

How to adopt clean coal technology

CONTINUED FROM PAGE 33

For example, in the power plants, if electrostatic smoke precipitators (ESP) are used, it would remove particulates (suspended particulate matters, mercury) by charging particles with an electrical field and then capturing them on collection plates. Wet scrubbers, or flue-gas desulphurisation systems, remove sulphur dioxide by spraying flue-gas with limestone and water. On the other hand, Low-NOx (nitrogen oxide) burners reduce the creation of nitrogen oxides by restricting oxygen and manipulating the combustion process. The Ultra Super Critical Coal fired power generation technology, if adopted, will require less coal consumption per megawatt-hour resulting in lower emissions, higher efficiency and lower fuel cost per unit of power generation. Low sulphur coal is a primary safeguard against SOx emission. Therefore, using low sulphur, low ash coal will significantly reduce potential hazards for coal fired power generation.

Coal gasification avoids burning coal altogether. Using IGCC technology involves integrated gasification combined cycle (IGCC) systems, where steam and hot pressurised air or oxygen combine with coal forces carbon molecules apart producing 'syngas', a mixture of carbon monoxide and hydrogen. Later, the syngas is burned in a gas turbine to produce electricity.

Nowadays, CCS technology is not an experimental project anymore. Many energy and environment researchers believe that the CCS is a technology that can significantly help avoid global warming by reducing greenhouse gas emission from fossil fuel burning. The CCS, if adopted in the coal burning industries, can separate CO2 and pump it underground where it can be stored for thousands of years. China has already undertaken a dozen of big CCS projects. China, the largest consumer of

coal in the world that emits one quarter of the world's greenhouse gases, continues to plan to double its coal fired power plants by 2040.

Continuing dependence on coal is not only the reality for China alone. The European countries famous for their environmental track records have been unable to deny coal use. Germany, the leading renewable energy campaigner, still relies on coal for half of its power. Poland generates 96 percent of its electricity from coal. South Africa, India, Indonesia, Israel, Australia, Japan, South Korea and Taiwan are ever more dependent on coal for power generation. Some European countries may have lesser share of coal based power generation at home but they buy power from neighbours who have excess coal fired power. Coal share for

electricity generation in the US has gone down from 49 percent in 2007 to 39 percent at present largely because of cheaper natural gas (including gas from shale fracking sources) availability at home. At the same time, the US has significantly increased its coal export to Asian markets during this period. Donald Trump's presidency has vowed domestic coal industry revival in the US. It is expected that the Trump administration will take measures to encourage coal industry development including big investments for clean coal development technology research. According to Global CCS institute, there are 22 large scale CCS projects globally of which 16 are in operation and 4 are under construction. Most of the operational CCS projects are in the US. In October 2014 the world's first clean coal

commercial power plant (the Boundary Dam project, which uses lignite as fuel, producing 115 MW power from Unit 3, was commissioned with other existing power units in 2013 along with CCS facilities) opened in Canada that can capture 90 percent CO2 and 100 percent SOx. Building this plant involved the investment of USD 1.3 billion with USD 240 million government subsidies. International Energy Agency published in 2009 a roadmap for the installation of 100 large scale CCS projects by 2020 but downgraded that target to 30 projects. Although proven, technologically complex CCS needs further research to make it economically attractive. Present technology of CCS works but it consumes almost 20 percent energy that the plant is supposed to produce for consumers. The present estimates suggest

that power plants with CCS cost 75 percent more than the plant without them. CCS also involves huge infrastructure to transport and store CO2. Therefore, without government subsidies installation and making CCS operational will be a big challenge.

While Bangladesh has been heading towards increasing its share for coal fired power generation, it should strike a balance between technology choice and supplying commercial energy at an affordable cost. Also, both supply security and low investment in emission reduction for coal use can be attained through domestic low sulphur, low ash and high calorie coal, if mined and used in a commercial scale.

The writer is a mining engineer. He writes on energy and environmental issues.



SOURCE: WWW.SEEKER.COM

RMG

Lifeline to Bangladesh Economy

- Accounts for **81%** of total export earnings
- Directly employs **4.4** million
- Contributes **16%** to GDP
- Indirectly supports livelihoods of **40** million
- Helped increase female literacy rate
- Reduced poverty rate

MADE IN BANGLADESH WITH PRIDE