



Overview of Best Management Practices in Conversion Technologies

Presented by:

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Overview of Presentation

- International Reference BMPs Facilities
 - Proven Technologies Exist
- Integrated Solid Waste Management (ISM)
 - Systems Approach for Robust Infrastructure
- What Will It Take to Build BMP Reference Facilities in California?
 - Industry / Government Collaboration
 - Government Leadership to Build Infrastructure

European Union



Envac System (Madrid, Spain)



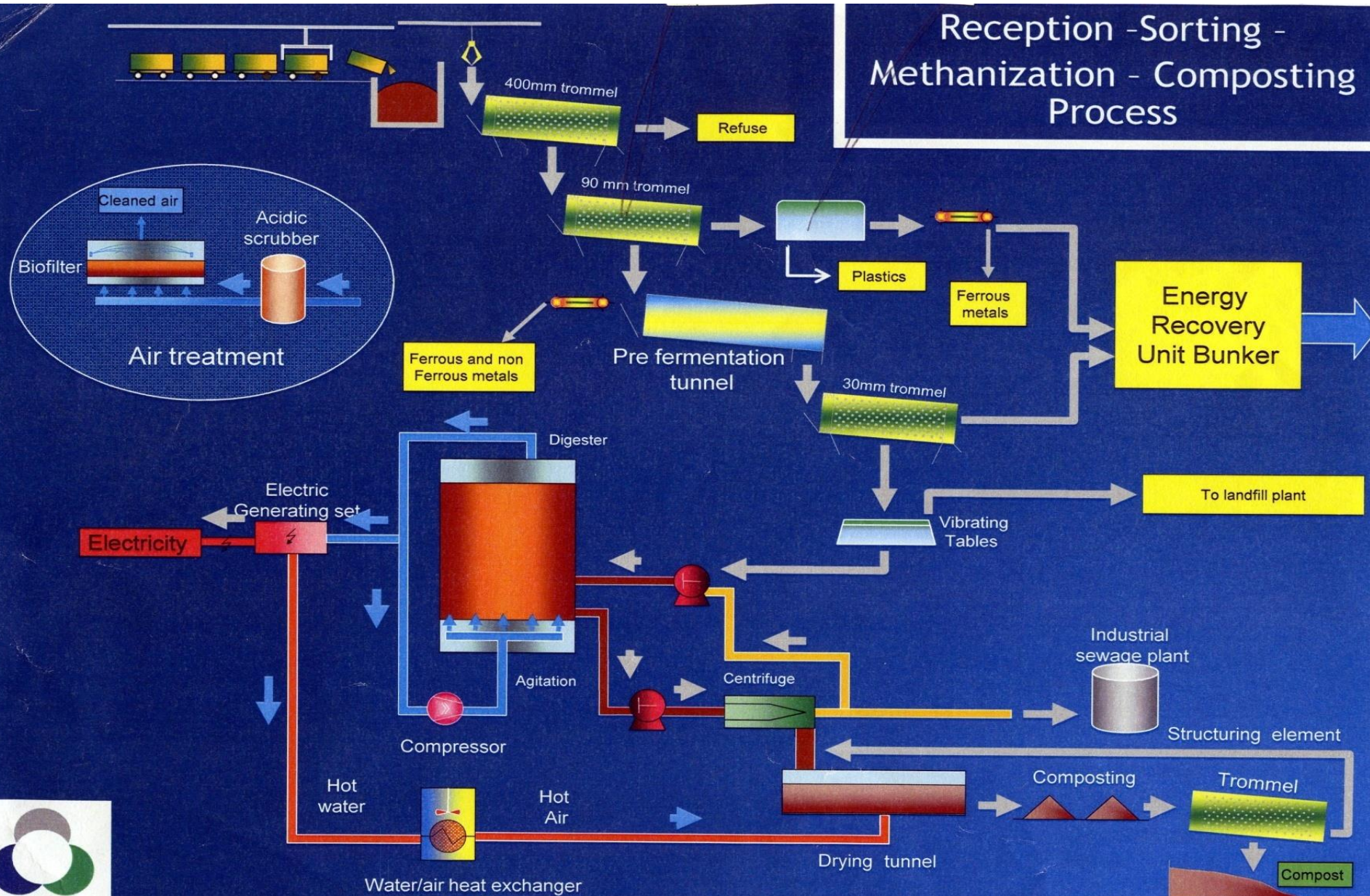
Surge Storage Area (Under Disposal Port)



Central Collection / Pneumatics



EveRe (France) Integrated MSW Treatment Facility



EveRe Community Viewing Walkway



Rail Container Unloading Center



EveRe MRF: RDF & Organics MRF



EveRe Facility (France)



Bio-Gas Internal Combustion Engine



In-Building Aerobic Composting



Biofilter



EveRe Aerobic Composting and Biofilter



WTE Control Room (Madrid)



Real Time Emission Monitoring (Madrid, Spain)



Asia



Yokohama City, JFE WTE Facility



Yokohama City, JFE WTE Facility



Yokohama City, JFE WTE Facility



Tipping Area, Yokohama City WTE Facility



Facility Entrance...!



