Electricity use in U.S. homes has been dropping since 2007; not from a slower economy or the surprising growth in solar, but from more efficient appliances, improved building practices and states shifting ratepayer spending from new power plants and transmission lines; into "Accelerated" Energy Efficiency benefits that are steadily reducing demand. **[1]**

[1a] **U.S. Electricity Use Dropping** "[From] 2007-2012,... electricity consumption in the U.S. declined by 1.9%, an average of 0.37% per year. Population grew by an average of 0.92% per year, while electricity use per capita declined by 1.21% per year." Page 6, "Why Is Electricity Use No Longer Growing?" by Steven Nadel and Rachel Young, February, 2014. <u>http://aceee.org/files/pdf/white-paper/low-electricity-use.pdf</u>





Source of data in Chart: U.S. Department of Energy, Energy Information Agency, EIA 826 Sales and Revenue Data 1990-2014, https://www.eia.gov/electricity/data/eia826/xls/sales revenue.xls



[1c] WI Electricity Use Dropping as Annual Percentage

YEAR	Total MWH USE	Annual Percentage Change
2007	65,233,608	
2008	64,172,029	-1.63%
2009	60,346,501	-5.96%
2010	62,687,176	3.88%
2011	62,717,972	0.05%
2012	62,972,609	0.41%
2013	62,970,067	0.00%
2014	63,503,852	0.85%
2015	62,660,970	-1.33%
Average	63,029,420	-0.47%

Source of data in charts: U.S. Department of Energy, Energy Information Agency, EIA 826 Sales and Revenue Data 1990-2016, https://www.eia.gov/electricity/data/eia826/xls/sales_revenue.xls

Source of data in Chart: U.S. Department of Energy, Energy Information Agency, EIA 826 Sales and Revenue Data 1990-2016, <u>https://www.eia.gov/electricity/data/eia826/xls/sales_revenue.xls</u>



[1d] Decline in Electricity Use Independent of Economic Growth (GDP)

Figure 2. U.S. retail electric sales and GDP for past 20 years (1993-2013). Note: Bottom of graph is not zero on the y axis. 2013 data is annualized by taking use in 2012 and adjusting based on differences between the first ten months of 2012 and 2013. *Source:* Prepared by ACEEE from EIA 2013d and BEA 2013b.

Above chart from page 4, "Why Is Electricity Use No Longer Growing?" by Steven Nadel and Rachel Young, February, 2014. http://aceee.org/files/pdf/white-paper/low-electricity-use.pdf

[1e] Reduction in Use from Energy Efficiency Measures "Taken together, the savings from utility energy efficiency programs (about 0.4% per year), appliance and equipment efficiency standards (0. 6% per year), and building codes (0.2% per year) total about 1.2% per year. This figure is similar to the decline in electricity use per capita and more than explains the 0.37% per year decline in electricity sales." From page 7, "Why Is Electricity Use No Longer Growing?" by Steven Nadel and Rachel Young, February, 2014. http://aceee.org/files/pdf/white-paper/low-electricity-use.pdf

[1f] 180% Increase in U.S. Energy Efficiency Spending 2008-2102:



Chart: Figure 5, pg 24, "2013 State of the Effciency Program Industry: Budgets, Expenditures and Impacts." by Consortium for Energy Efficiency, https://library.cee1.org/sites/default/files/library/11350/CEE_2013_Annual_Industry_Report.pdf

Data: Chart 5, Page 24, 2013 State of the Efficiency Program Industry https://library.cee1.org/sites/default/files/library/11350/CEE_2013_Annual_Industry_Report.pdf





July WI Consumption (Tab 6)	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
WPS	1,243,784	1,282,723	1,157,505	1,108,294	1,144,369	1,151,885	1,159,200	1,163,025	1,164,803	1,167,825
WE	2,649,352	2,799,117	2,421,572	2,439,219	2,466,454	2,493,559	2,521,686	2,527,602	2,531,173	2,545,406
NSP-	733,293	747,551	646,089	664,051	669,450	673,344	677,181	680,287	684,006	686,534
DPC	284,154	285,419	252,239	255,291	258,195	261,543	264,928	268,501	272,204	275,851
MG&E	377,460	382,613	385,003	325,107	326,699	328,542	330,410	333,353	335,224	337,087
WP&L	1,316,457	1,410,404	1,230,293	1,182,071	1,188,872	1,197,051	1,205,978	1,215,154	1,225,344	1,236,188
WIPPI	504,394	526,305	474,160	474,556	476,929	479,313	481,710	484,118	486,539	488,972
Superior	2,649,352	2,799,117	2,421,572	2,439,219	2,466,454	2,493,559	2,521,686	2,527,602	2,531,173	2,545,406
Manitowoc	51,000	54,500	49,900	50,400	50,900	51,400	52,000	52,500	53,000	53,500
Totals	9,809,246	10,287,749	9,038,333	8,938,208	9,048,322	9,130,196	9,214,779	9,252,142	9,283,466	9,336,769

