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Abatement solution for coal-fired power pollution

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Engineering, procurement and construction management (EPCM) are the South African representatives and suppliers of new Sulfacid flue gas desulphurisation (FGD) technology used to treat coal prior to the coal-fired process to reduce air pollution.

Sulfacid FGD technology, developed by German company Carbon Process & Plant Engineering (CPPE), is not reliant on limestone to remove oxides from sulphur, which is more practical in a country such as South Africa, where limestone is scarce.

EPCM senior project manager Dr **Gunther Hasse**, EPCM CEO **Itumeleng Kgomo** and CPPE CEO Dr **Alian Strickroth** argue that Sulfacid technology is the next step in unlocking the South African economy and ensuring a healthier population and environment.

This can be accomplished “by changing the nature and narrative of the coal-power industry in South Africa,” remarks Hasse.

Coal is used to generate more than three quarters of South Africa’s electricity, yet coal-fired power generation is responsible for most sulphur dioxide (SO₂) emissions into the atmosphere. This gas is

toxic and, therefore, detrimental to the health of community members who live in close proximity to coal-fired plants, says Strickroth.

The World Health Organisation has linked the inhalation of SO₂ with adverse health problems such as cancer and lung disease. Kgomo notes that, despite South African legislation to limit coal-fired plants' SO₂ concentrations, multiple transgressions of the atmospheric emission licence limits are being reported by the Department of Environment, Forestry and Fisheries.

The concept of the technology is derived from limestone-based wet flue gas desulphurisation, which also removes oxides of sulphur from flue gases, but Sulfacid FGD technology does not require alkaline adsorbents, such as limestone, to adsorb sulphur oxides.

“Sulfacid FGD technology is the abatement solution for the pollution coal-fired power generation industries are creating,” Strickroth tells *Engineering News*.

Eskom is implementing traditional limestone-based wet flue gas desulphurisation (WFGD) technology at its Kusile coal-fired power station, which is under construction, in Mpumalanga, and is planning to retrofit the same technology at its Medupi power station, in Limpopo.

Kgomo draws attention to the issue that WFGD requires large volumes of limestone, which is scarce, costly and of poor quality in South Africa

Sulfacid FGD technology converts sulphur oxides into sulphuric acid by adsorption in cold wet catalytic-process on a fixed bed of activated carbon, requiring only water and air, which Strickroth

reiterates would prove to be the superior abatement solution over the use of limestone.

“The solution of pollution is dilution,” he enthuses.

There is an increasing resistance against coal-generated power and an increasing public demand for renewable energy; however, Hasse who wrote the academic article *Next-generation, affordable SO₂ abatement for coal-fired power generation*, argues “Coal is not the opposition of renewable energy or Hydrogen.

The sulphuric acid produced when using Sulfacid FGD technology will stimulate the economy, says Kgomo, as sulphuric acid is used in, for example, the manufacturing of fertilizers, and petroleum refining and metal mining, consequently promoting the economic growth points in a variety of industries.

The process also produces 50% less disposable wastewater and demonstrates that coal no longer has to be “an enemy to the environment and contribute heavily to climate change”.

Expanding the function of a coal-fired power plant beyond electricity generation and steam production to the on-site manufacturing of chemical commodities is one of the plausible functional ways of unlocking South Africa’s economy, concludes Kgomo. 

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