ENERGY

Waste to Energy

Technology and Present Scenario

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24 April 2015

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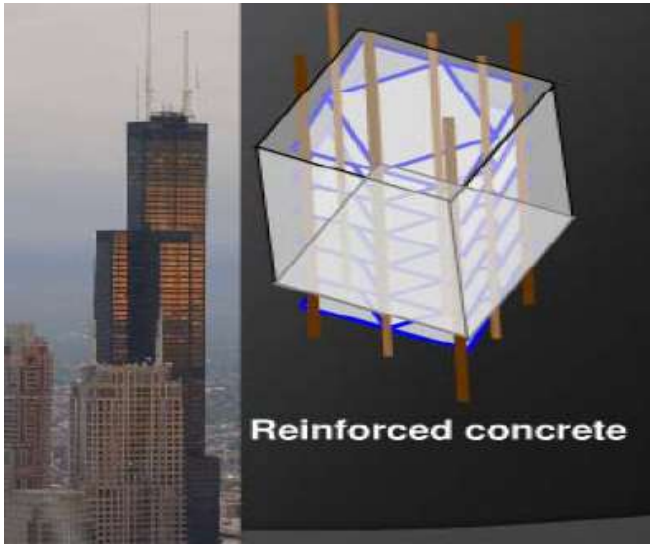
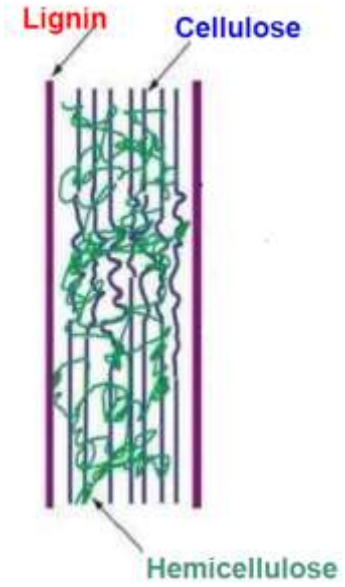
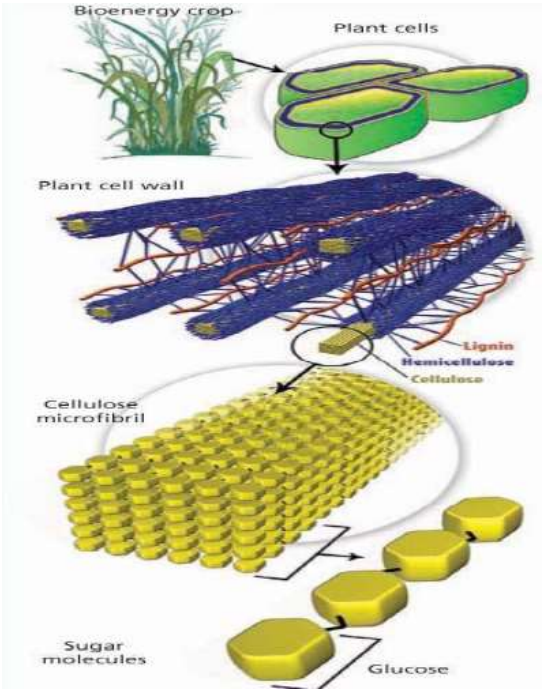
Basics of Biomass

