THE ECONOMIC IMPACTS OF Right of First Refusal (ROFR) Legislation

PELICAN INSTITUTE FOR PUBLIC POLICY

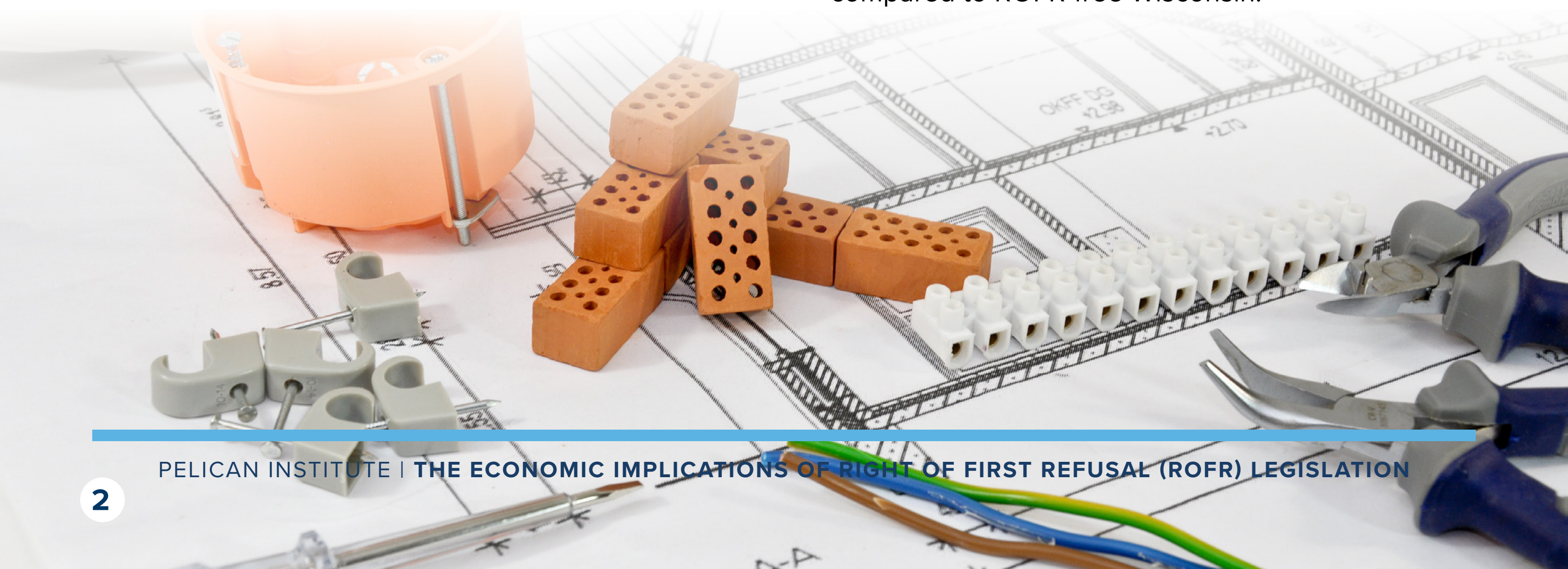
Introduction

To promote efficiency, transparency, and fairness in electricity transmission and planning processes in the United States, the Federal Energy Regulatory Commission (FERC) issued Order 1000 on July 21, 2011. Among other things, FERC Order 1000 removed the federal right of first refusal (ROFR) for new electricity transmission infrastructure construction. Previously, incumbent utilities had first dibs on new electricity transmission construction projects rather than allowing for competitive bidding. FERC saw that policy as problematic because it is against an incumbent utility's self-interest to allow new entrants to construct and own transmission even if the new entrants offer to do so at lower cost [Garg, 2013]. In fact, such ROFRs benefit incumbent utilities especially if new entrants offer more economically efficient transmission solutions. Order 1000 opened the door to competitive bidding on new electricity transmission infrastructure. However, FERC expressly allowed states to continue applying ROFR and other local or state regulations they might pass.

Minnesota, North Dakota, and South Dakota passed and implemented state-level ROFR almost immediately after FERC Order 1000. Nine other states have passed their own ROFR legislation more recently with varying degrees of success against judicial and political challenges. In states where incumbent utilities are granted monopoly status over delivery of electricity to customers in their service area, utilities have strong incentives to support ROFR legislation. They have lobbied heavily in favor of ROFR in state legislatures since FERC Order 1000 [Bruggers, 2023].

ROFR policies limit competition by acting as a barrier to entry. Utilities and their allies who benefit from ROFR policies point to union jobs, long-term relationships with stakeholders, and special expertise related to their service areas when arguing in favor of ROFR policies. The inefficient allocation of resources resulting from ROFR is harder to observe, and identifying the efficiency-enhancing impacts of market competition is difficult when there is no market competition. The utility lobbying mentioned above represents one such inefficiency. ROFR policies, and the cost of lobbying for them, ultimately result in higher rates paid by electricity consumers. This is particularly true when incumbent utilities operate under a rate-regulated monopoly model, as they do in most US states. Further, incumbent utilities may even enjoy a windfall from higher costs as rates are often set under "cost-of-service" regulation, where costs are passed along to customers by statute, utilities earn a fixed rate of return, and customers cannot seek relief from competitors.

This paper provides a brief history of state-level ROFR policies beginning with FERC Order 1000. It then describes how they lead to inefficient investment in electricity transmission. Finally, it presents estimates of the impact of ROFR policy on residential and commercial electricity prices in Minnesota, finding that consumers there pay tens of millions more for electricity each month compared to ROFR-free Wisconsin.



