Transport & Renewable Energy Policies in India

07.03.2018

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India at a Glance

17.8% of the world’s population
Improving urbanization rate

3rd largest economy in the world by GDP.
Expected to grow at a CAGR 7.5-8.4% through 2040

3rd highest in energy consumption

Average energy consumption growth has been 5.3% p.a.; Projected to increase further at a CAGR of 4.9% by 2022

Present energy consumption/capita is 606 KGOE:
• 1/12th of North America’s per capita energy consumption
• 1/5th of European Union consumption
• 1/3rd of global average
Key Energy drivers

Main Drivers
- Population
- Transport Mix
- Socio-Economic Factors
- Value Addition by Sectors
- GDP, Price & Income
- Energy Intensity & Emissions
- Urbanization
- Electricity Capacity

Socio-Economic Factors
Value Addition by Sectors
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Main Drivers
Population
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Socio-Economic Factors
Largely dependent on traditional fossil fuels and inching towards a gas economy

Rising import dependency is an area of concern
Alternate Fuels: Biofuels

Increased Demand for Biofuels

- Renewable, Environmentally cleaner fuel
- Boost Agriculture Sector
- Multiple feedstock like Agro-waste
- Reduces fossil fuel dependence & import bill
Biofuels: 3-pronged approach

• Bio-diesel Blending Programme

• 1st Generation Ethanol (thru Molasses route)

• Advanced Biofuels (Drop-in fuels, Bio-CNG, Biomethanol etc.)
## 1. Biodiesel: Demand vs Installed Capacity

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Quantity (In Million Litres)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diesel consumption, Year 2016-2017</td>
<td>91970</td>
</tr>
<tr>
<td>Biodiesel requirement @ 5% blending</td>
<td>4600</td>
</tr>
<tr>
<td>Installed Capacity</td>
<td>1570</td>
</tr>
<tr>
<td>Requirement for additional Biodiesel generating capacity</td>
<td>3030</td>
</tr>
</tbody>
</table>
Policy & Progress in respect of Biodiesel

- Aug, 2015 – Direct procurement of Bio-diesel allowed for bulk consumers
- Aug, 2015 - Retailing of HSD blended with Biodiesel (B5) started.
- June, 2017 – Retailing of B100 allowed for the limited purpose of blending with HSD.
- Biodiesel procurement qty by OMCs increased from 11 Million litres (2015-16) to 43.5 Million litres in 2017-18 (till Jan,18).
Used Cooking Oil (UCO): A potential source of Biodiesel

- Presents ample opportunity for Biodiesel production.
- Use of UCO in food chain is a health hazard.
- More than 23 MMTs of edible Oil being consumed annually in India.
- UCO generated from Eateries/ Restaurants could be diverted for Biodiesel production.
2. **Ethanol Blended Petrol (EBP) Programme: Procurement Growth Chart**

![Ethanol Supplied under EBP (million lit) chart]

- **Ethanol Supplied under EBP (million lit)**

<table>
<thead>
<tr>
<th>Year</th>
<th>Ethanol Supplied (million lit)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012-13</td>
<td>154</td>
</tr>
<tr>
<td>2013-14</td>
<td>380</td>
</tr>
<tr>
<td>2014-15</td>
<td>674</td>
</tr>
<tr>
<td>2015-16</td>
<td>1110</td>
</tr>
<tr>
<td>2016-17</td>
<td>665</td>
</tr>
<tr>
<td>2017-18</td>
<td>1250</td>
</tr>
</tbody>
</table>

*Contracted Qty. for ESY 2017-18 - 125 million liters*
EBP: Initiatives by Govt./ MoP&NG

✓ Government offering enhanced price to Ethanol Suppliers
✓ Opened alternate route for ethanol production “Lignocelluloses” (2nd Generation ethanol) in Dec’2014
✓ Procurement Process by OMCs made simpler
✓ Notification for mass emission standards issued by MoRTH in July, 2016 for flexi fuel vehicles running on E85, E100 or ED95 to enable manufacturers to develop flex fuel vehicles.
## Ethanol Demand Supply Status - India

