



FARM2FUEL

BUILDING INDIA'S BIOFUEL VALUE CHAINS

Presentation by Shuva Raha

Head – New Initiatives, Energy & Infrastructure, CII

3rd EU-India Advance Biofuel Conference

3 MARCH 2020 | NEW DELHI, INDIA

The time for biofuels is here.

- Biomass use ranges from household cooking to aviation fuels to megawatt-level power generation.
- India targets **20% ethanol blending** and **5% biodiesel blending** in fossil fuels by 2030.
- The **National Biofuels Policy 2018** establishes biofuels as a core emerging sector.
- The major thrust of this policy is availability of biofuels from **indigenous feedstock**.
- India's biofuel sector will require **estimated capex of Rs 100,000 cr** in next 4-5 years.
- Even with favourable policy, developing a new industry can still take substantial time.
- Downstream operations of biofuels have received due attention. **Now the upstream needs rapid development.**

Biofuels are more than blending statistics. They are a pillar of our economy.

- **Energy security** lower import dependency, capex savings
- **Energy access + justice** transport, cooking, heating, power
- **Agrarian reforms** increased farmer income, crop options and security
- **Industrial growth** bio-based rural, semi-urban, urban value chains
- **Waste management** agri, forestry, municipal, biomedical
- **Lower emissions** cleaner fuels, judicious processing of waste
- **People power** abundant and varied skilling and employment

SUSTAINABLE DEVELOPMENT GOALS



Confederation of Indian Industry
125 Years: 1895-2020

India is signatory to all 17 United Nations SDGs. **Biofuels sector impacts many SDGs**, illustrating its primacy in coming years.



FARM2FUEL

In India, the major use of biofuels is in the transport sector. But it also has the potential to be crucial in decentralised power and heating systems.

TRANSPORT FUELS

- Bulk and retail consumers
- Emission regulations for passenger vehicles, freight, aviation, marine ops warrant cleaner fuel blends
- Requires long-term policy, planning and investment to build robust supply network

POWER GENERATION

- Local / decentralised generation in rural / remote / hilly areas
- Hybrid power with solar and/or wind installations

HEATING

- Domestic cooking, heating
- Industrial boilers

CIRCULAR ECONOMIES

Biofuels from agri- or forestry residue / MSW can fuel transport, power and heating in well-planned rural / urban communities to enhance sustainable use of resources and provide affordable, consistent supply of energy.

Unlike most other fuels and resources, **biofuel sources are not homogenous in type, availability, extraction or processing methods.** Sources include:

AGRI-WASTE

Can be harvested in small / seasonal quantities (wheat straw, paddy stalks) or large volumes (sugar by-products)

FORESTRY RESIDUES

- Ranges from pine needles in Himalayan region to coconut waste in coastal areas
- Good source for local power

ENERGY CROPS

- Non-food crops grown on marginal lands without creating pressure on the food market
- Useful in crop rotation, other by-products such as cattle-feed

LIVESTOCK MANURE

- Methane can be converted into CBG for vehicles or combusted on-site for electricity

MUNICIPAL SOLID WASTE

- Biofuel producers can use existing collection networks

USED COOKING OIL

- Supply chain trials are on for food processing industry, all food business operators

The biofuels sector has a diverse set of players.

POLICYMAKERS

- Governments: national, state, international
- Nodal agencies
- Regulatory authorities
- Special Purpose Vehicles
- Judiciary, green tribunals

PRODUCERS

- Natural sources
- Farms and dairies
- Municipalities: households, hotels, hospitals, commercial units
- Industry: by-products, run-offs, custom products

ENABLERS

- Collection, handling agents
- Storage depots, resellers
- Transporters
- Financiers
- Technology providers

INFLUENCERS

- Academia & civil society
- Media

BLENDERS & MARKETERS

- Oil Marketing Companies
- Retailers

CONSUMERS

- Retail: cars, households
- Bulk: freight, rail, aviation, marine, industrial heating

The number of Union Ministries highlights the numerous verticals that must collaborate in a unified, coordinated manner to drive India's biofuel sector.

- Ministry of Petroleum & Natural Gas
- Ministry of New & Renewable Energy
- Ministry of Rural Development
- Ministry of Agriculture & FW: Department of Agriculture & Cooperation
- Ministry of Environment, Forest and Climate Change
- Ministry of Science and Technology: Department of Biotechnology
- Ministry of Consumer Affairs, Food & Public Distribution: Department of Food & Public Distribution
- Ministry of Heavy Industries and Public Enterprises
- Ministry of Housing & Urban Poverty Alleviation
- Ministry of Road Transport and Highway
- Ministry of Railways
- Ministry of Civil Aviation
- Ministry of Shipping

Each source stream of biofuels has its unique challenges.

- **Feedstock generation**: varying cyclicity, types, location, availability, volumes; high risk
- **Collection, segregation, transportation, storage, processing, conversion, supply**
- **Forecasting**: by nature, biomass is unpredictable; fuel supply needs high predictability
- **Resource allocation**: land, people, plants & machinery; slow pace of deployment
- **Technology development and integration**: rapidly evolving, complex, expensive
- **Financing**: high-risk investments, unstructured and new markets, diverse clients
- **Standardisation**: outputs from highly varied sources must meet final set specifics
- **Pricing**: competing with conventional fuels, price-sensitive market
- **Value chain management**: confluence of unorganized sectors and high-value industry
- **Stakeholder coordination**: governments, farmers, support sectors, financiers, industry, consumers, civil society

Major intervention areas include:

- **Upstream** feedstock generation and management chains should be organised into industries to establish professional practices and structured financing
- **Downstream** proper forecasting, pricing, retailing (storing, distribution, marketing) and consumer communication
- **Quality** development of test protocols; introduction of standards and certification for different biofuels and end-use applications
- **R&D** feedstock production, conversion and end-use technologies, uses of biofuel by-products
- **International** scientific and technical research, field studies, demo projects, pilot plants
- Inclusion of private sector at all levels of the value chain

CII has **multiple points of engagement** with the biofuels sector.

- CII national and state teams, Centres of Excellence
- **CII Task Force on Bio-Energy**: engages stakeholders on the national biofuel mission
- **CII Task Force on Sugar and Ethanol**: focus on scaling up 1G ethanol
- **CII Mission India@75**: nationwide, mission-mode
- **CII Foundation**: ‘Clean Air, Better Lives’ is addressing stubble burning in 100+ villages across Punjab and Haryana, covering 100,000+ acres of farmland and 15,000 farmers
 - Punjab: Ludhiana, Barnala, Patiala districts; Haryana: Rohtak, Sirsa, Fatehabad districts
 - An ecosystem of experts, corporates, state governments, village communities, farmer groups
 - Provide farm machinery, organise technical trainings and massive awareness drives
 - Air quality monitors installed to monitor village level air pollution data
 - **Needs to be integrated with the biofuels supply chain**