

Getting Serious About CO2

Part 1: Have I Got a Deal for You!

Question:

Online with active links: http://bit.ly/SOUL_Get_Serious_CO2

What business would make a similar investment seven times and not stop to check its performance?

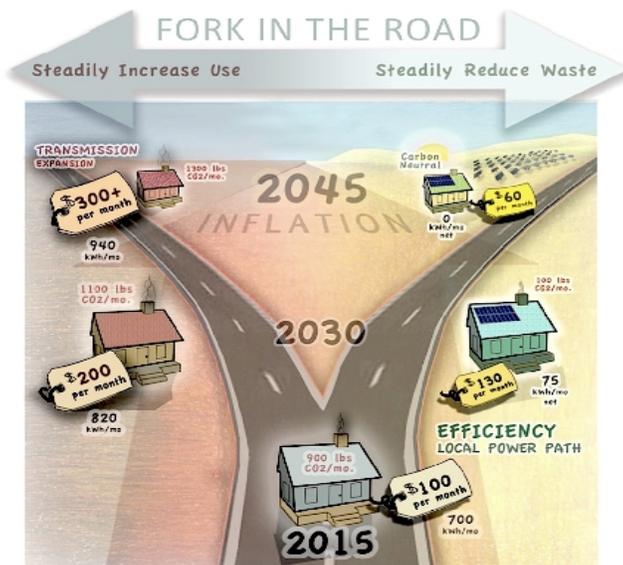
Answer:

One that is guaranteed 10.2% return no matter what the performance is.

Collectively, the electric customers of Wisconsin function as one, big investment business¹. We spend more than \$7 billion per year for four, basic expenses:

- 50-60% (\$55-65/mo) Payment on debt for power plants, transmission/distribution lines and other grid costs. These costs were previously approved by either the Wisconsin Public Service Commission or commissions in other states.
- 30% for Power (\$30/mo)
- 15% to one's utility (~\$15/mo)
- 1.2% (\$1.20/mo) for our collective Energy Efficiency rebate pool (Focus on Energy)

Want to guess which of these four expenses has proven to be the most effective at reducing CO2 emissions?



Since 2006, Wisconsin customers have invested in and built seven expansion transmission lines. All of the lines promised to deliver savings and faster reduction of CO2 emissions associated with our electricity use².

The companies who sold us these products, American Transmission Co (ATC), Xcel Energy and Dairyland Power Cooperative will not reveal their full costs including all perks. They also refuse to describe the impacts on average, monthly Wisconsin electric bills in traditional ways that citizens can evaluate³. Imagine going to a store and having the clerk say he/she has no clue what charges will be on your credit card.

Cost and accountability have come into intense focus because Wisconsin ratepayers and their elected officials are being asked to consider investing in an eighth, expansion transmission line, *Cardinal Hickory Creek*. Wisconsin has laws requiring the performance of our energy efficiency investments be audited every four years, but we lack the same, highly sensible ability to look at the economic and

environmental performance of the much larger amounts spent on transmission lines⁴. We do, however, have three indicators that costs have far outpaced the builders' estimated savings:

- **Absence of bragging.** Successful transmission builders would be crowing about savings in their application for *Cardinal Hickory Creek* but none exists. SOUL of Wisconsin asked builders to account for economic congestion relief savings from the past seven lines we were told the request was too vague and that the computations are too burdensome⁵.
- **Our electric bills.** Since 2006, Wisconsin rates have risen much faster than the national average and are the second highest in the Midwest. Since 2012, the fixed cost "meter fee" for each customer has risen an average of 9% per year⁶.
- **Flat and declining use has negated touted, potential savings.** In 2007 for the Paddock Rockdale 345 kV expansion line between Beloit and Madison (visible from I-39), ATC projected *losses* for what they considered to be a very unlikely one-half of one percent *growth* per year in Wisconsin electricity use. Official US Department of Energy data shows that Wisconsin use *dropped* an average .23% per year from 2007 to 2017-- a significant .7% less than the rate of growth ATC predicted would add costs to our bills, not shrink them.

[Update: A number of individuals in Southwest Wisconsin have been pointing out to their state lawmakers that the economic performance of expansion transmission lines is not tested in Wisconsin like it is for the Focus on Energy program. Four days before this article was released, five lawmakers whose constituents would experience real land, habitat and local economy losses from the *Cardinal Hickory Creek* line asked the Wisconsin PSC to test the performance of past lines to inform the current review.⁷]

Part II: Can We Get a Deal for Us?

