Waste to Energy

THE SMARTER

ARE TURNING

GREENER

ORGANIC RECYCLING
SYSTEMS PVT. LTD

www.organicrecycling.co.in

About ORS

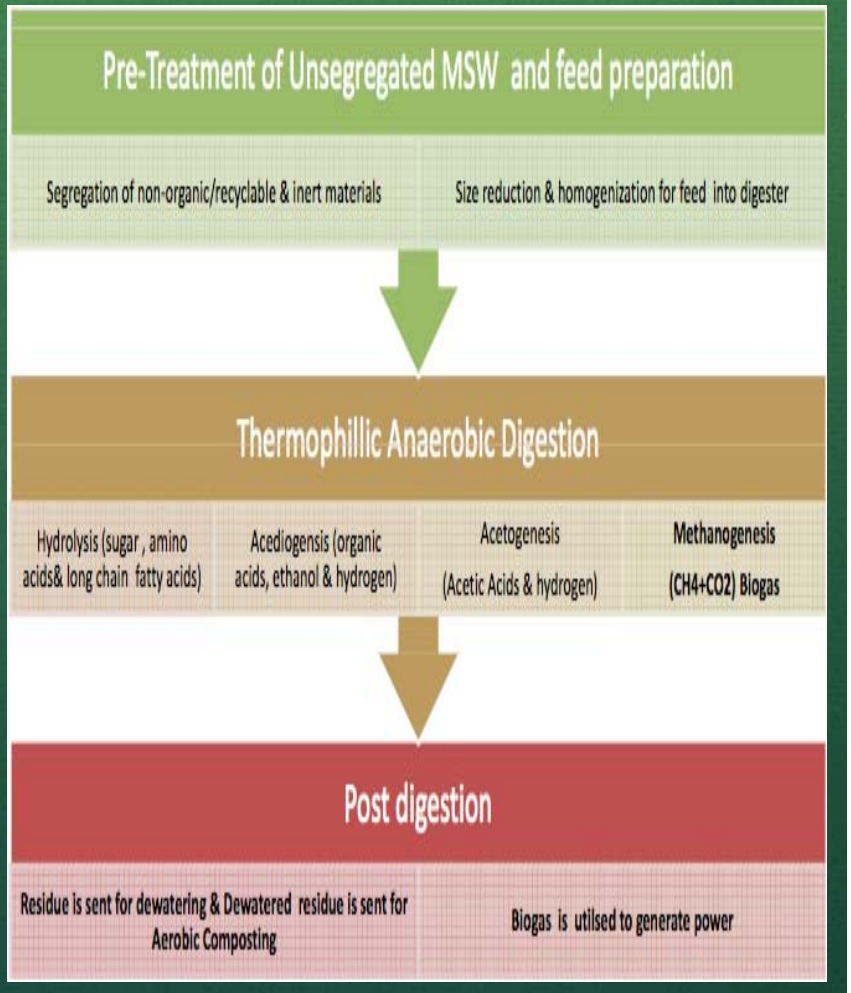
- ORS was **incorporated in 2008** as a strategic initiative between a team of technocrats (sector experts) & group of investors (Intellivate Capital) to promote 'Green field' projects in the field of integrated urban waste management.
- **Vision:** to become technology leader in urban waste management sector over the next five years by giving viable solutions to city administrations for mitigating environmental challenges poised by perpetuating waste disposal issues.
- **Mission** : to provide integrated technological solutions to ULB's for effective processing & disposal of Solid Waste in conformance with MSW handling rules (2004) with a focus on minimizing disposal burden to Landfill sites.

Our Achievement

- Development of Indigenous proprietary Technology DRYAD™ based on Theremophilic Biomethanation process to suit local environmental conditions after pilot validations.
- Successful Implementation of 400 TPD, 4 MW (Grid Connected) Waste to Energy Project based on unsegregated MSW at Sholapur, Maharashtra.

Our Technology

- DRYAD™ operates at 55^0C (temp suitable for operation in Indian cities)
- It has a high loading rate that requires less digester volume and in turn requires less area for operation as compared to landfills.
- Odour less operation as it's a closed process (which results in high public acceptance)
- Bio gas generation is in the range of 117nm3 to 124 nm3/ton of waste (which results in higher electricity generation)
- Captive consumption of electricity is low as compared to thermal technologies.
- Digestion & composting period ranges from 14 to 21 days which is less as compared to conventional processes.
- Quality of compost is better than conventional product as all inerts are being removed during pre-treatment & pathogens are completely absent as the digestion takes place at a high temperatures. The compost from the process qualifies for required FCO norms.