Lot a Line

	Year	July Use	Change in %
	2011	9,809,246	
WI Litilities Electricity Lise Projections 2011-2020	2012	10,287,749	4.88%
WI Oundes Electricity Use Projections 2011-2020	2013	9,038,333	-12.14%
From BSC SEA 2020 Litility Poporting for Month of July	2014	8,938,208	-1.11%
FIGHT FSC SEA 2020 Office Reporting for Month of July	2015	9,048,322	1.23%
	2016	9,130,196	0.90%
	2017	9,214,779	0.93%
All Data from PSCW Docket 05-ES-107 Required Utility Reports for 2020 SEA	2018	9,252,142	0.41%
"Strategic Energy Assessment 2020"	2019	9,283,466	0.34%
Strategic Energy Assessment 2020	2020	9,336,769	0.57%
http://psc.wi.gov/apps35/ERF_search/default.aspx	Average		-0.44%

Data Source: Wisconsin Utility Reports filed for SEA, PSC WI Docket 05-ES-107 http://psc.wi.gov/apps35/ERF_search/default.aspx

Electricity use in the Midwest has been dropping at a very fast clip of 2.24% per year according to data recently supplied by regional utilities. [2]



[2a] MISO Energy Sales Declined 2.24% Per Year 2007-2012

Data Source: Page 12, "Badger Coulee 345 kV Transmission Line Project Docket No. 5-CE-142 PSCW First Set of Request Items Request No. 01.151 Response" http://psc.wi.gov/apps35/ERF_view/viewdoc.aspx?docid=200029

[2b] Decline in Regional Wholesale Electricity Trading. During 2015, trading at the Indiana HUB within the MISO energy market was at 5% of 2008 peak use.



Note: Colored areas denote Regional Transmission Organizations (RTO)/Independent System Operators (ISO) Source: U.S. Energy Information Administration based on Ventyx Energy Velocity Suite

Annual Traded Electricity (MWH)





Source: U.S. Energy Information Administration based on Ventyx Energy Velocity Suite

Data Source: <u>http://www.eia.gov/electricity/wholesale/</u>

In 2012, 75% of the reduction in carbon emissions realized in the U.S. came from state and federally encouraged energy efficiency programs. [3]

[3a] "We also note that our results are consistent with a recent regression analysis by Afsah and Salcito (2013) who found that energy efficiency and conservation measures were the primary cause of reduced CO2 emissions in the United States in 2012. These authors estimate that nearly 75% of the decline in emissions was due to reduced energy demand, primarily attributable to energy efficiency but with a helping hand from the mild winter in the first quarter of 2012. The remaining emissions reductions were due to a shift toward natural gas in the electric power sector. " From page 18, "Why Is Electricity Use No Longer Growing?" by Steven Nadel and Rachel Young, February, 2014. <u>http://aceee.org/files/pdf/white-paper/low-electricity-use.pdf</u>

Due to dropping use and excess power, requests for new power plants in the U.S. in 2013 were down 50% from 2012. 22% of the new plants granted in 2013 are solar resources compared to 8% for wind. [4]

[4a] For records of dropping use, see footnotes 1a, 1b, 1c, and 1g.

[4b] Requests for new power plants in 2013 were down 50% from 2012. ". [in 2013,] Solar provided nearly 22%, a jump up from less than 6% in 2012. Coal provided 11% and wind nearly 8%. In total, a little over 13,500 megawatts (MW) of new capacity was added in 2013, less than half the capacity added in 2012." From APRIL 8, 2014 "Today In Energy" U.S. Energy Information Agency, http://www.eia.gov/todayinenergy/detail.cfm?id=15751

Since 2005 when Wisconsin utilities began adding charges for a greatly enlarged transmission system, our electricity rates have ranked highest or second highest in the Midwest. Though once below national average, by 2013 only seven states faced faster climbing rates than Wisconsin's. [5]



[5a] WI Average Residential Rate is Highest in Midwest in 2015

https://www.eia.gov/electricity/data/state/avgprice_annual.xls

[5b] Only 7 states have experienced electricity cost increases higher than Wisconsin since 2003.

