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SOCIAL COST OF FOSSIL-BASED ELECTRICITY GENERATION PLANTS IN IRAN

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Abstract

Energy costs not included in consumer utility invoices include human health problems triggered by air pollution from burning fossil fuels, and environmental degradation caused by global warming, acid rain, and water pollution. Such costs, peripheral to energy pricing, are called externalities because electricity producers and users do not pay for them directly. Society as a whole must pay. This pricing system masks the true costs of fossil-based electricity generation plants, resulting in overproduction and overconsumption of electricity. This leads to additional environmental damages, including those to human health. This study analyzes and evaluates the internalization of health effects and other environmental damages of these emissions. Results from several valuation studies are combined in a structured, data-driven Meta-analysis to estimate one common benefit function for Iran. Power plants in Tehran, Rasht, Bandar Abbas, Esfahan, and Yazd were selected as best representing the ecological and population characteristics of Iran. Marginal external costs of fossil-based electricity generation plants in Iran are roughly 1.9 to 8.99 cents per kWh. Marginal social costs are estimated at 6.87 to 11.25 cents for steam power plants, 7.37 to 12.75 cents for natural gas power plants, and 5.03 to 7.82 cents for combined cycle power plants (US\$). Variables that could affect the application of findings are categorized. The true costs of fossil-based electricity generation plants and the resulting damage to human health, the environment, and the economy encourage substituting renewable energy sources.

Key words: external cost, Iran, power plant, social cost, value transfer

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