

Transition to Specialty Chemicals

Samir Somaiya, CMD Godavari Biorefineries Ltd. sees lot of potential for the renewable chemicals globally as some of the large international companies have committed themselves to become carbon neutral. In an exclusive interaction he talks about the transition of company to specialty chemicals after successfully introduction of chemicals for fragrance & skincare to some of the global companies.

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Samir Somaiya
CMD, Godavari Biorefineries Ltd.

How is the market for green / renewable chemicals evolving globally and in India?

We see a big increase in the need for renewable/green chemicals. This trend is more visible globally. Large international companies are making public commitments to us renewable chemicals, biodegradable packaging, carbon neutral processes, and making a more sensitive approach to people, climate and the planet going forward. In this, there is a huge opportunity for companies in the renewable space to go forward.

To what extent renewable chemicals can replace the conventional chemicals and petrochemicals in India and what are the major concerns that will have to be addressed at various levels in India?

Renewable chemicals can be used in various ways and can be 'Identical' except that these are made from renewable sources. For example, one can make acetic acid from renewable sources that is made otherwise from petroleum feedstock. 'Drop-ins', and can completely substitute conventional materials; although they may be chemically different, with no loss of functionality. Green chemicals can also be completely different from material derived from conventional feedstock and have different properties but still may have the same end use. Some of the renewable chemicals may not have a fossil substitute.

In each of these cases, the substitution will depend upon many factors. One of the very first point is if the price of the renewable chemical can compete with that derived from fossil sources. Second, whether the end use segment is willing to pay a price premium for a renewable derived feedstock. We find that this is often the case in the skin care sector. In such cases, responsibly sourced, traceable, renewable and/or biodegradable chemicals can command a price premium from the end customer. Third point is whether the material properties can help command a better price. Finally, in some markets, the Governments are creating policies that promote the use of renewable raw materials.

Since your question particularly concerned India. In my opinion, bio-ethanol is a 'Drop-in' and there is a favorable Government policy to help encourage

EU and USA have significant policies to encourage investment in research, pilot plants and commercialization of renewable processes & technologies. In India, though the Government has created policy for renewable fuels & Bio CNG , there is no policy for renewable chemicals.

that blend to help our energy security and a lower carbon future. For chemicals, the market needs to mature to give us more value. But I think that consumer preferences are changing, and there are niche markets that reward use of such chemicals, and it is a matter of time before some end use segments grow the use of these feedstocks. How friendly are the policies in our country to support the growth of renewable chemicals and protect the domestic industry from imports?

In India, there are no policies for renewable chemicals. The Government has created policies for renewable fuel (ethanol blending), and also Bio-CNG. However, this support is not extended to the chemical sector.

In the EU and the USA, there are significant policies encouraging the investment in research, pilot plant, and commercialization of renewable processes and technologies. Further, there are policies in place to influence the attractiveness of these products. The US Bio-Preferred Program is one such example. The Carbon markets are also another way to help the economic viability of such initiatives.

Tell us about the Godavari bio-refinery model and how has the organization continued to stay financially viable? How have you addressed the cost challenge across the customers in India though these lead to higher ROIs across for the user industries?

Godavari Biorefineries is using four strategies for the future. The Government has encouraged the making of ethanol from sugarcane juice or syrup for blending in petrol for our transportation needs. Godavari was one of the first companies to aggressively adapt to this environment and supplied a large quantity of ethanol for the purpose this past year. This provides us much needed optionality to swing between ethanol and sugar based on the demand supply gap in sugar or ethanol. Currently, we are increasing our ethanol capacity to 400,000 lpd. With this we will have a capacity of over 100 million litres of ethyl alcohol in a single location.

In the chemical sector, we are making a transition to specialty chemicals. In the past few years, we have successfully introduced new chemicals that are in the fragrance or skin care field. We are also establishing more long term relationships with global companies that share our vision of a sustainable future, so that we can jointly develop products with their involvement. This 'joint' development approach helps us know the target product cost and quality of the customer. Achieving the same helps them achieve their ROIs.