Community-Based Facility



“No Shoes” in Control Room



Community Swimming Pool



Community Hot Tub / Spa



Community Thrift Store



Tipping Floor (Ebara Gasification Facility)



Carpentry Shop / Refurbishing Shop



Reverse Auction of Donated / Repaired Furniture



Community Tea Room



Reuse / Remanufacturing



Bioenergy (Foodwaste Processing) Facility, Japan



C & D Recycling Facility



Air Conditioner Recycling Facility



Washing Machine Recycling Facility



Plastic Chemical/Material Recycling Facility



Recycled PET Flakes



PET Flakes

JFE/ Eco-Frontier (Kasama, Japan)



Molten Slag (JFE Gasifier, Japan)



Products from Bottom Ash (Japan)



Medical Waste Feed System



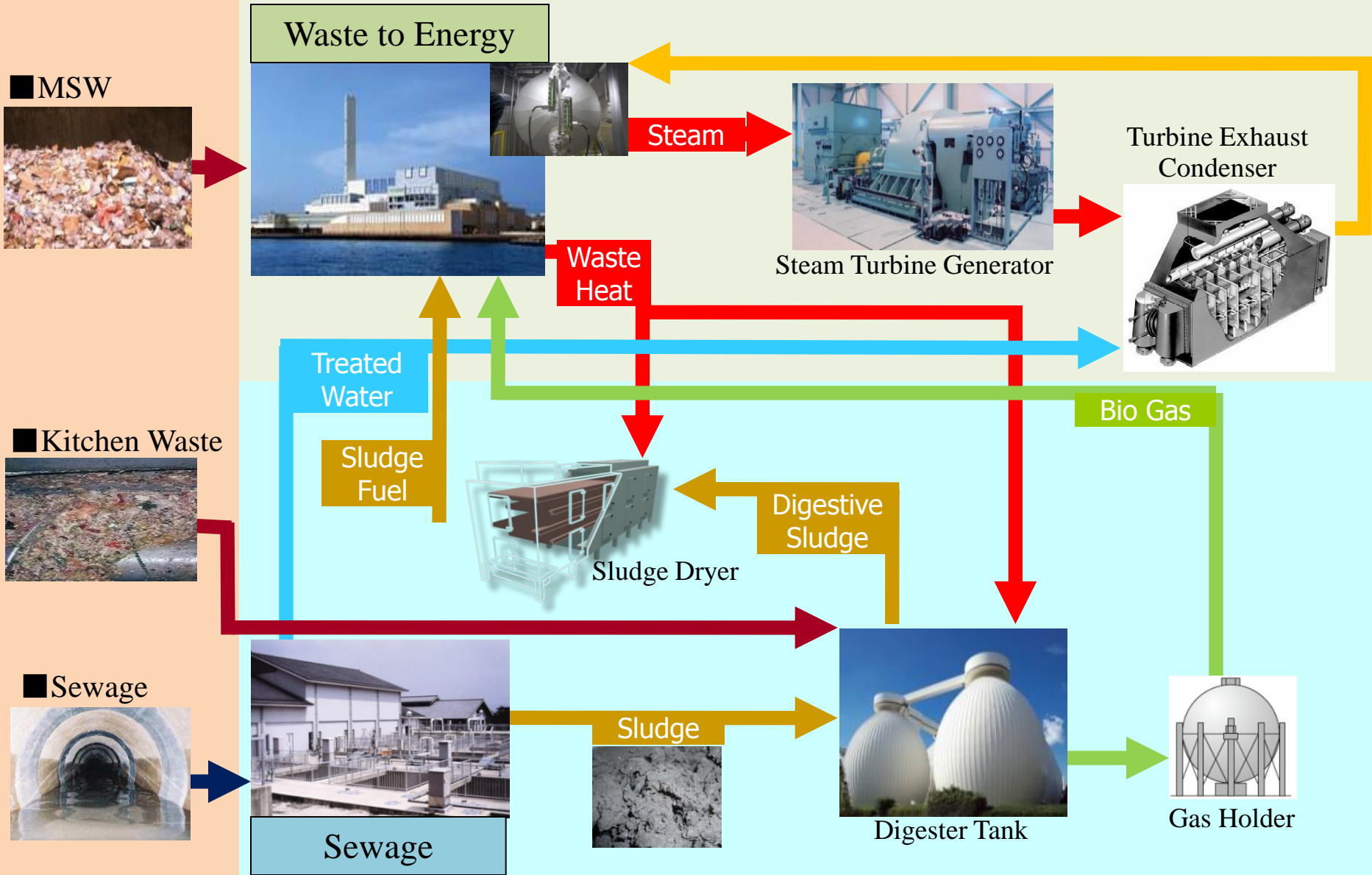
10-Tier Medical Waste Feed/Storage System



Treated Red Bag Waste at California Landfill



Combination of MSW and Sewage (Energy Efficiency Improvement)



