Waste to Energy Project – Nashik, India
Co-fermentation of Organic Waste and Septage

A Project under the International Climate Initiative (IKI) of Govt. of Germany

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Project Support by GIZ

Implementation Support and backstopping mechanism for project

GIZ – India (Technical & Finance Team)

International consultant (Consulaqua - Hamburg Germany)

National consultant (Paradigm, Bangalore)

Scientific Partner (Birla Inst. Of Sci. & Tech. Goa)
Key Components

Input material
organic waste: 10-15 TPD from restaurants
Septage: 10-20 TPD from community toilets

Volumes
Digester: 1500 m³
biogas-generation: approx. 2200-2600 m³/per day

Combined Heat and Power Unit (CHP)
feed into grid 3300 kWh per day
Excess heat is used for maintaining temp inside digester
Intersectoral approach
## PPP contract at a glance

<table>
<thead>
<tr>
<th>Project name</th>
<th>Description</th>
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<tr>
<td><strong>Technology</strong></td>
<td>Co-fermentation (Biomethanization process)</td>
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<tr>
<td><strong>Capacity</strong></td>
<td>10-15 TPD food waste from restaurants</td>
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<tr>
<td></td>
<td>10 – 20 TPD septage from community toilets</td>
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<td><strong>Capex Cost</strong></td>
<td>INR 8.2 Cr./ca. 1.1 Mio EUR (share by contractor 15 %)</td>
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<td><strong>Implementation method</strong></td>
<td>DFBOOT (Design – Finance - Build – Own – Operate - Transfer)</td>
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<td><strong>Contractor</strong></td>
<td>M/s VWMSPL, Bangalore</td>
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<td><strong>Expected output</strong></td>
<td>3300 KWh of power per day minimum guarantee</td>
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<td><strong>Tipping fees per month</strong></td>
<td>INR 5 Lakh (30 TPD collection, transportation, operation)</td>
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<td><strong>Concession period</strong></td>
<td>10 years</td>
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Steps for Implementation: a time intensive processes

- **Pre-feasibility study**
  Site and Partner selection

- **Feasibility study - Project design**
  Baseline creation through focused studies/assessments;
  Setting the stage through identifying boundary conditions

- **Detailed Project Report (DPR) preparation**
  - Operational model
  - Business model

- **Process negotiation with the partner and political clearances**

- **Tendering process** (3 attempts)

- **Construction – 18 month**

- **Commissioning - 2 month**
Supportive studies and baseline assessment (ring-fencing the conceptual approach)

➢ Study on biogas generation potential of different mixtures of organic waste and septage

➢ Study for characterization and quantification of organic solid waste generated in commercial establishments

➢ Wastewater study from selected Community Toilet Complexes (CTC) in Nashik
Gross gains for city of Nashik

- **Guaranteed electrical energy supply**
  - approx 1,00,000 kWh/month equivalent to approx. Rs. 6 lakhs (Euro 10 thousand) fixed tariff for power generated @ Rs.6 per unit

- **Reduced costs for management of waste**
  - saving costs for collection and transport for at least 500 tons of organic waste and 500 tons of septage per month
  - avoiding costs and improved conditions for processing organic waste for at least 450 tons of MSW

- **Reduced investment costs**
  - Grant is 85% and 15% by contractor
Gross gains for contractor

➢ **Tipping fee:**
  • Rs. 5 lakhs (7 thousand EUR) per month for collection, transportation and treatment of waste (100% O & M covered in tipping fees)

➢ **High quality fuel**
  • Pre segregated food waste as an efficient and energy rich source for biomethanation process, no long term storage or preprocessing required

➢ **Excess electricity:**
  • Contractor is free to collect more waste and to generate more energy (feed in to grid)

➢ **Manure:**
  • Contractor can sell digestate as manure (currently for Compost Rs. 3500/ton subsidy of Rs.1500/ton by central govt.)
Current Status

- Construction and commissioning is Certified by expert consultant
- Streamlining of all plant processes
- Implementation of systems for segregation and collection of waste streams

(5-6 Tons per day) + (8-10 Tons per day) = (1000-1500 kWh)
Project Benefits

- Treatment of two waste streams (solid waste & septage)
- Elaborated business model improves economic feasibility
- Reuse & recover supports the closure of material loops
- Anaerobic digestion ensures scientific treatment of fecal sludge
- Contribution to climate protection goals
- Approach for rapidly growing cities.
Way forward

➢ Research ongoing on developing products from effluent and sludge – PROM, Terra Preta, Compost etc. – **Birla Institute, Goa**;

➢ Reuse sludge from the Biogas reactor in the agriculture (pilot in Dhule district) as soil fertilizer and enhancer – **IWMI develop business model**;

➢ Both research studies are undertaken under the ProSoil project on soil improvement in agriculture, which is contributing to SEWOH global programme.
Reduce costs by

✓ Avoid organic waste going into the landfills
✓ Prevention of uncontrolled CH₄ emissions
✓ Energy production
✓ CO₂ emission reduction
✓ Manure cost
✓ Waste processing costs
✓ Landfill cost
✓ Water Cost
✓ Transportation Cost
✓ Septage treatment costs
✓ Over all Green House Gas reduction
✓ Leachate prevention
✓ ....

Thank You......