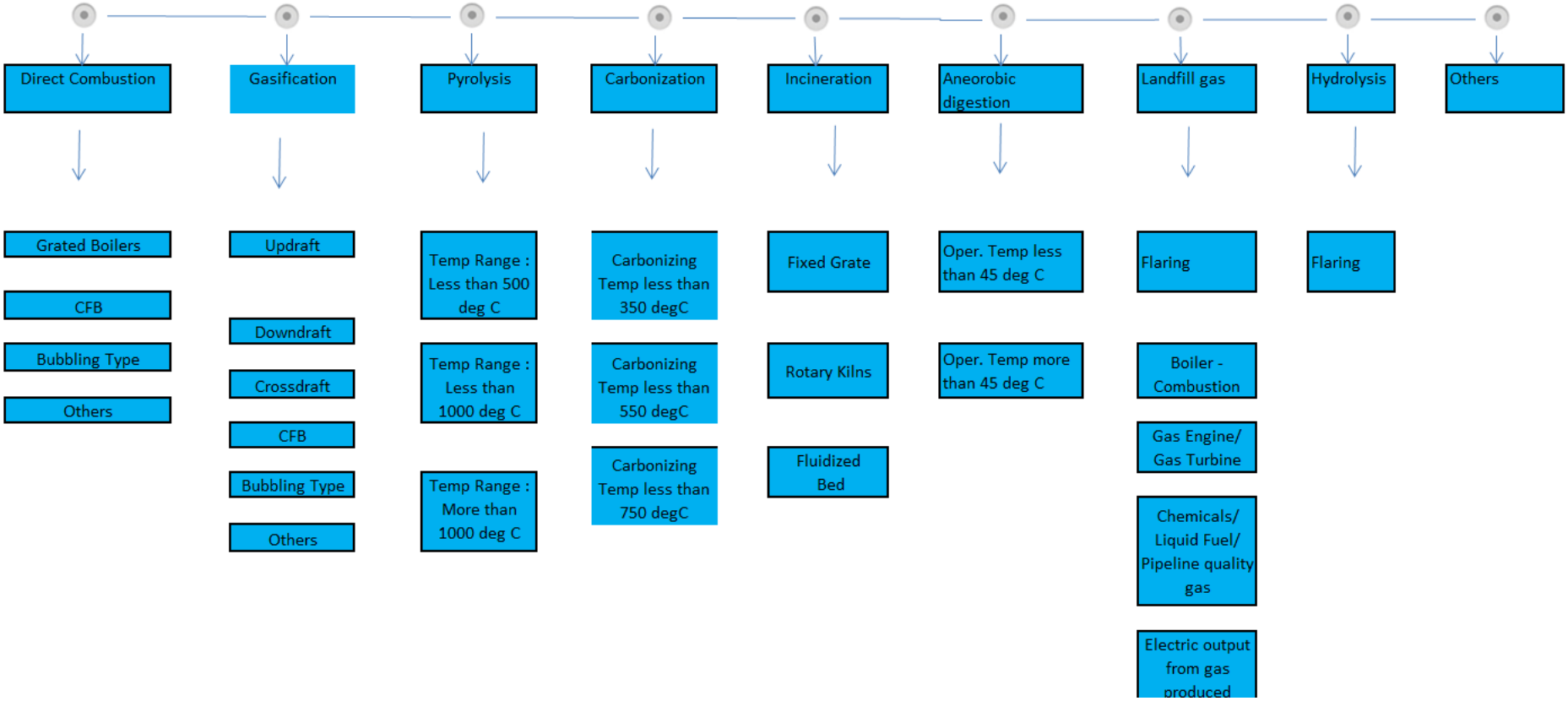




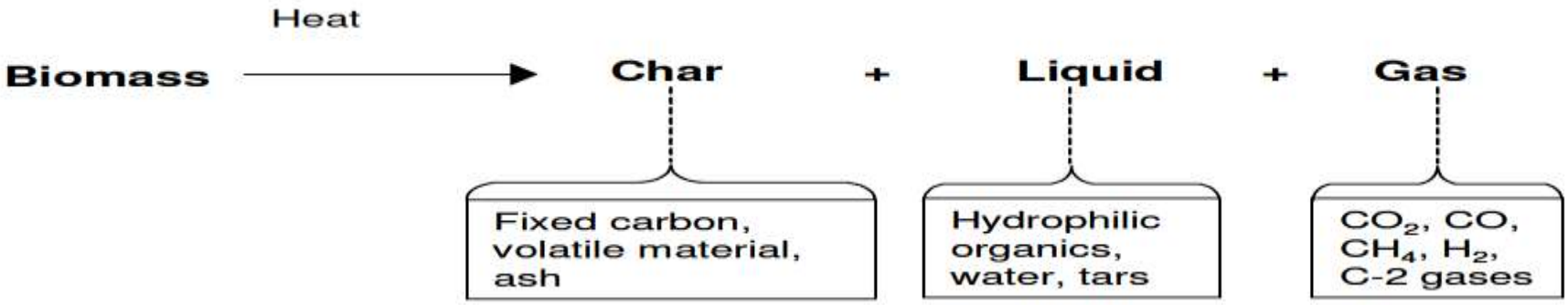


Castro Marina, September 19th 2011
Speaker : Anna Maria Raspolli Galletti, University of Pisa

