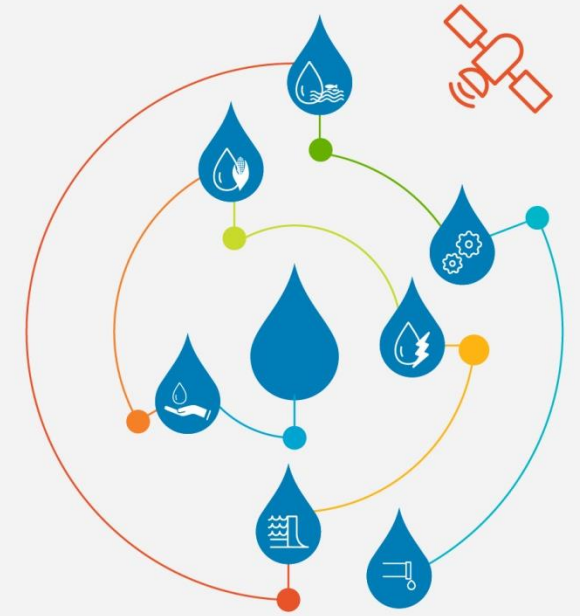


# Maximizing Resource Recovery – Anaerobic Co-digestion of Food Waste and Municipal Wastewater Sludge



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# Anaergia Vision: A Zero Organic Waste Future

Wastewater  
Biosolids



Source  
Separated  
Organics



Municipal  
Solid Waste



Food  
Processing  
Waste



Agricultural  
Waste



Integrated Solutions



Renewable  
Power



Renewable  
Gas



Recyclables



Fertilizer



Clean Water

**1,600+ Projects, 13 Offices, 384 MW, 4 Continents**



# Current Situation Globally

1.6 Billion tons of Food Waste produced globally...  
Billions of tons of Wastewater Sludge.....

## GHGs from Food Waste Equals Emissions from All Modes of Transportation Combined



Source: United Nations 2016

Organic Waste | GHG Emissions | Global Warming | Foul smell, Diseases | Landfill Fires



