

# ***EMISSION TRADING OR LOWER ENERGY PRICES? RE-ASSESSING THE IMPACT OF THE GREENHOUSE GAS INITIATIVE ON THE ENERGY TRANSITION***

Daniel Gatscher, Technical University of Munich, Center for Energy Markets, +49 163 6654716, daniel.gatscher@tum.de  
Svetlana A. Ikonnikova, Technical University of Munich, +49 89 289 28820, svetlana.ikonnikova@tum.de

## **Overview**

Historically, the U.S. federal government leaves most of the decisions related to the climate agenda and carbon goals to the states. Thus, instead of relying on a country-level emission trading system (ETS), as the EU does with its ETS, the states are free to set their own goals and policies to support them. A notable exception to the individual approach has been a cooperative effort to implement the Regional Greenhouse Gas Initiative (RGGI) by several Eastern States of the U.S.. Announced as “cap-and-invest” program, RGGI has been set up to incentivize the switching to clean energy. With individual CO<sub>2</sub> budgets, the eleven participating states attempt to limit their emissions from power generation.

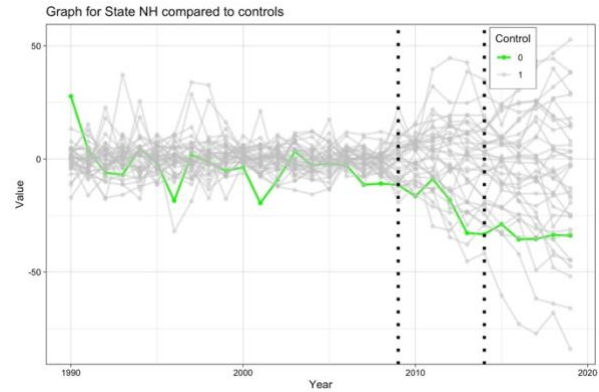
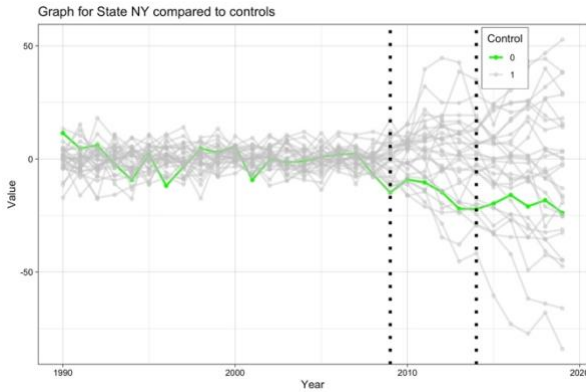
A decade after the introduction of the RGGI, data gave rise to an increasing number of studies assessing its efficiency. The common approach has been to compare the CO<sub>2</sub> emissions and fossil fuel usage between RGGI and non-RGGI states. While studies agree that RGGI serves its purpose, several issues have been raised. First, the limitations in the ability to account for the “shale revolution”: the growth in the natural gas supply and the sharp decline in the natural gas prices have coincided in time with the introduction of RGGI raising a question on to which extent the observed effect is induced by RGGI (Yan, 2021). Second, it was suggested that RGGI may have caused “carbon leakage” with the carbon intensive production outsourced to non-RGGI states affecting the observed CO<sub>2</sub> gap (Lee and Melstrom, 2018).

## **Methods**

The aim of our study is to address the raised issues. We develop a procedure enhancing the synthetic control method previously applied by Kim and Kim (2016) for RGGI analysis (Abadie and Gardeazabal, 2003). We implement the procedure to re-evaluate the previous results and report the changes. Considering the impact of the shale supply, we turn to the statistics on the production and import of unconventional natural gas by the states adjacent and remote from the RGGI, paying special attention to the growth of the Marcellus shale play located next to the RGGI states in the north-east of the U.S. and remote production in Texas and Louisiana. We build the counterfactuals for each RGGI-participating state testing the robustness of the previous results by including other the states from the Appalachian region, which may experience carbon leakage and the natural gas supply shock. We analyze the differences with those states using a different donor pool.

## **Results**

Our results imply that while the RGGI system indeed helped to reduce the CO<sub>2</sub> intensity of electricity production, in part the fuel shift should be attributed, as previously suspected, to the availability of cheap shale gas. We complement our analysis by computing the elasticity of interfuel substitution and its evolution over time for the different regions and find that states in the Marcellus play region exhibit a higher elasticity of substitution for coal and gas when compared to the remainder of the US states. Finally, we use the synthetic control and the elasticity model to project the response of Pennsylvania to joining the RGGI.



## Conclusions

In conclusion, we find that the implementation of the ETS by the RGGI, accompanied by the “shale revolution” are an ideal case for the application of the synthetic control method. Existing studies have not investigated the effect of coincidence of the two events. Thus, we suggest a new framework to quantify and separate the individual “treatment” effects. Using US state-level data, we create the counterfactuals in order to identify the regional extent of the effects and differentiate them. Still evolving, the methodology on the novel the synthetic control approach is finding its way into different branches of economics. Our study therefore calls for further investigation of energy related questions that take into account current developments in this method.

## References

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