

# Concept Note on Development of Certification Standards for Biofuels and Biomass



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Increased awareness and efforts are being made globally towards the sustainable extraction and utilization of the resources to minimize the harm and maximize the conservation. International and National Commitments focus towards the enhancing and introducing renewable sources of energy within the national frameworks. Biofuel as a source of the energy is now gaining attention globally with policies, targets and standards are being constituted for the successful implementation of the objective.

The major types of biofuels are Ethanol, Bioethanol Biodiesel (derived from vegetable oils and liquid animal fats), Green diesel (derived from algae etc.) and Biojet fuel etc. Though burning biomass releases carbon emissions, but it has been classed as a renewable energy source in the EU and UN legal frameworks as plant stocks can be replaced with new growth. Many first world countries have created targets for the biofuels usage.

**Biomass' resources are the biodegradable fraction of products, wastes and residues from agriculture, forestry and related industries as well as the biodegradable fraction of industrial and municipal wastes**

**Biofuels' are liquid or gaseous fuels produced from biomass resources and used in place of, or in addition to, diesel, petrol or other fossil fuels for transport, stationary, portable and other applications**



Conversion of biomass into Combustible fuel creates **biofuels**. The sources of biomass are waste from farming, horticulture, food processing, animal farming, human waste from sewage plants, etc. This biomass can either be used directly via combustion to produce heat, or indirectly after converting it to various forms of biofuel which can be achieved by different methods: thermal, chemical or biochemical. Apart from the waste and other sources, industrial biomass can be grown from numerous types of plants and tree species.

## Benefits of Biofuels as an Energy Source

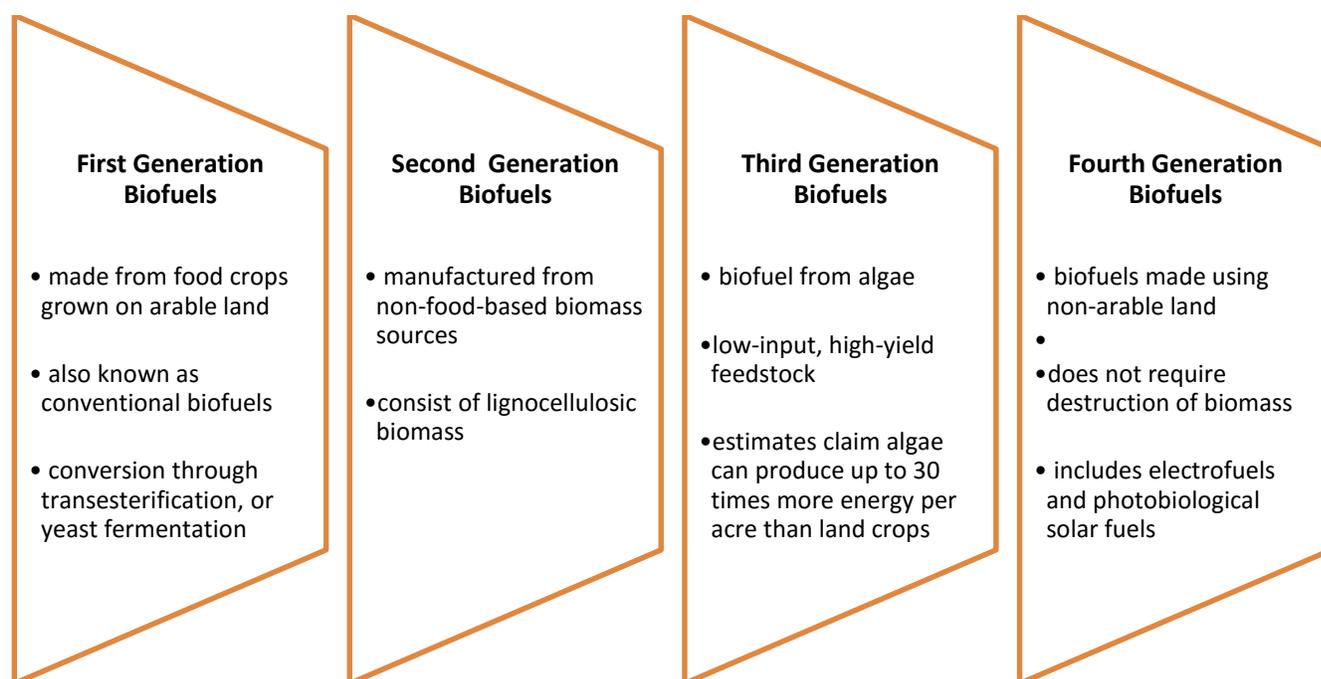
- ✧ Contribute to the NDC target of net emission reduction of the country
- ✧ Clean Environment, Pollution abatement and Emission Reduction
- ✧ Net CO<sub>2</sub> emission by burning biofuel is negligible (CO<sub>2</sub> emitted on combustion is equal to that absorbed from the atmosphere by photosynthesis during the growth of the feedstock)
- ✧ Biofuel projects can qualify as CDM projects and thus be part of emission trading
- ✧ Employment generation; boosts farmers income
- ✧ Reduce dependence on Oil Import
- ✧ Utilisation of multiple sources for production of biofuels: farm wastes, damaged food grains unfit for human consumption, municipal solid waste, used cooking oils, non-food crops, , algae, etc.
- ✧ Linkage with already existing Government initiatives such as Make in India, Skill Development, Doubling Farmers Income and other similar initiatives.
- ✧ promote use of renewable, alternative and clean fuel
- ✧ Improve National Energy Security
- ✧ Meet increasing energy needs

