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"Biofuel reduces carbon emission"

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Dr Ranjan Patnaik
Head, Biofuels Research Group, DuPont Knowledge Center (DKC), Hyderabad

DuPont, an American chemical company that was founded in 1802, has come a long way since its inception from being agun powder company to being one of the fiercest advocates of providing carbon-neutral energy to the world. DuPont's Knowledge Center in Hyderabad, which is spread across 15 acres and has received investments worth $29 million (130 crore), is home to DuPont-BP biobutanol advanced biofuels program.

Dr Ranjan Patnaik, head of Biofuels Research Group, DKC, Hyderabad, who was among the speakers present at EmTech India 2011 — an annual event conducted by Technology Review India — provided insights into the present scenario of biofuel consumption and R&D in India during the plenary discussion.

Dr Patnaik in his interview to BioSpectrum also acknowledged the fact that although much research has been done invarious laboratories across the world, only negligible proportion of this knowledge has actually got translated into reality.

Q What do you think is the future of energy in our country?

Dr Patnaik: The future of energy has to be diversified so that you do not invest everything in one form or source of energy.

The power portfolio has to be properly balanced and it has to be adjusted to the geo-political situation in every country.

Q We still have vast amounts of fossil fuels and we have an unlimited source of energy in the form of the sun. However, there is a lot of hue and cry over the scarcity of fossil fuels. What are your thoughts on this?

Dr Patnaik: The few major global trends that are happening around us are concerned with nutrition for the population and reducing dependence on fossil fuels. A lot of new technologies that have come into existence are slowly giving us the incentive to rethink — how we want to manage our energy portfolio. Although everything comes from sunlight but it is not going to fulfill all our energy needs. The sunlight has to be trapped into a usable form. One of the usable forms is the liquid transportation fuel, including petrol and diesel, and the other is electricity.

Q Which energy compounds is DuPont working on presently?

Dr Patnaik: DuPont is working on biobutanol. Biobutanol was first used in World War II as a fuel and it was obtained by the process of fermentation of renewable feed stocks with bacteria. Biobutanol has many advantages as compared to ethanol.

Biobutanol can also be directly used in the existing petrol or gasoline infrastructure. We use the technology of metabolic engineering and rewire the bacteria or yeast to make a pure product of biobutanol. We are also working with cellulosic ethanol, which is being obtained from non-edible agricultural residue (cellulosic biomass).

Q What is your personal take on the energy crisis?

Dr Patnaik: Although there is an ever increasing demand for energy, we should try to cut down on the usage and learn how to conserve. I believe that simple changes in one's lifestyle and daily habits can help us reduce energy consumption drastically.

Q Burning of fuels, irrespective of the source they have been produced from, leads to carbon di-oxide (CO2) emissions. Is there any way in which we can control this?

Dr Patnaik: Since, we value energy and we put a price tag on the kind of energy we access, an important factor that emerges is energy sustainability. Biofuel emerges as a clear winner in this context. If you analyze the life cycle of biofuels, from beginning of harvest to burning in the car, there is a net reduction in the carbon emission. We cannot expect this from fossil fuels. However, the present mixed energy portfolio has very negligible contribution from biofuels. Thus, what we are trying to do now is to balance the mixed portfolio in such a way that it accelerates towards a net zero scenario.

Q What is your opinion on the 'drop-in' biofuels and their usage in our country?

Dr Patnaik: We have been using ethanol as a blended biofuel in the form of E85 or E10 and butanol is now being used as it is a far advanced biofuel as it has several other properties better than ethanol. Butanol can be blended with petrol or gasoline at a much higher level than ethanol and can be dropped-in directly in the engine. We are also working on other technologies that are still in the incubation stage.

Q What are your major concerns associated with the future of biofuels?

Dr Patnaik: A good source of fuel is the one which you can apply with ease. A biofuel will be considered to be a good fuel only if it is efficiently able to run the present engines. Since there is still an abundant availability of fossil fuels and as such the internal combustion engines are not going to disappear, biofuels that can support the present infrastructure and power distribution grids will emerge as the champions in the future. However, it will take time for any such source of biofuel emerge as a major fuel soruce.

Saptarshi Chaudhuri in Bangalore