

# SUSTAINABLE GROWTH OF THE BIODIESEL INDUSTRY IN INDIA

Presented by:

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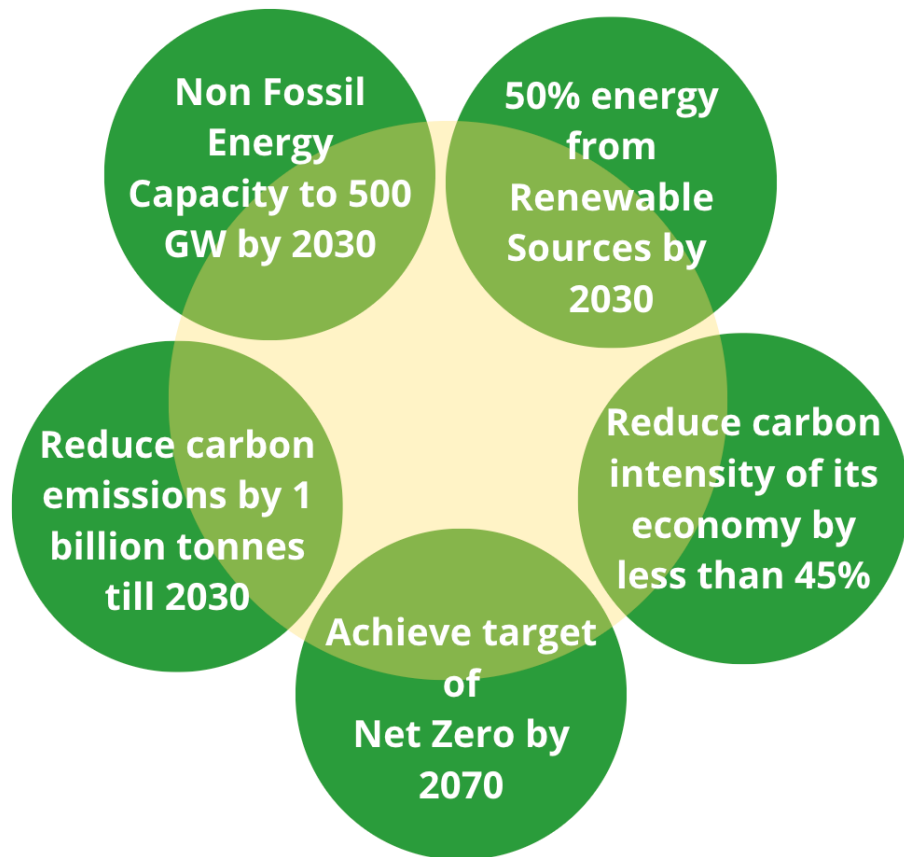
Director General

Biodiesel Manufacturers Association of India

**BMAI**  **BIODIESEL**  
MANUFACTURERS  
ASSOCIATION



Our Hon'ble Prime Minister Shri Narendra Modi, during his COP26 address, presented to the world – five nectar elements, 'Panchamrit', to deal with the challenges of Climate Change:



## Biodiesel has the potential to

- Make our country Energy Independent
- Create 1 Crore Rural Jobs
- Energize Villages
- Support Rural Economies
- Increase GDP

Biodiesel Industry can contribute significantly to achieve India's climate goals and has the potential to bring about an **IMMEDIATE GREEN REVOLUTION**

This is envisaged in India's National Policy on Biofuels AND the recently announced Finance Budget reiterates the Government's commitment in this direction.

# Advantages of Biodiesel

*Biodiesel Emissions vis-à-vis conventional diesel*

Emission Type	B5	B7	B10	B20	B50	B100
Particulate Matter	-3%	-4%	-6%	-12%	-27%	-47%
Hydrocarbons	-5%	-8%	-11%	-20%	-43%	-67%
Carbon Monoxide	-3%	-4%	-6%	-12%	-28%	-48%
SO <sub>x</sub>	-5%	-7%	-10%	-20%	-50%	-100%
CO <sub>2</sub>	-4%	-5%	-8%	-15%	-38%	-76%