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Present Qty (Million Lit)</th>
<th>Qty by 2022 (Million Lit)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Projected MS Consumption (17-18)</td>
<td>34000</td>
<td>44040</td>
</tr>
<tr>
<td>Ethanol (10% blending)</td>
<td>3400</td>
<td>4404</td>
</tr>
<tr>
<td>Ethanol available - Molasses Route</td>
<td>1400</td>
<td>1800</td>
</tr>
<tr>
<td>Ethanol Deficit</td>
<td>2000</td>
<td>2604</td>
</tr>
</tbody>
</table>

Source: PPAC- 2015-16
Availability of Ethanol for EBP

• Total ethanol from molasses: 3000 million litres
• Potable: 1000-1200 million litres
• Chemical: 600-800 million litres
• Available for EBP: 1000-1200 million litres
3. Advanced Biofuels: 2G Ethanol

- Surplus Biomass availability @120-160 MMT per annum.
- Enough to produce 25,000-30,000 Million litres of ethanol per annum.
- Government opened alternate route for ethanol production “Lignocelluloses” (2\textsuperscript{nd} Generation ethanol) in Dec’14.
- Oil Marketing Companies (OMCs) to establish projects of reasonable scale for producing ethanol from multi-feedstock lignocelluloses.
2G Ethanol: Policy & progress

• Govt. allowed procurement of Ethanol produced lignocellulosic route, for the purpose of Ethanol blending in Petrol

• Public sector Oil Companies to set up 12 plants across 11 States of the Country.

• Pre-commercial plants with capacity of 400- 450 tons/day at estimated cost of USD 125 – 150 Millions each.

• MoUs entered between OMCs & Technology Providers/State Govt. for 5 Biorefineries during Petrotech-2016.

• Technologies finalized for first few plants.
2G Ethanol: Policy support & other Opportunities

- Off-take assurance to 2G Ethanol suppliers for 15 Years already provided by OMCs.

- VGF Scheme under consideration:
  - Create 2G Ethanol capacity of 1000 million ltrs/annum
  - Support 10 demonstration plants based on novel 2G Technologies
  - Bring down cost of production of 2G Ethanol & spurt establishment of more Commercial scale Biorefineries

- Pockets of Surplus Biomass availability

- Willingness to adopt foreign Technologies demonstrated on commercial/pre-commercial/demonstration scale.
Other Advanced Fuels opportunities: Methanol, Drop-in fuels, Bio-CNG etc.

- Exploring possibility of blending methanol in Gasoline and enhancing methanol production capacity.
- Technology developed by Industries for converting Biomass, MSW etc. in Drop-in fuels meeting fuel standards.
- Bio CNG from agriculture residues is presently been undertaken on R&D basis for subsequent deployment at commercial scale.
- Notification issued by MoRTH for testing & exhaust emissions of vehicles running on Bio-CNG. This allows manufacturers to manufacture & sell vehicles fueled by Bio-CNG.
- MoU signed by IOCL on 15.1.18 for setting up 400 Bio-CNG plants in Punjab in next 5 years.
Efforts made to increase Biofuel contribution in Transport sector

• MoP&NG coming up with National Policy on Biofuels 2018 which will:

✓ Widen the feedstock base for generation of Biofuels.

✓ Delve into import/export restriction of Biofuels.

✓ Focus on Advanced Biofuels such as 2G Ethanol, Bio-CNG, Drop-in fuels etc. with increased R&D and incentives at par with Conventional Biofuels (Ethanol, Biodiesel)
Way forward for India

- Incentives on Biofuel blending in fossil fuels.
- Financial support to first few Advanced Biofuel plants for bringing in Commercial viability
- R&D support to institutions
- Incentives to feedstock growers.
- Stringent penalties on flouting laws relating to biofuel blending & feedstock generation programmes.
The Goal:
To achieve 10% bio-ethanol blending in petrol and 5% bio-diesel blending in diesel by 2022.
THANK YOU