Waste-to-Energy Technology



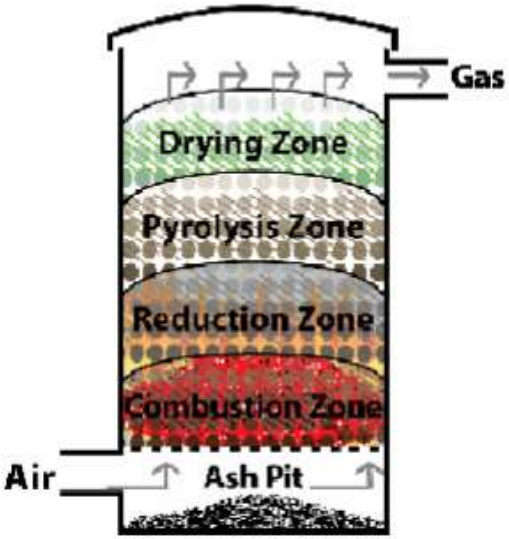
Pyrolysis, Carbonization, Gasification



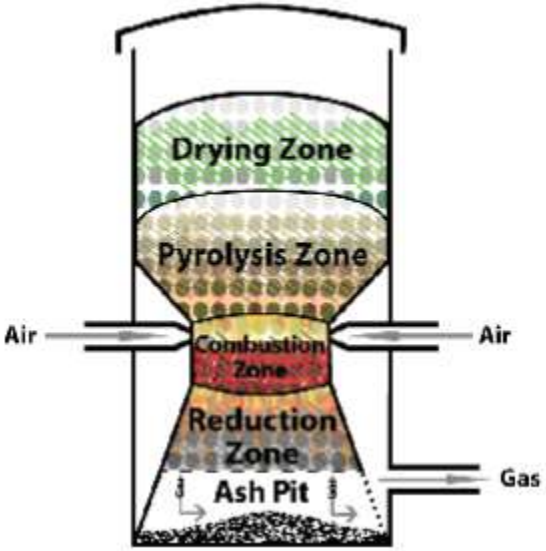
Carbonization	**35%**	**30%**	**35%**
Inert Atmosphere	**Lower temperature (400 deg C)** **Long Residence Time** **Higher Lignin content favours higher yield**		
Fast Pyrolysis	**12%**	**75%**	**13%**
Inert Atmosphere	**Moderate temperature (500 deg C)** **Short Residence Time** **High Yield Bio Oil**		
Gasification	**5%**	**5%**	**85%**
Partial Oxidation	**High Temperature (500 to 800 deg C)** **Long Residence Time**		

