

# Wind Power Producers' Costs And Associated Market Regulations: The Source of Wind Power Producers' Market Power

Yang Yu<sup>d,f,\*</sup>

<sup>a</sup>*Department of Civil and Environmental Engineering, Stanford University*

<sup>b</sup>*Department of Economics, Stanford University*

<sup>c</sup>*473 Via Ortega, Room 245, Stanford, CA, 94305, USA*

---

## Abstract

In this paper, I build a two-stage-multiple-hour model to analyze wind power producers' (WPPs) ability to manipulate price (ATMP) and market-power strategies in a sequentially structured electricity market. By exploring WPPs' cost structures and the dynamics that prices respond to wind-energy generation, the analyses demonstrate that WPPs can have significant ATMPs even though their marginal fuel costs are zero. Actually, the bidding rule regulating wind energy, which is different from the bidding rule regulating other technologies, provide WPPs a high flexibility to exercise their market power. The bidding rule, which allows WPPs separately determine their hourly generation, provide WPPs a particular strategy of utilizing wind-energy fluctuation and conventional generators' ramp constraints. My empirical simulation, which is based on data from Texas in 2012, demonstrates that WPPs already have ability to manipulate price in more than 900 hours in 2012. In some hours, they can inflate price by around 25%.

---

---

\*Corresponding author

*Email address:* yangyu1@stanford.edu (Yang Yu)

*URL: Telephone number:* +1-650-(387)1451. (Yang Yu)