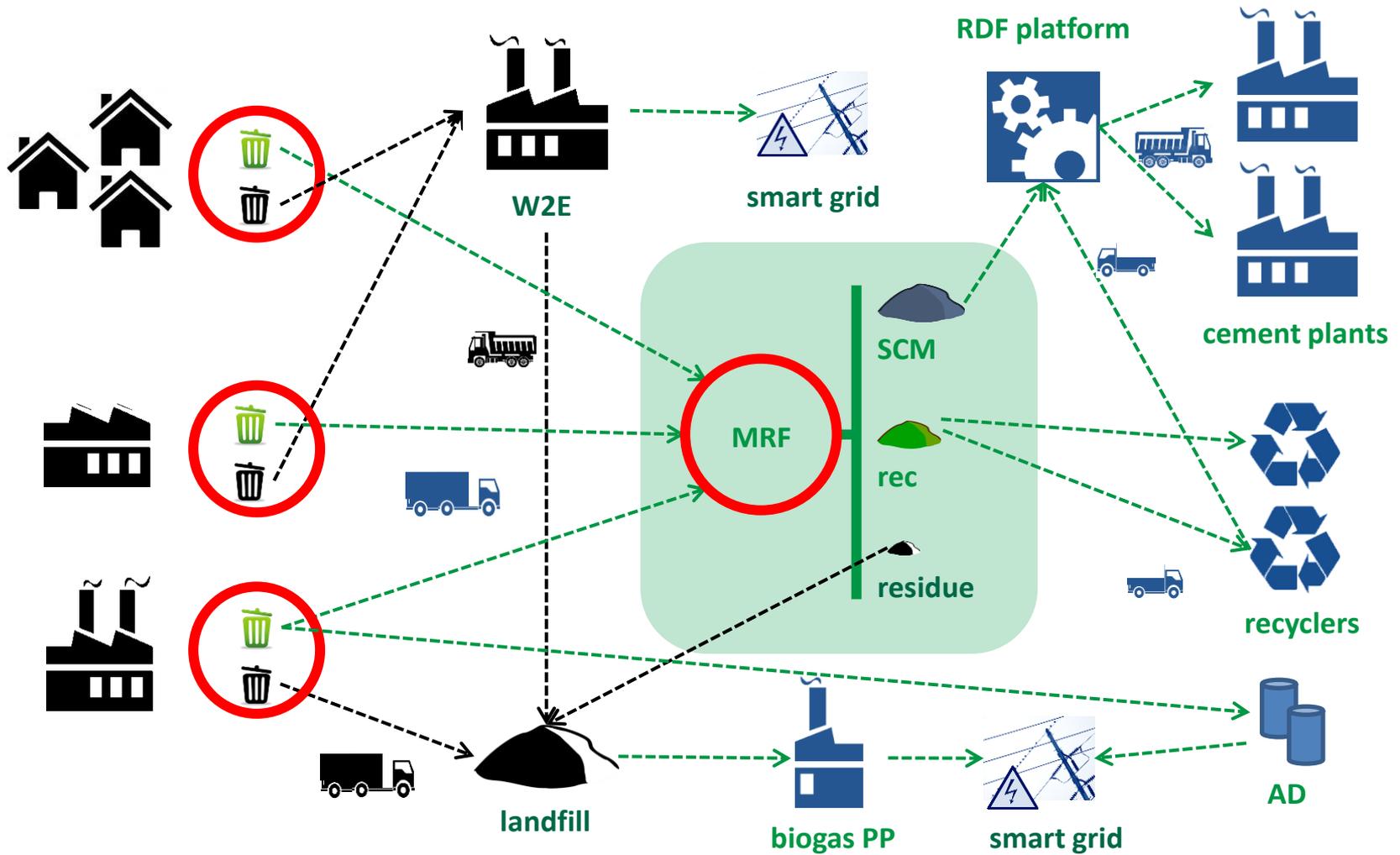
*Financial viability – Incinerator project example
(Malaysia)*

Systemic solutions

Developing vs. Developed



Systemic solutions



Segregation at source

Segregation at source (home, mall, factory, office...) costs very little, usually nothing = 0 \$/t.