Summary of Federal and State ROFR Policies

In 1996, FERC issued Order 888, which implicitly provided incumbent utilities the federal right of first refusal for transmission construction. It also created open-access transmission tariffs. This made allocation of existing transmission more competitive by requiring utilities to provide non-discriminatory access to their transmission lines, but made transmission investment less competitive by providing the ROFR for infrastructure construction and ownership. The ROFR embedded in FERC Order 888 was particularly problematic, and deviated from historical examples of ROFRs, as it did not even require incumbents to match more attractive bids by new entrants [Garg, 2013]. This meant incumbent utilities could determine both projects and costs, then pass along costs to customers through the rate regulation process.

FERC explicitly ended that ROFR when it issued Order 1000 in 2011. By then, a dearth of transmission construction was leading to electricity transmission congestion and inhibiting utilities' ability to provide "just and reasonable" rates to customers [FERC, 2011]. New transmission infrastructure was particularly important in the context of renewable, intermittent energy like wind and solar, which economic trends and state and federal policy supported.

Utilities began lobbying state legislatures to pass ROFR policies even before FERC Order 1000 was official policy [Garg, 2013]. The state legislatures in North Dakota, South Dakota, and Minnesota responded to these efforts by passing ROFR that mirrored FERC Order 888 in 2011 and 2012. Other relatively early adopters of state-level ROFR policies include Nebraska (2013), Oklahoma (2013), Alabama (2015), and Montana (2017). Finally, a bevy of states, many of which were connected to the Midcontinent Independent System Operator (MISO)[1] like the early adopters, passed their own versions of ROFR policies, starting with Texas in 2019, then Iowa (2020), Michigan (2021), Indiana (2023) and Mississippi (2023). This is because ROFR policies tend to lead to this type of policy competition between states. Anti-competitive costs from ROFR policies spill over into other jurisdictions on the same transmission system. Inefficient transmission investment within a state leads to inefficient transmission on the grid as a whole, while a checkerboard of ROFR policies complicates negotiations over interstate transmission projects.

The courts have struck down ROFR policies in two states. The Iowa State Supreme Court described Iowa's policy as "quintessentially crony capitalism" when it struck down ROFR legislation there. While the Court noted the problematic nature of the ROFR policy, the ruling itself was at least partially based on the fact that it was passed in a logrolling maneuver that violated Iowa's Constitution [Kauffman, 2023]. In its criticism of the policy, the Iowa Supreme Court quoted the Fifth Circuit U.S. Court of Appeals, which had earlier struck down Texas' ROFR policy on grounds that it violated the Dormant Commerce Clause of the US Constitution [Kleckner, 2023]. The Fifth Circuit's description of the situation, as relayed by the Iowa Capital Dispatch, is quite salient:

> 'Imagine if Texas — a state that prides itself on promoting free enterprise — passed a law saying that only those with existing oil wells in the state could drill new wells. It would be hard to believe.' Yet, 'Texas recently enacted such a ban on new entrants in the building of transmission lines that are part of multistate electricity grids' [Kauffman, 2023].

1 An independent system operator (ISO) like MISO is a non-profit organization that coordinates the flow of electricity on (usually) interstate electric transmission systems. They are independent of electricity producers and consumers. ISOs seek to balance supply and demand over different planning periods, prevent blackouts, and facilitate competition. MISO manages a large electric transmission system in the central US.

Economic Costs of ROFR Legislation

ROFR laws grant incumbent utilities the exclusive right to construct new transmission lines, creating a barrier to entry for potential competitors. Proponents of ROFR point to easy-to-observe benefits of such policies like increased demand for local labor and previous projects they've completed which provide evidence of their expertise. However, incumbents lack the competitive pressure to innovate and reduce costs [Pfeifenberger et al., 2021]. Ultimately, the inefficiencies resulting from ROFR policies result in higher electricity rates for consumers. Unfortunately, the impacts on ratepayers have a long lag, and the lack of a competitive bidding process makes higher construction costs difficult to observe.

An additional unseen cost that is becoming more worrisome as additional states pass or consider ROFR policies is the "transitory gains trap" [Tullock, 1975]. Once a company gains a regulatory advantage, it will invest in maintaining that advantage even when it leads to overall inefficiencies. In the case of ROFR, incumbent utilities invest resources in lobbying and political influence to retain their privileged position, diverting resources from more productive uses. This dynamic can lead to a cascade of state-level ROFR policies, as incumbents in other states seek to secure similar advantages. The overall transmission infrastructure becomes less efficient and consumers bear the burden of higher costs.

Energy Costs of ROFR: Evidence from Wisconsin and Minnesota

This section compares electricity prices in Minnesota and Wisconsin to estimate the costs of Minnesota's ROFR policy. Both states are part of the Midcontinent Independent System Operator (MISO) region. This common regulatory framework, and other similarities, help in making meaningful comparisons between the two states' electricity markets. Being in the same transmission system means that the states coordinate on electricity transmission and share similar market rules and structures, which is crucial for a controlled analysis of the ROFR law's impact on prices [U.S. Energy Information Administration 2022a, b]. One potential issue is cost spillovers: inefficient transmission investment in Minnesota will impact MISO as a whole, potentially inflating prices in Wisconsin. This means the comparison likely underestimates the impact of ROFR on prices.

Minnesota and Wisconsin have comparable energy generation and consumption profiles. Both states rely on a mix of coal, natural gas, nuclear, and renewable energy sources [U.S. Energy Information Administration 2022a, b]. There is one notable difference in their energy portfolios: wind generation in Minnesota increased substantially relative to wind generation in Wisconsin during the period in which Minnesota implemented ROFR.[2] The estimated impact of ROFR on electricity prices actually becomes larger after controlling for this difference in wind generation.

The climate and geography of Minnesota and Wisconsin are also similar, with cold winters and warm, humid summers. Therefore, seasonal variations in electricity demand due to heating and cooling are comparable between the two states. Energy consumption by sector is extremely similar across Minnesota and Wisconsin as indicated by Figure 1.