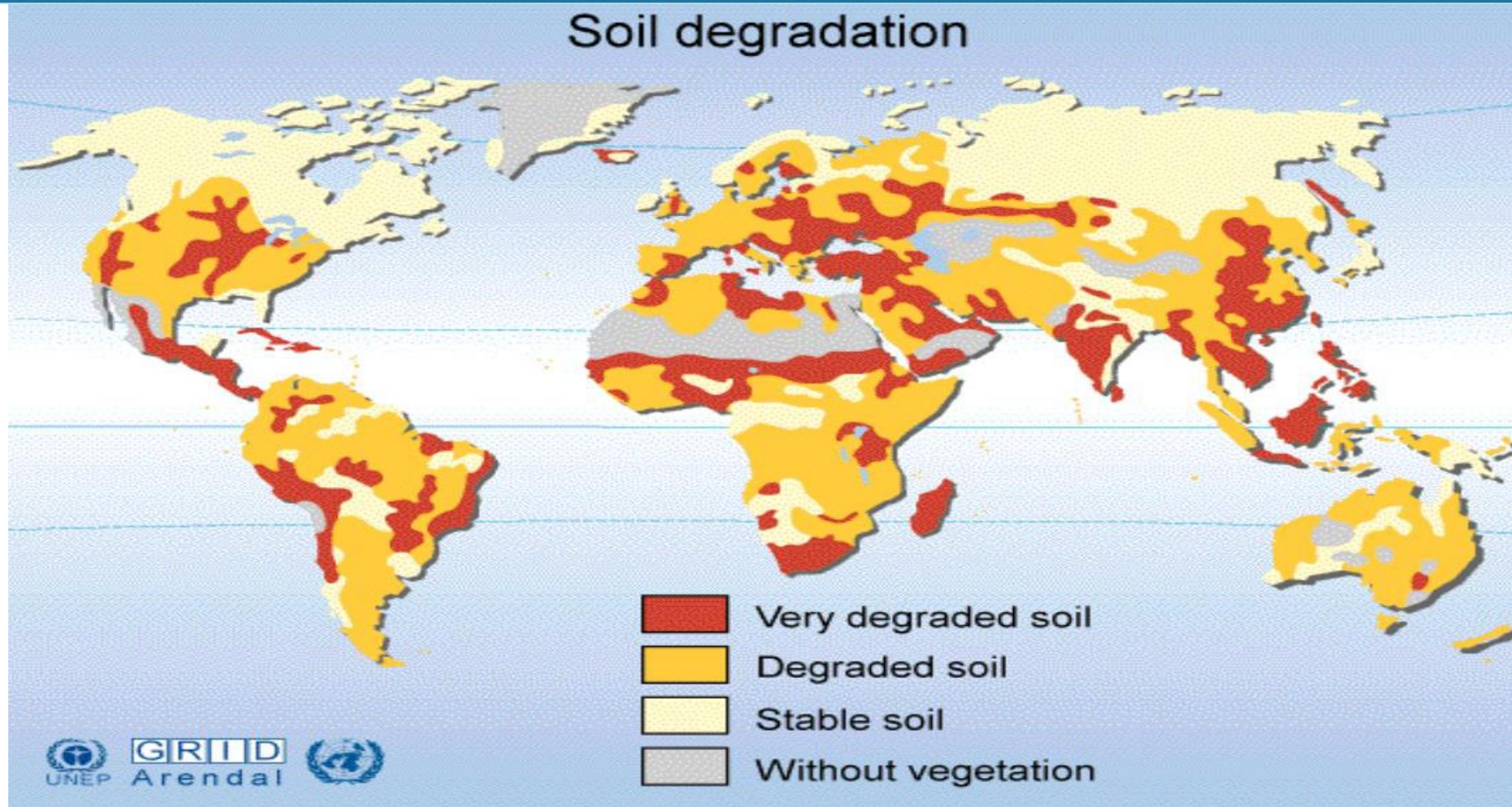
# Landfill – Full, on Fire and Failing.....