The moment waste gets comingled, 10-40 \$/t is wasted in subsequent segregation cost (if any) or landfilling.

If not segregated at source 30-50% of recoverable material is wasted due to contamination.

Shared infrastructure

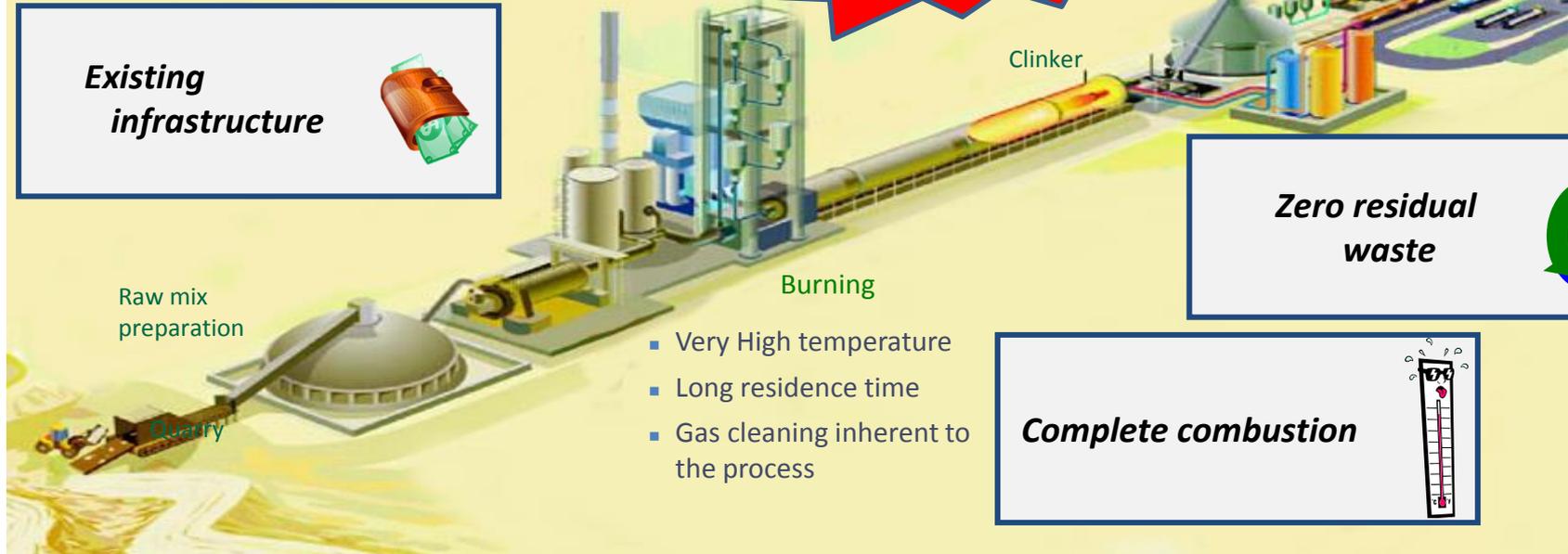
Cement manufacturing process

There are about >200 cement kilns in Asia (ex.China)

Existing infrastructure

Zero residual waste

Complete combustion



A closed cycle process without residual or waste/byproduct.