2 See https://www.eia.gov/electricity/data/browser/

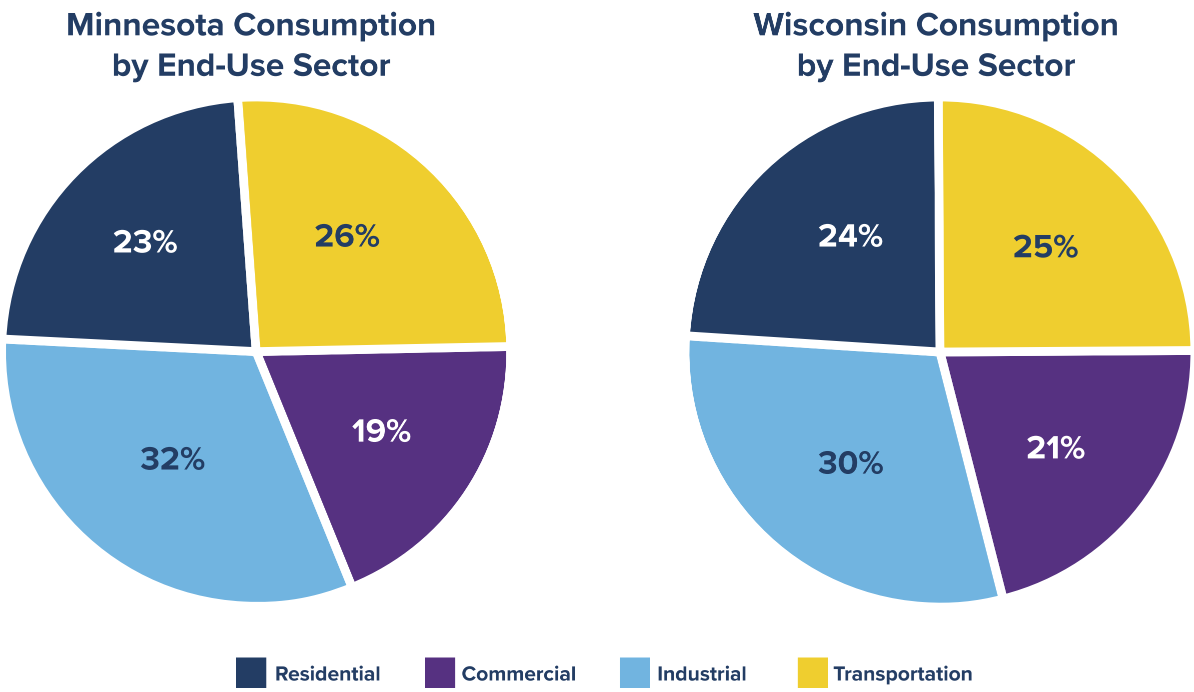


Figure 1: Comparison of energy consumption by sector in Minnesota[3] and Wisconsin[4].

These similarities between Minnesota and Wisconsin, and the fact that Minnesota adopted ROFR immediately after FERC Order 1000 while Wisconsin did not, make them ideal for estimating the impact of ROFR on electricity prices.

Commercial and industrial prices were rising at similar rates in Minnesota and Wisconsin prior to FERC Order 1000 and the passage of ROFR in Minnesota, and were actually rising slightly faster in Wisconsin than in Minnesota. These trends can be observed in Figure 2 below. Before 2012, Wisconsin and Minnesota both operated under the common ROFR framework of FERC Order 888, so differences in prices across the two states do not reflect differences in ROFR policy.

Beginning in 2012, the Wisconsin electricity price inflation slows dramatically. This change in trend occurs immediately after FERC Order 1000; while the rising price trend in Minnesota is essentially constant throughout the sample period. These trends make sense in light of the theoretical discussion of ROFR policies above: ROFR policies are predicted to increase transmission costs and electricity prices, and electricity price inflation slowed in Wisconsin after ROFR ended there. More, electricity price inflation in Minnesota remained relatively high and stable as ROFR policies remained in place there throughout the 2007 to 2017 period.

3 https://www.eia.gov/state/?sid=MN#tabs-2
4 https://www.eia.gov/state/?sid=WI#tabs-2

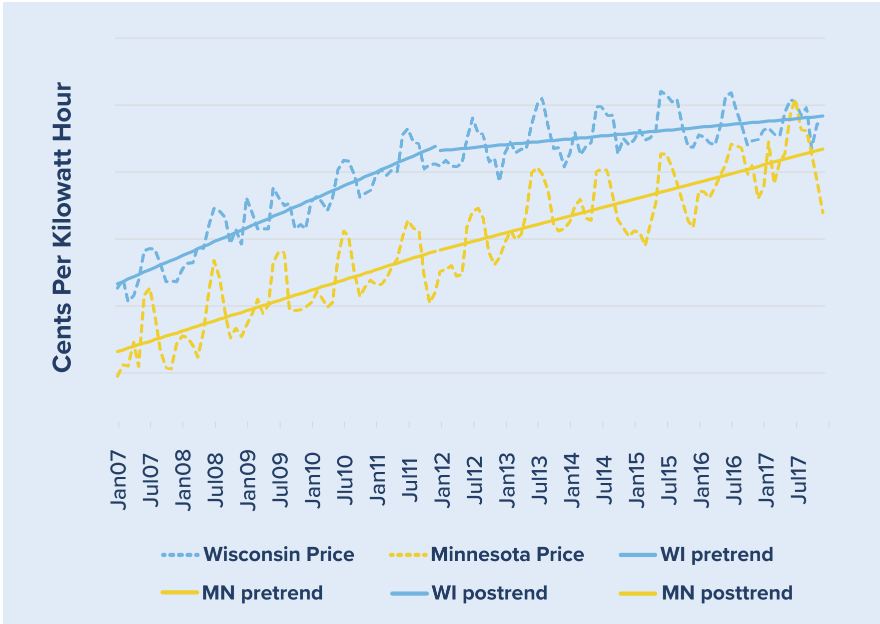


Figure 2: Trends in Commercial and Residential Electricity Prices in Minnesota and Wisconsin. Trend lines show prices before and after January 2012 when Minnesota implemented ROFR at the state level.

