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# Case Studies of Innovations in Chemical Technology Centred around Sustainability and Value Creation

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(ABSTRACT)

Innovations are all about a "twist in the tale" that leads to a beneficial outcome. The talk will focus on some important processes which were worked on for over two decades and successfully improved through simple innovations. To begin with, three processes related to bio-resources will be discussed. These include the original work on *Jatropha* biodiesel (US Patent 7666234) that evolved from a successful collaboration with Daimler Corporation, integrated production of carrageenan/ethanol and seaweed sap – a potent foliar spray – from fresh seaweed of *K. alvarezii* (US Patent 6893479), and, similarly, integrated production of oil and vegetable salt from the halophyte, S. *brachiata*. From the perspective of sustainability, recent innovations that have helped to realise substantial energy savings in certain processes/applications will also be covered. One example of this is the bypassing of energy intensive reverse osmosis in certain industrial processes such as brine preparation for the Solvay process (Indian Patent 366123). The talk will also cover examples of green chemistry and feedstock substitution revolving around benzylic bromination as a technology platform (US Patents 6740253, 9527073). Finally, the lecture will discuss concerns around the presence of high concentrations of fluoride and uranium in phosphate fertilizers and propose a possible solution that might empower countries to act locally to rid the fertilizers of such impurities.