Gasification – Different Reactor Designs

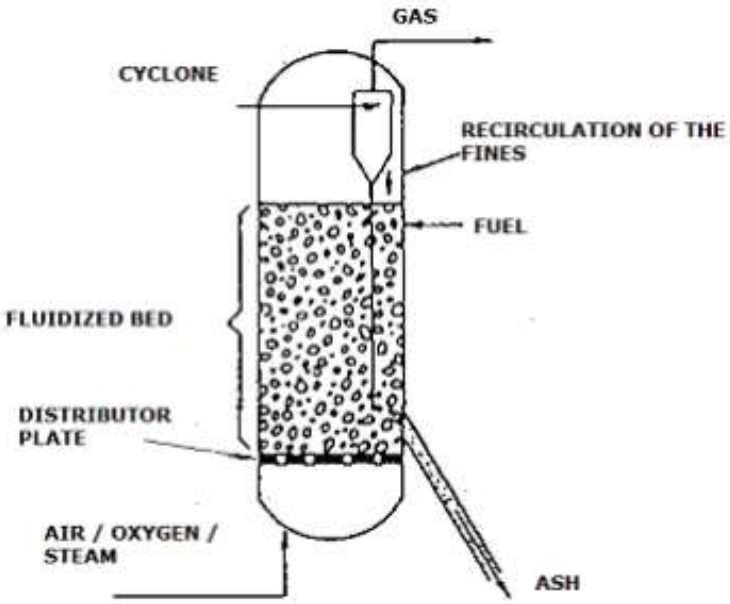
Updraft Gasifier



Down Draft Gasifier



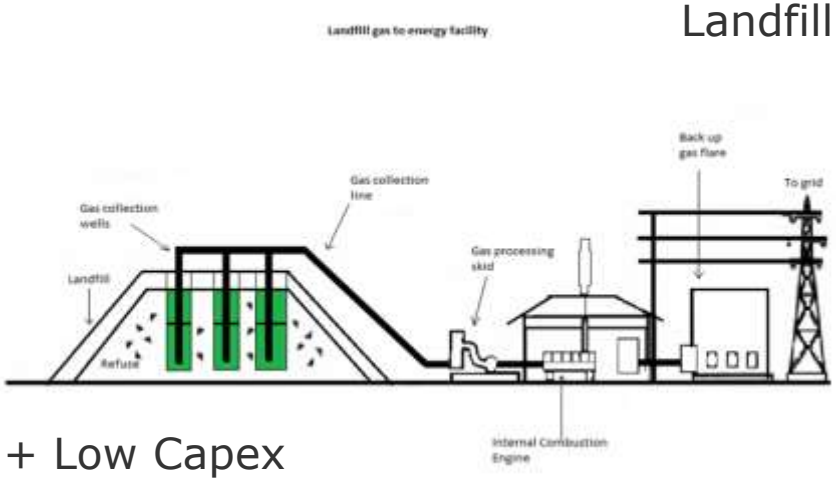
Fluidized Bed Gasifier



http://www.enggcyclopedia.com/2012/01/types-gasifier/

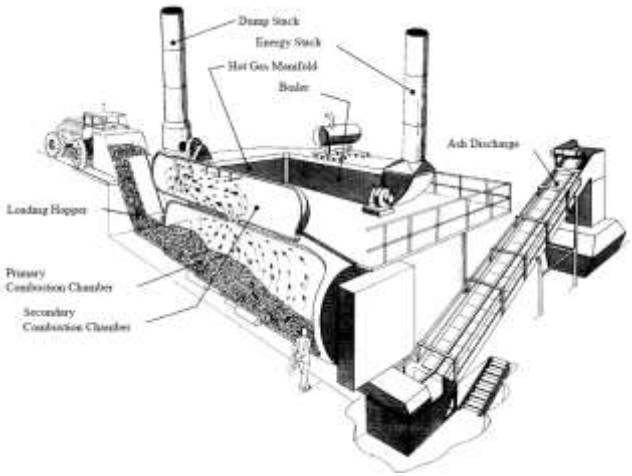
MSW – Modular Incineration and Landfill

Landfill



+ Low Capex

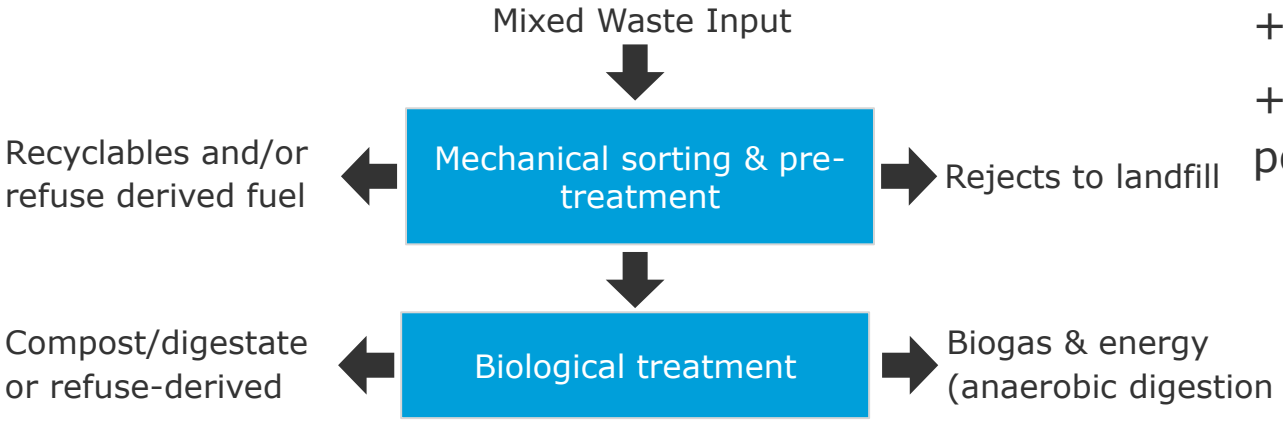