Photo: The Nation/ANN



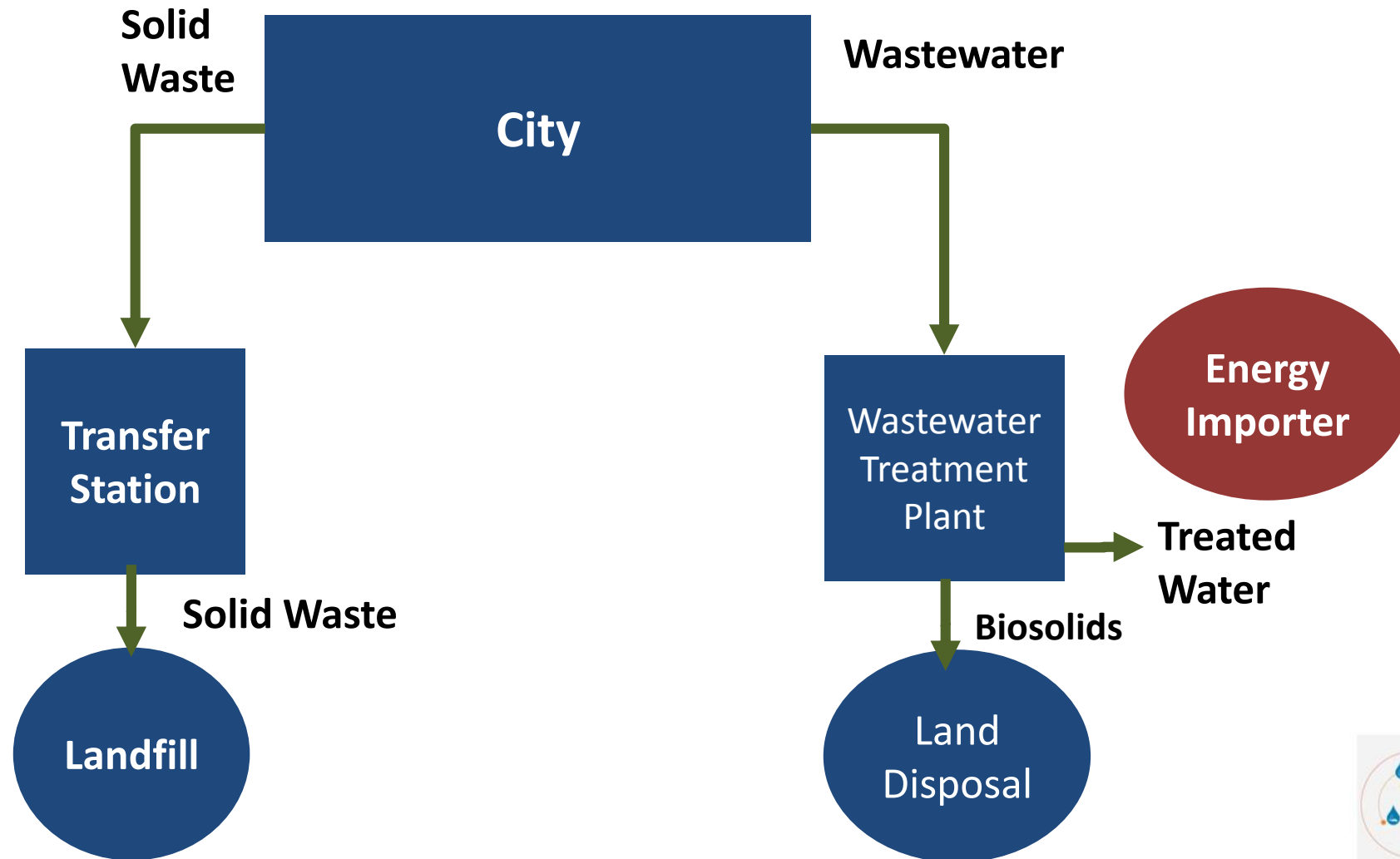
# Soil Degradation...Fertility of land degrading..



**A third of the planet's land is severely degraded and fertile soil is being lost at the rate of 24bn tonnes a year, according to a new United Nations-backed study**