States With Highest Rate Increases 2003-2013



Data Source EIA Form 861 https://www.eia.gov/electricity/data/state/avgprice_annual.xls

From 2007 to 2012, as most states collectively doubled their investments in Energy Efficiency, Wisconsin's allocation dropped to 75% of the 2007 amount. [6]

[6a] U.S. States Nearly Double Energy Efficiency Expenditures:



Chart: Figure 5, pg 24, "2013 State of the Effciency Program Industry: Budgets, Expenditures and Impacts." by Consortium for Energy Efficiency, https://library.cee1.org/sites/default/files/library/11350/CEE_2013_Annual_Industry_Report.pdf

Data: Chart 5, Page 24, 2013 State of the Efficiency Program Industry https://library.cee1.org/sites/default/files/library/11350/CEE_2013_Annual_Industry_Report.pdf **[6b] Wisconsin Focus on Energy Spending in 2007 and 2012.** The 2011 Energy Efficiency budget was 74% of the budget for the program in 2007 and in 2012 it was 81% of the 2007 amount. Program spending in the Wisconsin is close to \$1 per month per residential customer which is less than spending in surrounding states.



Source: https://www.focusonenergy.com/about/evaluation-reports



Data source: http://aceee.org/sites/default/files/publications/researchreports/u1408.pdf

As Wisconsin's electric rates and fees race to keep up with the debt created by these transmission additions, the shortages in efficiency incentives to improve our homes, farms and businesses force us to pay hundreds of millions in unnecessary electricity expenses each year. [7]

[7a] In October of 2014, as in prior reports, the Wisconsin Public Service Commission attributes the state's region-leading rates and fixed fee increases to state utilities needing "to obtain cost recovery" for new transmission and generation infrastructure purchases. Electric customer indebtedness is created by the "high, fixed cost nature of the utility business" with practice of amortizing costs with guaranteed, high interest over a period of 30-40 years.

WI RATES

"Rates can vary widely based on factors such as whether a state is in a construction cycle for generating facilities or transmission infrastructure. ... Wisconsin remains ahead of many other states with respect to its investment in new electric generation and transmission facilities... This required generation plants and transmission facilities to be constructed beginning in the late 1990s and continuing through recent years for which utilities now seek to obtain cost recovery. (PSC 2020 SEA, page 31. PSC ref # 220557)

"Energy rates continue to increase across customer classes both in Wisconsin and the Midwest. Rate increases are generally driven by sales decline, transmission, generation, distribution and renewable investments, increased federal regulation of pollutants, fuel price volatility and purchased power costs, as well as the high fixed-cost nature of the utility business. "(PSC 2020 SEA, page 4. PSC ref # 220557)

[7b] WI utilities will collect an additional \$7 billion over the next 30 years in revenue just



Select Wisconsin Utility 30 Year Revenue Increases Created by Additions in Fixed Fees, 2012-2016

Graphic from La Crosse Tribune, May 29, 2015 http://lacrossetribune.com/news/local/scel-seeks-to-raise-fixed-cost-for-electricity-use/article_6bb617e2-6253-53fd-ad15-fda1a07d4d29.html

Utility	Fee Increase/Mo	Customers*	30 Year Revenue Generated (billions)
Wisconsin Electric Power Co	\$8.30	1,243,812	3.716
Wisconsin Public Service Corp	\$13.20	478,160	2.270
Northern States Power Co	\$6.00	267,472	.577
Madison Gas & Electric Co	\$1.78	157,886	.101
Alliant (WP&L) Proposed in two stages^	\$6.26	470,861	1.061
			7.725

from 2012-2016 Fixed Fee Increases.