While the US overall is not as good a comparison group for Minnesota, we do observe a similar divergence in trends between US average prices and Minnesota prices displayed in Figure 3. The overall US price trend was not rising as quickly and did not fall as much as it did in Wisconsin after FERC Order 1000. However, Figure 3 does provide some evidence of cost-saving efficiency gains resulting from FERC 1000 across the US as a whole.

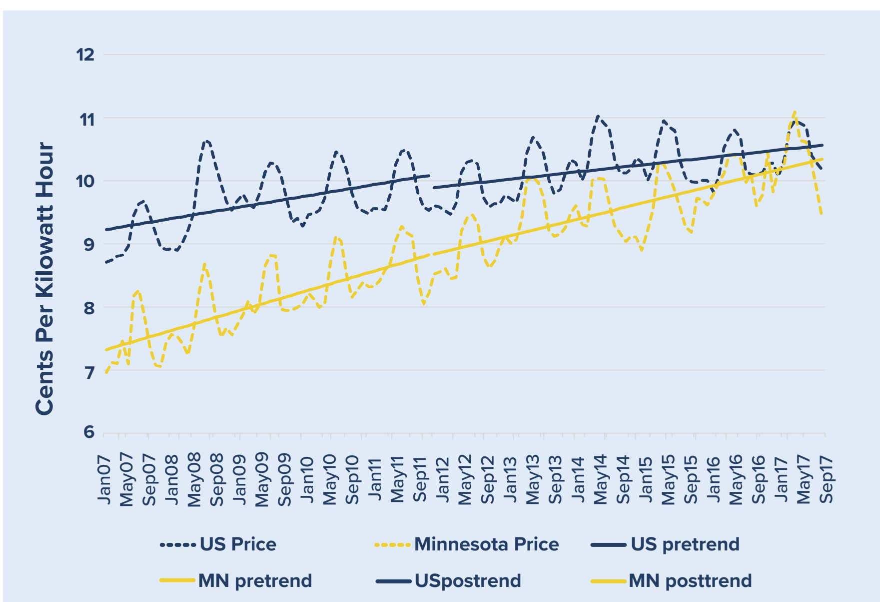


Figure 3: Trends in Commercial and Residential Electricity Prices in Minnesota and United States average. Trend lines show price trends before and after January 2012 when Minnesota implemented ROFR.

Table 1 provides numerical interpretations of the trends observed in Figure 1 and Figure 2.[5] The first row of the table shows the estimated impact of Minnesota's ROFR policy on electricity prices, controlling for pre-existing electricity price differences between Minnesota and Wisconsin and trends in prices over the ROFR implementation period in both states.

	Residential and Commercial	Residential Only	Commercial Only	v. US
ROFR Impact	**0.298**	**0.241**	**0.427**	**0.944**
Minnesota/Wisconsin Pre-Difference	-1.287	-1.896	-1.54	-1.582
Price Trend Control	1.219	1.169	1.169	0.573
Constant	9.359	12.020	9.584	9.655
Sample Size	264	264	264	264
R^2	0.73	0.75	0.72	0.69

Table 1: Impact of ROFR in Minnesota: first column shows impact on average residential and commercial prices, second column only residential price, third column only commercial prices. The last column used the United States average as the comparison group rather than Wisconsin.

The first estimate in the first row, 0.298, means that electricity prices in Wisconsin were 0.298 cents per kilowatt-hour lower on average in the post-2012 period because Wisconsin did not have ROFR during that time. Conversely, electricity prices in Minnesota were 0.298 cents per kilowatt-hour higher than they would have been in the absence of an ROFR policy. Monthly retail and commercial sales of electricity in Minnesota reach up to five billion kilowatt-hours per month, so this policy currently costs residential and commercial rate-payers up to $15 million a month, or more than $180 million per year.6

The second and third columns of Table 1 show the impact broken out by residential prices and commercial prices. When residential prices are considered in isolation, we find an increase from ROFR of 0.241 cents per kilowatt-hour, which is not statistically significant. But we find a larger effect on commercial prices when those are considered in isolation: 0.427 cents per kilowatt-hour, which is statistically significant. Commercial users in Minnesota currently consume approximately two billion kilowatt-hours per month so the impact of ROFR represents additional monthly electricity costs of almost $8.5 million for commercial electricity consumers there.

The last column of Table 1 shows the impact of ROFR on commercial and residential prices using the US as the basis for comparison rather than Wisconsin. Here, we see a much larger impact of ROFR policies. Continuing ROFR in Minnesota increased prices by 0.944 cents per kilowatt-hour based on this comparison. This likely overestimates the impact of ROFR. However, the coefficients in the first three columns likely underestimate the impact of ROFR, as it results in cost increases in Minnesota which will spill over into other states connected to the MISO system, including Wisconsin.

The estimates in the second row of Table 1 indicate that consumers in Minnesota enjoyed, and continue to enjoy, prices lower than Wisconsin and the US average, but the first row estimates indicate that ROFR diminished this advantage. The estimates in the third row show the expected

5 A Technical Appendix is provided at the end of the paper that provides more detail about the difference-in-differences analysis and data.
6 See https://www.eia.gov/electricity/data/browser/

electricity price inflation in Minnesota and Wisconsin from 2007 to 2017. For example, the average of commercial and residential prices was expected to increase by 1.219 cents per kilowatt-hour in Minnesota, but increased by an additional 0.298 cents per kilowatt-hour as a result of Minnesota sticking with ROFR: Minnesota prices increased about 25% more than expected as a result of ROFR.