YEAR	APPROX DIESEL CONSUMPTION PER ANNUM (IN CRORE KL)	% OF BIODIESEL BLENDED AT MINIMUM LEVELS EXPECTED*	APPROXIMATE QUANTITY OF BIODIESEL REQUIRED (IN CRORE KL)
1	9.00	2	0.18
2	9.63	2	0.19
3	10.30	3	0.30
4	11.02	5	0.55
5	11.79	5	0.58
6	12.62	6	0.75
7	13.50	7	0.94
8	14.45	8	1.15
9	15.46	9	1.39
10	16.54	10	1.65
<b>TOTAL</b>	<b>124.34</b>		<b>7.73</b>

One Kilolitre (KL) of Diesel emits about 2.680 MT of Carbon Dioxide  
 India's current consumption of Diesel is about 9 Crore KL.

**Thus currently, India emits 24.12 crore MT of Carbon Dioxide from usage of diesel.**

One KL of Biodiesel would produce 0.703 MT of Carbon Dioxide.

**Thus, difference in Carbon Dioxide emissions is 1.977 MT per KL of Diesel consumption.**

INDIA WILL CONSUME 16.54 CRORE KL PER ANNUM IN TEN YEARS' TIME\*

**WITH A 10% BLEND INDIA WILL REQUIRE 1.65 CRORE KL OF BIODIESEL**

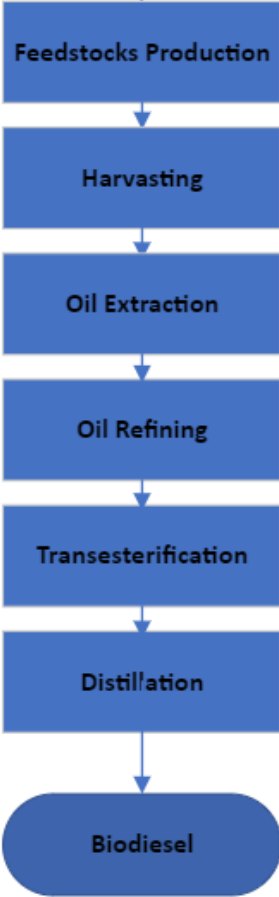
WITH THIS INDIA SHALL BE ABLE TO REDUCE CARBON DIOXIDE EMISSIONS BY APPROX. **3.27 CRORE METRIC TONNES PER ANNUM FROM 10<sup>th</sup> YEAR ONWARDS.**

To replace 2% of India's current Diesel consumption  
 - 18 lakh KL of Biodiesel would be required in the first year  
 - 165 lakh KL in 10th year with gradual increase in blend ratio\*

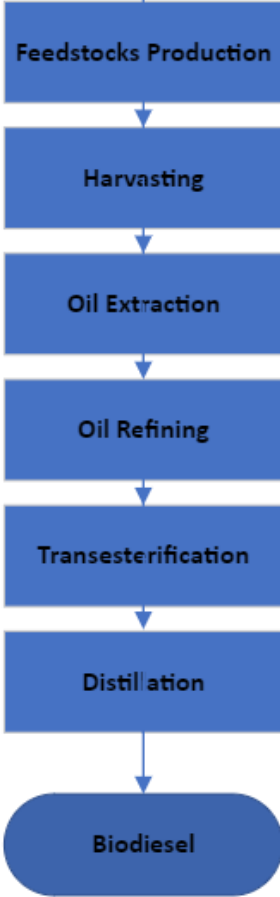
\*Growth of Diesel demand estimated at cumulative 7% p.a. from current 9 crore KL p.a.