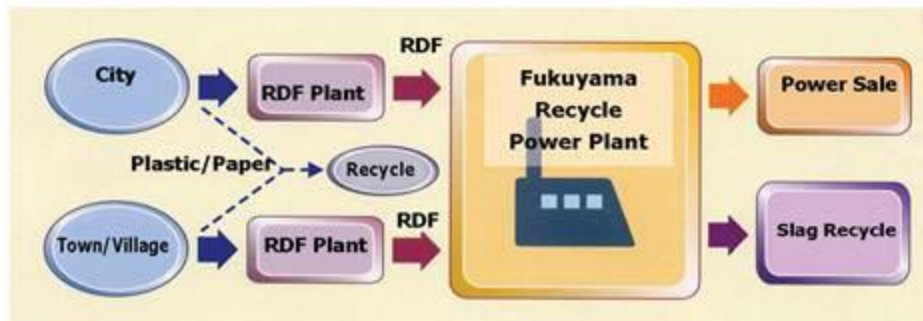
Fukuyama Regional RDF Gasification Facility

1. Plant Outline

Furnace Type	: JFE High Temperature Gasifying and Direct Melting Furnace
Plant Capacity	: 314 t/d
Fuel	: Pelletized RDF (18.2 MJ/kg)
Power Generation	: 20 MW
Boiler	: Natural Circulation / Tail End Type (6.0 MPa / 450 deg-C @ SH outlet)
Exhaust Gas Control	: Slaked Lime and Activated Carbon Injection, Bag Filter, Cathartic Reactor
Site Area	: 26,000 m ² (approx. 6.5 acre)



2. Waste to Energy System in Large Region



Fukuyama City and 8 neighboring municipalities participate in this scheme.



Valderringomez Technology Park Education Center



Valdemingomez Technology Park Education Center



Valdemingomez Technology Park Education Center

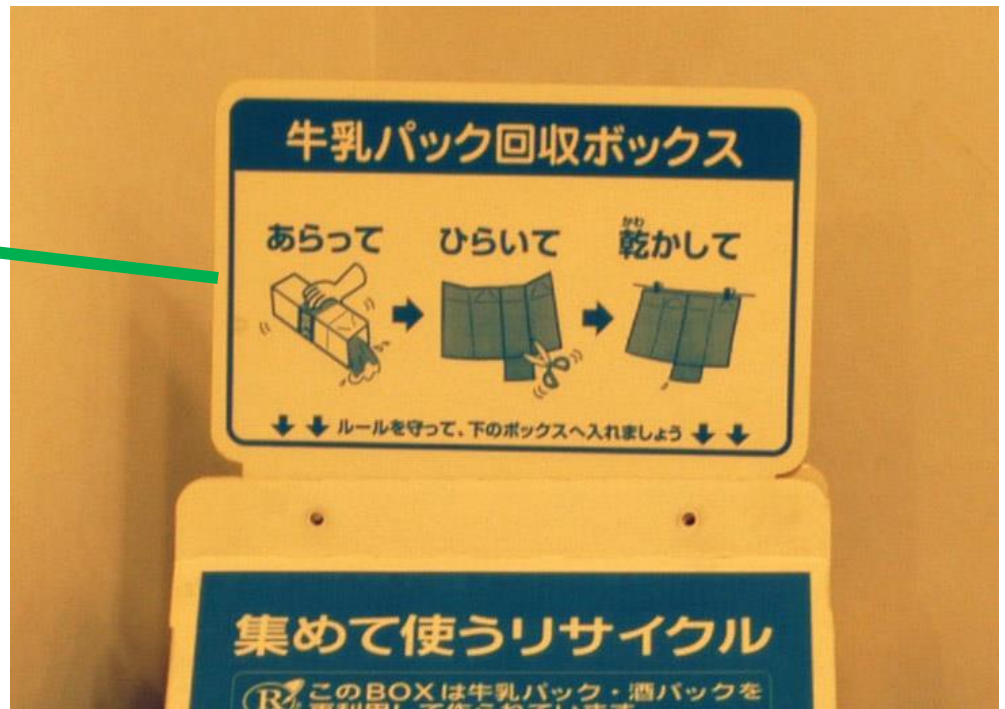


Extensive Source Separation of Recyclables



Example of Japanese Recycling Program

“Social Processing”



Extensive Source Separation of Recyclables



Extensive “Pre-Processing” at Source



Source Separated Food Waste Collection Program (Taiwan)