Liquid biofuels are of particular interest as infrastructure is already in place to use them. The liquid biofuel in greatest production is **ethanol** which is made by fermenting starch or sugar. The second most common liquid biofuel is **biodiesel**, which is made primarily from oil producing plants such as soybean or palm oil by trans esterification. Biodiesel has found greatest acceptance in Europe and is used in diesel engines, usually blended with petroleum diesel in various percentages. R&D work is going on for the use of algae and cyanobacteria as a source of biodiesel which is not economically competitive at present. Biofuel industry is already certified in Europe and is gaining ground in India.

Biofuels have immense potential to increase farmers' incomes and strengthen rural economies. The ability to grow energy crops in addition to food and fiber crops could transform agriculture in India. As a refined product, biofuels can add value to raw agricultural goods and even utilizing crop residues. Ethanol industry has become an engine of economic development and job creation. However if not implemented with care, the actions that increase biofuel production can put upward pressure on food prices, increase greenhouse gas (GHG) emissions, and exacerbate degradation of land, forest, and water sources. A strong global biofuels industry will not emerge unless these environmental and social concerns are addressed. To meet the need for managing the potential risks and benefits of biofuel development should specify not only clear standards governing biofuel content and production processes, but also certification processes for verifying whether particular biofuels meet those standards, and specific metrics or indicators on which to base the certification. To achieve the same, it is intended to constitute a SDG for development of suitable certification standards for biofuels and biomass. The SDG will be serviced by an in-house working group called Technical Working Group (TWG).The management practices will, inter alia, respect social, economic, environmental considerations as also relevant national and international legal obligations.

