

China: Clean and Efficient Technologies

Overview of Non-Renewable Resources 2010 Update



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INTRODUCTION

This report focuses on China's traditional, non-renewable energy sectors - *coal, oil, and nuclear power*, which together account for about 90% of China's energy mix. It analyzes current technology levels, penetration of *clean¹ and efficient technologies* specific to the three sectors, as well as potential opportunities for foreign companies. This report does not include the renewable energy sectors (e.g. wind, hydro, biofuels etc.), which may be covered in a separate report.

All data and figures in this report are current through the end of 2009.

EXECUTIVE SUMMARY

Energy efficiency and pollution. China's rapid economic growth has been accompanied by widespread pollution and environmental degradation. This, combined with limited energy resources and inefficient use of energy, has caused the central government to make *clean technologies* and *energy efficiency* a strategic priority starting from 2005. In the 11th Five-Year Plan (2005-2010), the government has set the targets of reducing energy intensity² per unit of GDP by 20% and reducing emissions for major pollutants (e.g. carbon dioxide and sulfur dioxides) by 10%. To achieve these goals, the government is continuously drafting and implementing laws in all energy sectors.

Coal sector. Coal plays an integral part in the Chinese economy, accounting for 70% of the energy mix. As such, improving cleanliness of coal extraction and combustion is critical to reducing overall emissions. Clean/energy-efficient products that are needed in this sector include: *coal beneficiation products, Coal Mine Methane extraction technologies, gas turbines, Circulating Fluidized Bed boilers, pollution control technologies* such as *desulfurization technologies*, and *coal conversion technologies* such as *advanced pulverized coal gasifiers*.

¹ There is as yet no universal definition for the term "clean technology". In this report, *clean technologies* are defined as technologies that, either directly or indirectly 1) optimize the use of earth's finite fossil fuels while 2) significantly reducing environmental impacts and 3) are economically competitive. This report only considers clean or efficiency-increasing technologies specific to the coal, oil, and nuclear sectors.

² Energy intensity is the quantity of energy required per unit of output – e.g. per unit of GDP. A reduction in energy intensity means that less energy is being used to produce goods.

Oil sector. Oil accounts for about 19% of China's energy mix. There is a strong government focus on using more efficient technologies so as to reduce reliance on imports, which supply almost half of China's oil needs. In recent years, an increasing proportion of imported oil is heavy crude oil, as opposed to China's domestic light crude oil. This has resulted in ongoing upgrading and expansion of refineries and petrochemical plants to deal with this more complex and more polluting form of oil. Processes for which foreign technology is needed are: *heavy crude oil recovery and refining, deepwater exploration and recovery, and petrochemical refining.*

Nuclear sector. The government is actively promoting the construction of nuclear power plants as it is seen as a clean and efficient energy source for China's densely populated East coast (currently it only accounts for 0.8% of the energy mix, but government targets are for nuclear to account for 6% by 2020). Large multinationals already present in China dominate the sector. Technologies that are needed include *steam generators, main circulating pumps, monitoring systems, pressurizers, and valves.*

Best prospects and market access. The best opportunities are in areas where domestic technology is inadequate and foreign technology can significantly contribute to increased cleanliness and efficiency. Nevertheless, the government encourages prospective buyers (such as power plants) to purchase domestically manufactured or assembled equipment wherever possible. Besides competition from domestically manufactured products, new entrants also face strong competition from other foreign importers that have a presence in China. The majority of foreign companies active in the market are already manufacturing here, or if not, they have at least a sales/technical center or office in China.