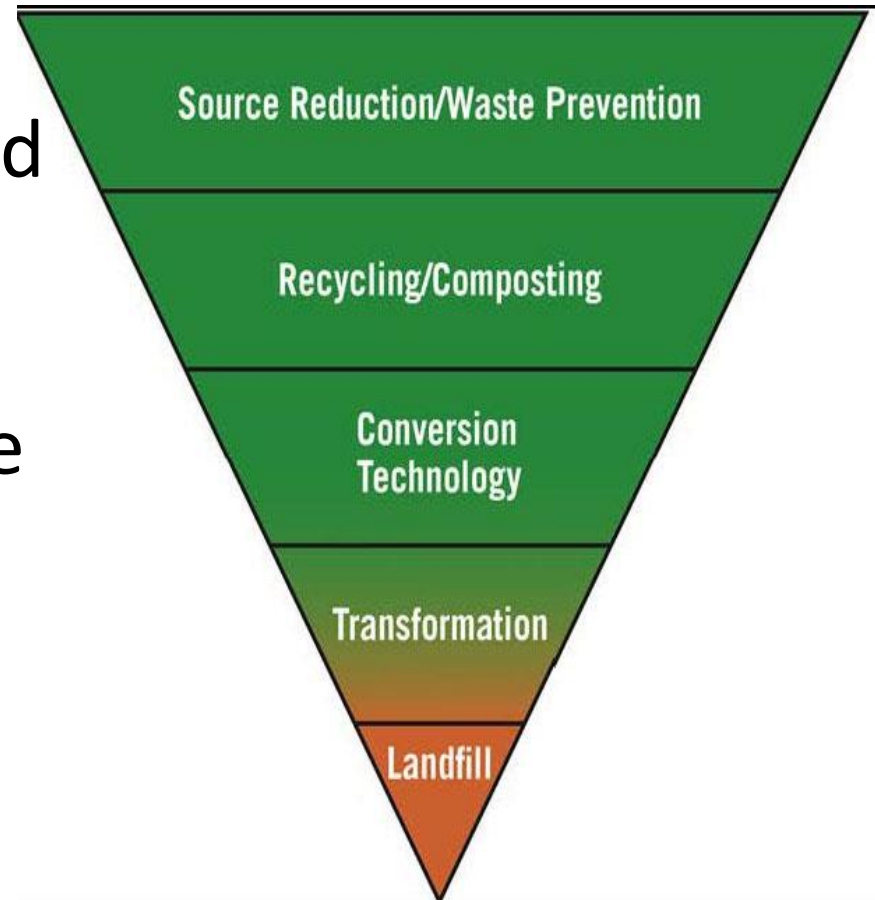


Bali Incinerator, Taiwan (I.M. Pei)

