Electricity price more volatile during uncertainty periods in renewable energy regulation

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Three members of the BiRTE research group at the UPV/EHU's Faculty

of Economics and Business have published an analysis of the evolution in electricity prices during a 16-year period (2002 to 2017); the article appears in *Energy Economics*, a journal positioned in the first decile in the field of Economics.

The study set out to see how various factors linked to renewable energy affect the price of electricity. As a starting point, "the incorporating of this energy is known to exert a dual effect: firstly, it lowers the price, in other words, the energy that is transacted is cheaper, because renewable energy has a unit cost of production very close to zero. Secondly, however, it increases price volatility, fluctuations that occur in the price, because as it is an intermittent energy, availability and therefore generation cannot always be guaranteed," explained Aitor Ciarreta-Antuñano, lead researcher in the BiRTE research group and co-author of this publication.

However, the authors wanted to go one step further in the analysis of volatility and incorporate into the analysis the influence exerted by the regulatory framework, the policies that govern the setting up of renewable energy plants and the grants used to provide them with incentives. "The regulatory framework is crucial in the electricity market and, what is more, is greatly influenced by European directives. We wanted to see whether the periods in which there was uncertainty in this aspect have influenced the volatility of the price of electricity," said Ciarreta. To do this "we built a statistical model with the data on the electricity prices of the Spanish market that included the data on a 16-year period," to be able to see on the basis of which indicators volatility varied.

Increased volatility associated with regulatory uncertainty

The statistical analysis of the data revealed "a grouping or cluster of volatility in the specific period in which there was uncertainty in the regulatory framework in Spain." In the period analysed, from 2002 to 2017, the researcher highlights the differentiation of "phases in which there is a very stable regulatory framework, such as that which occurred between 2007 and 2012, when direct grants were awarded to generate renewable electrical power. However, in 2012, there was a change in the regulations which did not settle down until 2014 and these two years of regulatory uncertainty coincide with the period that saw the highest level of volatility in electricity prices, which has nothing to do with the fact that renewable energies lead to a certain volatility owing to their intermittent nature. Economic players are disrupted most by the uncertainty associated with regulatory policies," stressed the doctor of Economics.

The period of regulatory uncertainty described was caused by various factors, as Ciarreta described. "From 2010 onwards the economic crisis also reached the electricity market and this crisis was accentuated by the high deficit growth occurring during the previous period, in which the degree of funding of renewables was regulated so that it ended up accounting for nearly 3% of GDP. The European Union was also putting pressure on Spain to control that deficit."

Faced with this situation, the government tried to put together a new system designed to promote renewable energies because Spain also had to meet the aims on reducing CO_2 emissions. It took the country two years to establish the new system and when it was implemented uncertainty returned to the markets. "The rate of return offered by the new regulatory system was lower, and one may more or less agree with what had been established, but we can see that this did not affect the volatility of the price of electricity, uncertainty affects it much more. Investors derive more security from knowing what they have to comply with," said the researcher. And at the end of the day, citizens, too, are

affected, because most of us are paying rates that depend on the daily market price," he added.

The researcher believes that the results obtained in this analysis should serve "as a wake-up call for regulators, so that they do not adopt measures to change regulations hastily, and that regulation should be kept as stable as possible. And if they make any changes, they should allow the players to react in such a way that uncertainty is not incorporated in electricity markets."

More information: Aitor Ciarreta et al, Renewable energy regulation and structural breaks: An empirical analysis of Spanish electricity price volatility, *Energy Economics* (2020). DOI: 10.1016/j.eneco.2020.104749

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