



RAISING THE SPIRIT

As India prepares to roll out E20 petrol from April, ethanol supply can make or break its flex-fuel dreams

Richa Sharma & Prashant Mukherjee

In 1826, when independent efforts by Henry Hennel in Great Britain and SG Sérullas in France gave the world its first synthetically prepared ethanol, little did anyone know that one day the chemical compound would become much more than an intoxicating ingredient in alcoholic beverages. Ethanol was used as lamp fuel in the pre-Civil War period in the US and powered the early Model T cars. But it couldn't compete with petroleum products due to the latter's low cost and availability.

Centuries later, ethanol is back in action, in India.

With a view to decarbonise the transport sector, the government is promoting the use of biofuels in the country and has mandated 20% ethanol blending in petrol by 2025. While India started a pilot in 2001, it was in June 2022 that it achieved the target of supplying 10% ethanol-blended petrol.

For a country that heavily depends on imports to meet its oil needs (86% is imported), shifting to blended fuel will save precious forex. That is the aim of the National Biofuel Policy introduced in 2018. But making enough ethanol available for blending is easier said than done.

Here's why. On February 6, Prime Minister Narendra Modi rolled out 20% ethanol-blended petrol (E20 flex fuel) in 11 states, ahead of its planned launch in April. But there are some obvious challenges in adopting ethanol. The immediate constraint is capacity.

Although India produces a lot of ethanol, not all can be used to optimise blend rates. For instance, back in 2016, India produced around 3 billion litres of ethanol. But almost half of it was diverted to distilleries. After all, liquor is a major revenue source for most states. Another 600-800 million litres from the supply pool were used to produce chemicals.

Efforts are now being made to iron out this challenge with higher ethanol production.

The current annual ethanol production capacity in the country is approximately 10.37 billion litres, which includes approximately 7 billion litres of molasses-based and around 3.37 billion litres of grain-based production capacity. Oil central public sector enterprises (CPSEs) are now setting up second-generation (2G) ethanol bio-refineries

in Panipat (Haryana), Bathinda (Punjab) and Bargarh (Odisha), each with a production capacity of 100 kilo litres per day and at Numaligarh (Assam) with a production capacity of 185 kilo litres per day.

Pankaj Kasliwal, deputy general manager-research and development at Indian Oil Corporation, says, "The government has mandated 2025 for meeting 20% ethanol [blending] in gasoline and we are geared up to do it by 2024. For that, we require almost 10.15 billion litres of ethanol. As of date, the production is 50%. But 11 commercial plants of 100 kilo litres per day of ethanol production are coming up very soon. These include three each of IOCL, HPCL and BPCL, and one each of MRPL and NRL. This will increase the production of ethanol to meet the target. Post-2025, when production starts, ethanol is going to be surplus".

As per the road map prepared by NITI Aayog, which is based on the projected sale of motor spirit (MS), the estimated requirement of ethanol for blending with petrol is 5.42 billion litres for ethanol supply year (ESY) 2022-23, 6.98 billion litres for ESY 2023-24, 9.88 billion litres for ESY 2024-25, and 10.16 billion litres for ESY 2025-26.

Also, under the Ethanol Interest Subvention Scheme to encourage sugar mills and distilleries, 1,141 projects with an estimated ethanol production capacity of 40.12 billion litres have been approved.

Senior officials of Indian Oil Corporation say they have got a surplus of waste available, but the challenge is that it is in pockets. "Molasses is available only in areas where there is cane industry—like UP, Haryana and Maharashtra. Where it is not available, there needs to be a network for transporting and blending ethanol. Transportation will be a challenge and we should not spend more money on it than the fuel itself. Pipeline is the cheapest mode of transport. Once there is surplus (ethanol), pipelines and biorefinery can be put up in nearby places and oil-marketing companies can have marketing terminals like Amazon has warehouses," says Kasliwal.

According to a BPCL official, "We have to double ethanol blending by 2025. All oil marketing companies, along with the government, have decided that 130-150 new distilleries need to be set up to meet the requirement. At present, distilleries are present in Maharashtra and UP—basically the sugarcane crop area. But now it has been decided that new distilleries will be set up in other states like Madhya Pradesh so that it can be locally procured and supplied to nearby depots and refineries."

BPCL is setting up an integrated bio-ethanol refinery at Bargarh, which is likely to start production by the end of 2023. Constructed at a cost of ₹1,607 crore, the daily capacity will be 100 kilo litres of 1G and 2G ethanol. The first generation uses sucrose and starch-containing feedstock like sugarcane, rice, maize, barley, sugar beet and sweet sorghum, while 2G uses lignocellulosic biomass like straw, grass and wood.

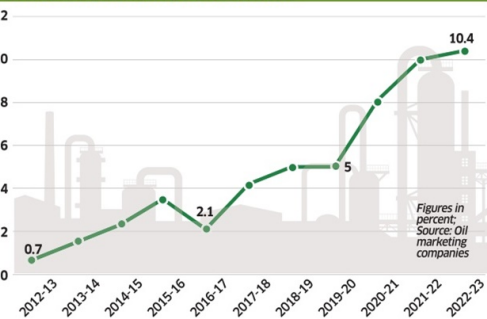
MAKING ENGINES BLEND-READY

For flex fuel, the plan is simple: ramp up ethanol production, slowly start blending it with petrol and get to a point where the country could reduce oil imports by a substantial amount. Another major variable in the flex-fuel equation is the engine of the vehicles that will have to use the blended compound.