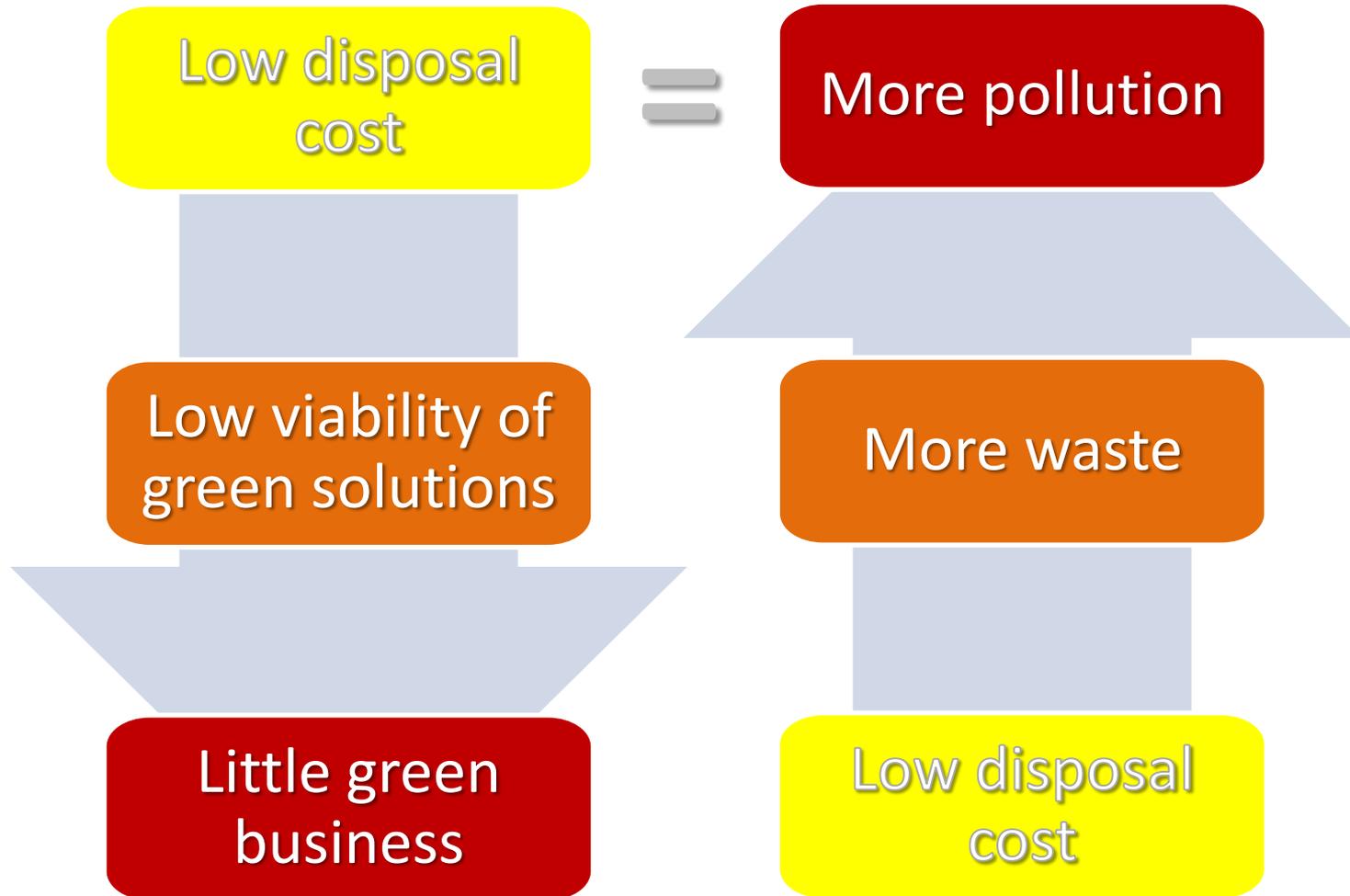
Waste derived commodities



**Dormant market
>500 m\$ (ex. China)**

Common misinterpretations

Waste to wealth



Modern alchemy

Prevailing lack of disposal fee in the WM value chain addressed through promises of ground-breaking technologies. This noise creates a lot of expectation resulting in “paralysis by analysis”. Well proven concepts are frequently trusted less than “experimental magic”.

- W2E
- Incineration
- Recycling
- Co-processing
- Gasification
- Plasma
- Pyrolysis
- Composting
- ...

W2E the first or the last resort?

Does mass burning of wet low energy bearing waste really make an economic sense?

Is incinerator ash the legacy we want to make?

Have all other options been exhausted before signing up for incineration? (usually dressed in W2E clothes)

Global air and water, local waste



EU freely trades thousands of tons of Alternative Fuels and Alternative Raw Materials. Can Asia create a similar market? The potential is tremendous!