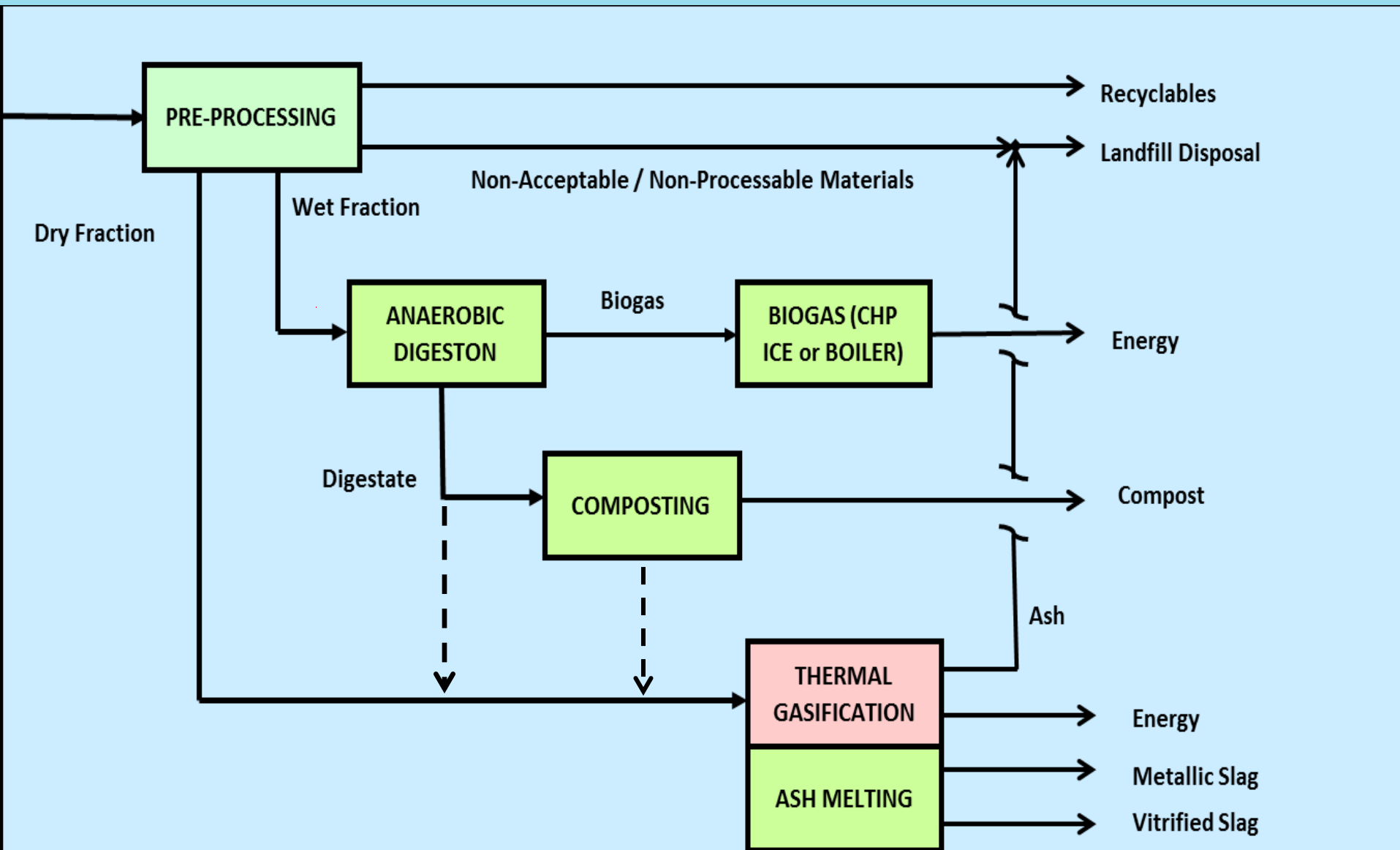


Combination of Programs / Policies to Achieve Minimum Disposal at Landfills

- Maximize waste prevention, recycling, and composting
- Anaerobically digest remaining decomposable fraction
- Convert residuals to energy or fuels, and recycle/convert ash



Integrated MRF with Conversion Technology

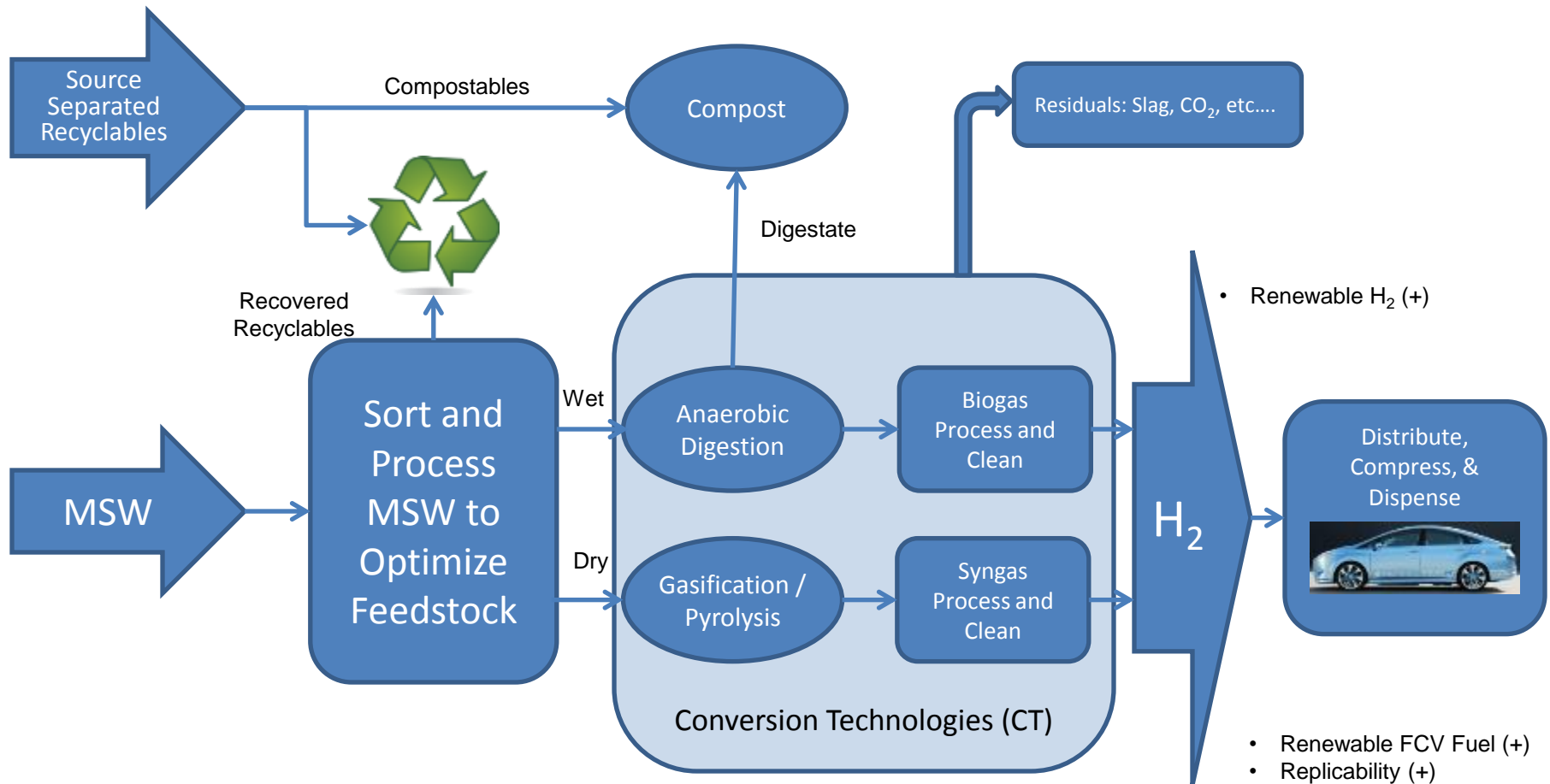




FCV – Fuel Cell Concept Car



Municipal Solid Waste to Renewable Hydrogen



- Readily Available (+)
- Environmentally Beneficial (+)
- Inexpensive Feedstock (++)
- Widely Varied Composition (-)