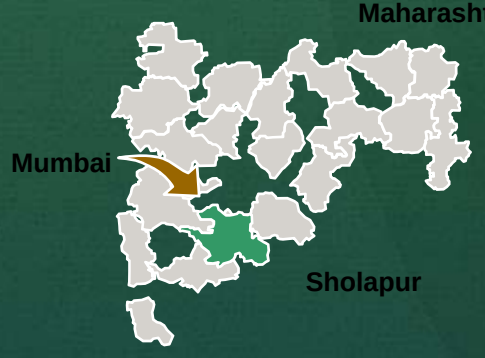


Sholapur Project

Sholapur Project (400 TPD)

- City with population of 1.1 million
- Concession Agreement for 29 years with local authorities
- Financial Closure achieved for INR 600 Million (45% equity,55% debt)
- Power Generation capacity – 4 MW
- Organic Compost – 80 TPD
- PPA signed with MSEDCL for a period of 20 years at a levelised tariff of Rs 4.88 per unit (expected Rs. 6.00 per unit)
- Stream 1 (200 TPD) commissioned in August 2012
- Stream 2 (200 TPD) commissioned in March 2013
- Current Status: Grid Connected (5th July 2013)

Site location



Plant Video

Challenges

Technological

Implementation of technologies without customization in consideration of local environmental parameters

Existing waste collection practices do not focus on source segregation making it difficult for processing of waste

Financial

Lack of confidence among FI's, due to past failure in sector makes it difficult of to raise project finance

Cost of finance is high for such projects as FI's consider the projects to be of high risk.

Statutory

Delays in obtaining clearances and approvals from various administrative stakeholders.

Stakeholder Buy-ins

Delay in PPA with DISCOMs for mutually acceptable tariffs

ROW issues delay the grid connectivity beyond implementation time frame

Mitigating Challenges

Technological

Incremental improvisations in technology by observing data from an operational pilot plant for over a year

Development of proprietary equipment to ensure proper mechanical segregation of heterogeneous waste

Financial

Funded the project at higher equity contribution of 45%

Adopted cost +method for tariff fixation thereby ensure secured returns, negating effect of high cost of funding

Statutory

Kept open & transparent communication with stakeholders for obtaining clearances and approvals , ensured prompt compliance of procedures.