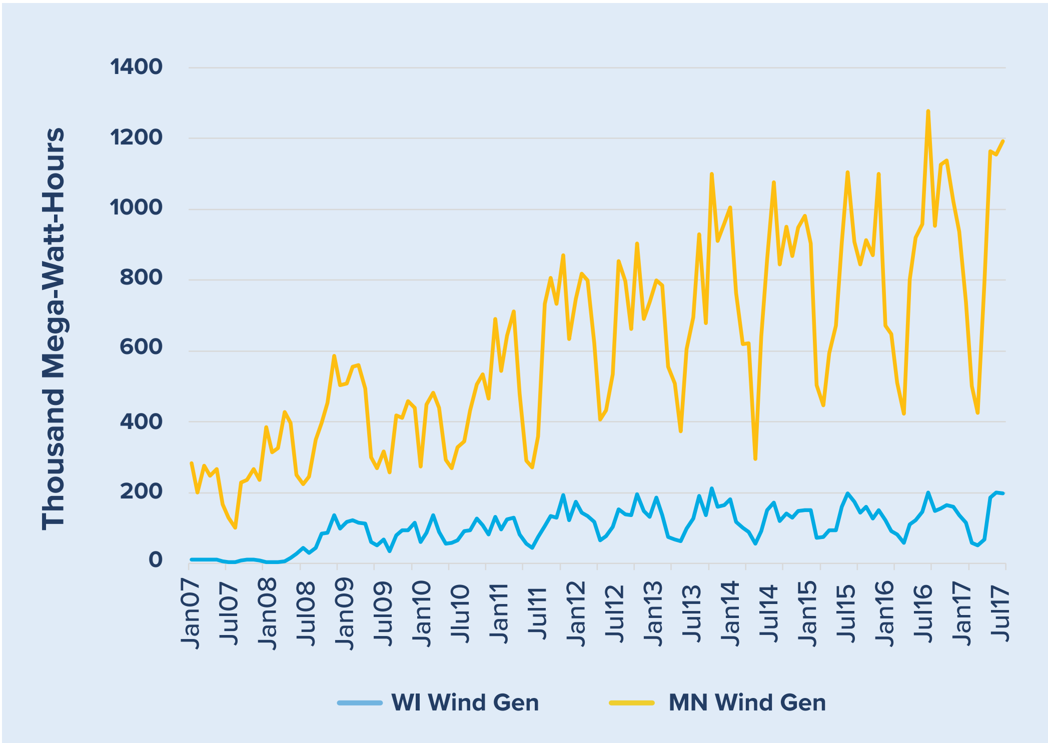


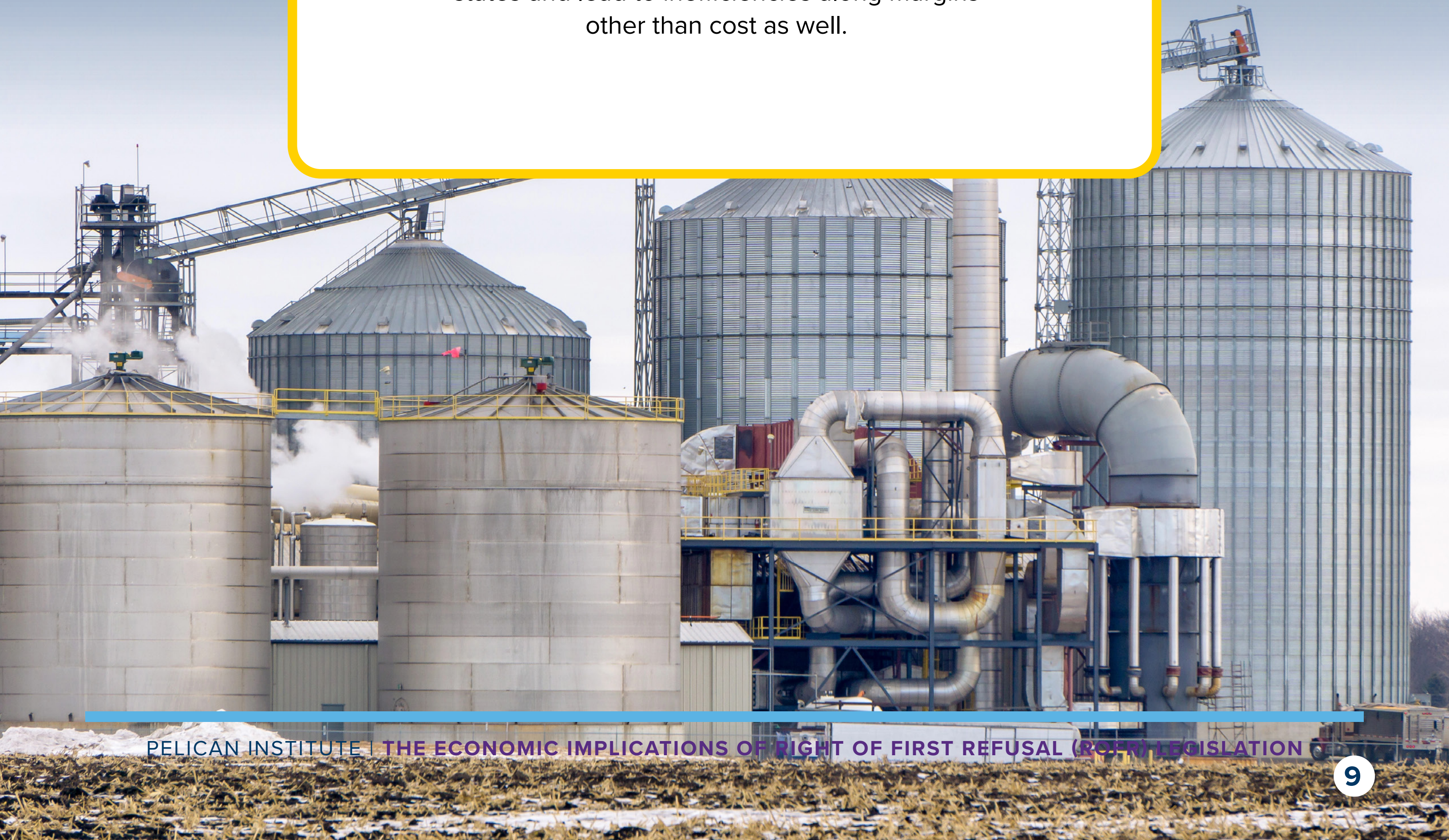
Figure 4: Trends in electricity generated from wind in Minnesota and Wisconsin. Minnesota has a renewable energy portfolio standard (RPS) that requires electricity providers to procure 25% of their electricity from renewable sources by 2025. This RPS was passed in 2007 [Database of State Incentives for Renewables & Efficiency (DSIRE), 2023]. Minnesota's largest utility, however, is not subject to the RPS.