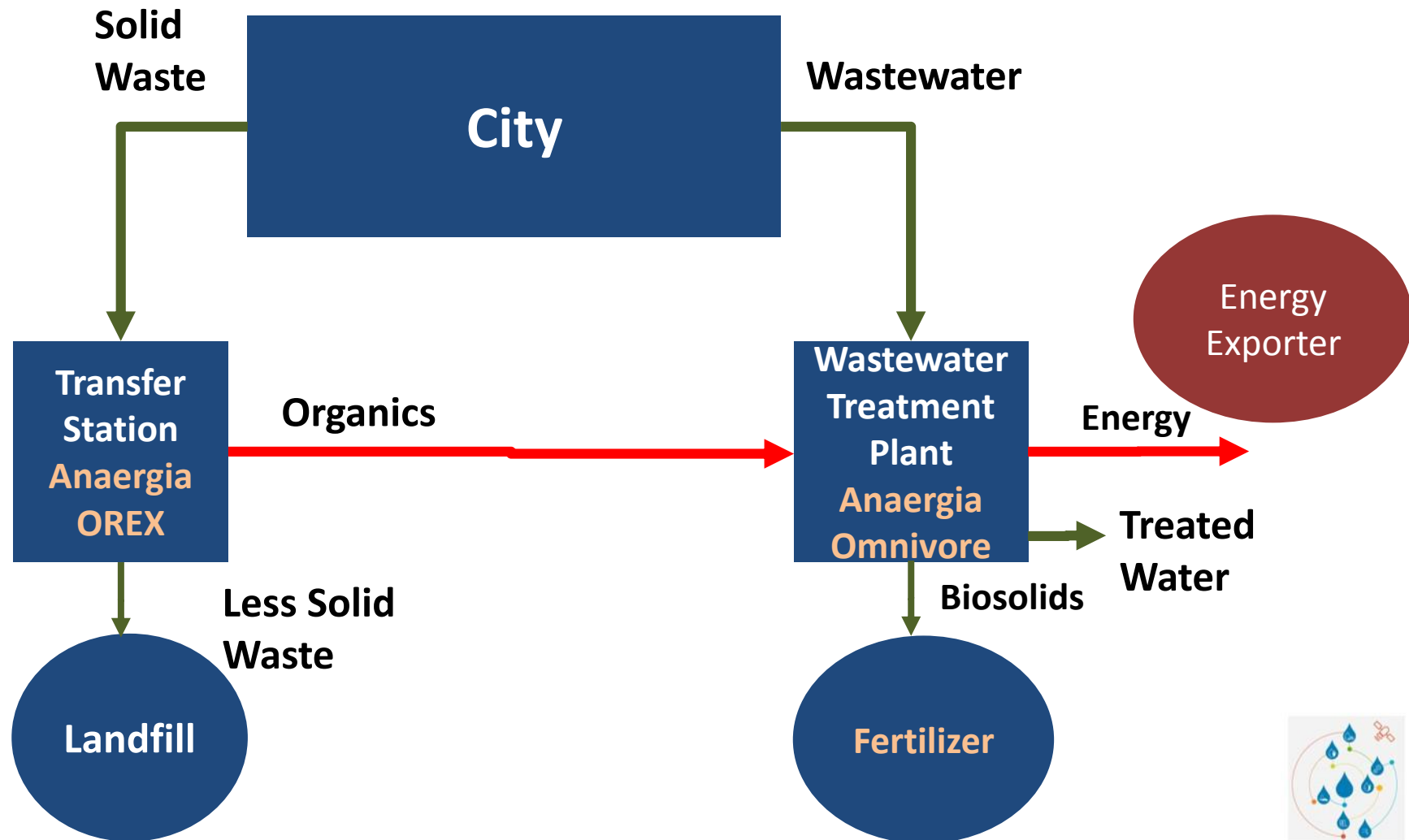
# Anaergia's Approach of Resource Recovery: Paradigm Shift