Modular Incinerator



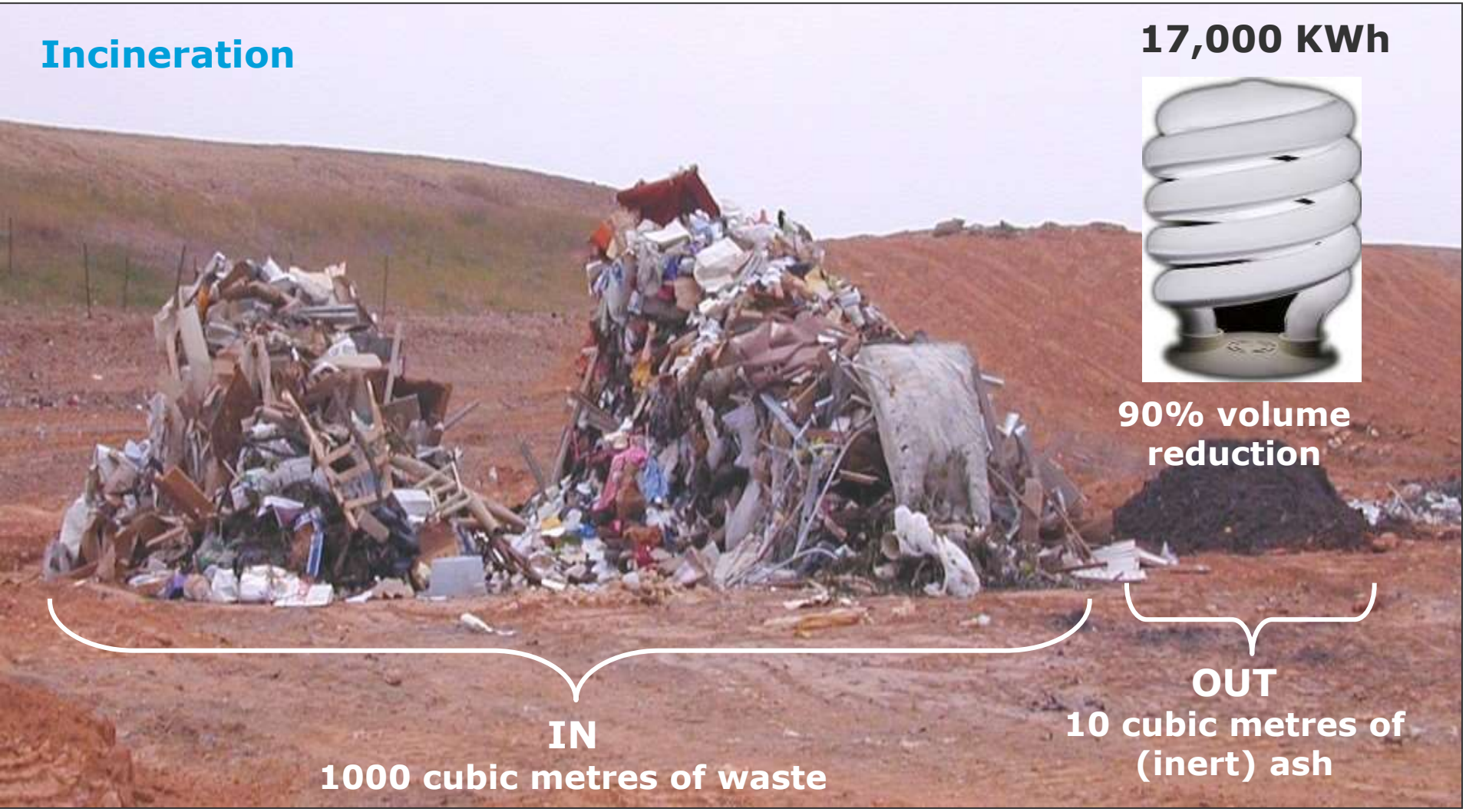
+Energy Conservation

+Land Usage

+Low Risk to Water/ Air pollution

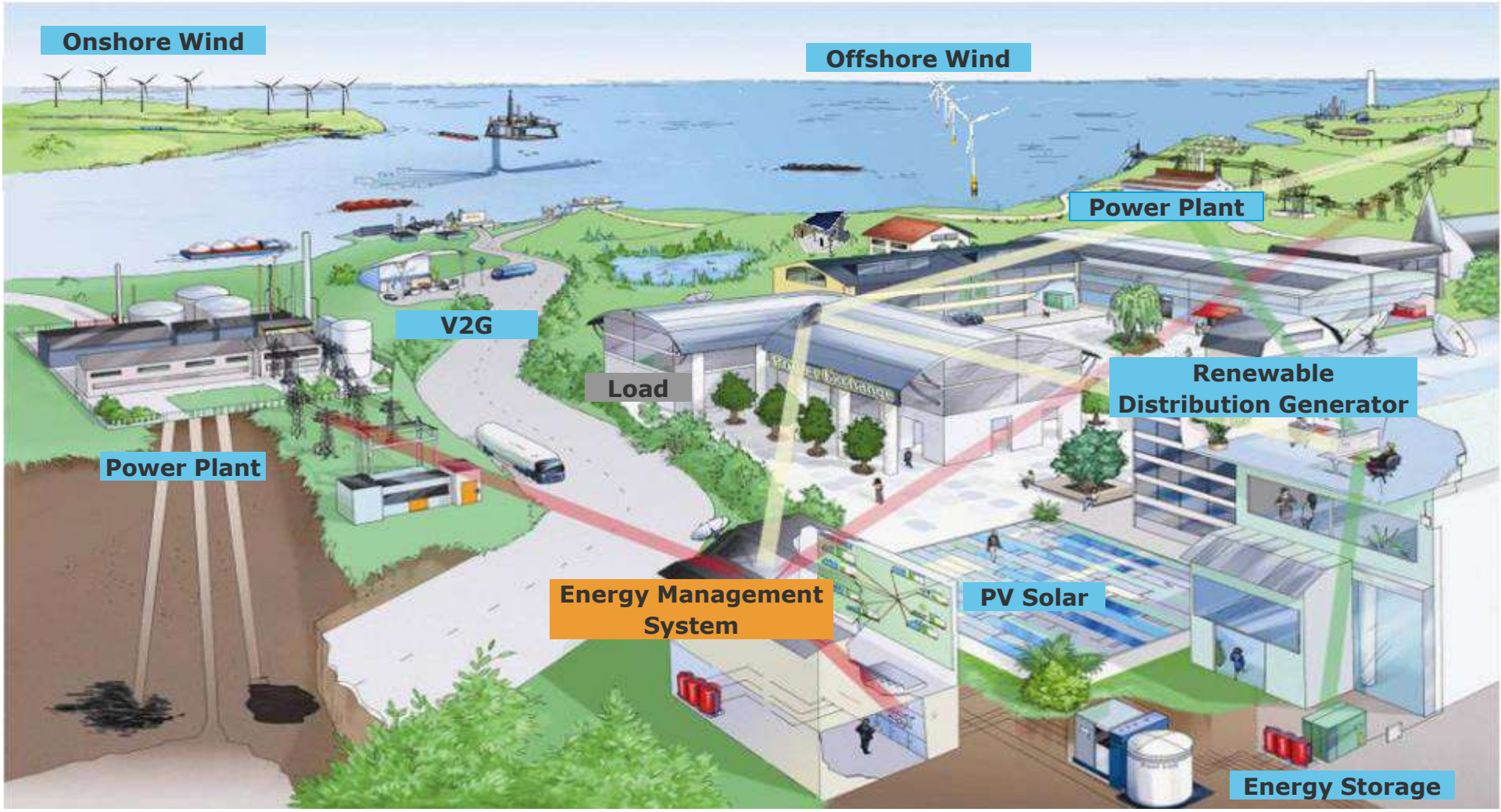


MSW - Saving Land space in the Landfill, Generating Clean Energy



Source : Burgeoning Prospects for Waste-to-Energy in the United States" by Ted Michaels, President Energy Recovery Council

