Title: Trace Metals Analysis of Lignite Coal from Kosovo and Air Pollution-Related Health Risk



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More than 6600 coal-fired power plants serve an estimated five billion people globally and contribute 46% of annual CO_2 emissions. Gases and particulate matter from coal combustion are harmful to humans and often contain toxic trace metals. The decades-old Kosovo power stations, Europe's largest point source of air pollution, generate 98% of Kosovo's electricity and are due for replacement. Kosovo will rely on investment from external donors to replace these plants. Here, we examine non-CO_2 emissions and health impacts by using inductively coupled plasma mass spectrometry (ICP-MS) to analyze trace metal content in lignite coal from Obilic, Kosovo. We find significant trace metal content normalized per kWh of final electricity delivered: As (22.3 ± 1.7), Cr (44.1 ± 3.5), Hg (0.08 ± 0.010), and Ni (19.7 ± 1.7) mg/kWh$_e$. These metals pose health hazards that persist even with improved grid efficiency. We then explore the air-pollution-related risk associated with several alternative energy development pathways using the European Commission's External Costs of Energy (ExternE) modeling program. Our analysis estimates that Kosovo could avoid 2300 premature deaths by 2030 with investments in energy efficiency and solar photovoltaic energy backed up by natural gas. Energy policy decisions should account for all associated health risks, as should multilateral development banks before guaranteeing loans on new electricity projects.

Biography

Raj Fadadu graduated from the University of California, Berkeley in 2018, where he studied Public Health and Conservation & Resource Studies. During college, he was a Research Scholar for the Institute of International Studies and research assistant for the Berkeley Center for Green Chemistry, Nobel Laureate Randy Schekman, and UCSF Benioff Children's Hospital Oakland. He is currently a MSc/MD candidate in the Berkeley - UCSF Joint Medical Program and aims to conduct research regarding the impact of environmental factors on dermatological outcomes.

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