Wisconsin electric customers are committed to conservation and environmental goals,..

A 2018 study⁸ by the American Council for Energy Efficient Economies (ACEEE) shows that Wisconsin electric customer commitment to reducing use and lowering CO₂ is high by all standards. Even at its current, under-funded level, the ability target energy efficiency to improve transmission efficiency could be saving us many millions.

During the controversial Badger-Coulee transmission line review in 2014, engineer Bill Powers found that targeting from \$4-19 million in energy efficiency, load management and community solar programs would eliminate need for \$190 million⁹ in transmission updates designated as the Low Voltage Alternative to the \$500 million transmission line.

It's crucial to keep in mind that our CO₂ problem is *part and parcel of the power in our outlets*. In 2016, power in the Midwest averaged 8% renewable energy, but 73% came from fossil fuel generation¹⁰. After many billions spent just on expansion transmission lines, that percentage has increased a few percent. More and more people who have been studying and following transmission expansion for more a decade now understand that utility expansion is too cost and land inefficient to carry us to our ambitious environmental goals. A pleasure drive in almost any direction in Wisconsin shows that our rural economies and habits simply can't handle the scale of expansion that for-profit, Midwest utility interests have uniquely envisioned as a *best case* solution.

"The cheapest energy is the energy you don't use in the first place." - Sheryl Crow

Though most Wisconsinites share the "waste not, want not," sensibility, many households fall considerably short of even the simplest best practices. For example, electricity consumption dropping around 13% is very common just from someone in the household comparing usage numbers from month to month. There are also a surprising number low and no cost improvements and inventive tricks that can raise the achievement to 30%¹¹. These, combined with increasingly better habits, automatic timers and replacing an inefficient appliance or two can produce cuts as high as 50%¹². Unlike the non-guaranteed, estimates that utilities make, these CO₂ reductions and dollar savings are both maximized and guaranteed.

Data in The American Council for Energy Efficient Economies report, reveals Wisconsin customers' innate ability to leverage energy efficiency rebates to slash use¹³. In 2017, Wisconsin ranked sixth in reduced electricity use per rebate dollar states made available¹⁴.

State Energy Efficiency Program Performance Reduction in Electricity Use Per Invested Dollar			
Ranking	State	Monthly Rebate Amount	Percentage Reduction
1	Hawaii	\$1.21	1.5%
2	Arizona	\$1.39	1.3%
3	Michigan	\$1.85	1.5%
4	Ohio	\$1.34	1.0%
5	California	\$3.00	2.0%
6	Wisconsin	\$1.02	0.7%
7	New York	\$1.90	1.2%
8	Colorado	\$1.45	0.9%
9	Utah	\$1.40	0.8%
10	Illinois	\$0.00	1.3%

Unfortunately, Wisconsin ranks very low, 36th among 46 participating states, when it comes to the amount our state lawmakers will allow us to pool for broad customer investment. Only South Dakota's per capita rebate amounts are smaller among midwestern states.

State lawmakers, please note, these dollars do not come from utilities or taxes¹⁵; they are the small payments *customers* make our monthly bills that pass *through utilities* into a rebate

fund that *customers* draw upon when its time to invest in a highest efficiency appliance, make overdue improvements on a dwelling, buy double insulated windows and use innovations like realtime smartphone and computer use monitoring and control of our houses even when we are at work.

Question:

Environmentally, how effective are these appliance, equipment, dwelling and human behavioral improvements at reducing CO₂?

Combining state data from ACEEE's report with state CO₂ emission records from the US Department of Energy, one can see that states leading the way in CO₂ emission reduction have rebate pools that average three times larger than pools in the lowest performing state group.