### Generations of Biodiesel

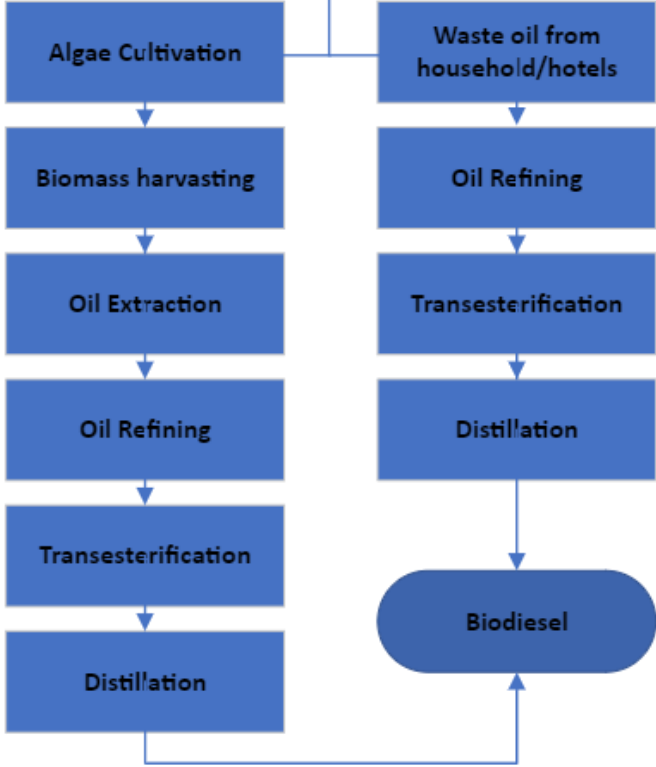
#### 1st Gen. (Edible Oil)



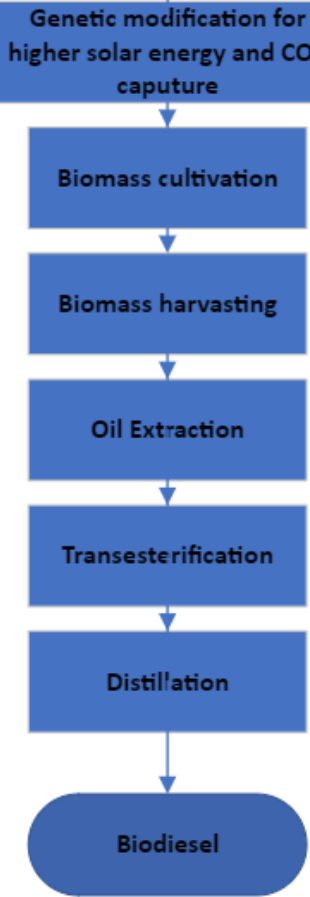
#### 2nd Gen. (Non-Edible Oil)



#### 3rd Gen. (Waste Oil)



#### 4rth Gen. (Advance Solar Oil)



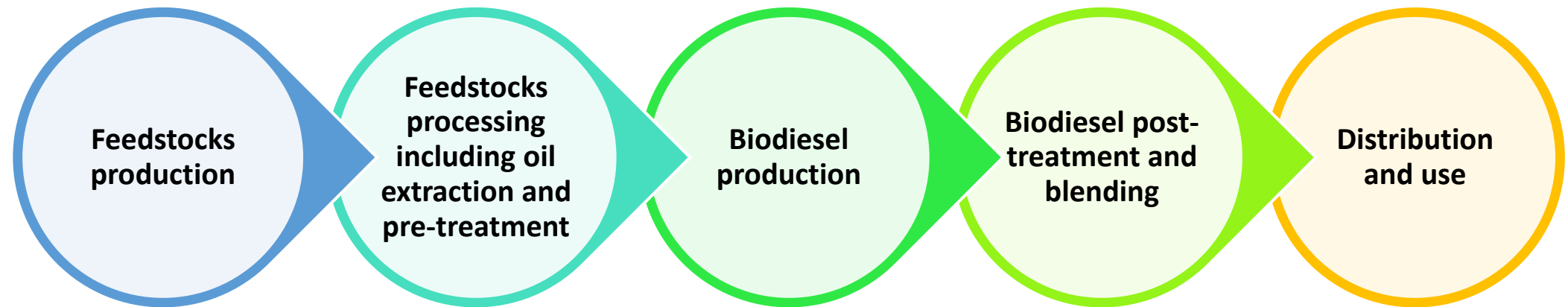
# Various Feedstocks for Biodiesel production

