Overview
States in the Great Plains area are endowed with the most abundant onshore wind resources in the United States (NREL). Among other policy instruments, state governments have introduced property tax rebates and exemptions to facilitate the development and deployment of renewable energy. While a rich literature has assessed other state policies such as renewable portfolio standards, feed-in tariffs, net metering policy, empirical evidence on the effectiveness of property tax incentives is scarce. Most surprisingly, Hitaj (2013) finds that property tax credits has negative effects on added capacity at the state-level. Moreover, property tax is an important source of revenue for local governments: on average, local governments received 47% of their own-source general revenues from property taxes.

In this study, we examine property tax incentives as a policy instrument to stimulate wind development in eight states in the Great Plains: Colorado, Iowa, Kansas, Minnesota, North Dakota, Nebraska, South Dakota, and Wyoming. Our analysis focuses on estimating the effects of property tax incentives on wind turbine installation at the local level and the subsequent fiscal impact on state and local governments.

Data
We use GIS to construct a measure of local wind potential at the county-level using wind resources data from NREL. We obtained data on utility-scale wind turbine from USWTDB and aggregate the data to county-level to match with the wind resources data and local socioeconomic conditions to construct a panel of 590 counties from 2007 to 2016 for the empirical analysis. We also use data on property tax revenue collected from various state agencies and municipal governments for the analysis of local fiscal impacts.

Methods
We first develop a prediction model for the assessed value of wind turbines to estimate the effective tax rate and subsidies on wind power generation. We exploit time variation in policy adoption and spatial variation in wind resources to estimate the effects of property tax incentives on the installation of wind turbines. We explicitly control for state renewable energy portfolios and use state-specific trends to control for other concurrent policies at the state-level. Preliminary results suggest that state property tax exemptions, on average, increase installed capacity by approximately 600-700 Megawatts; this effect seem to diminish with higher wind potential. Based on the estimation, we derive the implied cost of subsidy on wind energy shared between state government and local governments.

Conclusions
The contributions of this study is threefold. First, we collect extensive data on the details of property tax incentives to support wind development and provide descriptive evidence on their evolution in recent years. Second, we empirically test whether property tax incentives affect wind development. Finally, we estimate the cost share of the effective subsidy to provide implications for the fiscal distribution among state and local governments.
Figure 1: The effects of property tax exemption on wind energy development

References