Energies, vol.13, no.6, pp.1426-1-1426-20, March, 2020.

Considering local air pollution in the benefit assessment and cost allocation of cross border transmission projects

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Abstract-

Developing a regional power system to achieve a high level of integration of national systems requires sufficient development of the regional transmission grid. This is possible only with appropriate schemes for the complete cost-benefit analyses, and cost allocation of these transmission investments, which plays a critical role in the selection of the most efficient network investment and the proper assignment of their cost to the national systems. Network reinforcements affect the operation of power systems and, therefore, the externalities of power generation. This paper examines the impacts of integrating local air pollution damage from power production within the benefit assessment and cost allocation of transmission investments. The paper describes the methodology followed and illustrates its application in a real-life case study where a simplified version of a European network is considered. Within this case study, we have assessed the impact of considering the reduction in air pollution damage achieved through a particular HVDC project between France and Spain on the benefits, and benefit-driven cost allocation, computed for this project. In this case study, local pollution related benefits are a relevant fraction of the overall benefits of the considered transmission project. However, considering the local air pollution benefits of the project does not affect the net positive benefits of each country significantly, resulting in a limited change in the cost allocation of the project.

Index Terms- electricity transmission; benefit assessment; cost allocation; health damages; local air pollution

Citation:
Sun, D.; Olmos, L.; Rivier, M. "Considering local air pollution in the benefit assessment and cost allocation of cross border transmission projects", Energies,

vol.13, no.6, pp.1426-1-1426-20, March, 2020.