Edible oil (1st generation)	Non-edible oil (2nd generation)	Waste oils (3rd generation)	Solar biodiesel (4th generation)
Cashew nut	Aleutites fordii	Animal tallow	Photobiological solar biodiesel
Coconut	Babassu tree	Biomass pyrolysis	Electro biofuels
Corn	Calophyllum inophyllum	Botryococcus braunii	Synthetic cells
Cotton seeds	Castor	Chicken fat	
Hazelnut	Cerbera odollam	Chlorella vulgaris algae	
Mustard	Crambe abyssinica	Dunaliella salina algae	
Olives	Jatropha curcus	Poultry fat	
Palm	Jatropha curcus	Fish	
Pistachio	Karanja	Waste Cooking Oil	
Rapeseed	Mahua indica		
Radish	Milk bush		
Rice bran	Nagchampa		
Soyabean	Neem		
Sunflower	Nicotiana tabacum		

# Benefits and Limitations different generations of Biodiesel

	First generation	Second generation	Third generation	Fourth generation
Benefits	<ul style="list-style-type: none"> <li>• Easy biodiesel conversion process.</li> <li>• Easy availability of crops.</li> </ul>	<ul style="list-style-type: none"> <li>• No effect on food supply.</li> <li>• Feedstock's can be grown on non-arable land.</li> <li>• Less production cost.</li> </ul>	<ul style="list-style-type: none"> <li>• Waste food oil can be used for biodiesel production.</li> <li>• Growth rate of algae is high.</li> <li>• No effect on food supply.</li> <li>• Can be use seawater or waste water for algae growth.</li> </ul>	<ul style="list-style-type: none"> <li>• More lipid content.</li> <li>• More CO<sub>2</sub> absorbing ability.</li> <li>• High energy content, rapid growth rate.</li> </ul>
Limitations	<ul style="list-style-type: none"> <li>• Affect food supply.</li> <li>• Low crop yield.</li> <li>• Limited area of cultivation.</li> <li>• Less adaptability of crop to environmental conditions.</li> </ul>	<ul style="list-style-type: none"> <li>• Less cost-effective conversion technology.</li> <li>• Low crop yield for some feedstock.</li> </ul>	<ul style="list-style-type: none"> <li>• High energy consumption for algae cultivation.</li> <li>• Low lipid content in open pond system.</li> <li>• Expensive oil extraction process from algae.</li> </ul>	<ul style="list-style-type: none"> <li>• High initial investment.</li> <li>• Research on infancy level</li> </ul>

# Biodiesel Production Cycle





# Policy Initiatives by Government of India

Policy/Guidelines	Year	Summary/Objective
<b>Biodiesel Purchase Policy</b>	2005	Policy sets out measures to support activities for blending of bio-diesel in diesel and marketing of such blended fuel.
<b>National Mission on Biodiesel</b>	2009	Objectives was to bring unutilized wasteland in to productive use by promotion of Jatropha and Pongamia Plantation for 20% blending with HSD.
<b>Notification 1</b>	Aug, 2015	Government allowed direct sale of Biodiesel (B100) for blending with diesel to Bulk Consumers
<b>National Policy on Biofuels</b>	2018	India sets its target of achieving 5% blending (B5) of biodiesel with conventional diesel by 2030.
<b>Notification 2</b>	June, 2017	Government allowed sale of biodiesel to all consumers for blending with diesel.
<b>Guidelines</b>	April, 2019	Government notified guidelines for sale of biodiesel for blending with HSD for transportation purposes and has granted permission exclusively for sale of biodiesel (B-100) only and not for any mixture thereof of whatever percentage.
<b>Union Budget</b>	Feb, 2022	Rs. 2 per litre additional excise will be levied on any unblended fuels after 1 <sup>st</sup> October 2022

# Biodiesel – International Scenario

Country	Blending Target	Current Blend rate
Indonesia	B20 by mid-2022	28.6%
Malaysia	<small><sup>(1)</sup> Blended with 5% pure biodiesel with 95% conventional diesel fu</small> B30 by 2025	10%
Colombia	B12	11%
Philippines	B5 by 2022	3%
US	B12	6%
European Union	-	7-8%
Australia	No mandate	0.1%