As noted above, Minnesota generates more electricity from wind than Wisconsin, and the difference in wind generation across the two states has grown over the period from 2007 to 2017, as shown in Figure 4. This level of wind generation may impact electricity prices and also be correlated with the impact of ROFR policies, as transmission plays a key role in integrating wind into the electricity grid. For these reasons, the impact of ROFR was also estimated with a control variable for wind generation.

The results are very similar whether or not wind generation is taken into account. This indicates that differences in wind generation across Minnesota and Wisconsin are not considerably impacting our results. In fact, we find a larger negative impact of keeping ROFR in Minnesota when controlling for wind generation: ROFR is associated with 0.353 cents per kilowatt-hour higher prices for commercial and residential end-users in Minnesota, or conversely 0.353 cents per kilowatt-hour savings for those users in Wisconsin. Wind generation is associated with lower electricity prices regardless of whether residential prices, commercial prices, or both are used to estimate the model, but the impact is not significant. Interestingly, one of the key costs of Minnesota's ROFR policy is slowing development of transmission that could bring Minnesota's ample wind resources to high electricity demand markets more readily.

Conclusion

This paper provides abundant theoretical and empirical evidence that **ROFR policies increase electricity prices.** The Federal Energy Regulatory Commission recognized the costs of ROFR and thus did away with it when it released Order 1000. Unfortunately, monopoly utilities and their allies convinced legislatures in some states to pass their own ROFR policies. Barriers to entry like ROFR policies are a defining characteristic of a monopoly. They limit competition and ultimately lead to inefficient investment in electricity transmission infrastructure. This ultimately leads to higher costs for electricity end-users – hundreds of millions of dollars per year in Minnesota alone. This likely underestimates the costs of ROFR, as those costs spill over into other states and lead to inefficiencies along margins other than cost as well.



References

Alabama Legislature. Alabama energy security act of 2015, 2015. URL https://law.justia.com/codes/alabama/2023/title-37/chapter-4/ article-7/.

Joshua D. Angrist and Jörn-Steffen Pischke. Mostly Harmless Econometrics: An Empiricist's Companion. Princeton University Press, 2008. ISBN 9780-691-12034-8.

Frédéric Bastiat. What is Seen and What is Not Seen. Economic Sophisms, 1850. URL https://www.econlib.org/library/Bastiat/ basEss1.html.

James Bruggers. Transmission utilities want to revive their right of first refusal. can they succeed?, 2023. URL https://insideclimatenews.org/ news/26042023/transmission-utilities-right-first-refusal/.

Database of State Incentives for Renewables & Efficiency (DSIRE). Minnesota renewable portfolio standard, 2023. URL https://programs.dsireusa.org/system/program/ mn#:~:text=Minnesota' s%20Renewable%20Portfolio%20Standard,power%20districts%20in% 20the%20state.

Federal Energy Regulatory Commission (FERC). Promoting wholesale competition through open access non-discriminatory transmission services by public utilities; recovery of stranded costs by public utilities and transmitting utilities, 1996. URL https: //www.ferc.gov/industries-data/electric/industry-activities/ open-access-transmission-tariff-oatt-reform/ history-oatt-reform/order-no-888.

Federal Energy Regulatory Commission (FERC). Transmission planning and cost allocation by transmission owning and operating public utilities, 2011. URL https://www.ferc.gov/sites/default/files/2020-04/ OrderNo.1000.pdf. Order No. 1000, issued July 21, 2011.

Rishi Garg. What's best for the states: A federally imposed competitive solicitation model or a preference for the incumbent? state adoption of right of first refusal statutes in response to ferc order 1000 and the dormant commerce clause, April 2013. Briefing Paper No. 13–04.

Indiana General Assembly. Indiana code § 8-1-38-9, 2013. URL https://iga.in.gov/legislative/laws/current/ic/titles/008/ articles/001/chapters/038/.

Iowa Legislature. Iowa code §478.16, 2020. URL https://www.legis.iowa. gov/docs/code/2022/478.16.pdf.

Clark Kauffman. Citing 'crony capitalism,' Iowa Supreme Court blasts late-night legislative logrolling, March 2023. URL https://iowacapitaldispatch.com/2023/03/29/citing-crony-capitalism-iowa-supreme-court-blasts-late-night-legislative-logrol

Tom Kleckner. Scotus won't take up texas appeal of rofr law, 2023. URL https://www.rtoinsider.com/65790-scotus-wont-take-up-texas-rofr-law/.

Michigan Legislature. Michigan compiled laws § 460.593, 2016. URL https://www.legislature.mi.gov/mileg.aspx?page=getObject& objectName=mcl-460-593.

Minnesota Legislature. Minnesota statute § 216b.246, 2012. URL https://www.revisor.mn.gov/statutes/cite/216B.246.

Mississippi Legislature. Mississippi code title 77, chapter 3, 2015. URL https://law.justia.com/codes/mississippi/2015/title-77/ chapter-3/.