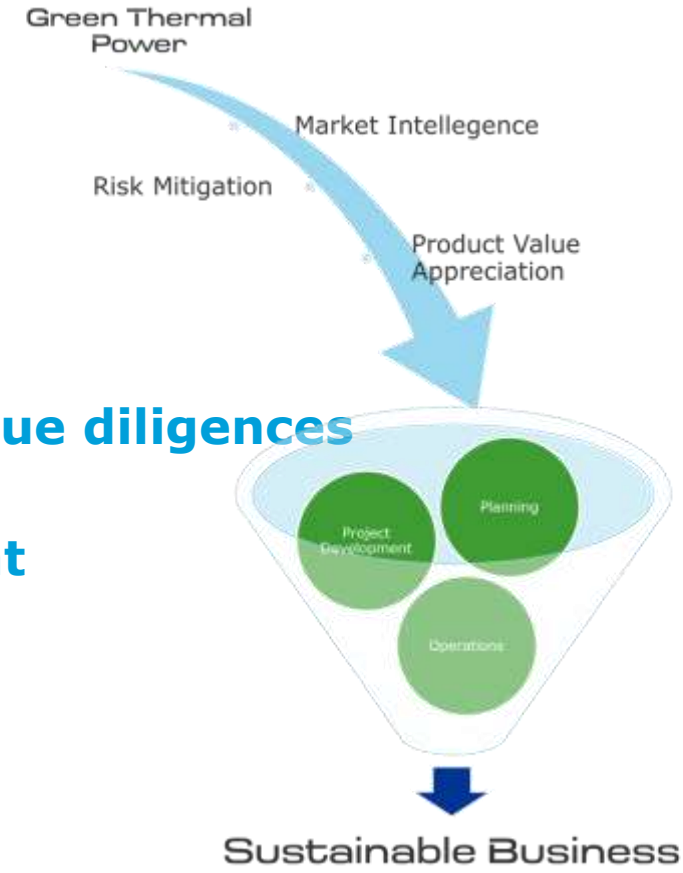
Diverse Energy Assets Brought Together in a Microgrid