Fee amounts from PSC WI rate decisions and these news articles:

http://www.jsonline.com/business/alliant-energy-proposes-power-rate-hike-big-jump-in-customer-charge-b99729414z1-380332131.html

 $http://lacrossetribune.com/news/local/xcel-seeks-to-raise-fixed-cost-for-electricity-use/article_6bb617e2-6253-53fd-ad15-fda1a07d4d29.html and the second second$

Utility customer numbers from form EIA-861 schedules 4A, 4D4A and 4D & EIA 861-S. http://www.eia.gov/electricity/sales_revenue_price/xls/table10.xls

Utility	2006	2016	% Annual Increase
Alliant	\$7.50	\$15.00	7.2%
MGE	\$8.50	\$21.74	9.9%
WE	\$6.00	\$16.00	10.3%
WPS	\$7.50	\$21.00	10.9%
XCEL	\$8.00	\$17.00	7.9%
Average			9.21%

[7c] The "race" to keep up with utility debt payment. The need to increase rate and/or fixed fee accelerates when energy use drops, especially for long term that was expected to be collected under higher growth rates. The impact of lower growth rates on ratepayer costs is reflected in forecasting tools provided by the U.S. Energy information Agency. The intensity of the impacts on costs can be seen In the plot below where the rate under "Low Economic Growth" conditions is only .2% / year lower than the "Reference" or business as usual conditions.

In the Badger-Coulee proceeding, utility applicants refused to provide estimates of long term cost impacts based on current Wisconsin utility projections of a *declining* rate of -.44% per year (see chart 1g).



Data Source: http://www.eia.gov/forecasts/aeo/data/browser/#/?id=8-AEO2015

Data Source: Chart created with EIA tools: <u>http://www.eia.gov/forecasts/aeo/data/browser/#/?id=8-AEO2015</u>

[7d] Costs for the "Regional Transmission System" charged to the electric customers of Alliant Energy utility increased 2.1% from 2015 to 2016 resulting in \$2 per month increase to residential customers. Including this increase, charges for regional transmission amount to

19% or \$20 of the average monthly electric bill.

Regional Transmission Service



2016 Transmission costs were implemented January 1, 2016. The "Regional Transmission Service" (RTS) line captures the transmission costs from ITC Midwest and other transmission providers and breaks them out from the rest of a customer's bill.

Regional Transmission Service Q&A

What is Regional Transmission Service?

Transmission is the high-voltage lines that carry power long distances between power plants and the neighborhood substations that serve our customers. The RTS line item reflects only the actual cost of this service.

What is the impact to my bill?

The average electric bill is made up of several parts. One of which is the cost for transmission service, labeled Regional Transmission Service (RTS). Because RTS only makes up only one part of your total bill, the overall impact on bills is much smaller, and will vary depending on customer class.

Н	ere	is the	e percentage	increase	for	the	RT	S fo	r each	customer	class fo	r 2016:	
---	-----	--------	--------------	----------	-----	-----	----	------	--------	----------	----------	---------	--

Customer	RTS Rate	RTS Rate	RTS Factor	%	RTS Component of
Class	Unit	2015	2016	Change	Overall Bill*
Residential	\$/kWh	0.02567	0.02858	11%	19%
General Service	\$/kWh	0.02579	0.02837	10%	20%
Large General Service	\$/kW	7.40	7.99	8%	22%

*Percentage of total transmission to total annual bill.

How often will the rates for the transmission costs change?

Costs for transmission service are subject to the authority of the Federal Energy Regulatory Commission. Alliant Energy adjusts its charges annually to reflect any changes which have occurred for these transmission costs. The charge is per unit of energy you use, so the actual cost adjusts annually based on your usage and any change in the charge.

Source https://www.alliantenergy.com/AboutAlliantEnergy/Newsroom/RateCases/030377 Annotarions in red

Above 2016 cost increase report replaced by 2017 report,

https://www.alliantenergy.com/en/CustomerService/AlliantEnergyService/RatesandTariffs/ElectricRatesIOWA/RegionalTransmissionService

indicating the residential rate charge decreased from .02858 / kWh to .02788 / kWh with the overall residential bill impact remaining at 19%.

[7e] Hundreds of millions in electricity wasted. Investment in Energy Efficiency in Wisconsin is significantly lower than in surrounding states (see 6B, above) leading to hundreds of millions in wasted energy expense each year and much more in the long term. According to a 2015 Evaluation of the performance of Wisconsin's Energy Efficiency and Renewable Energy program, Focus on Energy, the ratio of cost to electric savings is 5:1 with annual savings of more than \$400 million (see illustration below). At this ratio, If energy efficiency incentives were increased only \$1 per month instead of recent, multiple dollar fixed fee increases collected in large part for capital utility debt, electricity savings in WI would be in excess of \$400 million per year.

