

13.1

**R&D centers and schools for carbon management and sustainable energy future:
India's perspective**

Baleshwar Kumar

(Former)National Geophysical Research Institute, Hyderabad, A.P., India

India has the world's 2nd largest population and is an emerging economy with GDP growth of 6-7% per year and increasing annual energy demand of ~5%. The energy scenario in India, as it is in the rest of the world, is primarily driven by conventional fuels, which may last at the most for another 200 years. Hence, there is an urgent need for exploring and exploiting unconventional fossil fuels such as oil shale, shale and tight gas, coal-bed methane, underground coal gas, and gas hydrates. Because of potential constraints on the energy sector due to carbon management regulation, the cost of producing energy from fossil fuels may increase by 30-40% in the near future. The development of unconventional fossil fuel resources and carbon management becoming a serious issue for energy production has made the development of clean energy alternatives an area of high research intensity. While the advanced economies (particularly the U.S., Europe, Australia, Russia, and Japan) have made large investments into carbon management and clean fossil fuel energy research centers, India has yet to develop and implement major initiatives in this area. A plan for the establishment of Indian institutes for carbon management and unconventional fossil energy research to meet the immediate need for development of technological acumen as well as to facilitate international collaborations and public/private partnerships will be presented and discussed. A viable mechanism for funding these research centers will also be described.