

TRENDS AND CHALLENGES IN GAS CLEANING

Gernot Krammer

Institute of Process and Particle Technology, Graz, University of Technology,
Petersgasse 116, 8010 Graz, Austria

ABSTRACT

Gas cleaning market is strongly linked with industrial production and particularly fossil fuel combustion. A shift from oil for transportation and coal for energy production to alternative means has a strong impact on the gas cleaning market. Since gas cleaning measures are often regarded as a nuisance or unavoidable necessity, the driver for gas cleaning is mostly through authorities setting emission limits. The use of fossil fuels comes with the formation of CO₂ which contributes to global warming. While technology for CO₂ capture (CCS) is already available, it comes with the penalty of high costs and yet basically unresolved product handling. This situation supports the trend towards alternative energy production concepts to satisfy the increasing need for energy. Thus a decoupling of economic growth and coal usage can be expected in the coming years that will render the gas cleaning market stagnant or even declining though in part supported by the still huge market for retrofit. A market without significant growth potential and already ripe technologies at hand will pursue research and development more on an incremental basis rather than disruptively: Technology that is cheap, and easy to install and operate will be favored over ultimate cleaning and high costs. For small biomass combustion units the particle removal is not solved satisfyingly to meet the mostly unskilled operators' needs. Primary measures have already contributed to some improvements but additional filter systems will be needed. To move from a nuisance to a valued process operation, the product from gas cleaning needs to become valuable rather than a landfill product. In other words, end-of-pipe technology ought to be phased out by at least producing construction material, fertilizer, or an intermediate product as a valued raw material for metals and other materials. New materials need to be employed or tailored for gas cleaning operation, such as functionalized fibers for particle removal and gas cleaning, surfaces that allow basically passive gas cleaning in in-door and out-door application. Of course, fine dust emissions particularly in densely populated regions as well as rising global CO₂ concentrations need to be tackled also on the immission side.

KEYWORDS

Gas Cleaning, Filtration, Emissions, Coal