Montana Legislature. Montana code annotated § 69-5-202: Right of first refusal, 2017. URL https://leg.mt.gov/bills/mca/title_0690/ chapter_0050/part_0020/ section_0020/0690-0050-0020-0020.html.

Nebraska Legislature. Nebraska revised statutes § 70-1028, 2013. URL https://nebraskalegislature.gov/laws/statutes.php?statute= 70-1028.

North Dakota Legislative Assembly. North Dakota century code § 49-03-02, 2023. URL https://www.ndlegis.gov/cencode/t49c03.pdf.

Oklahoma Legislature. Oklahoma statute § 17-1001, 2013. URL https://www.okenergytoday.com/2024/02/rofr-pbr-cash-and-the-oklahoma-legislature/.

Johannes Pfeifenberger, Judy Chang, and Michael Hagerty. Cost savings offered by competition in electric transmission: Experience to date and potential value for electricity consumers. Presented to Power Markets Today Webinar, 2021. URLhttps://brattlefiles.blob.core.windows.net/files/23611_cost_ savings_offered_by_ competition_in_electric_transmission.pdf.

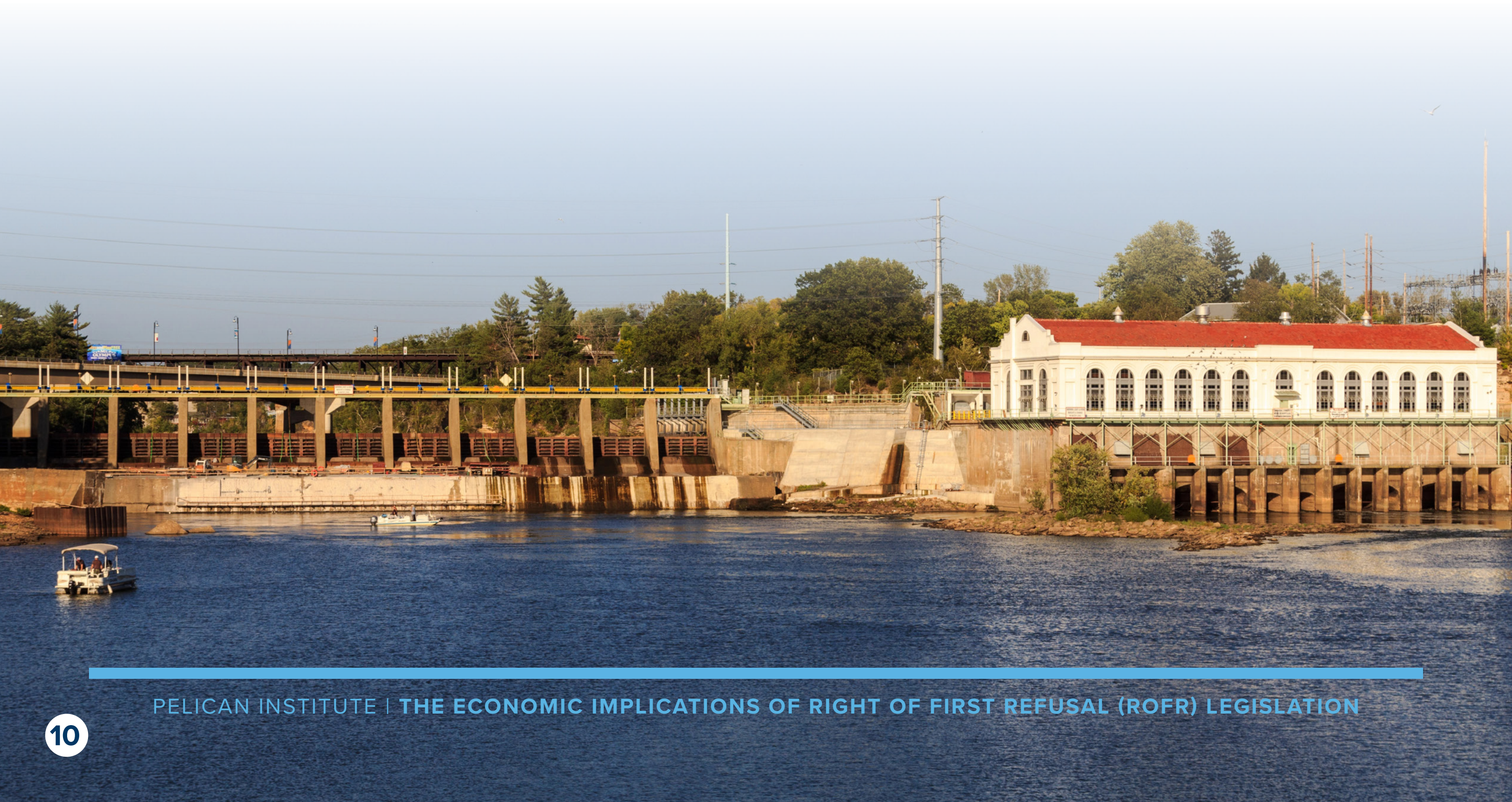
South Dakota Legislature. South dakota codified laws § 49-32-20, 2015. URL https://sdlegislature.gov/Statutes/49-32-20.

Texas Legislature. Texas utility code § 3.051, 1997. URL https://statutes. capitol.texas.gov/docs/sdocs/utilitiescode.pdf.

Gordon Tullock. The transitional gains trap. The Bell Journal of Economics, 6(2):671–678, 1975. URL https://www.jstor.org/stable/3003138.

U.S. Energy Information Administration. Minnesota state profile and energy estimates, 2022a. https://www.eia.gov/state/analysis.php?sid=MN.

U.S. Energy Information Administration. Wisconsin state profile and energy estimates, 2022b. https://www.eia.gov/state/analysis.php?sid=WI.