# Cities' Current approach to organics is Landfilling and Disposal

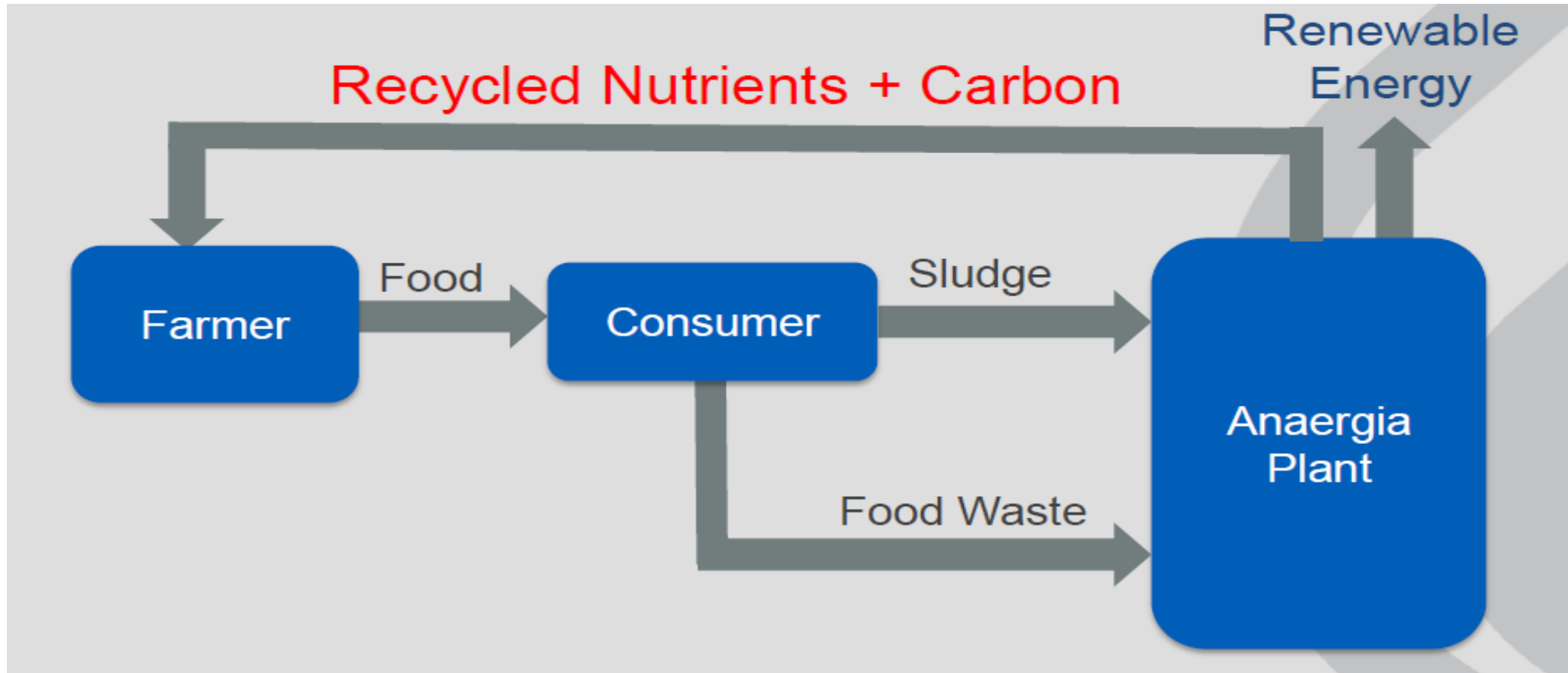




# Anaergia's Omnivore technology enables the use of municipal wastewater treatment plants as conversion facilities



# Our Approach : Circular Economy



# Omnivore Co-digestion Demo Project at Ulu Pandan WRP

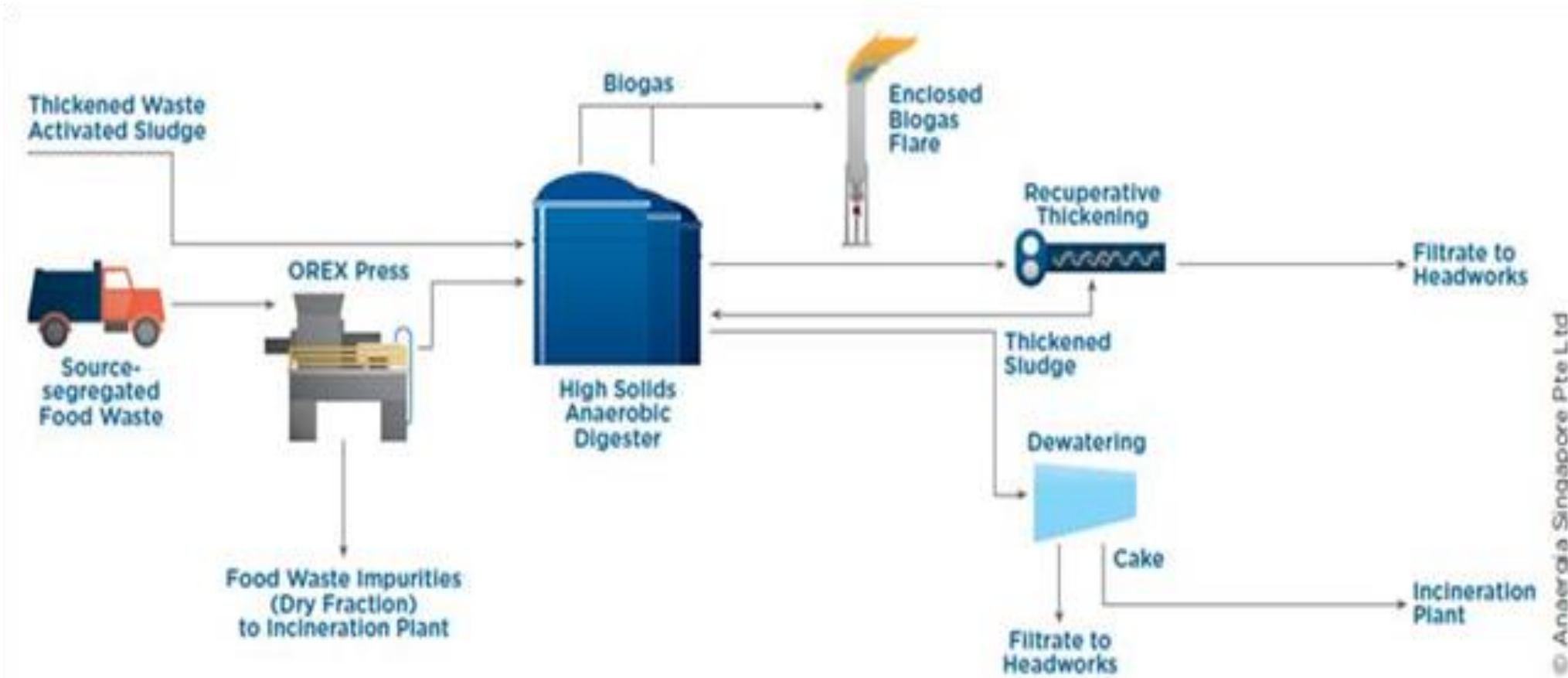


Fig. 1: The OMNIVORE™ process (patented by Anaergia) to be demonstrated at Ulu Pandan WRP



# Food Waste Co-Digestion Demo Plant at Ulu Pandan WRP



# Singapore Demonstration Plant Basics



- Commercial FW 10-20 tons/day
- Mix of vegetable, fruits, animal by-products, bags, packaging, metals
- Current contamination 10-15%



- BIOREX150 extracts organics from contaminated FW
- Extruded organics are digested with Wastewater sludge at Ulu Pandan WRP



# Anaergia's OREX Handles Contaminated Waste

- Preprocessing technology must be robust enough to accept any level of waste contamination – Not dependent on Human Behavior....
- Higher contamination expected in 400 tons/day of commercial food waste