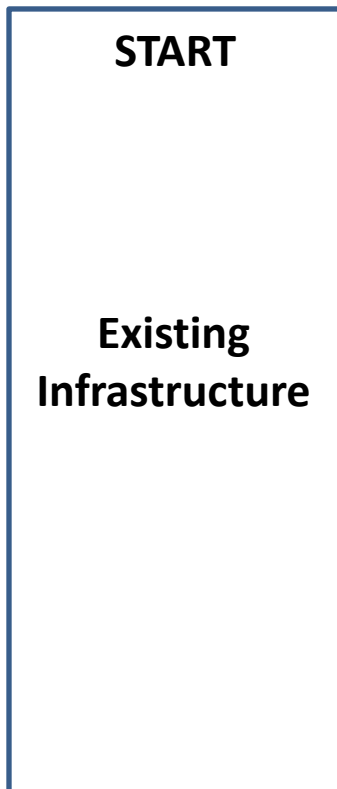
- Known Technologies / Processes (+)
- Requires Tailoring to Feedstock & Type of CT (-)

- Proven Technologies (+)
- Used Worldwide (+)
- Few US MSW Applications (-)

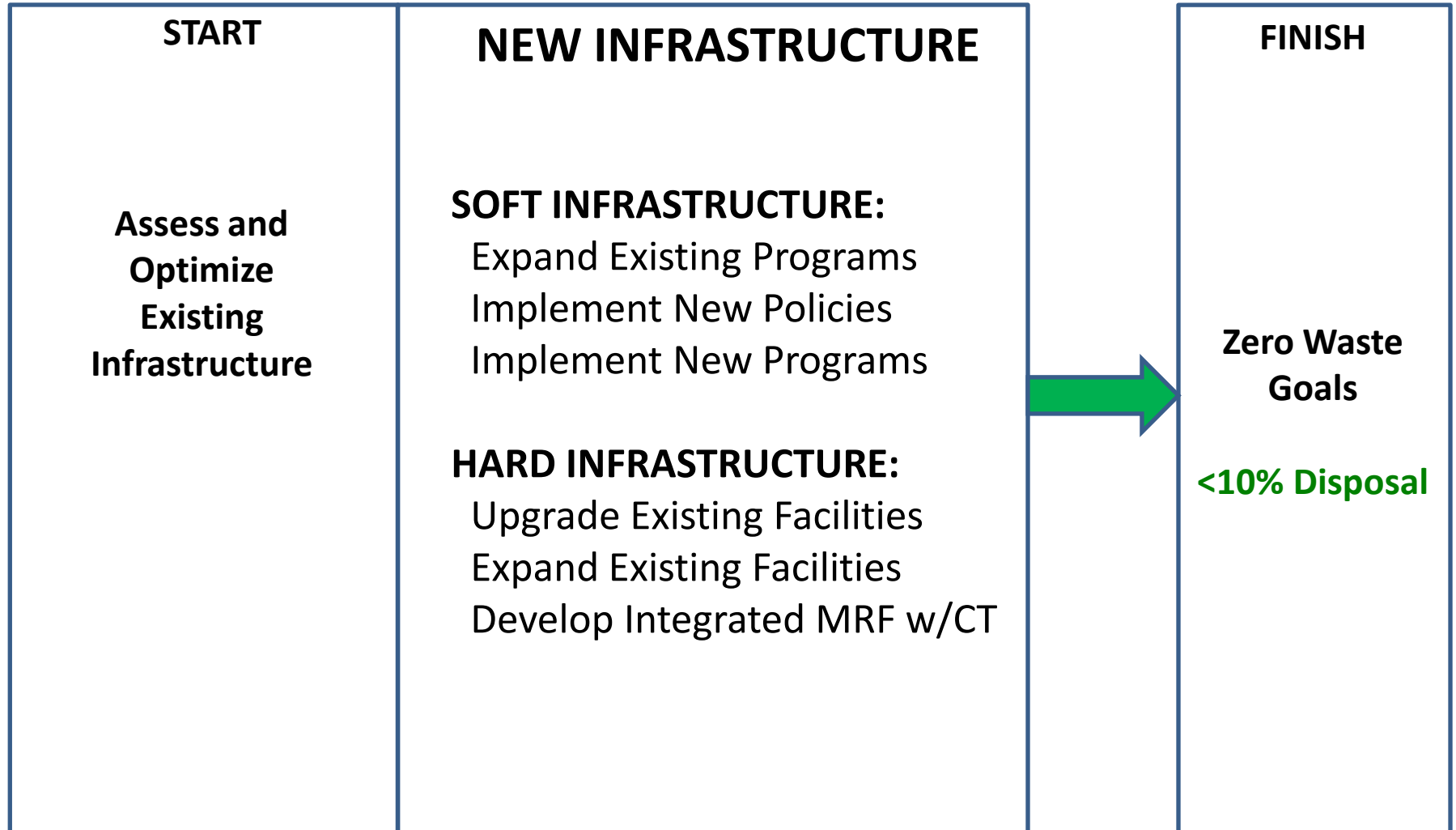
- Renewable H₂ (+)

