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ENERGY PLANNING AND ECONOMIC GROWTH IN CHINA AND INDIA: A COMPARATIVE ANALYSIS OF RECENT DEVELOPMENTS

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China and India have distinctly different economic systems -- the former follows a socialistic economic model lately opening up to westernized or capitalistic ideas such as competition, while the latter, a mixed economy consisting of both public and private sector industries liberalizing during the last decade -- but they are at a comparable level of industrialization and economic development, with India trying to catch up and surpass China's rapid growth, specially in the manufacturing sector. India, with limited domestic petroleum resource and a large population yet to cross a threshold level of per capita energy consumption, is undergoing increasing strains on its limited, poorly maintained but rapidly growing physical infrastructure, so vital for the optimal functioning of the increasingly global supply chain for products and services. China is more generously endowed with petroleum, coal and hydro energy resources, but there is strong evidence now that its industrial performance in future will be heavily constrained by the shortage of energy. Both India and China are trying to enter into long term petroleum exploration and supply contracts around the world, especially in the developing countries in Africa, Asia and Latin America. Comparative assessment of efficiency in energy use in major industrial sectors between India and China, the objective of this paper, would be useful in our understanding of the constraints to rapid industrialization and economic growth in these two countries and their role in reducing the emission of greenhouse gases responsible for global climate change.

During the last 10-15 years China has been opening up its economy to westernized or capitalistic ideas such as competition and incentive programs and at the same time modernizing its technology base through direct investment by multi-national corporations. There is also a paradigm shift in India since 1985 heralding economic liberalization and privatization of the public sector industries which culminated in 1991 in economic liberalization and opening up of the economy to foreign direct investment. But in both these countries the energy production and distribution sectors are still mostly owned and controlled by the government and it is too early to speculate whether these industries will undergo any basis changes in their ownership structure and operating policy. A new electricity act has been adopted in India and in the new regulatory structure, the private sector involvement has been allowed in the electricity generation and distribution sectors. Coal and petroleum based industries are still under government ownership. Similar changes have also taken place in China.

Indian energy planners have expressed much concern at the high energy intensity of the Indian economy and the chronic shortages of energy, especially electricity. Yet the Chinese economy consumes more than two-and-a-half times of energy when compared to India per unit of GNP. Per capita energy consumption in China (kgoe1094) is more than twice that in India (kgoe520), which is partly explained by the higher per capita GDP in China (\$ 1470) when compared to India (\$640). Are there inherent reasons in the form of industrial structure, scale and level of technology adoption, and the pricing and organization of the energy production and distribution system in China and India which are responsible for this anomaly? Do the Indian economy and the energy sectors share the same inefficiencies

which might explain the stagnation and low productivity of the basic and energy incentive industries such as steel, electricity, non-ferrous metals, and fertilizers, or there are other reasons for their poor performance? Recently, steel, non-ferrous metals, and automobile industry in India have vindicated themselves by acquiring some of their major competitors in the international market.

In this paper, a comparison of energy sector planning and economic growth strategies in these two traditional yet rapidly changing societies is attempted based on recent economic planning and energy policy documents and statistical information available from these countries. The energy intensity of major industrial sectors in these countries will be compared to account for differences due to the scale and level of technology applied. The alternative energy sector development strategies in these two countries related to coal, petroleum, electricity and renewable energy sectors will be also analyzed to determine their role in supporting rapid (double-digit) economic growth expected in the two economies, and the sustainability of such growth over a long period to allow a smooth transition to a world where global climate change has been contained.