"For 10% ethanol blending, no change was required for existing engines. With 20%, while the fuel can be used, there can be effects on the engine over prolonged usage. Ethanol is corrosive in nature and rubber-related materials can be impacted, and their life could be reduced. So, during regular services, customers would be asked to get some changes made and that will be the responsibility of automobile companies," says the BPCL official quoted above.

Eventually, India will need flex-fuel engines that can take more than 20% ethanol blend. For example, in Brazil, the blend can go up to E85 (85% blend of ethanol in petrol). Toyota and other automakers have been working to bring flex-fuel

ETHANOL BLENDING PERCENTAGE



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Brazil has spearheaded some of the big shifts in the field of biofuels, especially ethanol. Today, it is home to the world's largest fleet of cars that use ethanol—27 million cars, 73% of the total, can use a mix of ethanol and gasoline.

In the UK, petrol is currently mixed with 5% ethanol—which is due to increase to 10% this year. However, in places such as Brazil and the US, the use of ethanol as fuel is far more widespread.

To learn from global experiences, the Society of Indian Automobile Manufacturers (SIAM) recently entered into an agreement with the US Grains Council (USGC), a nonprofit developing export markets for ethanol, to establish a framework of cooperation covering scientific, technical and policy aspects of producing, blending, distributing and marketing ethanol as well as automobile compatibility in a sustainable and environment-friendly manner.

"Corn is a predominant part of ethanol in the US and the mandate is 10%, like in India, but there is the availability of E85 (85% blending). On price difference, from E0 to E85, the cost goes down by around 40%," says an official of the council.

BOTTOM LINE

India has been working hard to reduce its dependency on foreign oil, and blending domestically produced ethanol with conventional fossil fuels is an opportunity to reduce reliance on oil imports. But ethanol is a complex derivative extracted as a by-product during the process of making sugar from sugarcane.

There are also concerns that ethanol production will increase the demand for water-intensive sugarcane crop. However, the India Sugar Mills Association says that as of now only surplus sugar syrup is diverted for ethanol and "the future plan is to increase yield productivity rather than increase land acreage".

On paper, blending is a cost-effective measure as the price of ethanol is much lower than petrol. In the last quarter, ethanol price was ₹59 per litre and before that it was ₹63 per litre. Can the consumer expect some price relief once blending of ethanol with petrol becomes more widespread?

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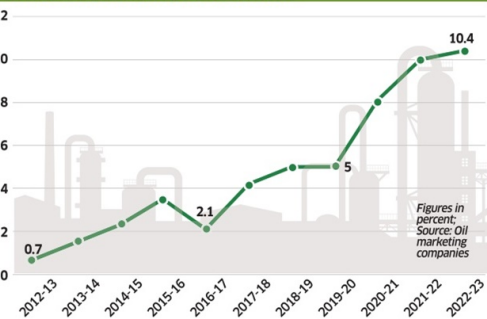
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रिलायंस गैस पाइपलाइन में हुआ गैस रिसाव का मॉक ड्रिल का अभ्यास

कलेक्टर के निर्देश पर प्रशासनिक अधिकारियों ने लिया जायजा

शहडोल, (वीअ)। विश्व प्रसिद्ध रिलायंस इंडस्ट्रीज की स्थानीय रिलायंस गैस पाइपलाइन लिमिटेड में अचानक गैस रिसाव से पूरे क्षेत्र में हलचल मच गई ? यह बात अलग है कि जैसे ही कंपनी के अधिकारियों व प्रशासनिक अधिकारियों को मालूम पड़ा कि यह मॉक ड्रिल है, तो लोगों ने चैन की सांस ली।

कंपनी द्वारा दी गई जानकारी के मुताबिक 17/ फरवरी/23 को ग्राम जल्दी टोला में रिलायंस गैस पाइप लाइन लिमिटेड में आकस्मिक मॉक ड्रिल का आयोजन जिला प्रशासन के अधिकारियों की मौजूदगी में सम्पन्न हुआ, यह मॉक ड्रिल कंपनी की पाइप लाइन में अचानक हुए गैस रिसाव एवं आग लगने आदि की स्थिति से निपटने के लिए अभ्यास स्वरूप किया गया। मॉक ड्रिल में रिलायंस कंपनी



की ओर से इमरजेंसी रेस्पॉन्स टीम ने भाग लिया तथा गैस लीक व आग को काबू में लेना एवं घायलों को यथा शीघ्र उपचार हेतु भेजने का सफल परीक्षण किया गया तथा इमरजेंसी सुरक्षा के लिये उपयोग में लाये गये उपकरणों के बारे में भी प्रशासनिक अधिकारियों को अवगत कराया गया। जिला प्रशासन की ओर से कलेक्टर वंदना वैद्य के निर्देशानुसार,

सोहागपुर अनुविभागीय अधिकारी प्रगति वर्मा, तहसीलदार दीपक पटेल, राजस्व निरीक्षक जीवेन्द्र सिंह एवं पुलिस अधीक्षक कुमार प्रतीक के निर्देशानुसार टीआई बुद्धार राजेशचन्द्र मिश्रा, स्वास्थ्य चिकित्सा दल बुद्धार एवं नगरपालिका बुद्धार से इमरजेंसी रिस्पॉन्स टीम सहित रिलायंस के अधिकारियों ने संयुक्त रूप से भाग लिया।