FROM WASTE TO ENERGY: BIOGAS IN GHANA
alternative utility model with resource recovery

Integrated Waste Management Sectoral Meeting
Accra, Ghana

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WE EAT

WE DISCHARGE

ORGANIC FERTILIZER

RE-USE

ENERGY

WE RECYCLE
the reality
80% of waste water globally ends up in eco system without treatment or re-use.
...and 20%
high in CAPEX and OPEX
lack of ownership and low maintenance
... or lack of good solutions for non-sewered areas
the need for a different approach
## Biogas Plants

<table>
<thead>
<tr>
<th>Location</th>
<th>Source of Feed</th>
<th>Use of NH3 Gas</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Jubilee House</td>
<td>Toilets + Food waste</td>
<td>Cooking</td>
</tr>
<tr>
<td>2 Ashaiman SHS</td>
<td>Boys’ Dormitory</td>
<td>Cooking</td>
</tr>
<tr>
<td>3 MUDOR</td>
<td>Various</td>
<td>Bottling Biogas for sale</td>
</tr>
<tr>
<td>4 Safi Sana</td>
<td>Market</td>
<td>Electricity</td>
</tr>
<tr>
<td>5 Maritime Hospital</td>
<td>-</td>
<td>Electricity</td>
</tr>
<tr>
<td>6 St. John’s SHS</td>
<td>Girls’ Dormitory</td>
<td>Electricity</td>
</tr>
</tbody>
</table>
Negative impact

• On people’s health
• On the eco system
• On th

Result:

HIGH ECONOMIC COST, DIRECT OR HIDDEN
The (local) government in most cases is aware but:

- Lack of expertise to develop and run the system
- Lack of capacity or interest to operate
- No need for a one-off intervention
- Lack of financial means to maintain the system
- And / or ....
Market opportunities that push innovation

growing demand for nutrients & energy due to urbanisation
the Safi Sana approach
Value chain in a PPP

1. waste collection
   - public toilets
   - organic waste

2. factory
   - factory

3. sale end products
   - organic fertilizer
   - electricity
The process

1. organic waste
2. waste mixing
3. anaerobic digestion → biogas
4. drying beds
5. composting
6. waste water treatment
7. compost packaging and storage
8. irrigation water
9. nursery → vegetable seedlings
10. electricity to the grid
11. power & heat generation
12. electricity to the grid
The Client’s benefits

• A solution for non-sewered areas
• Income generator to lower product life cycle cost (and competitive to doing nothing!)
• Operational responsibility out-sourced
• End-to-end solution to boost local ownership and acceptance
• Positive impact on the Government goals for sanitation and hygiene goals, agriculture and renewable energy
• Being innovative generates big exposure...
Our services

1. Feasibility study (pre-project) – go / no go / how

2. PPP contract:
   - Design, Build and Operations (DBO-T)
   - Setting up supply and sales channel
   - Community engagement and capacity building
   - Remote monitoring and help desk
QUALITY OF WASTE

new sanitation | organic farming | renewable energy
High Initial Cost (breakeven is still over 5 years!)

Effective channels for subsidizing

Turn around for securing permits and licences

Lack of workable examples
Prospects

- Policy for public participation
- Feed in Tariff Regime
- High Demand for End produce
- Availability of feedstock
Lessons Learnt so far

- A huge in-balance between demand and supply
- Obstacles to scaling up
- Very limited funding options for municipalities
- Need for tangible political commitment
- Increased community engagement is key
- Management of people’s expectations.
collection from toilets
collection from markets
supply at Safi Sana factory
supply at Safi Sana factory
processing
processing
fertilizer production
fertilizer sales
fertilizer sales
electricity sales
community engagement / training
remote monitoring and help desk
the way forward
Uptake & Upscaling

Waste-to-Energy is a reality, an economic reality and a reality for SDG 3. Let’s pursue it in Ghana and in Africa because our conditions for biogas generation is better than any other continent. Don’t let our “wasteful resource” kill us.

1. The Public Sector through the relevant government ministries and regulatory agencies integrate into our subnational local governance system and compel every district assembly to at least run Safi Sana or the Mudor models and feed into the national grid or standalone community energy systems.

2. Activate the provisions of the gazette Building Code of Ghana in respect of biogas plants replacing septic tanks effectively to promote and upscale Biogas Technology.

3. The Switch African Green Project which’s main focus is the Development of Green Business came as a blessing to the Private Sector’s Commercialization efforts of the Biogas Technology in Ghana and the Private Sector players/the Biogas Association of Ghana must live to its mandate.

4. Mainstream this into the technical/vocational, TVET and engineering training courses.