	May 20, 2016				
Table 23. Sector Costs Co	mparison				
Costs	CY 2015				
Residential		Focus on Ener	rgy Cost to		
Incentive Costs	\$21,377,732	Benefit Ratio	for Savings in		
Administrative Costs	\$4,421,952	Electricity Exp	pense (\$88.7		
Delivery Costs	\$10,084,023	Million / \$454	million) is		
Total Residential Non-Incentive Program Cos	ts \$35,883,707				
Nonresidential		Γ	· 1		
Incentive Costs	\$40,612,777	J			
Administrative Costs	\$4,070,977				
Delivery Costs	\$16,623,494				
Total Nonresidential Non-Incentive Program	Costs \$61,307,247				
Total for Residential and Nonresidential Sect	ors	Table 26. CY 2015 Co	Table 26. CY 2015 Costs, Benefits,		
Incentive Costs	\$61,990,509	and Modified TRC Test Results by Se			
Administrative Costs	\$8,492,929	Nonresidential	Total		
Delivery Costs	\$26,707,516	\$4,070,977	\$8,492,92		
Total for Residential and Nonresidential Sect	ors	\$16,623,494	\$26,707,51		
Non-Incentive Program Costs	\$97,190,955	\$162,338,959	\$202,095,63		
	····-	\$183,033,430	\$237,296,08		
Electric Benefits	\$114,250,435	\$340,422,234	\$454,672,66		
Gas Benefits	\$29,894,236	\$238,838,527	\$268,732,76		
Emissions Benefits	\$25,236,521	\$85,344,610	\$110,581,13		

Including Job Creation, Environmental and other Community impacts, the benefit ratio is

6.7:1

Table 28. Portfolio-Level Cost-Effectiveness Results for Additional Benefit/Cost Tests

Calendar Year	Residential	Nonresidential	Total
CY 2015: Expanded TRC B/C Results	6.92	6.64	6.70
CY 2015: UAT B/C Results	4.02	9.45	7.44
CY 2015: RIM B/C Results ¹	0.56	1.08	0.91

¹ For the CY 2015 cost-effectiveness analysis the lost revenue portion of the RIM test assumes a fixed utility rate that does not escalate over time, while the avoided energy costs are escalated on a yearly basis resulting in greater benefits than costs for the nonresidential Portfolio.

Tables from Focus on Energy / CY 2015 Evaluation / Evaluation Findings Volume 1:

https://www.focusonenergy.com/sites/default/files/WI%20FOE%20CY%202015%20Volume%20I.pdf Prior and subsequent audits: <u>https://www.focusonenergy.com/about/evaluation-reports</u> A sweeping package of new, expansion transmission lines adding 30 to 40 years of ratepayer debt at 10-12% guaranteed interest with 15 or more slated in other states. Utilities have refused to provide complete estimates of costs but they likely dwarf the cost of adequately funding Energy Efficiency and Solar incentives in Wisconsin. [8]

[8a] WI transmission expansion projects are identified on the accompanying map. Expansion projects in other states for which WI ratepayers would assume a share of the costs are listed below. The \$6.4 billion total accounts only for "project costs" during construction. Over 30-40 years, including financing, operation, maintenance costs, security and other costs, the final cost to ratepayers is considerably higher. MISO has not yet estimated 30-40 year end costs for ratepayers. For rough estimates, some electrical engineers use a multiplier of 4-5 times project cost which computes to about \$4 month per WI electric customer over 30 years if Wisconsin's share is 14%.

Note the MISO's cost estimates for these MVP expansion projects assume a very high, irrelevant energy growth rate of .8% per year. Taking into consideration the impact of lower energy use as described in [7c] above, actual costs will be much higher.