Business cases

TDF, a globally traded commodity

TyreCycle, Australia

- 80,000 tpy of high energy product made out of waste
- All product traded within Asia
- Australian owned & operated profitable manufacturing business
- Used tyre collection, recycling and recovery, international trading.



RDF, an immediate solution

EcoEdge, Philippines

- 40,000 tpy of MSW originated product diverted from a landfill and converted into fuel for cement industry
- The first industrialized MRF in Manila
- JV between a local waste management group and an MNC



HW in industrial ecology

GEPIL, India

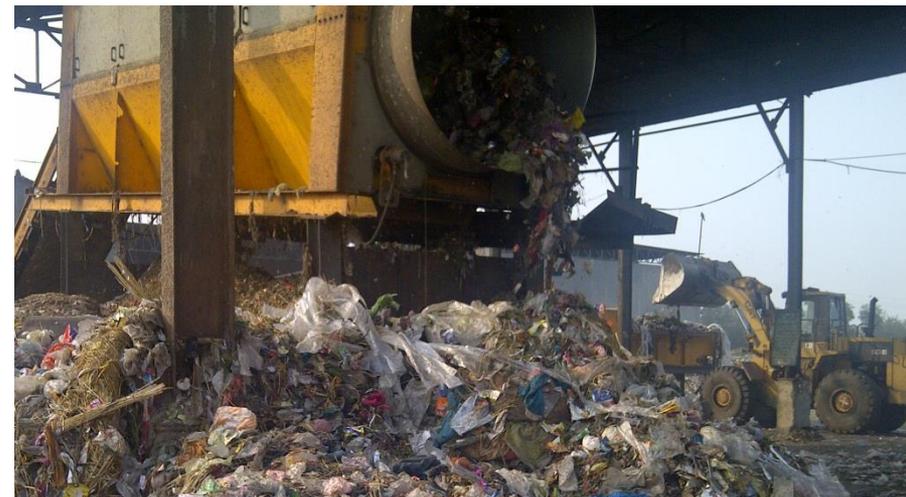
- A hazardous waste management company which recognized the potential of co-processing, created a network of facilities that produce solid and liquid alternative fuels
- Approximately 15,000 tpy of liquid and 25,000 tpy of solid AF diverted from incineration



Synergy that saved a green business

Lahore Compost, Pakistan

- Built to produce compost out of the organics from MSW
- Converted to make 60,000 tpy of RDF for cement industry
- The compost plant would have to close down without RDF
- JV between compost and cement companies



PEF, efficient waste recovery

ResourceCo Asia, Malaysia

- Turning local C&I waste into fuel for cement industry as a replacement of fossil fuel
- The only foreign investment in this business in Malaysia
- 50,000 tpy



Conclusions and “soul searching”

Conclusion

- There is a dormant huge waste derived product market in Asia
- Governments need to be involved in unlocking it
- Available technologies suffice to deliver results
- Green business costs money but can be prosperous
- Cheap solutions are always dirty
- Segregation at source saves a lot of money

There is a long way from:

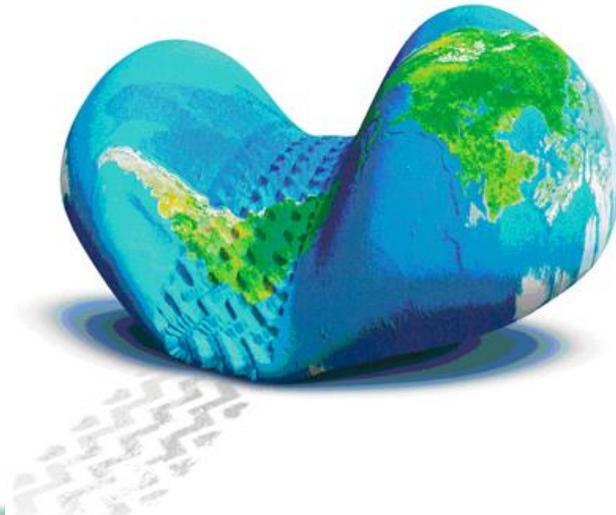
...where we are...



...to where we can be!



Are we the problem,
or are we the solution?



THANK YOU!