Bio-refining means products from agriculture and we work closely with the farmer to help enhance yields and productivity, in order for the farmer to be financially better off, and the farm and soil to be healthy.

To promote well grown and well processed foods, we have established a brand 'Jivana' to promote pure and high quality food products that we need on a daily basis.

When & why did your organization stop producing acetic acid and took the decision to restart the business on demand in October 2018 which received USDA certification in next few months?

We stopped making Acetic Acid over a decade ago. In this case, we made the same chemical from renewable sources (ethanol) that is also made from fossil resources. With the reduction in import duties, the entire Indian alcohol based chemical industry that made acetic acid from ethanol found itself unable to compete with petroleum sources. Along with all the others, we too shut down.

We reinvested and resumed the manufacture of acetic acid only on a very small scale. There are a few customers the world over desire to buy this product because their end market segment is ready to pay a premium for the same. This is a small market and the demand fluctuates. But we are hopeful that the market will grow.

Which is the best suited bio refinery model for India to realize the sustainability goal? How can we build world class bio refineries in our country?

I hope we are working on demonstrating that. It is a model that works closely with farmers. In India, farmers have small land holdings. Any engagement has to help them be financially sustainable and for the farm to be productive in the short and longer term. We are working with our farmers to reduce their water footprint, and encourage the use of intercrops to reduce fertilizer use and give them a dual income. Similarly, biorefining is the process of converting the feedstock into value added products. These find applications in foods, fuels, electricity, chemicals, pharmaceuticals, fragrance chemistry, bio materials, agrochemicals and much more. There has to be a thinking towards a circular and cascading biorefinery that continuously strives to find and add value.

A few years ago, we installed an incinerator boiler to recover energy from our waste. Now, we are implementing a process to extract potash from the ash from the incinerator. This potash will then be sold to our farmers. Currently, India imports almost all its potash needs. Through this example, we are showing how we can cascade and add value, and the process is circular.

As a country, we need research to keep imagining the future. Research and practice go hand in hand. In Europe, I have seen large pilot plants where lab work can be taken further. We need to have such facilities to further bio-refining in India.

How supportive is the National Biofuels Policy towards setting up 2nd generation bio-refineries and what are the challenges that still need to be addressed?

The National Biofuel policy helps the making of biofuels. India is an agrarian economy and has an abundance of biomass. However, the collection of the biomass will always be a challenge. So the availability of this biomass at the processing site is an entry barrier. At Godavari Biorefineries, we have invested much in energy efficiency and engineering to make available surplus bagasse on site for use as a next generation feedstock.

20 Secondly, ethanol from biomass is what is called 2-G (2nd generation). These are possible, and we are seeing demonstration facilities around the world. However, these are expensive and are made possible with Government support and subsidy. The Government of India is also supporting the creation of such Greenfield facilities to make 2G ethanol. But as in every other location, these facilities are very expensive. The Government makes them possible with 'Viability Gap Funding.' I believe that India should also experiment with our own model. We need to encourage 'bolt on' solutions of adding equipment and technology to existing infrastructure. For example, our sugar mills already have biomass on site and downstream ethanol facilities. A 'bolt on' approach will only add what is necessary to complete the 2G addition, reducing funding needs. The

We need to encourage 'bolt on' solutions of adding equipment and technology to existing infrastructure which will only add what is necessary to complete the 2G addition and reducing funding needs. The current biofuel policy provides for 'Viability Gap Funding' only for Greenfield facilities and needs to be modified for 'Bolt on' facilities as well.

current biofuel policy provides for viability gap funding only for Greenfield facilities. It needs to be modified for 'bolt on' facilities as well.

In summary, I think India has a great agriculture base. There is lots of biomass and we have the education and research system to dream. The market is large and people are imagining a better and more sustainable future for their children. Biorefining of biomass is the way for a more sustainable way of life. ■