ANNUAL MEDIA CONCLAVE ON THE STATE OF INDIA’S ENVIRONMENT
The Dilemma of Waste-To-Energy
An Overview
Legacy of Waste-To-Energy

- First Waste-To-Energy (WTE) plant commissioned in 1987 at Timarpur, Delhi.
- Designed to incinerate 300 tonnes of waste per day (TPD) and generate 3.75 MW of electricity. It failed and shutdown in 1990.
- Capital cost of Rs. 20 crores and operational cost of Rs. 1.25 crores.

Source: CSE, 2019
2016 onwards: Policy push for WTE

• NITI Aayog recommended WTE plants of 511 MW capacity in “Three Year Action Agenda”
• Suggested formation of the Waste to Energy Corporation of India to promote incineration plants in PPP mode
• In September 2017, National Thermal Power Corporation (NTPC) invited investors to set up 100 WTE plants

Today: March 2019

Source: CSE, 2019
WTE plants in the country

Source: CSE, 2019
What to **Burn**

- As per Solid Waste Management Rules, 2016; **Only segregated non-recyclable high calorific waste** be sent to WTE plants
- Of the 55 Million tonnes of MSW generated every year in India, only about 15 per cent can be classified as non-biodegradable, non-recyclable, high-calorific-value waste.

**Fuel available VS WTE Capacity**

<table>
<thead>
<tr>
<th>Waste available for incineration</th>
<th>Capacity of 48 WTE (existing, tendered and proposed)</th>
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</thead>
<tbody>
<tr>
<td>0</td>
<td>[VALUE]</td>
</tr>
<tr>
<td>5000</td>
<td></td>
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<tr>
<td>10000</td>
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<td>15000</td>
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Quantity of waste in tonnes per day

Source: CSE, 2019
What Delhi Burns

- Delhi generates 11,600 TPD of solid waste
  i. 10% recovered by Informal sector
  ii. 25% is inert material
  iii. 65 % can be treated (biological-60% and thermal-40%)

- Waste that can be treated thermally is 13% (1500 TPD) of 11,600

Source: CSE, 2019
Burn wrong stuff means?

- 1. **Pollution goes up** – as the plant now emits toxins and is not designed to clean up. This means people who live near plants are exposed and protests increase.
- 2. **Toxic waste goes up** – bottom ash in plants using mixed waste is high and disposal becomes a problem.
- 3. **Efficiency of the plant goes down** – fuel quality determines the energy output – online portal of government shows 50% efficiency of plants. This means viability goes down and plants shut down.
Choice of Technology requires:

- Composition and calorific value (CV) of cities is studied by CSE with population as measure
  - Cities with population over 1 million
  - Cities with population 0.1-1 million
  - Cities with population below 0.1 million

<table>
<thead>
<tr>
<th>Composition</th>
<th>Calorific Value</th>
<th>Affordability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bio-degradable fraction ranging from 40-70%</td>
<td>CV ranged from 1411-2150 Kcal per kilo</td>
<td>Cost per kWh</td>
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<td></td>
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<td>Coal and solar: Rs. 3-4</td>
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<td>WTE: Rs. 7</td>
</tr>
</tbody>
</table>
The Challenges

- Low segregation percentage
- Low calorific value
- High moisture content
- Environmental, Social and Health costs