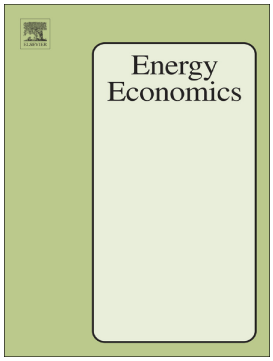

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Economic growth and greenhouse gases in Europe: a non-radial multi-sector nonparametric production-frontier analysis*

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Abstract

Energy use has become a topical issue when assessing the economic growth of countries. Indeed, energy use gives rise to greenhouse gas emissions, which are undesirable side-products of economic growth. In this paper, we present a non-radial multi-sector nonparametric production-frontier approach specially tailored for addressing this issue. Our approach is consistent with previous works and in line with recent policy and regulation implementations. We also make use of second-stage country- and sector-level regression analyses to investigate how the efficiency results are affected by exogenous factors. We apply our method to the case of 10 sectors in 19 European countries. Our results highlight the need for policy and regulation implementations for each sector individually. Indeed, our efficiency and regression results show that there exists a sector heterogeneity and that the room for increasing economic growth/reducing greenhouse gas emissions is clearly different for each sector in every country. Finally, our results highlight two sectors: 1) Agriculture and 2) Electricity, Gas and Water, and that the Europe 2020 objectives are well set since they target the most inefficient countries/sectors.

Keywords: Economic growth; energy; greenhouse gases; production-frontier; multi-sector, Europe.

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