- Renewable FCV Fuel (+)
- Replicability (+)
- Requires Development (-)

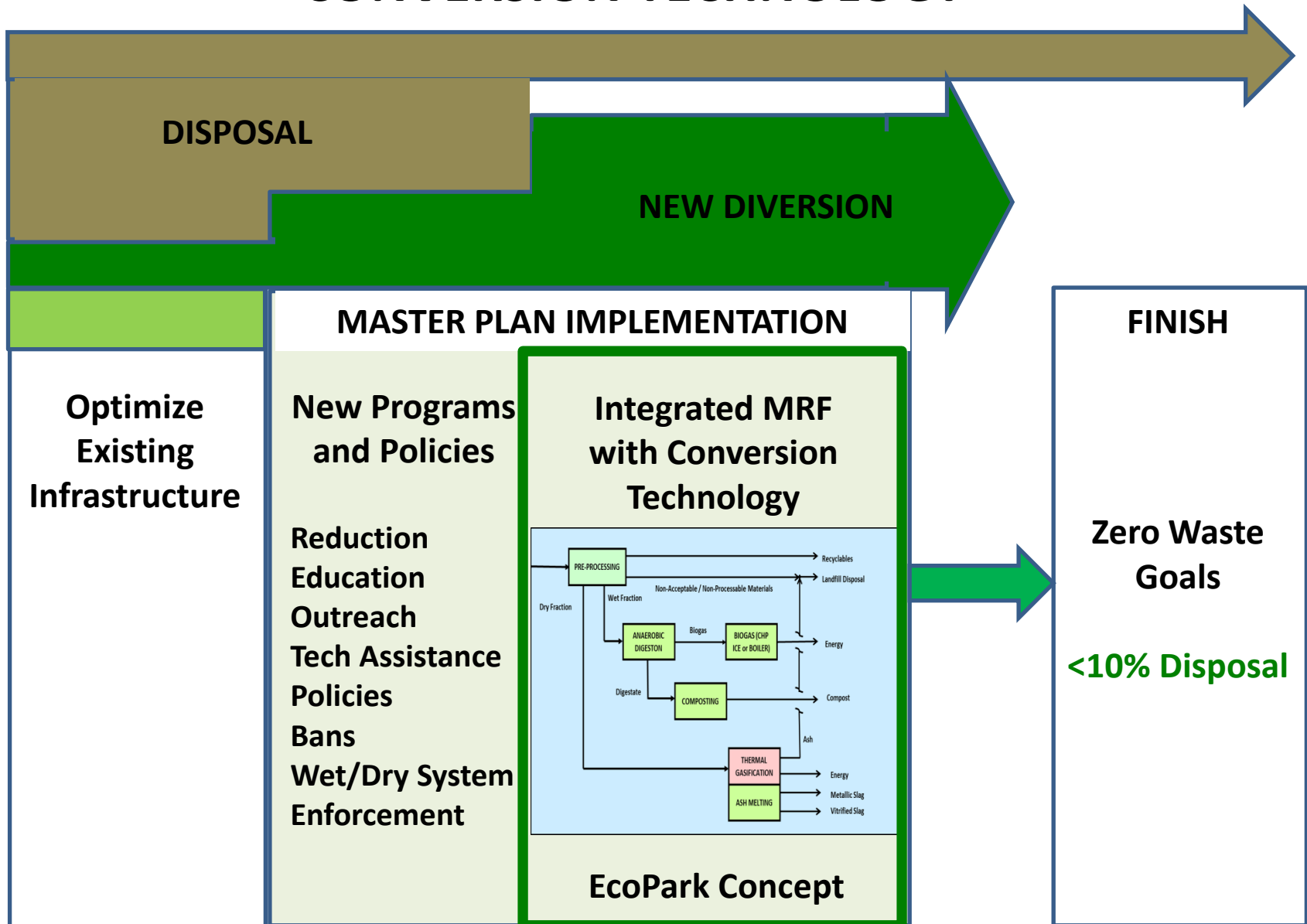
SYSTEMS ENGINEERING BASED APPROACH TO INTEGRATED WASTE MANAGEMENT PLANNING



SYSTEMS ENGINEERING BASED APPROACH TO INTEGRATED WASTE MANAGEMENT PLANNING



ROLE OF THE INTEGRATED MRF WITH CONVERSION TECHNOLOGY



Building the Infrastructure

- Collaboration of Industry and Government
- Role of Government and Political Leadership
 - Life-Cycle / Systems Engineering Approach
 - Create Robust / Flexible Infrastructure
- Create the Supporting Infrastructure
- Invest / Encourage Innovation
- Paying the True Costs
- Role of Education
- Focus on Protection of Public Health and Protection of the Environment

ACHIEVING YOUR “VISION”



Building a Robust IWM Infrastructure

Industry/Government Collaboration

Governance (Government Leadership)

Kaizen (Continuous Improvement...there is no “Best”, commit to continuously making it better)

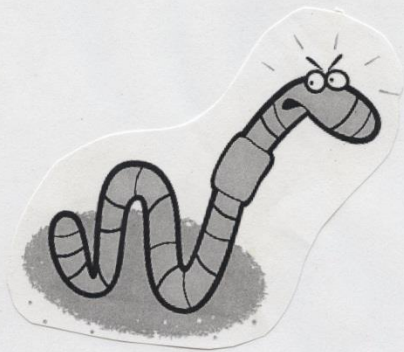
Character is Defined by Your Actions

PASSION AND / OR INSANITY ?