## Biofuel Generations

Based on the source of biomass, biofuels are classified into four major categories:



### Comparative between biofuels and their fossil fuel equivalents

Biofuel	Fossil Fuel	Differences
Ethanol	Gasoline/ Ethane	<ul style="list-style-type: none"> <li>• Ethanol has about 50% the energy per mass of gasoline</li> <li>• Ethanol burns cleaner than gasoline, producing less carbon monoxide</li> <li>• Ethanol can be used as a fuel for vehicles in its pure form (E100)</li> <li>• Ethanol is used as a gasoline additive to increase octane and improve vehicle emissions</li> <li>• Engines must be modified to run on ethanol</li> </ul>
Biodiesel	Diesel	<ul style="list-style-type: none"> <li>• Biodiesel has energy equivalent to regular diesel</li> <li>• Biodiesel burns cleaner than diesel, producing less particulate and fewer sulfur compounds</li> <li>• Biodiesel can be used as a fuel for vehicles in its pure form (B100)</li> <li>• Biodiesel is more corrosive to engine parts than standard diesel</li> <li>• Engines have to be designed to take biodiesel</li> </ul>
Methanol	Methane	<ul style="list-style-type: none"> <li>• Methanol has about 33-50% as much energy as methane</li> <li>• Methanol is a liquid and easy to transport</li> <li>• Methane is a gas that must be compressed for transportation</li> </ul>
Biobutanol	Gasoline/ Butane	<ul style="list-style-type: none"> <li>• Biobutanol has energy equivalent to that of gasoline</li> <li>• Biobutanol can run in any car that uses gasoline without the need for modification to engine components</li> </ul>

(Source: <http://biofuel.org.uk/>)

Cost, Availability and Food Supply are the three major factors deciding the balance between biofuel and fossil fuel uses around the world. Biomass and Biofuels have multiple applications across different sectors. The prominent ones are: Transportation, Power generation, Heating, Rural economy

### International Scenario of Biofuels

European Parliament's 2009 **Renewable Energy Directive (RED): 2009/28/EC** and the **Fuel Quality Directive (FQD): 2009/30/EC**, mention biofuels as the most effective way to achieve a low-carbon transport sector. As per their directives, by 2020, 20% of the energy used in the EU and 10% of the energy used by each member state in the transport sector must come from renewable sources.

EU RED introduced mandatory and non-mandatory sustainability requirements for biofuels. Mandatory requirements are conditions that biofuels have to fulfil in order to be eligible for financial support or to count them towards national targets. These criteria apply regardless of the origin of the biofuels and bio liquids.

As of June 2013, the European Commission (EC) had recognized 13 certification schemes for biofuels. The EC was a pioneer in the implementation of co-regulation (such as the voluntary certification schemes provided for by the EU RED) in the field of biofuel sustainability. This is the first time the EC has used certification schemes as a co-regulation element.

## Biofuel Policy Scenario in India

To promote biofuels in India, the **National Policy on Biofuels** was first made by Ministry of New and Renewable Energy in 2009. The current Ethanol Blending Programme is at a target of 5% blending. The future targets are to achieve 10% blending by 2022 and which could be further increased to 20% blending by 2030. The Indian approach to biofuels, in particular, is somewhat different to the current international approaches which could lead to conflict with food security. It is based solely on non-food feedstock to be raised on degraded or wastelands that are not suited to agriculture, thus avoiding a possible conflict of fuel vs. food security.

The new approved **National Policy on Biofuels in May 2018** intends to align this growing sector in India. The salient expected benefits, as mentioned in the policy, are as follows:

- Reduced Import Dependency
- Cleaner Environment
- Health Benefits
- MSW Management
- Infrastructural Investment in Rural Areas
- Employment Generation
- Additional Income to Farmers

The National Policy on Biofuels 2018, under Clause 6.1 mentions “*standards and certification for different biofuels and end use applications.*” Thus biofuel sustainability standards could serve as the tool to better implement the policy and keep a check on the resource sustainability.

## Biofuel Developments in India

Rajasthan is the first state to adopt national policy on biofuels. According to this policy the state government will put emphasis on increasing production of oilseeds, promoting research in the field of alternative fuels and resources. It is one of the fastest developing states in terms of biofuel and have privileged to become first state to develop Biofuel Policy in the year 2006. Chhattisgarh, Karnataka, Maharashtra, Uttar Pradesh are the other states that are extensively working on promoting and developing programs and schemes on biofuels.