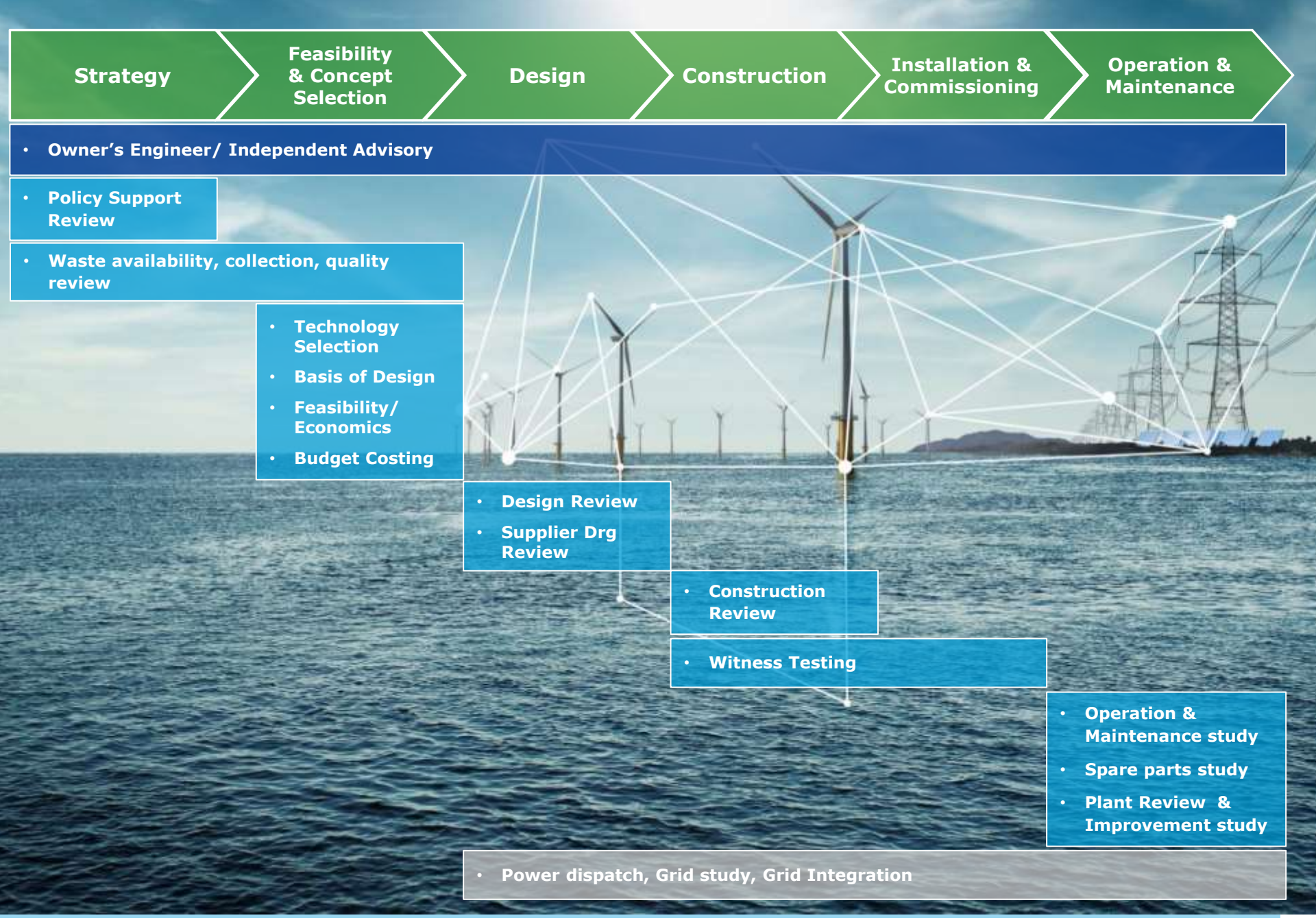


DNV GL in W2E

DNV GL - Service Offerings

1. **Feasibility studies & Market Studies**
2. **Bankers and lenders support**
3. **Technical benchmarks and technical due diligences**
4. **Operational performance improvement**

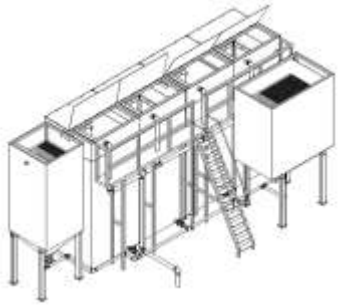


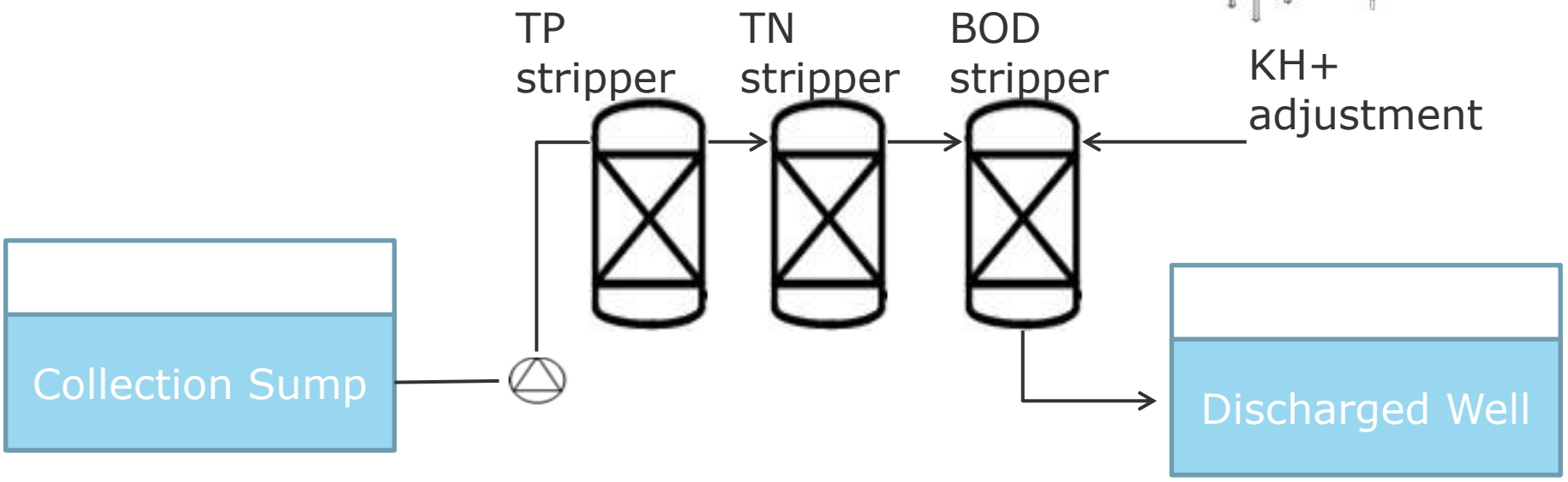

Strategy
Feasibility & Concept Selection
Design
Construction
Installation & Commissioning
Operation & Maintenance
• Owner's Engineer/ Independent Advisory
• Policy Support Review
• Waste availability, collection, quality review
• Technology Selection
• Basis of Design
• Feasibility/ Economics
• Budget Costing
• Design Review
• Supplier Drg Review
• Construction Review
• Witness Testing
• Operation & Maintenance study
• Spare parts study
• Plant Review & Improvement study
• Power dispatch, Grid study, Grid Integration

Wastewater Treatment Technology

- To address the above issues of low BOD and low C/N ratio which are able to meet effluent standard at reasonable costs.