Multi-Value Transmission Projects (MVP's) with Interstate Cost Sharing					
Project ID	Project Name	Estimated Project Cost (2016\$)			
[1]	[2]	[5]			
1203	Brookings, SD - SE Twin Cities 345 kV	\$670,743,534			
2202	Reynolds to Greentown 765 kV line	\$387,493,373			
2220	Ellendale to Big Stone South	\$395,670,000			
2221	Big Stone South to Brookings	\$226,720,000			
2237	Pana - Mt. Zion - Kansas - Sugar Creek 345 kV line	\$422,071,023			
2239	Sidney to Rising 345 kV line	\$81,880,341			
2248	Adair - Ottumwa 345	\$191,850,587			
2844	Pleasant Prairie-Zion Energy Center 345 kV line	\$33,042,267			
3017	Palmyra Tap -Quincy-Meredosia - Ipava & Meredosia-Pawnee 345 kV Line	\$666,973,721			
3022	Fargo-Galesburg-Oak Grove 345 kV Line	\$217,754,491			
3127	N LaCrosse-N Madison-Cardinal -Spring Green - Dubuque area 345-kV	\$1,034,547,000			
3168	Michigan Thumb Wind Zone	\$510,000,000			
3169	Pawnee to Pana - 345 kV Line	\$120,976,800			
3170	Adair-Palmyra Tap 345 kV Line	\$153,369,959			
3203	Reynolds to E. Winnamac to Burr Oak to Hiple 345 kV	\$271,000,000			
3205	Lakefield Jct Winnebago - Winco - Burt Area - Webster 345 kV line	\$541,119,569			
3213	Winco to Hazelton 345 kV line	\$464,348,611			
		\$6,389,561,277			

......

Annual MISO Withdrawals based on 2014 values with years 2017-2036 escalated assuming an annual energy growth rate of 0.8% consistent with the assumed energy growth rate used in the MTEP15 Business as Usual Future.

Above chart from MISO MVP Indicative Costs 26A Schedule, tab 1: https://www.misoenergy.org/ layouts/miso/ecm/redirect.aspx?id=196552

[8b] An adequately funded Energy Efficiency program in Wisconsin could cost as little as \$1 per month and increase current energy savings about 60% A Higher Performing Energy Efficiency Program in WI

like Minnesota's would allow electric customers to add \$60 million to our Focus on Energy rebate pool. By ACEEE standards, this would eliminate 60% more energy use than our current program at a cost of about \$1 per month returning \$5 in energy savings. An accelerated program like that in Massachussetts' would cut 333% more at a cost \$4 per month returning about \$16 in energy savings. Both amounts are small in relation to recent fee increases for long term debt on utility expansion.

State	2014 spending (\$million)	% of statewide electricity revenues	Score (4 pts.)
Rhode Island	81.1	6.81%	4
Massachusetts	503.8	6.14%	4
Vermont	48.1	5.95%	4
Maryland	319.3	4.27%	4
Washington	279.5	4.22%	4
Oregon	159.8	3.88%	3.5
Connecticut	180.6	3.62%	3.5
California	1237.6	3.14%	3
lowa	108.5	2.80%	2.5
Utah	57.2	2.27%	2
Illinois	265.1	2.13%	2
Minnesota1	135.6	2.09%	2
New Jersey	201.5	1.96%	1.5