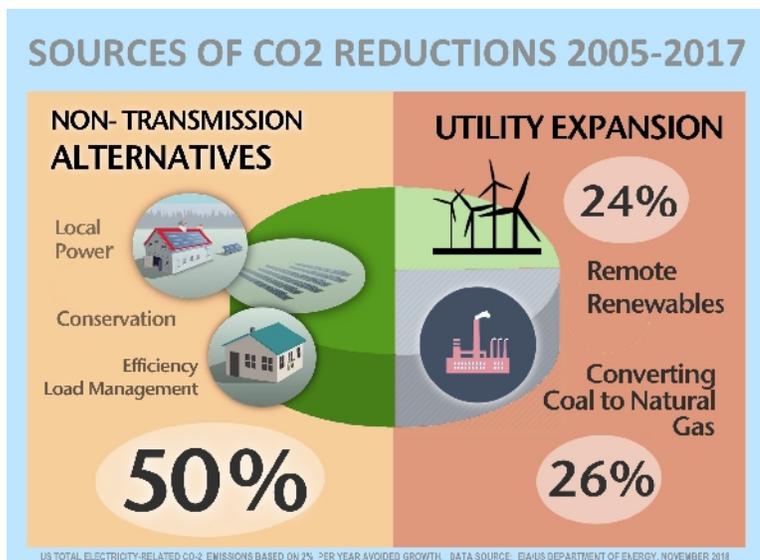


Despite keen public interest, Wisconsin rebates to help electric customers afford more efficient appliances and needed home-business energy improvements rank near the bottom measured per person.

There are expected¹⁶ dollar to CO2 reduction performance variations in middle state groupings but in overview we can how state's with CO2 reduction success stories are simply allowing informed and motivated end users to play larger roles. If one visits other states and witnesses the very different attitudes people have about running their lives and homes it comes to mind that Wisconsin has a market place if not a moral obligation to allow customers equity in the dollars we spend. It has been five years since retiring PSC Commissioner Eric Callisto wrote in his final decision,

"I think we should ...evaluate placing a fair and transparent value on distributed generation, and at least start down the discussion path of the role of regulated utilities in a future with flat load growth, increased distributed generation and more robust consumer involvement in energy choices."¹⁷

The profound capabilities of home, business and increasingly community-based solutions are also born out by data in a national finding by the US Department of Energy portrayed in this graphic¹⁸.



ingredient is massive public persuasion. Letters to editors, phone calls and visits with elected and business leaders-- measures every person can find time to squeeze in. But *the* most important occasion is massive turn out for public hearings when people can talk directly to Commissioners.

In the most recent success story in New Jersey¹⁹, an extra day had to be added to the public hearings after the first day was consumed entirely by elected officials and community leaders speaking their priorities. Commissioners should be on hand²⁰ to listen to all us and to experience our generous goals for all of Wisconsin between June 24-28 in Middleton, Dodgeville and Lancaster. Details forthcoming. Adjust your work and vacation schedules.

Part III: Big is Big

With utilities in Wisconsin posing many more renewable energy and natural gas power plants,...

Dropping costs of solar panels and the prospect of affordable battery storage has more people on the urge of "going solar" than ever before²¹. As we pursue these personal dreams and the collective goal of CO2 reduction, it is crucial to understand that the immortal declaration, "all things are created equal" does not apply to renewable energy. On that theme, also keep in mind that a highly efficient family without savings to dream provide all, equal value.

Home, farm, business and community-serving solar is much better at reducing CO2 reduction for a simple reason. When the sun shines, use of the grid is completely turned off. The adage, "Make hay when the sun shines," applies to vacuuming, washing clothes, air conditioning, taking showers and numerous other pleasures. A clothes line is directly solar and wind powered. If your

State CO2 Reduction Performance Groups	2007-2017 Group Average CO2 Emission Reduction	Group Average Energy Efficiency Rebate per Capita per Month in 2017
MD, DC, NY, MA, DE	54%	\$3.11
OH, PA, NC, IL, CA, IA	35%	\$2.03
MN, WV, AZ, NVIN, KY, UT, NM, MI, CA, OK	28%	\$1.49
MT, HI, SD, CO, FL, WA	18%	\$1.35
MS, WI, NJ, MO, LA, TX, WY	10%	\$0.94

Data from ACEEE 2017 Energy Efficiency States. States without EE programs, or with CO2 emission increases or with outlying statistical factors are not included in this sampling.

Which spending record should Wisconsin PSC commissioners reward as they weigh use of millions of *our* dollars and *our* powers in considering the Cardinal Hickory Creek transmission line over the next 120 days? With the help of nationally respected engineers, *SOUL of Wisconsin*, *Driftless Area Land Conservancy* and *The Environmental Law and Policy Center* will place before our Commissioners several, Wisconsin-specific Non-Transmission Alternatives to choose from. But sound science, solid economics and legal accountability provide only half of the ingredients. Luckily, we have success stories from several other states to pull from

