

Coal Gasification: Clean Option for Energy

Today, major concern for the world, including India, in its pursuit for rapid development and growth is to harness clean source of energy for reducing over-dependence on the fossil fuels. The temporary respite for India in its oil import bill from declining crude oil prices to below \$45 per barrel is likely to be over, as the crude prices have already bounced back to \$60 per barrel and may stabilize anywhere between \$85 to 100 per barrel. On looking at the power scenario in the country, we find that out of around 2.5 lac Mega Watts of installed capacity, 60% is coal based. India needs to burn around 750 million tons of coal per annum to run all its coal fired thermal power plants at full capacity. Though, coal is one of most polluting sources of energy, yet, it is expected to continue to dominate capacity enhancement in the ensuing couple of decades. But, extracting coal in India is constrained by growing opposition to land acquisition for mining and stringent environmental laws. Use of coal in its present form in power generation is also not environmentally clean. Since Underground Coal Gasification (UCG) requires less surface area for operation than conventional coal mining and is more eco-friendly, it offers a cleaner process and also facilitates extracting of energy from even such deep and isolated coal and lignite deposits where mining is not techno-economically feasible. If UCG technology is perfected, to supplement the country's underground coal mining, it can help to address the problem of energy security with clean environment. It would facilitate development of sustainable energy-resources based on clean technologies, viz Coal Based Methane (CBM), Coal Mine Methane (CMM) and Underground Coal Gasification (UCG).

Indeed, coal gasification can help India and other major and fast growing economies, including even the US as well as China, to unlock the vast potential of coal reserves as a cleaner source of energy. Both surface and under the ground modes of gasification of coal have the potential to solve energy constraints, more cleanly than conventional methods. The coal gasification process can turn coal and coke into a synthesis gas called syngas, comprising a mixture of hydrogen and carbon monoxide which burns as cleanly as natural gas and can be used for generating power, or making chemicals or fertilizers. The bye-products of coal gasification are also highly useful as the fly ash is useful for cement industry, sulphur for fertilizer plants and chemical applications, and the slag as building material or for roads.

Efforts are underway to establish coal gasification start-ups for energy needs and fertilizer manufacturing. But, such endeavors are feeble and India is almost a decade behind China in coal gasification. Underground coal gasification (UCG) is considered a clean coal technology

and when used for electricity generation, UCG produces 25% less greenhouse gases (GHGs), 80% less nitrous oxides and 95% less oxides of sulphur per megawatt hour than traditional coal-fired power generation

Although India has much lower emission of GhGs on per capita basis vis a vis most industrialized countries including China, yet, in aggregate it is the fourth largest GHG emitting country in the world and has therefore, begun to face the heat in all climate conventions to contain GHGs. UCG can help us in containing growth in GHG emissions. Besides, if India reduces its dependence upon fuel import, it can better balance its trade and current accounts, besides bringing the fiscal deficit and price-rise under control. The way shale gas has helped US to revive growth and consolidate its currency by curbing trade and current account deficits, India can also replicate the same by embarking upon coal gasification in a big way. UCG also offers a potential way of extracting energy from deep seated coal deposits, which cannot be mined at present due to techno-economic constraints. The Coal India Limited has also now begun to offer two coal blocks to potential service providing partners, with a deal for profit sharing. Five Indian and three foreign companies have evinced their interest to do so. If Coal India prefers an Indian partner, with techno- nationalistic considerations to facilitate technology development at home. India would soon be at the fore-front in energy security. Looking towards proven coal reserves of 301.56 billion tonnes against an annual consumption of 0.75 billion tonnes per annum for our present day installed thermal power generation capacity, India should embark upon coal gasification in a big way with focus upon participation of indigenous players for techno-nationalistic considerations to attain self-dependence in energy.

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