

Success Stories of Advanced Biofuels for Transport

PRAJ'S ADVANCED BIOREFINERY

Year of plant start-up:	2016
Location:	Pune, Maharashtra, India
Technology:	Praj's 2 nd generation Biomass to Bioethanol technology ("enfinity") and biomethanation of stillage to biogas and renewable CNG
Plant capacity:	1 million litres ethanol per annum (MLPA)
Operational experience achieved:	Plant commissioned in December 2016. Operational for 2 campaigns of 3 months each.
Total Capital Expenditure:	--
Principle feedstocks:	Principle feedstock: Rice straw, sugar cane bagasse, wheat straw, corn cobs, corn stover, cotton stalk, saw dust.
Feedstock Capacity:	more than 4000 MT ¹ /Year (bone dry basis) Feedstock supply arranged through local farmers and biomass suppliers from different parts of India.
Products/markets:	Present: Fuel ethanol, Bio-CNG, Bio-fertilizer and CO ₂ . In pipeline: Bio-chemicals (Xylitol)
Technology Readiness Level (TRL):	TRL 9 – actual system proven in operational environment

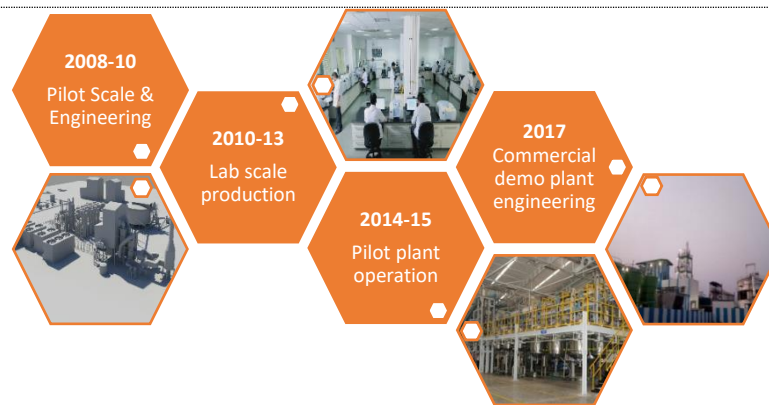
DESCRIPTION

From 1st generation to 2nd Generation ethanol technology, we thrive on challenges. We have over 750 references in 75 countries across the globe. Each of these plants carry our signature of technology innovation and integration, delivering lower water and energy footprint.

This knowledge helped us in developing the 2nd generation cellulosic ethanol technology "Enfinity".

Praj's state of the art second generation ethanol pilot plant facility is operational since 2009. This facility has tested more than 450 MT of biomass such as corn cob, cane bagasse, corn stover, empty fruit bunches (EFB), rice straw, etc. Rigorous testing and 800,000 man-hours of technology development efforts enabled us to scale the "Enfinity" to 1 Mln litres per annum capacity.

¹ MT = Metric tons



Key milestones

Stakeholders involved:

Farmers and Village level entrepreneurs, Biomass suppliers, project developers, policymakers, Public sector units (IOCL, HPCL, BPCL MRPL); organizations, EPC and PMC (GoI- agencies)

Financing Support:

Invested 100% by PRAJ.

The National Biofuel Policy of Government of India (GoI) supported the mission of 10% ethanol blending by 2022 and 20% by 2030 and procurement of cellulosic ethanol through Oil Marketing companies. There will be Viability Gap Funding from GoI to support commercial projects of 100 m³/day capacity.

Contribution to Sustainable Development Goals:

Promote sustainable agriculture : Sustainability in agriculture by using the agricultural crop residue to produce ethanol, which result into higher returns to farmers and resolve crop residue management issue. It also add fertility to soil by providing biofertilizer which is generated through process.

Ensure healthy lives and promote well-being for all at all ages : Smoke produced due to burning of agricultural crop residue deteriorated the human health, by using residue in the process to produce bioethanol will avoid the burning of crop residue, resulting in improving air quality and human health.

Ensure sustainable consumption and production patterns : It ensures the sustainable crop production and economical development of society. Crop residue generated is going to be consume by such projects. It assures crop production and its utilization pattern. Ethanol produced from such projects will also help to meet the demand of Ethanol Blending target (EBT) of the said state.

Take urgent action to combat climate change and its impacts: Due to crop residue burning in the field air pollution has increased, by utilizing such biomass to produce bio ethanol and blending it in gasoline will reduce burning activity and will reduce climate impacts. By adopting 20% EBP in India will save ~ 26 MMT GHG emission.

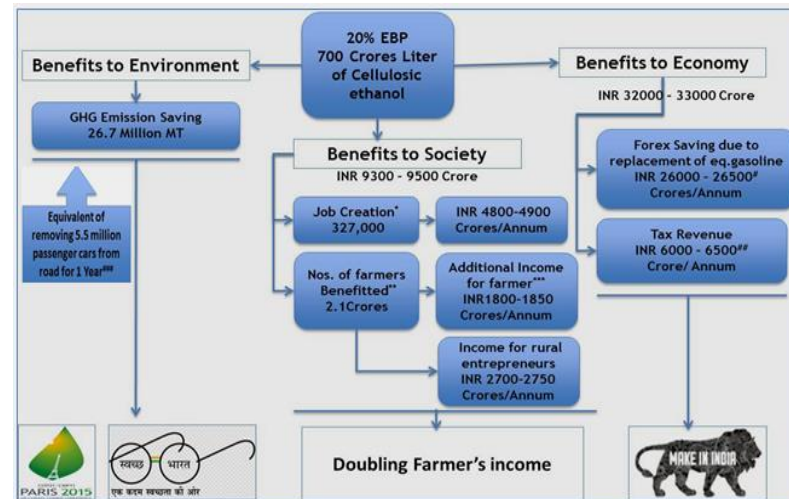
Protect, restore and promote sustainable use of terrestrial ecosystems: Usage of crop residue in bioethanol production will lead to betterment of ecosystem by way of

improving soil condition, restoring fertility by avoiding burning, by maintaining better and quality grain production, by blending ethanol in gasoline etc.

Ensure access to affordable, reliable, sustainable and modern energy for all:

Production of ethanol from crop residue and making it available for transport fuel ensures affordability reliability to society.

Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all,



Contribution to GHG emission reduction in transports:

High GHG reduction potential through ethanol blending in gasoline

Employment:

Nearly 3,027,000 additional direct and indirect jobs will get created by adopting 20% ethanol blends in India.

Replicability and scale-up potential:

The PRAJ technology demonstration facility is now scalable to commercial scale.

Success factors:

National Biofuel Policies, commitment to reduce GHG emissions as per COP 21, improving farmers Income, create rural employment and reduce fossil fuel imports and forex saving.

Constraints:

Regulatory support mechanisms to support capital expenditure first few projects and premium for price products.



Pictures from the facility

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More information: <https://praj.net/>



The ART Fuels Forum brings together 100 experts and leaders representing the alternative transportation fuels Industry to facilitate discussions, elaborate common positions on policy issues and identify market penetration opportunities and barriers for these fuels. The Forum is established and financed by the European Commission under the project name “Support for alternative and renewable liquid and gaseous fuels forum (policy and market issues)”.

www.artfuelsforum.eu

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