# Bottlenecks in growth of Biodiesel sector in India

- Industry mostly entrepreneur driven, therefore not organized
- Multiple feedstocks and its decentralized availability and procurement
- Lack of policy support from the government side
- Incoherent policies of OMC's which are hindering growth of the sector
- No financial incentives

# What Biodiesel Industry demands

- Parity: to be treated at par with the other biofuels viz- Ethanol and CBG sector
- A central coordination agency/ministry to address the various problems faced by the biodiesel industry on the lines of ethanol and CBG
- Financial incentives for the development of the sector
- An action plan for ensuring availability of feedstocks keeping in mind the blending targets, considering both short and long duration crops

# Specific Demands of the Biodiesel Industry

- To be included under PLI**
- Promotion of Used Cooking oil recycling**
- Top up of UCO to be banned with immediate effect**
- Procurement of Used Cooking Oil by non core industries and its exports to be restricted**
- Dynamic Price mechanism to be implemented by OMC's, and old quarterly tendering should be allowed**
- Incentives should be provided for research and development**

# Specific Demands by the industry

- Differential GST for sale to OMC's and sale to private consumers should be removed and a uniform GST of 5 percent be imposed
- The 2 Rs. Per liter penalty clause as proposed in Union Budget 2022 should be imposed with immediate effect without any delay
- Imports of machinery should be permitted at a lower tax rate
- International price parity, as is done for the natural gas should be the criteria for biodiesel industry as well
- Agriculture ministry should draw a roadmap for bioenergy plantation crops and biodiesel industry should be made a stakeholder in the National Oil Palm Mission

PARTICULARS	
RBD Palm Stearin	VARIABLE
<u>Other Raw Materials Input</u>	
Methanol	VARIABLE
Catalyst	VARIABLE
<u>TOTAL OF MATERIAL INPUT (A)</u>	
<u>OTHER COSTS</u>	
Electricity (units)	FIXED
Fuel (Litres)	FIXED
Tanker Weighment Charges per 10 MT	FIXED
Freight Inward & Outward (per MT)	FIXED
Salary, Wages, Admin, Repairs, Dep, Misc etc.	FIXED
<u>TOTAL OF OTHER COSTS (B)</u>	
<u>CONTRIBUTION (C)</u>	
<u>TOTAL (A + B + C) = D</u>	
<u>Material Output</u>	
Biodiesel (B100)	
<u>Less: Crude Glycerine</u>	
Effective Basic Ester Cost on Ex-factory basis in Bulk (per MT)	
Effective Basic Ester Cost on Ex-factory basis in Bulk (per KL)	
<b>COST IN LITRES</b>	

**It is suggested that to have dynamic pricing structure, periodic review of the following items should be carried out:**

- Cost of Raw Material
- Cost of Industrial Solvent
- Cost of Catalyst

Cost of Raw Materials i.e. for Oil based raw materials like Palm Stearin, Fatty Acids, Acid Oils can be found with Solvent Extractors Association of India, such periodic prices are published on their website periodically

Cost of Raw Materials like Used Cooking Oils, Animal Tallow can be found with from the Biodiesel Nodal Body

Cost of Industrial Solvent and Catalyst can be obtained from local industry and importers

BMAI can be a one stop data point for such prices and correct pricing alongwith past patterns and future possibilities data can be provided as required.

## Unblended fuel shall attract an additional differential excise duty of Rs. 2/- litre (Budget 2022)

At current levels of Diesel consumption of India, OMCs will have additional expense of Rs. 18000 crores per annum on any unblended fuel.

Biodiesel industry CAN directly contribute to OMCs savings. Illustration as under:

Diesel Consumption in LAKH KL	Additional Excise in Rs. Per litre	Additional Outflow FOR OMC'S in Rs. Crores
900.00	2	18000

Diesel Consumption in KL	% BIODIESEL Blend	Qty in KL	Diff in Rs. per litre (=126-77)	Total Outflow in Rs crores
90000000	2	1800000	49	8820

**SAVINGS THAT CAN BE ACHIEVED BY OMC'S THROUGH 2% BIODIESEL BLENDING:**

**RS. 9180 CRORES**





# BMAI BIODIESEL MANUFACTURERS ASSOCIATION

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