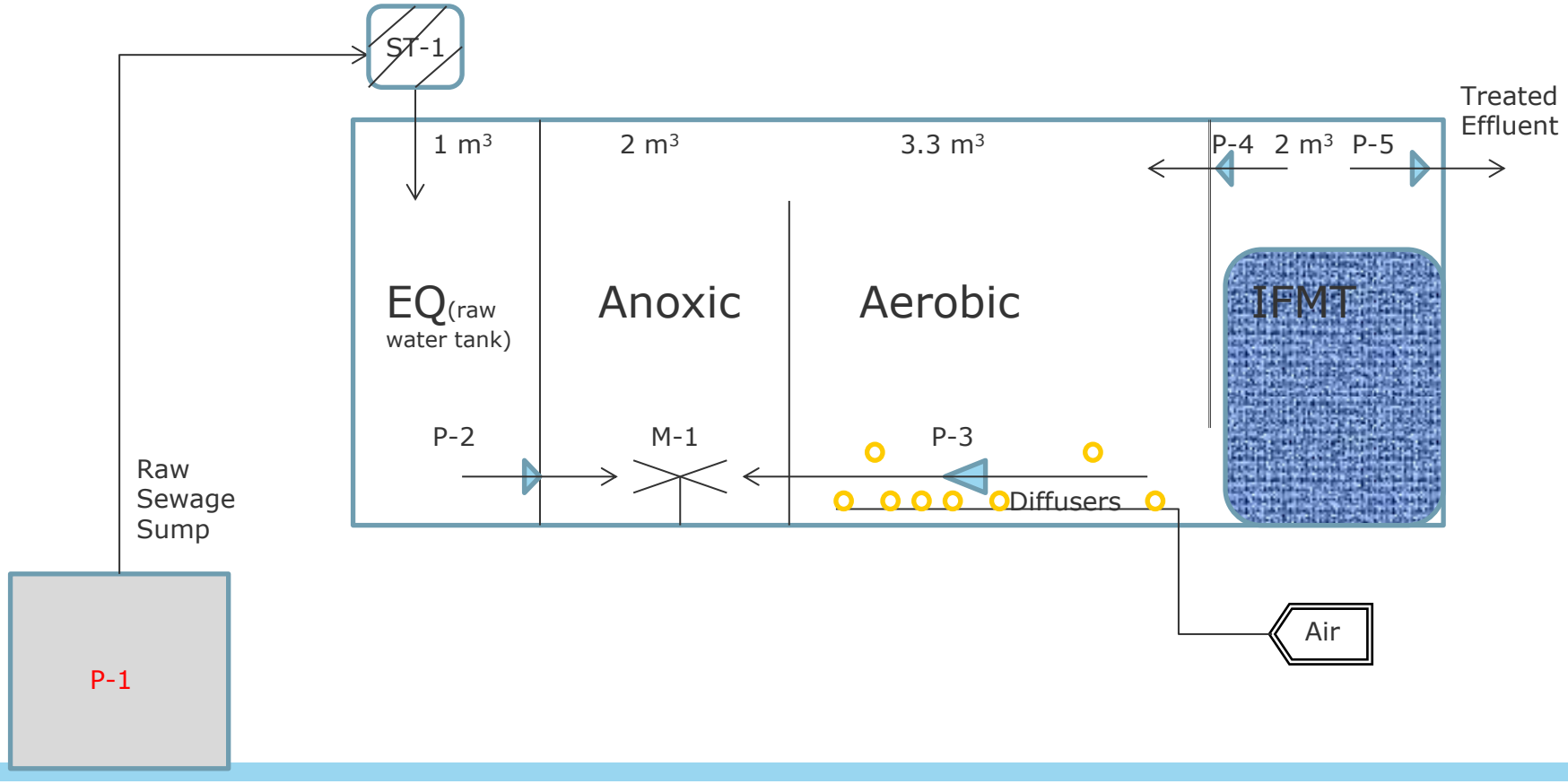
- Biofilm Multi-stages Stripper- process





Wastewater Treatment Technology

- Due to limited space, decentralized wastewater treatment stations, with small footprints, are to be built for hospitals, hotels, apartments, commercial points in urban areas and resorts
- Biomatrix Technology incorporating into existing tanks



Conclusion – Renewable is already Today's choice

Waste-to-Energy gets rid of waste …. and

- **Electricity (KWs) and by-products (bio oil, charcoal)**
- **Environment**
- **Economics**
- **Real Estate (better land usage)**

The End

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