75.0

13.5

67.0

106.6

202.8

39.5

86.4

201.3

51.9

36.5

4.9

11.0

5.3

5,919.8

50.5

1.01%

0.99%

0.90%

0.86%

0.83%

0.63%

0.60%

0.59%

0.56%

0.47%

0.44%

0.44%

0.40%

1.09%

1

0.5

0.5

0.5

0.5

0.5

0.5

0.5

0.5

0

0

0

0

Wisconsin

Missouri

Florida

Ohio*

Texas Tennessee

Kentucky

North Carolina

South Carolina

South Dakota

West Virginia

Wyoming⁴

US total

Median

District of Columbia

Table 9. 2014 electric efficiency program spending by state

Table 13. 2014 net incremental electricity savings by state

92.923 854,582 866,721 194,861 61,046 25,734	0.66% 0.64% 0.59% 0.57% 0.56%	1.5 1.5 1.5 1.5 1.5
92.923 854,582 866,721 194,861 61,046	0.66% 0.64% 0.59% 0.57% 0.56%	1.5 1.5 1.5 1.5 1.5
92.923 854,582 866,721 194,861	0.66% 0.64% 0.59% 0.57%	1.5 1.5 1.5 1.5
92.923 854,582 866,721	0.66% 0.64% 0.59%	1.5 1.5 1.5
92.923 854,582	0.66% 0.64%	1.5 1.5
92.923	0.66%	1.5
500,784	0.68%	2
159,310	0.81%	2
213,468	0.71%	2
768,927	0.74%	2
527,283	0.76%	2
824,756	1.22%	3.5
595,548	1.27%	3.5
792,354	1.29%	3.5
387,863	1.32%	3.5
1,386,912	1.35%	4
144,240	1.53%	4.5
1,190,123	1.57%	4.5
4,082,256	1.58%	4.5
102,770	1.85%	5.5
1,339,026	2.50%	6
268 468	3.51%	6
2014 net incremental savings (MWh)	% of 2014 retail sales	Score (6 pts.)
	2014 net incremental savings (MWh) 268,468 1,339,026 102,770 4,082,256 1,190,123 144,240 1,386,912 387,863 792,354 595,548 824,756 527,283 768,927 213,468 159,310 500,784	2014 net incremental savings (MWh) % of 2014 retail sales 268,468 3.51% 1,339,026 2.50% 102,770 1.85% 4,082,256 1.58% 1,190,123 1.57% 1,44,240 1.53% 1,386,912 1.35% 387,863 1.32% 792,354 1.29% 595,548 1.27% 824,756 1.22% 768,927 0.76% 768,927 0.74% 213,468 0.71% 500,784 0.68%

Table 9 from page 26 and Table 13 from page 31 of "The 2015 State Energy Efficiency Scorecard"

http://aceee.org/sites/default/files/publications/ researchreports/u1509.pdf

http://aceee.org/sites/default/files/publications/researchreports/u1509.pdf

Long-term energy "planning" that roundly rejects the option of accelerated energy efficiency investments in in favor of increasing consumption and extending the life of fossil fuel power plants while dramatically increasing the carbon footprint in Wisconsin and within the region. [9]

[9a] In 1998, the PSC of Wisconsin ceased conducting "Integrated Resource Planning[^]" which required that all proposed capital utility investments including transmission and power plants pass cost-benefit analysis demonstrating that energy dollars would not be better spent on end-user investments in Energy Efficiency, Load Management and Local Power. As documented in [6b], WI energy spending on end user improvements stagnated in while investment in transmission and power plants soared [see 7a].

^Reasoning for this major change in energy policy from the perspective of utility interests, see "LIGHTS OUT: WISCONSIN'S ELECTRIC FUTURE," by Pete Millard, published in "Wisconsin Interest," Fall, 2001. <u>http://www.wpri.org/WIInterest/Millard10.3.pdf</u>. Also, "Electric Industry Restructuring" published by the WPSC, January 13, 1997. <u>http://www.energymarketers.com/Documents/elecrest.htm</u>.

[9b] MISO Regional Transmission Expansion Planning assumes carbon emissions will continue to rise. At the request of more than 100 municipal resolutions, staff of the Public Service Commission of Wisconsin asked MISO to provide a CO2 impacts assessment for the Badger-Coulee transmission expansion proposal. The document they submitted shows that in all but one of the six energy "futures" they anticipate in utility planning, *carbon emissions in the region would continue to rise*. The exception is even more telling.

In regard to general public impressions created by utility interests that transported wind energy would increase enough with transmission expansion to create net environmental gains, the submitted data shows the opposite. Under the "Regional Wind" scenario, CO2 emissions would continue to rise at the rate of 1.2% per year with 17 transmission lines in place, a five fold increase in midwestern wind resources and a national 20% renewable energy requirement in effect.

In the "Constrained Carbon" future, MISO's data illustrates the unavoidable necessity of increased investment in energy efficiency in conjunction with *significant carbon taxing* before any expansion of the grid system can trim CO2 emissions over time. The explanation is rooted in the rules under which the electricity market operates after it was placed under utility control in 1998. Under conditions when demand for electricity is *not* lowered over time by energy efficiency, the increased grid capacity allows under-utilized or "stranded" coal and natural gas power plants to power-up and deliver CO2-ladened power into the market.

The following chart contains data from Tables 12 and 13 on pages 38 and 39 of, "ATC's Planning Analysis of the Badger Coulee Transmission Project, Revised Appendix D, Exhibit 1," PSC REF#:204739 <u>http://psc.wi.gov/apps35/ERF_view/viewdoc.aspx?docid=204739</u> MISO CO2 emission data is from pages 4-6, "Part 3 of the Applicants' Responses to PSCW Staff's Fifth Set of Data Requests." (PSC REF# 210501) <u>http://bit.ly/MISO-CO2-Increases</u>.

