

ERSA Policy Brief

October 2019

The relationship between renewable energy and retail electricity prices: Panel evidence from OECD countries

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The centrality of electricity to everyday life is indisputable, and the price thereof can have significant implications. Previous literature is inconclusive over the effect of the renewable energy share in the energy mix on retail electricity price as country-specific regulatory policy has a significant impact on retail electricity prices.

The purpose of this study is to examine the effect of the continuously increasing share of Renewable Energy Sources (RES) in the energy mix on electricity prices in 34 OECD countries for 1997 to 2015, considering the change in electricity market structure. Our study extends on the research done by Moreno, López and García-Álvarez (2012) broadening the country group from European Union (EU) countries to include OECD countries as only EU countries fall under the emission trading scheme (EU- ETS). Extending the time period from 1997 to 2007 to include the most recent time period that was characterized by the financial crisis and its aftermath, allows us to view the subsequent constraints on investment as well as the decrease in the cost of Renewable Energy technologies.

The results show that the influence of the renewable energy share in the energy mix to retail electricity prices is positive and statistically significant. The two-way fixed effects estimation results suggest that an increase in the share of renewable energy led to an increase in retail electricity prices while an increase in electricity market concentration to a decrease in electricity prices, *ceteris paribus*, confirming a priori expectations. The current increase of RES-E on electricity prices is marginal and is largely due “RES-E support schemes financed by the electricity market” (Moreno et al., 2012). IRENA (2018) projected that renewable energy sources would be price competitive with fossil fuels within the next two years, we suspect that with future data the relationship will eventually be negative. Encouraging private RES-E support schemes could effectively mitigating the increases in retail electricity prices bringing about this relationship sooner. Emissions trading schemes by the energy industries only hold a significant effect for EU countries. Most countries’ energy dependency changed over the period, declining in both energy exports and imports (Dedeoğlu and Kaya, 2013) and holds no significant effects for retail electricity prices in this analysis. Majority of these findings support the results of Moreno et al (2018).