Editorial

Drying is necessarily a very energy-intensive operation. With escalating energy costs it will be increasingly important to come up with better drying technologies that are not only energy-efficient but also provide necessary quality of dried product and also be eco-friendly simultaneously. It turns out that often these are conflicting requirements. Using cheaper and more abundant fuel is one way o cut energy costs, if not energy usage, for thermal drying. A quick search of relevant literature quickly dispels the validity of such an assumption. Let us consider the case of *brown* coal- the poor cousin of *black* coal, which is well-regarded for its nice qualities including high calorific value and especially low moisture content and lack of need to dry it prior to use.

High water content is the main reason why greenhouse gas emissions are higher for brown coal than for black coal combustion. Indeed, about 37 % more carbon dioxide is emitted per unit of power generated using brown coal compared to black coal. Water must be heated and evaporated prior to combustion; brown coal may contain as much as 2 kg water per kg of dry solid.

High moisture content seems like a simple matter to treat. It turns out that to reduce greenhouse gas emissions when firing brown coal requires very high-tech new technology such as the advanced pressured fluidized bed combustion technology which calls for integration of coal drying, partial gasification, gas cleaning, gas and steam turbines etc. According to a recent study in Australia, conventional power station technology firing brown coal generates about 1250 kg of CO_2 per MWh of power generated. For black coal the comparable figure is 30 per cent lower. With best possible technology brown coal-fired stations may reduce emissions by 40 per cent but these are still high relative to natural gas cogeneration plant (400 kg/e-MWh) and far-removed from 20 kg/e-MWh for renewable energy sources.

Clearly sustainable energy sources are the best but still unlikely to be competitive with conventional natural gas-fired power plants. One of the most abundant of fossil fuels viz. brown coal, however, must have a future as the energy-hungry world demand grows. Drying of coal and other biomass must become an increasingly important technological need around the world. Advances in this area will pay rich dividends for those who come up with unique and highly efficient as well as eco-friendly drying technologies for these applications.

A long-neglected area of R&D now must be revived and given fresh impetus. The US government has already identified the need to utilize coal as part of its long term energy policy. Other countries will follow suit too. If electrical power generators have to pay for the greenhouse gas emissions, improvement in drying efficiency becomes even more crucially important. According to one estimate this will add at least 3 cents per kWh for brown coal-fired stations, about 2 cents/kWh for black coal and

negligible additional costs for renewable energy sources. Thus, although cheapest in terms of fuel cost, brown coal can be more expensive than other fossil fuels if the emissions are taken into account. All the more reason to combine drying with environmental considerations!

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