In 2014, Bharat Petroleum Corporation Ltd’s Assam-based facility Numaligarh Refinery Limited (NRL) has signed an agreement with Chempolis Ltd, a Finland-based bio refinery unit. NRL is implementing India's first bio-refinery project to produce bio-ethanol with co-production of furfural and acetic acid from locally available non-food biomass feedstock with technology from Finland. Bamboo is the major non-food biomass feedstock. NRL has already signed MoUs with Nagaland Bamboo Development Agency (NBDA) and Arunachal Pradesh Bamboo Resources Development Agency (APBRDA) for sourcing of bamboo for the bio-refinery which is expected to be operational by 2019.

More recently in August 2018, paving the way for the usage of alternative fuels in the aviation sector, country’s first ever biojet fuel-powered flight was successfully tested between Dehradun and Delhi. The Indian Air Force (IAF) is also testing and experimenting with biojet fuel on its fleet.

Directorate General of Civil Aviation (DGCA) has issued draft guidelines for airplane operators engaged in international operations to capture their fuel consumptions and carbon emissions data annually, starting from 01 January 2019. Further, beginning 2021, the operators will have to meet offsetting requirements by purchasing and cancelling “emission units”. After the adoption of Carbon Offsetting & Reduction Scheme for International Aviation (CORSIA) by International Civil Aviation Organization (ICAO).CORSIA aims to address any

annual increase in total CO<sub>2</sub> emissions from international civil aviation above the baseline value based on the average of 2019 and 2020 levels in order to avoid the impact of any unusual fluctuations in air traffic in 2020 levels.

## **Biofuels Sustainability Certification Need in India**

Climate change has fuelled the growing interest in renewable energy sources, clean technology, clean energy, including biofuels. Increasing fossil fuel prices, energy security concerns and environmental consciousness, have motivated countries to explore alternative and clean energy sources. Globally, biofuels have caught the attention in last decade and advocated as cost effective and environment friendly energy alternative and further a replacement to fossil fuels.

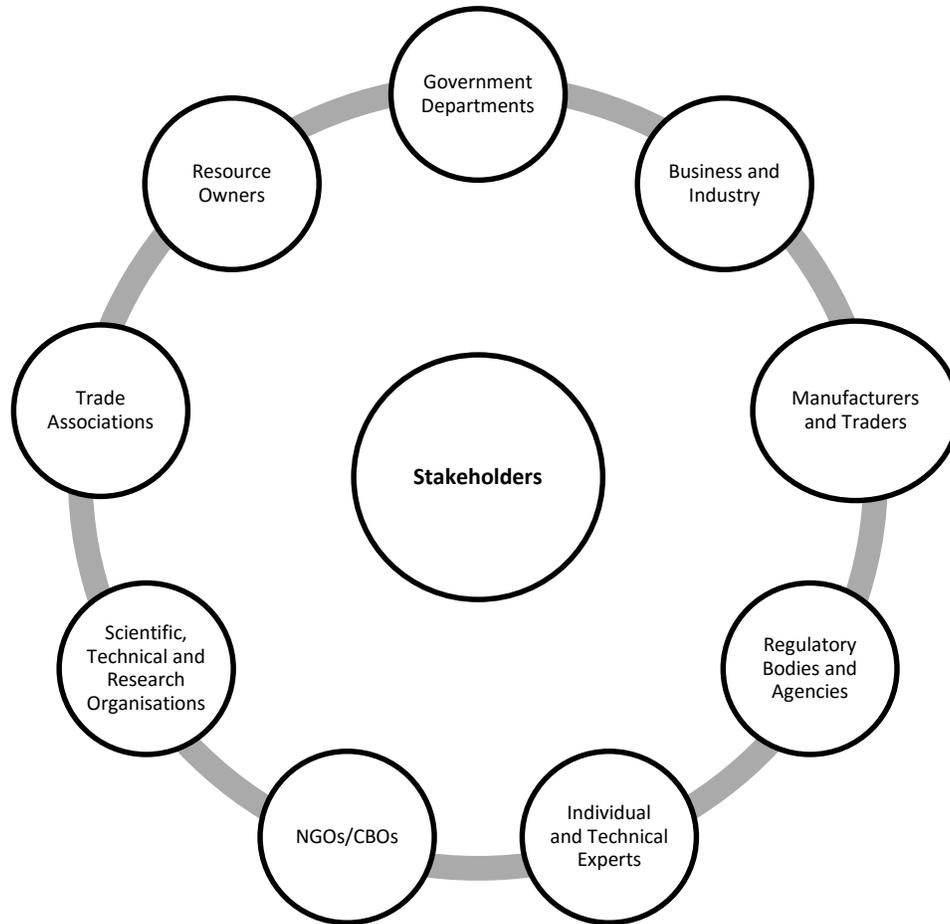
When produced and used appropriately, biofuels can deliver lower net GHG emissions than gasoline. Once commercialized, 2G biofuels made from crops like switchgrass or from cellulosic waste and may result in further reductions of GHG emissions. Fuel purchasers, manufactures may not have the resources, or expertise to analyse sustainability through each stage of the product life cycle. Biofuel sustainability certification systems have emerged to serve this purpose.