In the increasing number of cases when state utility commissioners have backed customer preferences for Non-Transmission Alternatives, the most important, common

dream includes using excess solar power to charge an electric car someday, your conservation has a very productive goal. In contrast, utility-scale renewables increase our dependency on the grid. If utility-controlled *electricity markets* have any relation to *profits*, the dominance of fossil fuel generation will reign for decades²². If CO2 emission reduction is your highest goal, rather than pressuring utilities to eek forward, consider phoning up your lawmakers and setting up a meeting to discuss how she/he can enable *you and your neighbors* to get things done. A very, very small number of utility employees wake up, look in the mirror and ask, "What can I do to improve the powers of customers today?" If you are content to see some of your dollars being use for expansion, rest well. For-profit utilities are fully capable of building many, many projects for customers to pay for without the benefit of a customer cheering section.

A proposed, 300 MW solar facility aimed at occupying 5-6 square miles of prime farmland near Montfort, in Southwestern WI creates a good model to see how home local and community compare in terms of results²³: CO2 emission reduction over time.

Everywhere on earth is someone's home. A 2-3 mile "drive-by" through a sea of fenced-in solar panels on popular Highway 18 is no minor inconvenience or transformation. To date, all solar plants of this scale have been located in sparse, arid areas. If development on this scale proves to be less environmentally effective, we electric customers would be left paying the costs for monopolized lands, depleted local economies and devastated tax bases. And lost farm land.



"Utility-scale" or grid-feeding renewables are very land intensive.

Apply 100% renewable energy goals to Wisconsin's 2016 electricity use, would engage about 800 square miles of solar installations or about 2400 square miles of wind turbines²⁴. Wisconsin would become an *escape from state*.

Yet, overnight, in response to public concern about climate change, nearly all utilities are recognizing that renewables are the only kind of power the public will tolerate. Under the rubric of "low cost, cleaner power," a larger amount of fossil fuel natural gas generation in Wisconsin lurks under the surface²⁵.

Utility clamor for "new steel in the ground," is now daily news echoed by a state utility commissioner pointing out demand for power is flat and more than enough power exists. Perhaps soon they soon add that it takes 30-75 years for customers to pay down high interest mortgages on power plants. But commissioners in states like Massachusetts with accelerated efficiency and distributed solar programs have quicker come back, they point out that any *need* for new power plants can be more easily chiseled away than served up. Enjoying the same solar potential and number of customers as Wisconsin, Massachusetts has installed 1500 MW of rooftop solar and only 400 MW of utility scale renewables.

We know new power plants are unnecessary, but our plants are mostly fossil-fuel powered. Is Massachusetts' style channeling the money to home, business and community solar better in terms of fast CO2 reduction?

if we channel the \$500 million for the proposed 300 MW solar plant at Montfort/Cobb into home and business installations at double the current Focus on Energy solar incentive rate, the figures are very compelling. The resulting 191,000 distributed solar installations would avoid 4 to 5 times as much CO2 emissions while saving each household about \$76 per month over 30 years. These savings include the 5 kW solar installations costing about \$9,000 each after rebates.

Electric Customer Spending Option	Cost	Total MW Installed Solar	Solar Homes (5 kW each)	Avoided Energy Cost Per House Per Month	Avoided CO2 Emissions Over 30 Years Metric Tonnes
Badger Hollow Solar Facility	\$506,880,000	300	0	0	5,987,898
As Distributed Home Solar					
Current FOE Incentive Rate	\$506,880,000	1,915	382,938	\$72	50,702,922
Doubled FOE Incentive Rate	\$506,880,000	957	191,469	\$76	25,351,461
2010 FOE Incentive Rate	\$506,880,000	563	112,640	\$81	14,914,099
No FOE Incentive Rate	\$506,880,000	203	40,550	\$68	5,369,076

Assumptions: **Badger Hollow Solar Facility (30 Years)**: \$1.10 per watt; Land; Substations; 20% Revenue Adder; 25% cost 345 kV Cardinal Hickory Creek Transmission Line; 93% Efficiency; 73% EPA CO2 Avoidance Rate (MISO 2016 Fossil Fuel %) **Distributed Solar Homes (30 Years)**: \$2.50 /watt less .26, .52, .90 per watt FOE incentives, 97% Efficiency; Electricity: .19/kWh 30 Average; 100% EPA CO2 Avoidance Rate; **Owner Assumed Solar Costs** per 5kW array: \$11,000; \$9,800; \$8,000 and \$12,500; Monthly savings include solar panel/installation costs.