Technical Appendix

DATA

Monthly retail and commercial electricity prices for Minnesota and

Wisconsin were collected from the U.S. Energy Information Administration (EIA) Electricity Data Browser.[7] The prices are reported in cents per kilowatt-hour (kWh). The sample period spans from January 2007 to December 2017. This timeframe was chosen to capture the period before and after FERC Order 1000, which was issued in July 2011, and Minnesota's implementation of the Right of First Refusal (ROFR) in 2012.

The EIA defines the commercial sector as the "energy-consuming sector that consists of service-providing facilities and equipment of businesses; Federal, State, and local governments; and other private and public organizations, such as religious, social, or fraternal groups." It defines the residential sector as "an energy-consuming sector that consists of living quarters for private households."[8]

I also collected monthly wind electricity generation in megawatt-hours from the EIA Electricity Data Browser in order to control for any impact it may have on electricity prices.

METHODS

In order to estimate the impact of Minnesota's ROFR policy on electricity prices, we rely on non-parametric visual inspection of electric price series in Minnesota and Wisconsin in addition to estimating the following parametric difference-in-differences model:

$$\begin{aligned} ElectricityPrice_{it} &= \beta_0 + \beta_1 ActiveROFR_{it} \\ &\quad + \beta_2 Minnesota_i + \beta_3 MinnesotaROFR_t + \epsilon_{it}. \end{aligned} \tag{1}$$

I apply regression model 1, which represents a standard difference-in-differences model, to residential and commercial prices in Minnesota and Wisconsin. I apply the model to the average of residential and commercial prices and to residential prices and commercial prices separately.

This difference-in-differences model is ideal for estimating the impact of ROFR on electricity prices as it controls for observed and unobserved differences between Minnesota and Wisconsin,[9] while also controlling for observed and unobserved changes over the ROFR implementation period that are common to Minnesota and Wisconsin,[10] e.g., changes in national inflation. These controls allow the effect of the ROFR to be isolated in the ActiveROFRit active variable. The driving assumption behind the difference-in-differences model is that Minnesota would have experienced similar changes in commercial and retail electricity prices as were experienced in Wisconsin had it not implemented ROFR. The primary mechanism by which to validate this assumption is visual inspection of the price trends before policy implementation.

7 See https://www.eia.gov/electricity/data/browser/
8 See https://www.eia.gov/tools/glossary/
9 The Minnesotai variable is coded 1 for observations in Minnesota and 0 for observations in Wisconsin to serve this role.
10 The MinnesotaROFRt is coded 0 for months before Minnesota implemented ROFR and 1 for months after implementation of ROFR in Minnesota

As mentioned above, I also run a version of the model that controls for wind generation as wind generation had a rising trend in Minnesota relative to Wisconsin during the sample period:

$$ElectricityPrice_{it} = \beta_0 + \beta_1 ActiveROFR_{it}$$
$$+ \beta_2 Minnesota_i + \beta_3 MinnesotaROFR_t + WindGeneration_{it} + \epsilon_{it}. \qquad (2)$$

I also compare Minnesota residential and commercial electricity prices to the United States averages for completeness. Although Wisconsin provides a much better comparison for the purposes of our analysis, comparison to the whole US shows how Minnesota's trend has deviated from the national average in a manner similar to the way Minnesota and Wisconsin price trends have diverged since 2012.

Results from using ordinary least squares (OLS) to estimate model (1) and model (2) are displayed in Appendix Table 1 and Appendix Table 2, respectively.

Appendix Table 1. Impact of ROFR in Minnesota: first column shows impact on average residential and commercial prices, second column only residential price, third column only commercial prices. The last column used the United States average as the comparison group rather than Wisconsin.

	Res and Com	Res Only	Com Only	v. US
Electricity Price Impact of ROFR	0.298**	0.241	0.427***	0.944***
	(2.18)	(1.26)	(2.91)	(7.180)
$Minnesota_i$	-1.287***	-1.896***	-1.54***	-1.582***
	(-12.77)	(-13.39)	(-14.23)	(-16.28)
$MinnesotaROFR_t$	1.219***	1.169***	1.169***	0.573***
	(12.64)	(13.54)	(11.25)	(6.16)
Constant	9.359***	12.020***	9.584***	9.655***
	(131.39)	(120.00)	(124.92)	(140.50)
N	264	264	264	264
R^2	0.724	0.745	0.724	0.686

t statistics in parentheses.

$^{*} p < 0.10$, $^{**} p < 0.05$, $^{***} p < 0.01$

Appendix Table 2: Impact of ROFR in Minnesota: first column shows impact on average residential and commercial prices, second column only residential price, third column only commercial prices. Each model controls for the impact of wind generation on prices.

	Res and Com	Res Only	Com Only
$ROFRActive_{it}$	0.353**	0.260	0.514***
$Minnesota_i$	-1.232***	-1.878***	-1.458***
$MinnesotaROFR_t$	1.231***	1.840***	1.186***
	(12.58)	(13.36)	(11.27)
$WindGeneration_{it}$	-0.00017	-0.00006	-0.00033
	(-0.70)	(-0.17)	(-1.01)
Constant	9.370***	12.023***	9.584***
	(128.33)	(117.00)	(124.92)
N	264	264	264
R^2	0.724	0.745	0.726

t statistics in parentheses.

$^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$


09:34am
Bedroom
DEVICE

Author

Gavin Roberts, SENIOR FELLOW, ENERGY
DEPARTMENT OF ECONOMICS, WEBER STATE UNIVERSITY

Dr. Gavin Roberts is an Associate Professor and Chair of the Department of Economics at Weber State University. His research, primarily in energy economics, environmental economics, and regulation, has been published in respected journals including the Energy Journal, Energy Policy, and Public Choice. His work has been featured cited by the National Institutes of Health and the National Law Review, and featured by the Cato Institute, Reason Magazine, and the Boston Globe, highlighting his influence in shaping economic and environmental discourse.

504-500-0506

info@pelicaninstitute.org

pelicaninstitute.org

/PelicanInstitute

@PelicanInst

PelicanInstitute