

Innovation from the Refinery to the Road

Girish Rao, Shell Bitumen R&D Manager

Any talk by an oil & gas industry person must begin with the sustainability challenge and this presentation will be no different. The 'energy transition' from hydrocarbon to renewable is one of the greatest challenges to the human race. In this talk I will be sharing how Royal Dutch Shell, as an oil and gas major, is stepping up to this massive challenge at time when the business environment is far from buoyant. The need to deliver 'more energy but less CO₂', whilst being very difficult, also generates a lot of scientific excitement and some of this excitement will be shared with the audience. As scientists and engineers the sustainability cause should be of relevance to the research ongoing at IISc whilst the effect of climate change should be of interest to any Indian citizen as we are one of the countries most at risk to climate change.

The bulk of the presentation will focus on Shell bitumen products, where the research effort for this Downstream business is based entirely in Bangalore. The portfolio of projects range from characterising bitumen at a molecular or colloidal length scale (physical chemistry) to how these systems mix with additives (material science/polymer science) to the manufacture of the bitumen from crude oil (chemical engineering) and finally how the bitumen product is applied to aggregates to produce an asphalted road (civil engineering). The focus on asphaltenes, a group of molecules of critical importance to bitumen and crude oil, is an area of research which should generate particular interest as their structure and behavior remain unclear but might be unlocked if viewed through the fresh lens of IISc experts.

The talk will close with comments around the presence of Shell in India (its past and future) with particular emphasis on the new Technology Centre in Bangalore, one of the three Shell technology hubs.