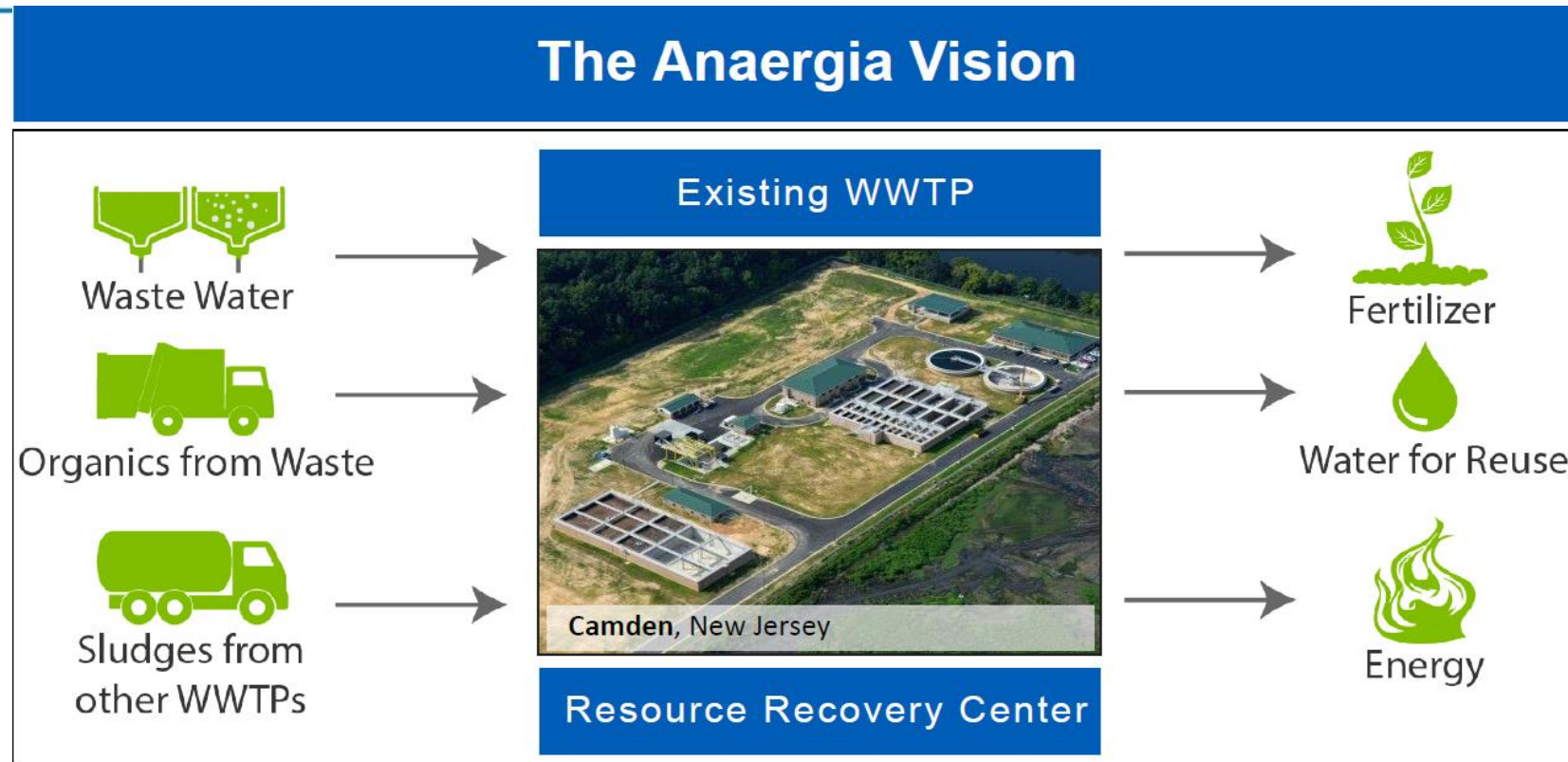




# Drivers - Adoption possibilities for Asia

- **Regulatory Driver** – Policies to promote Organics diversion from landfill.
  - **Cooperation:** City Solid waste and Sanitation Department need to cooperate
  - **Regulatory support:** For local permits, licenses, PPA, etc – also for conducting Feasibility studies.
  - **Economical Driver:** Tipping fees, Renewable Energy PPA's, GPA's.
  - **Delivery Model** – DBO, BOT, EPC – If BOT the with proper incentives.
- 
- ❖ Most of the landfill in Asian cities are full and have burning problems.
  - ❖ The cities are dense with minimal space for new Infra facility.
  - ❖ Many cities like Manila, Bangkok, Delhi, Chennai, Da Nang, Hanoi, Bandung, etc have existing wastewater Infrastructure which can be tapped into.

# Maximizing Resource Recovery – Many Benefits



- **Organics Diversion from Landfill | GHG Reduction**
- **Making Wastewater plants Energy Exporter | Clean & Green Power**
- **Fertilizer | Organic Compost**
- **Leveraging Synergy – Saving overall disposal costs**

# THANK YOU

(Anaergia Vision: A Zero Organic Waste Future)

