

Analysis of External Cost of Health Impact for Taiwan Power Plants

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ABSTRACT

The CASES program originated from Externalities of Energy (ExternE) plan highlights the thermal power generation dominates the main contribution of the external cost of energy. This article focuses on the calculation of health impact external costs caused by the thermal power generation using the Impact Pathway Approach (IPA). The target pollutants emission from the power station consist of PM₁₀, SO₂, NO_x, Dioxin, Cd, As, Cr(VI) and Ni, with concerned health-impact categories of long-term mortality, restricted activity days, chronic bronchitis, bronchodilator, lower respiratory tract disease, congestive heart failure, cardiovascular disease(hospitalization), respiratory system(hospitalization) and carcinogenicity. The result of health impact assessment demonstrates the priority of unit external cost as oil-fired power generation, coal-fired power generation and gas-fired power generation in sequence. In terms of air pollutants, the main contributor of external cost of coal-fired power generation and gas-fired power generation is NO_x, while SO₂ makes the largest contribution of external cost in the oil-fired power generation. On the contrary, dioxin and heavy metals make less contribution of external cost in the thermal power generation. In addition, the comparison of unit external cost of 2014 generation baseline with 2025 context simulation for the different power generators, this paper illustrates that renewing gas-fired power generators facilitates the reduction of unit external cost effectively.

Keywords: external cost, health impact, thermal power generation, Impact Pathway Approach

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