UCO Collection Potential in China

Technical Committee “Waste, Residues and Advanced Low Carbon Fuels”

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About ECO

- Focus on Waste and Low-value Feedstock Upgrading
- Clean Application in Fuels, Chemicals & Materials
- Wholly owned subsidiary of the Hong Kong and China Gas Group

Based in Hong Kong

Business Focus in Greater China

In-house Research & Development
A Supplier of Advanced Biofuels
Our Green Strategy

To convert low value feedstocks into high value products

Low Value Feedstocks

Technological Innovations

High Value Products
About ECO HVO Plant

- Located in Zhangjiagang, China
- Commission since 2017 Q4
- 100% waste based-HVO
- Design capacity ~ 100,000 t/a
History: Illegal Recyclers of UCO in PRC

- Waste Cooking Oil collected in catering sectors
- Back to human food chain restaurants in PRC after pretreatment
History: Illegal Recyclers of UCO in Taiwan

• Taiwan “Gutter Oil” Scandal in 2014 affecting more than 1200 businesses and 250 types of food
Now: China UCO Distribution

- ~60 collecting points certified under ISCC
- A few collection points certified under National Italian Scheme (NIS)
## Typical UCO Quality in China

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Free Fatty Acid</td>
<td>1-6% (%(M/M))</td>
</tr>
<tr>
<td>Water, Impurities &amp; Unsaponifiable matters</td>
<td>0.1-2% (%(M/M))</td>
</tr>
<tr>
<td>Iodine Value</td>
<td>≥80 g/100g</td>
</tr>
<tr>
<td>Sulphur Content</td>
<td>50-200 mg/kg</td>
</tr>
<tr>
<td>Chlorine Content</td>
<td>50-150 ppm</td>
</tr>
</tbody>
</table>
Estimate of UCO Qty in PRC *(Rule of Thumb)*

<table>
<thead>
<tr>
<th>Population</th>
<th>Share of Urban Population</th>
<th>Annual Per Capita Consumption of Edible Oil</th>
<th>Share of Edible Oil Actually Converted into UCO</th>
<th>Volume of Urban UCO Generated</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.4 Billion</td>
<td>56%</td>
<td>22.19 KG</td>
<td>20% - 30%</td>
<td>3.4 to 5.1 MMT</td>
</tr>
</tbody>
</table>
Renewable Policy: Shanghai Biofuel Test Point

200 biofuel-supplying petrol stations
30,000 tonnes of B5 biodiesel made from UCO
0.3 RMB/L (4 US cents) cheaper than regular diesel
QR code for traceability
UCO MUST be used locally, special approval required for export out the city
Development of UCO Collection Point in China

- Systematic collection of UCO in Shangdong, Suzhou, Taizhou, Zhangjiagang
- Ensure the traceability of UCO supply
Policy: Dedicated Treatment Facility for Cities

Licensing for Restaurant, Kitchen and Agricultural waste collection and processing

Towngas China: SuZhou Treatment,
- Design capacity: 100,000 MT/a
- GPS: Route tracking and navigation
- RFID: Auto recording collecting information
Thank You

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