On the impact of nuclear power generation on electricity spot prices : A French Perspective

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Abstract :

The soaring of electricity prices in Europe, during 2021-2023 period, was mainly driven by two fundamental determinants : natural gaz supply from Russia, and nuclear power shortage as a record number of France's 56 nuclear reactors had gone offline for overdue maintenance and checks related to corrosion issues.

In this paper, we explore the impact of both nuclear plants power generation and imported gas prices in Europe (TTF) on electricity spot in France over the period 2021-2023, taking into account the electricity consumption dynamics, renewables (solar and wind) generation and and cross-border exchange as control variables.

Our empirical results show that there is a negative relationship between nuclear electricity generation and power spot prices. The nuclear supply squeeze induced an historical jump in electricity spot prices in France. Moreover, the soating of gas prices,(TTF), as Russia had cut the volumes it sends to Europe after Ukraine's invasion, exacerbated the upward impact of nuclear generation on french electricity prices. Furthermore, there is a clear evidence that the surge in electricity prices in France was more largely due to nuclear supply squeeze than to Russian gas flows.

Keywords : Electricity prices, Nuclear power, Natural gas, Renewables

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