As Non-transmission Alternative engineers are prone to add, emission and savings benefits are even higher for direct, community-serving solar arrays prolonging the lifespans of expensive transformers and other transmission expenses. Note that home installations provide savings and comparable emission reductions without Focus on Energy incentives. This counters the argument that utility-scale installations are environmentally superior because solar panels cost less per watt.

Part IV: Not Your Father's Focus on Energy Program

With Climate Change upon us, should we support and "all of the above" investment path?

Wisconsin Governor Evers recently announced that he wants the 1.2% cap on Wisconsin Efficiency investments lifted.²⁶. Notes to self: Email Evers and thank him, Email my state lawmakers telling them to support this request as like lawmakers did in 2009.

What are some innovative ideas that would improve our Focus on Energy program? Audit after audit, experts single out under developed customer outreach, teaching and giving reliable advice. Most community newspapers are happy to run articles. How about a series featuring winners of prizes for inventive conservation tricks? We have a new agricultural program that most Wisconsin farmers are unaware of. How about modest wages for youth to work under the guidance of retirees to help elderly households install LED bulbs, low-flow shower heads, seal obvious cracks and see that water heater is set to 110°? Proactive programs provide highly valuable, unbiased advice. The current arrangement of presenting web visitors phone numbers of businesses that pitch products before information breeds doubt instead of trust in good products and in Focus on Energy.

Utilities are unnecessarily at odds with customers in Wisconsin because our ancient rate structures challenge utilities as energy use drops. It time our lawmakers learned about efficiency program *decoupling*. Bottom line: there is so much money to be saved through efficiency measures that sharing some of the revenue with utilities is a win-win.

Wisconsinites are not people who renig on our commitments. We understand that a large part of electricity costs go to paying down debt on existing power plants and transmission lines. We understand that fewer units of electricity sold will mean new charges on our bills to make good on past PSC approvals. But customers will stand up when we hear that more utility debt is cost effective and customers will not take kindly to penalizing measures like efficiency, home solar and load management – our tools to aggressively cut CO2.

As electric customers we are allowing our dollars to be burned up on both ends. We do not have "all of the above" resources to fund expansion and right-sizing at the same time. Dollars that go towards utility expansion and high interest debt, directly subtract from those that flow to customers as renters, home owners, businesses owners, neighborhoods and communities. All growth is not equal or necessarily good. We only have one planet; we do have the power to size up our demands.