Buy-ins

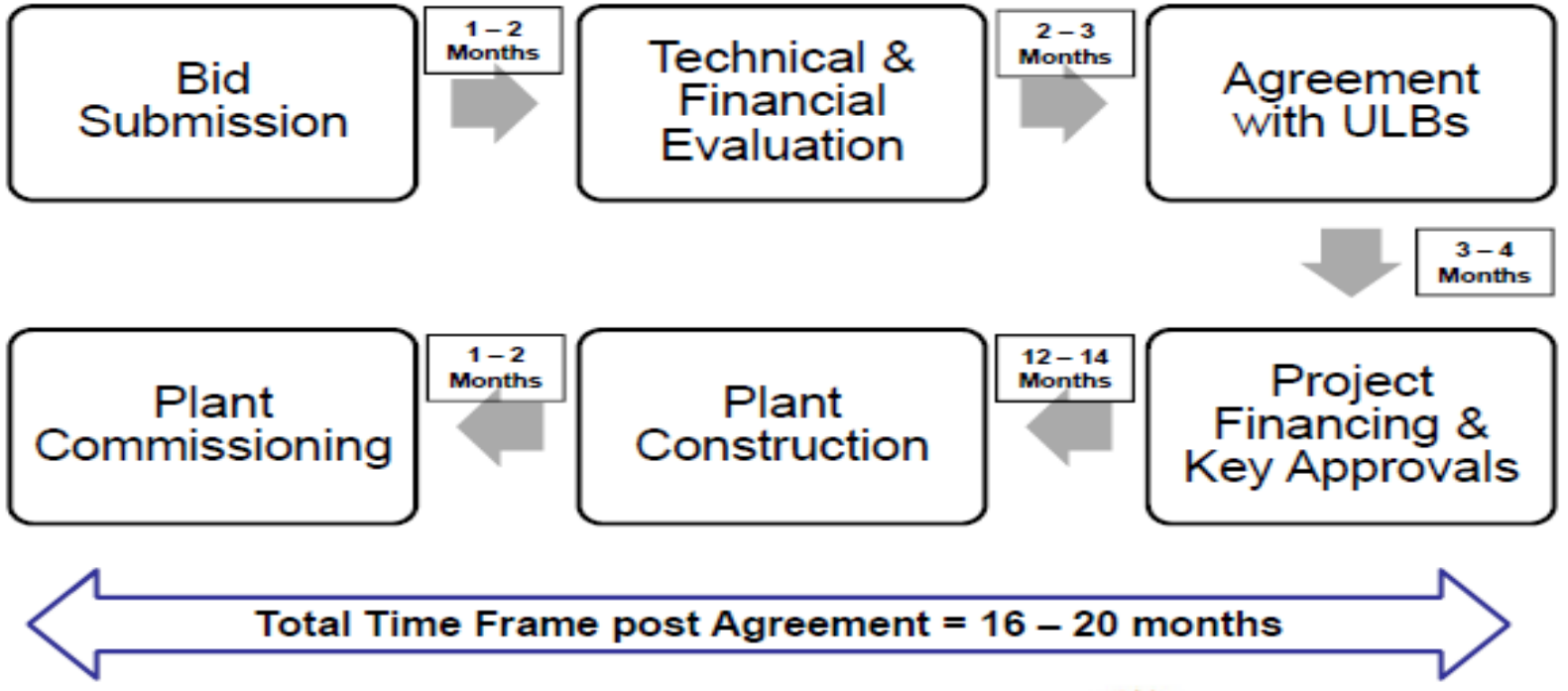
Got levellised Tariff from regulatory agency for sale of electricity for 20 years directing DISCOM to purchase power from the project.

Took responsibility of grid connectivity from DISCOM

Settled all ROW issues amicably

Implementation

Typical Project Implementation Process



Commercial Feasibility

- Levellised Tariff for a period of 20 years on cost +methodology ensuring 21% (avg) return on equity and 14% on debt component
- EBIDTA Margins of 75%
- Break-even in 4.6 years
- Eligible for 100% tax exemptions for 10 years and excise/customs exemption on equipment

Sectorial Perspective

- Approx 90% of MSW in the country is subjected to Landfill / Earth Cover / Compaction for waste disposal resulting into:
  - Ground water, air and soil pollution
  - Agitation from local population
  - Shortfall of land in urban areas

All ULBs are looking for immediate, scientific and sustainable solutions for waste disposal

- Energy requirements of India are expected to grow at 5.6-6.4% per year, which implies a fourfold increase in the next 25 years
- Potential power generated from scientific treatment of waste is expected to be 2700MW, while only 40 MW has been installed
- Power Tariff Policy 2006 requires all power distribution companies to procure minimum 6% of their power from renewable resources, including MSW to Energy Projects

Opportunities in Waste to Energy Projects seems promising (but equally challenging)

Source : India Energy Outlook 2007, KPMG

Indian Ministry of New & Renewable Energy (MNRE) annual report 2008

Sectorial reforms (way forward)

- Encouragement of Tipping fee: Tipping fee for processing of MSW so as to reduce cost of segregation and thereby ensuring reduction in electricity tariff so that DISCOMs are encouraged to buy Power at competitive rates.
- Single window clearance; ULB's to obtain all clearances and approvals for the project so as to reduce delay in implementation.
- Mandatory purchase of organic compost from city waste by Fertilizer companies under CSR obligations.

What Next?

- Secured 1000 TPD waste management project at Bangalore, Karnataka. The Plant once commissioned will process 1000 TPD of unsegregated Mixed MSW to generate 10 MW of Power and 150 TPD of organic Compost at a cost of INR 165 Million. Project to be completed in 36 months time frame (under phase wise implementation).
- Determined to aggregate projects for processing 5,000 TPD – 10,000 TPD (50 MW – 100 MW) of MSW over the next 5 years.
- International collaborations for providing integrated technological solutions to ULB's.
- Global contracts for setting up waste processing facilities based on DRYAD™

Thank You!

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