

# India's Energy Needs: Analysing the Role of Hydrogen Energy and Fuel Cell Technology

Surbhi Gupta<sup>1</sup> and Nitish Kanetkar<sup>2</sup>

<sup>1,2</sup>TERI University

E-mail: <sup>1</sup>surbhigupta0705@gmail.com, <sup>2</sup>nitish.kanetkar@students.teriuniversity.ac.in

---

**Abstract**—India has a voracious appetite for energy. Abundant, inexpensive resources have fuelled technological advances from the industrial revolution to the present. Continued growth will require a continued supply of inexpensive energy that is not suitable with current resources. In the Ideal, albeit distant, future is the world of pollution free and renewable sources and hydrogen is likely to be a crucial part of this idealistic future. The hydrogen economy is a system that uses hydrogen as a major carrier in the energy supply cycle. Hydrogen economy evokes a vision of sustainable and environmentally friendly energy usage in the future. That vision follows a historic trend toward using energy sources that produce less and less carbon as a by-product. Hydrogen is seen as the clean fuel of the future as its only by-product is water. Before hydrogen can become a significant part of the energy economy, many fundamental technological issues must be addressed. Government, research institutions and businesses, including the oil and gas industry must play important roles in solving problems related to hydrogen production, transport, storage and distribution. Our study aims to focus on the Indian transition to hydrogen economy; the major challenges in this path, strategies adopted to overcome the roadblocks and to analyse the future of hydrogen economy in India.