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Ajit Sapre

Reliance Industries Ltd, India

Biofuels and bio-chemicals: One perspective Reliance Industries, India

Reliance Industries has committed a significant R&D effort in the area of renewable energy and bio-chemicals. The current focus at RIL is in four key areas: Agri-residue to kerosene; Jatropa to bio-diesel, algae to bio-crude and cellulosic sugars, and syngas to bio-chemicals, e.g., isoprene and butadiene. This presentation will mainly focus on role of synthetic biology and engineering to make these technologies commercially viable. Innovations in biology especially synthetic biology had made it easier to leverage living micro-organisms to produce products useful for human life and civilization. We at RIL have developed cutting edge tools and technologies for synthetic biology to utilize the fullest potential of this opportunity. We are exploring the use of micro-organisms like algae and natural photosynthesis, which forms the fundamental basis for bio-crude and other value added products such as proteins from algae. Algae, in particular, are highly efficient convertors of sunlight to stored energy. Advances in synthetic biology and gene editing can enable significant increases in productivity or overall photosynthesis. Coupled with the availability of different high-throughput technologies and bioinformatics platform along with innovative engineering breakthroughs, algae can potentially provide opportunities to significantly impact different facets of human life and civilization. To be commercially competitive, improvements in cultivation systems, biology, harvesting, and maximizing oil yield from biomass are still needed. This presentation will cover learnings from our algae research and will feature an amalgamation of engineering and biology. In parallel, applications of synthetic biology in *E.coli* and *Clostridium* with cellulosic sugars and syngas as feed, has made it possible for us to produce many high value bio-chemicals. This presentation will cover use of modern biology tools and learnings from our algae and bio-chemical research..

Biography

Ajit Sapre has more than 35 years of experience in the petroleum refining and petrochemicals business, technology development and management. He received his PhD from the University of Delaware and MBA from Cornell University. His experience includes technical and managerial assignments in research, engineering, licensing, business, manufacturing units and corporate planning. He has strong management and technical background in refining, petrochemicals processes development, catalyst development, chemical reaction engineering, optimization technologies, computer integrated manufacturing and intellectual asset management. He has experience in upstream, downstream (refining, petrochemicals, polyester, lubes) and renewable energy sectors. He has published more than 100 technical papers, one book and has more than 45 US patents to his credit.

Ajit.Sapre@ril.com