

Title:**India's Energy Future and Carbon Management****Abstract:** (Your abstract must use 10pt Arial font and must not be longer than this box)

The energy scenario in India is driven by coal, oil & gas, hydroelectric, nuclear and renewable resources. Coal, the most important & abundant fossil fuel in India, accounts for 55% of India's energy need, with ~75% of it consumed in the power sector. 35% of energy requirements are met by petroleum products, 8% by hydroelectric and the remainder by nuclear and other resources. India's energy requirements are expected to grow at 5-6 %/yr to sustain GDP growth of ~ 8%. To meet the challenges of India's energy outlook, R&D initiatives for exploitation of alternate source of fuels (oil shale, gas hydrates and coal bed methane) and carbon capture & storage have been started. India is the third largest producer of coal and present estimates of coal reserves are 247.85 billion tons with 99% of total reserves in sedimentary rocks of Gondwana formations of peninsular India and ~1% in Tertiary formations of Northeast India. Oil shales are one unconventional alternate energy resource that may supplement declining conventional hydrocarbon production. These are fine grained sedimentary rocks with relatively high organic content from which significant quantities of shale oil and combustible gas can be extracted. Similar rocks, with most of their oil generating potential preserved, occur interbedded with the Tertiary coal in Northeast India, mostly in the region called the belt of Schuppen. The estimated in-place oil reserve of these carbonaceous shales is greater than 15 billion tons. Oil from carbonaceous shale is produced by retorting, an energy intensive process in which the rock is heated to 450-550°C in the absence of oxygen. However, pyrolysis of kerogen and the decomposition of carbonates in oil shale may evolve significant amount of CO₂ during oil production. This could be a serious defect from the view point of global warming. Deep coal seams that are not commercially viable for coal production could be used for permanent underground storage of carbon dioxide (CO₂). An added benefit of storing CO₂ in this way is that additional useful methane will be displaced from the coal beds. CO₂ released from oil shales could also be used for Enhanced Oil Recovery in depleted oil fields of Northeast India. New R&D initiatives in India towards carbon management for sustainable energy future with special reference to alternate fuel resources will be presented and discussed.

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