Keeping in view, the recent thrust of the government to significantly promote production of renewables including biofuels and biomass energy in both public and private sectors, it will be worthwhile and right time to devise checks and balances to ensure that production of such renewables is sustainable. The time-tested instrument to ensure sustainability in any sector is a 'Sustainability Certification Standard'. Such a standard when developed for production of biofuel and biomass energy, will prevent unsustainable production of these renewables. A certification system will provide third-party verification and ensure that feedstock are grown and converted in a sustainable manner and thus help in creating sustainable market linkages in this sector. Keeping the aforesaid in view, NCCF has embarked on an initiative to develop Certification Standard for Biofuel and Biomass (BioFM) facilitating sustainable growth of this sector and also for ensuring that vital biological resources of the country are not unsustainably exploited. This will further help the government, policy makers and other stakeholders to develop incentive based mechanisms and dovetail with the existing schemes, policies and plans along with further strengthening the needs and requirements of the sector.

## **Biofuel Certification Standard Benefits**

- Will check on the resources being used for production of biofuel
- Will ensure resource sustainability
- Will ensure only surplus food grains are utilised for production of ethanol for blending with petrol
- Will ensure illegal land conversions don't take place
- Financial incentives can be dovetailed with such voluntary co-regulation mechanisms
- Biodiversity Conservation

## Stakeholders involved in the process



## About the Organisation

Network for Certification and Conservation of Forests (NCCF) is a non-profit organization registered under the Societies' Registration Act, 1860, established to have a globally aligned nation specific certification scheme and standards for enhancing market and public access of forest, trees outside forests, non-wood forest products, protected areas and wetlands and other conservation landscapes and projects.

NCCF has successfully developed the certification standard for Sustainable Forest Management (SFM) and the development of Standard for sustainable management of Trees Outside Forests (TOF), the Standard development for Non-Wood Forest Products (NWFPs) and Protected Areas and Wetlands (PAWs), Quality Planting Material (QPM), Ecotourism, Sustainable Pet Trade are under way.

People's participation is an important mandate in the organisations objectives, for which NCCF adopts a "bottom-up" approach to governance. It builds on national members whose local expertise is complemented by the experiences of internationally-active organizations. The organisation has a Governing Body and a Standard Development Group (SDG). The Standard development is carried out through a multi stakeholder Standard Development Group (SDG), the apex body constituted for developing the Standard Draft, including but not limited to the professional foresters, representatives of business groups, forest based industries, NGOs (social and environmental), workers and trade unions, certification bodies and many more.

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