

# The Impact of Renewable Energy Tax Incentives on Electricity Pricing in Texas

Mary Rudolph

pdamien  
3/31/23

## Abstract

*Background:* Texas has abundant sunshine, strong winds, and wide-open spaces—the perfect natural elements to entice renewable energy facilities to the state. However, Texas’s property taxes are the largest tax that energy businesses will face (Texas Taxpayers and Research Association, 2021), which could create a barrier to entry. To overcome this issue, business-friendly tax codes were created. Texas tax code Chapter 313 gives school districts the opportunity to provide significant benefits to companies. It does so by offering a 10-year limit, ranging from \$10m to \$100m, on the taxable value of a new, green energy project (Texas Taxpayers and Research Association, 2021)—a lucrative incentive for companies wanting to invest in wind and solar projects.

*Aims:* The preceding discussion leads to the following questions that are addressed in this thesis: (A) How have the number of tax-incentivized, active green energy facilities impacted the real-time, wholesale price of electricity (\$/MWh) in Texas? (B) By how much do prices decline as a result of increased wind/solar generation in the state? (C) Are the electricity price reductions from wind and solar generation similar?

*Analysis:* To answer the above queries, novel skew-t regression models were implemented on a large dataset, focusing on the North, Houston, and West regions of the Electricity Reliability Council of Texas (ERCOT), because these regions account for 80% of the state’s energy consumption. Analysis focused on the hours ending at 3am, 11am, and 4pm, due to ERCOT’s time-of-day pricing. Energy demand is generally low at 3am, while it increases during the day, peaking around 4pm to 6pm.

*Key Findings:* (A) Tax incentives that increase the number of active wind and solar facilities lead to a statistically significant ( $p < 0.0001$ ) reduction in wholesale electricity price (\$/MWh), ranging between 2.31% and 6.6% across ERCOT during different hours of the day. (B) For a 10% increase in tax-incentivized green energy generation, during a 24-hour period, there is a statistically significant ( $p < 0.0001$ ) reduction in the production cost (\$/MWh), ranging between 0.82% and 1.96%. (C) Electricity price reductions from solar are much lower than those from wind generation.