JOIN THOUSANDS AT THE

CARDINAL HICKORY CREEK TRANSMISSION LINE PUBLIC HEARINGS BEFORE THE PSC

JUNE 24 - JUNE 28

PLACES & TIMES TO BE ANNOUNCED

SOUL OF WISCONSIN SUPPER LEGAL FUNDRAISER

MONTFORT, WI COMMUNITY CENTER

SAT. APRIL 27, 3-8pm

NOTES

- 1 Wisconsin lawmakers define what kinds of investments customers can make and create accountability. The three Commissioners heading the Public Service Commission of Wisconsin make the final spending decisions. Commissioner positions are appointed by the Governor in Wisconsin. In some states, PSC Commissioners represent specific areas and are elected by citizens.
- 2 Net energy cost savings & environmental benefits claimed, 2007-2018
<http://soulwisconsin.org/Resources/FootnoteHarbour.pdf#page=46>
- 3 The sellers have never offered to provide customers, lawmakers or the PSC evidence that their products are delivering as promised, even when asked by intervenors representing customer interests. See response to data request 15, pdf p. 48
<http://apps.psc.wi.gov/pages/viewdoc.htm?docid=360493>
- 4 WI Transmission Expansion Spending table excerpted, pdf p. 40
<http://soulwisconsin.org/Resources/FootnoteHarbour.pdf#page=40>
- 5 Request 10C, pdf p. 20 *Applicants' Responses to SOUL of Wisconsin's First Set of Discovery Requests*,
<http://apps.psc.wi.gov/pages/viewdoc.htm?docid=357719>
- 6 Wisconsin Utilities, 2012-2016 Fixed Fee Increases, <http://soulwisconsin.org/Resources/FootnoteHarbour.pdf#page=13>
- 7 (Bipartisan, Wisconsin State Legislators) *Request for Economic Performance Testing of Expansion Transmission Lines*,
<http://apps.psc.wi.gov/pages/viewdoc.htm?docid=361228>
- 8 The 2018 State Energy Efficiency Scorecard, <https://aceee.org/research-report/u1808>
- 9 Writes engineer Bill Powers regarding the *Badger-Coulee* transmission line proposal, “The cost of the no-wires alternatives to offset the 0.22 percent per year peak load growth scenario, at \$3.37 million (Load Management), \$9.45 million (Energy Efficiency), and \$18.75 million (community solar), are a fraction of the \$190.9 million identified by ATC to upgrade LV segments as an alternative to B-C.” pdf p. 46, <http://bit.ly/Powers-Direct>
- 10 MISO 2016 State of the Market Report, excerpt on pdf p.36
<http://soulwisconsin.org/Resources/FootnoteHarbour.pdf#page=36>
- 11 SOUL’s free, “Wisconsin Meter Watch” initiative has demonstrated that households are capable of very significant reductions without sacrificing quality of life. http://soulwisconsin.org/Documents/13X13_EfficiencyHandout.pdf
- 12 Electric hot water heaters which are common to rural Wisconsin average about 30% of household use. Replacing one with an *On Demand* propane water heater not only reduces associated CO2 emissions by a factor of 3-5, but also eliminates the possibility of the high current drain during peak demand hours when power has more CO2 content.
- 13 On p.10, ACEEE points out “..the third tier Kentucky, Nevada, Ohio, and Wisconsin are tied for 29th. Small improvements in energy efficiency will likely have a significant effect on the rankings of states in these middle tiers.”
- 14 State annual reduction percentage in electricity use divided by the rebate dollars collected for this purpose.
- 15 Why Did WI Utilities Bother to Cut WI’s Energy Efficiency Program a Mere 7%?,
http://soulwisconsin.org/Documents/7-percent_EE-First_ForknRoad.pdf
- 16 Only 2017 spending is compared. State groupings are used because of significant differences in CO2 emission amounts from state to state, annual variations in emission generation and some state energy efficiency programs directly rewarding utilities for CO2 reduction. The correlation between spending and emission reduction would also be improved if spending and emission amounts were analyzed every year from 2007 to 2017 and statistically trended.
- 17 MGE order PSC REF#:226563 http://psc.wi.gov/apps35/ERF_view/viewdoc.aspx?docid=226563
- 18 *Carbon dioxide emissions from the U.S. power sector have declined 28% since 2005*,
<https://www.eia.gov/todayinenergy/detail.php?id=37392>
- 19 *Surging opposition defeats contentious \$111m power line project* <https://tworivertimes.com/surging-opposition-defeats-contentious-111m-power-line-project/>
- 20 For Badger-Coulee, the encouragement from newspaper editorials, county and state lawmakers proved helpful in assuring the attendance of at least one PSC Commissioner at all three public hearings.
- 21 *Rural Northern Wisconsin Logs Record-Setting Solar Group Buy*, Kari Lydersen, <https://www.usnews.com/news/best-states/wisconsin/articles/2018-12-08/rural-northern-wisconsin-logs-record-setting-solar-group-buy>
- 22 For end users, the cost of all types of electricity are equalized and are expected to increase from 2-5% per year for coming decades. When utility interests write of, “low cost renewable energy” they are referring to the wholesale price which is very low *for all kinds of electric generation* – about 3 cents per kWh. The only practical way to lower the rate of increase to abandon the utility expansion model prioritize maintaining a “right-sized” electricity system.
- 23 The Renewable Portfolio Standard (RPS) requires utilities to purchase a specified percentage of renewable energy. It does not set accountable goals for CO2 reduction because market rules set by the utilities do not require new renewable energy to replace fossil fuel generation. This and other factors are behind the very low percentage of renewable energy in midwestern outlets and the extremely slow progress after billions spent towards remote renewables.
- 24 Wisconsin land use involved to meet 100% 2016 Wisconsin net generation with utility scale solar or alternatively, utility scale wind turbines. <https://gallery.mailchimp.com/b59cfca00987b6608bf82d01f/images/f3e99378-77d8-4f1f-bd87-050a691d8526.png>
- 25 *USDA/RUS Draft Environmental Impact Statement: Cardinal Hickory Creek transmission line proposal would economically advantage 15 lower fossil fuel and renewable power plants in southwest and south central Wisconsin*
http://bit.ly/15_Power_Plants
- 26 *Tony Evers proposes carbon-free electricity by 2050*, Chris Hubbuch, Wisconsin State Journal,
http://bit.ly/Evers_MoreEEConservation