Can You Save Landfill Space By Using Your Leftovers?

By Terri Tseng



**Daughter's
High School
Thesis Paper**

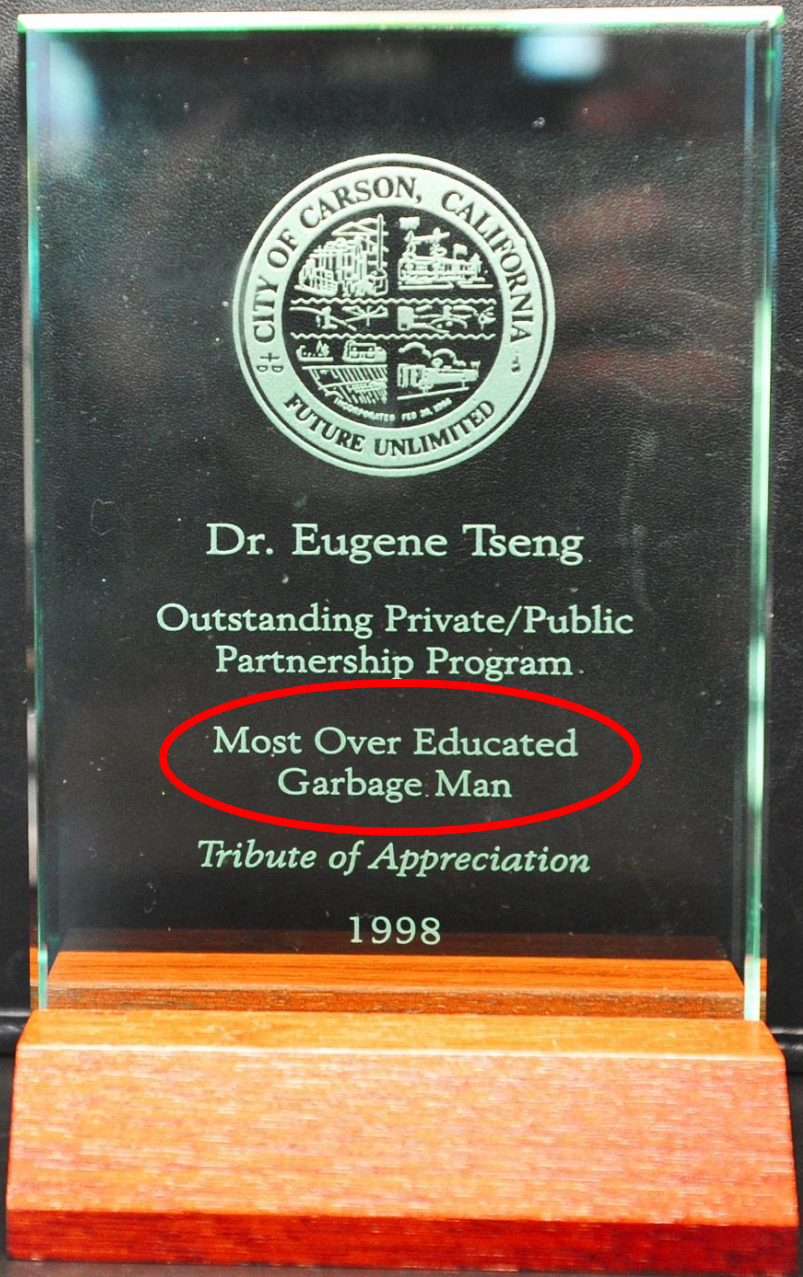
What I Want out of Life

I figure that life is very precious so I want to make the most of it. I have a long list of things I want to be but I will write down the ones that I want the most. First I want to be an astronomer. Second I want to be a writer. Third I want to be a scientist developing new software and computer parts. But one thing is for sure. I DO NOT want to be an environmentalist that jumps in the dumpsters and sorts out the trash like my dad!

So far I have read a lot of books from most categories that I know pretty much about the jobs I described in the first paragraph. I am very happy that I have already won a writing contest.

I like classical music and play the piano. I know I do not seem like Joe Average, but that's just me. I plan on getting a nice and cozy house just like the one I live in now. One goal that I have is to be happy, healthy and live to an old age.

I hope to have contributed to my community and the world by preventing asteroid impact, bringing laughter to homes and by making things in life more efficient before I die.



THANK YOU.!

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