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Estimating the Cost of Future Global Energy Supply

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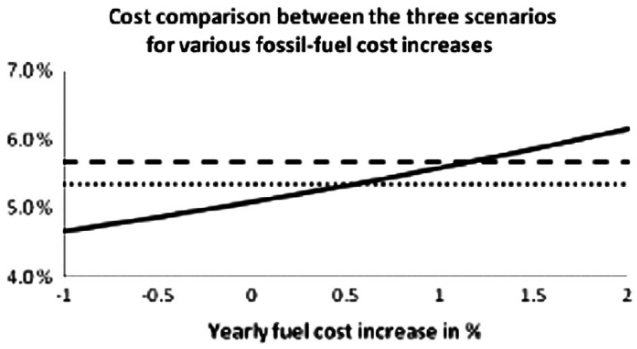
In a recent work [1] we consider the relative costs for global energy supply. The approach chosen relies on a comparative static exercise of estimating the cost of three energy scenarios representing different energy futures. The first scenario (business as usual) predicts the future energy-mix based on the energy plans held by major countries. In the second scenario (renewable energy) as much of the primary energy supply as possible is replaced by renewable energy by 2050. The cost of the renewable energy generating technologies and their theoretical potential are taken into account in order to create a plausible scenario. The third scenario (nuclear) is based on the use of nuclear and renewable energy to replace fossil-fuels by 2050. Endogenous learning rates for each technology are predicted based on considerations related to each energy source. It results from the analysis that going fully renewable would cost between 0.4 and 1.5% of the global cumulated GDP over the period 2009-2050 compared to a business as usual strategy. However, externalities for example related to energy storage, land use and carbon emission has not been included. The figure below shows a cost comparison between the three scenarios.



This figure compare the costs of a nuclear (dotted curve), renewable (broken curves) and fossil (full curve) scenarios as a "function" of fossil fuel price variation. The figure is taken from [1].

Keywords: Energy costs, resources

[1] P. A. Narbel and J. P. Hansen, *Renewable and Sustainable Energy Reviews*, **34,** 91 (2014)

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