

Harnessing Energy From Waste

Encashing hay to arrest brown skies

By [Atul Mulay](#) October 21, 2021

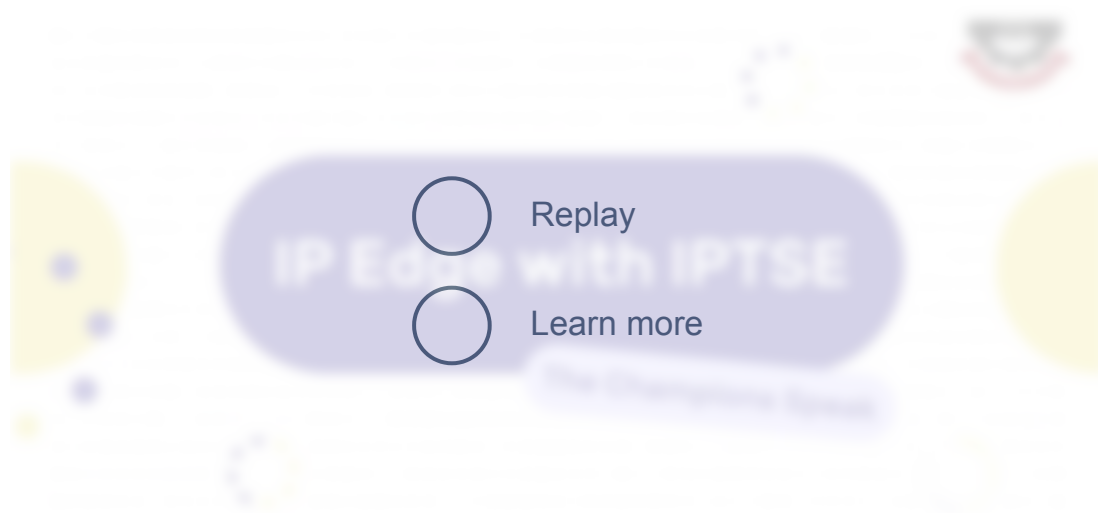
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Come winter and India's national capital gets shrouded in a thick blanket of smog that is a result of the humongous burning of crop stubble on acres and acres of farmland in neighboring Haryana and Punjab. The social and political debates on the problem too get as dark as the smoke billowing in the sky.



The good news is that through technology, this concern can translate into opportunities that will not only curb pollution but will also lend a delightful solution to the energy issue of our country. While changing seasons may be called a magical manifestation of nature, human interference only distorts its glory and in fact turns it against humanity's interest. Winters in the surroundings of Delhi come with the unpleasant onslaught of smoke and pollution that threatens to suffocate humans and animals alike. It's high time a solution was sought that is not a tactical one but sustainable.

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Rightly called the 'Granaries of India', Punjab and Haryana produce a major proportion of wheat, sugarcane and rice in the country. As a new strain of paddy was developed that enabled the farmer to harvest two crops a year instead of one, farmers were prohibited from planting paddy before 10 June each year and thereby pushed the yield further by two months. This affected the economics at the farmers' end and the new schedule left no leeway to uproot and store the remnants after harvesting paddy. This left the farmers with no option but to set the stubble afire to save time.

The irreversible impact

phosphorous, 25kg potassium and more than a kilogram of sulphur in the soil are destroyed. These are all important nutrients that maintain the fertility of the soil. Smog in Delhi skies has long since been a cause of grave concern and once again all eyes turned to the mass scale burning of farm waste. A research conducted by the Indian Institute of Technology; Kanpur revealed that farm waste incineration leaves 17-26 per cent of pollutants in the form of suspended particles in the air. While customarily the waste burning period extends up to 45 days, there has been 40 per cent pollution suspension at peak points. It is estimated that farm waste which was about 5.6 crore tonne in 2010 is expected to increase to 86.8 crore tonne by 2030; about 17 per cent of the waste is burnt on the farm itself.

Farm waste to fuel; the technology to convert this very farm waste into fuel has been developed which will not only counter the farm waste burning issue but also save precious foreign exchange as country's dependency on fossil fuel imports reduces. This also addresses the problems of greenhouse gases and climate change. The problem is well defined. The solution is before us and feasible. It is powerful enough to benefit every link in the chain from producer to consumer to policy makers.

What then stops it from being implemented?

The snag as we see it is that the farmers must be educated on the larger picture where their farm waste becomes a resource for biofuel. Paddy stubble can be a very useful raw material for biofuels such as ethanol, compressed biogas. However, the entire process and supply chain logistics which includes sorting of the waste, transporting it to collection

The Indian government is very serious about the production of biofuels, and has taken welcome initiatives towards this. Especially noteworthy are the National Biofuel Policy 2018 and the 'Sustainable Alternatives towards Affordable Transportation' – SATAT. Both these initiatives are expected to give the right impetus to India's drive of sustainable energy. The government has also taken pivotal steps by executing the policy of mixing 20 per cent ethanol in petrol by 2025 instead of the earlier decided timeline of 2030. Oil marketing companies in India have plans to set up 12 number of 2nd generation ethanol plants of which six are already under execution. These will need a feed of about 1.5 lac tons of organic waste per year. SATAT program envisages the setting up of 5,000 compressed biogas plants over a period of five years; efforts are underway to develop the ecosystem. Offtake mechanisms, funding programs, and co-product certification are underway. Besides land transport, bio-fuel would be extensively used in marine and air transport.

Energy security is a vital issue on agenda for India and hence alternate and sustainable energy sources are being earnestly explored. The farmer who feeds the nation will also be able to power it, literally. They only need to know that not just the crop but also the 'stubble' from their land is a rich resource and that the government and society is keen to reward them for supplying it.

Biofuels are not just seen as an alternative to vehicle fuels. It can be instrumental in building an entirely new economy. The use of agricultural waste for the production of bio-fuels would open up a massive income source to the farmers. Bio-fuels would thus not only drive machines and vehicles, but they would also drive a brand new rural economy towards prosperity.

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