Badger-Coulee Carbon Emission Impacts Under Six Futures from 2020 - 2026

Future	Assumptions	CO2 Tons 2020	CO2 Tons 2026	CO2 Emission Change
Robust Economy	Energy use 13% greater than WI utilities predict 20% Renewable Energy Requirement in WI,IA,IL No New Coal Retired 1200 MW Coal Added 4200 MW Natural Gas Added \$50 Per Ton Carbon Tax Increase Existing Wind 3X 150 MW Solar; 200 MW Biogas	611,29,642	679,062,431	Increases +1.7% Per Year
"Green" Economy	Energy use 13% greater than WI utilities predict 25% Renewable Energy Requirement in Midwest 900 MW Coal Retired 1200 MW Natural Gas Added Increase Existing Wind 5X	551,093,620	590,817,405	Increases +1.16% Per Year
Slow Growth	Energy use 2% greater than WI utilities predict No Change in Renewable Energy Requirements 450 MW Coal Retired 800 MW Coal Added Increase Existing Wind 1.5X	473,563,243	486,686,208	Increases +1.45% Per Year
Regional Wind	Energy use 8% greater than WI utilities predict 20% Renewable Energy Requirement in Midwest 900 MW Coal Retired 600 MW Coal Added \$25 Per Ton Carbon Tax 1800 MW Natural Gas Added Increase Existing Wind 5X	546,468,922	588,656,408	Increases +1.24% Per Year
Limited Investment	Energy use 5% greater than WI utilities predict No Change in Renewable Energy Requirements 450 MW Coal Retired \$25 Per Ton Carbon Tax Increase Existing Wind 1.8X	526,929,955	550,496,165	Increases +.73% Per Year
Carbon Constrained	Energy use 2% greater than WI utilities predict Major Increase in Energy Efficiency 25% Renewable Energy Requirement in Midwest 67 MW Solar and Biogas 1700 MW Coal Retired \$50 Per Ton Carbon Tax Increase Existing Wind 2X	484,555,106	385,310,866	Decreases -3.4% Per Year

Short-sighted economic "planning" that commits Wisconsin to shipping hundreds of millions of our renewable energy dollars out of state to utility-favored developers rather than helping Wisconsin families and communities develop on-site and local solar facilities *saving Wisconsinites* hundreds of millions of dollars creating local jobs and lowering emissions faster, and much more cost-effectively. [10]

[10a] Because the utility interests proposing the Badger-Coulee line could not guarantee tangible benefits like carbon emission reductions or energy savings over time, they created economic modeling^^ on the premise that it would be cheaper for WI electric customers to pay for the development of remote wind energy where the wind blows stronger in the Great Plains rather than develop local renewables where use of predominately fossil fuel power from the grid is directly abated.

The potential savings the transmission builders estimated** over 40 years under "Slow Growth" conditions amount to about 1/8 of the annual savings of WI's under-funded energy efficiency program [7e].

Under questioning of WI PSC staff*[^], the applicants refused to compare their modest outcomes to those of the same millions being spent *in-Wisconsin economies* developing local renewable power and energy efficiency with *guaranteed* emission and energy savings.

** See Table 2, page 9, 5.6 in "ATC's Planning Analysis of the Badger Coulee Transmission Project, Revised Appendix D, Exhibit 1," PSC REF#:204739 http://psc.wi.gov/apps35/ERF_view/viewdoc.aspx?docid=204739

^^ See page 54, 5.6 Renewable Investment Benefit, in "ATC's Planning Analysis of the Badger Coulee Transmission Project, Revised Appendix D, Exhibit 1," PSC REF#:204739 http://psc.wi.gov/apps35/ERF_view/viewdoc.aspx?docid=204739

*^ See WI Commission Staff Data Request No. 01.90 PSC Ref#193819 http://apps.psc.wi.gov/pages/viewdoc.htm?docid=193819

[10b] End cost to ratepayers for many types of locally and remotely produced renewable energy have been analyzed by Columbia (Missouri) Water & Light Municipal Utility. When higher prices for transmission carried power during peak hours are factored in, most forms of locally produced renewable energy, including solar, cost less than wind power purchased from two remote locations outside of their footprint.

Columbia (MO) Water & Light - 2014 & 2015 Renewable Energy Costs

	Addtions and Savings in Relation to Wh	olesale-Grid Power Cost Includ	ling Time of Demand Pricing Adjustment*		
	2015 Report with 2014 Prices	Increase/Decrease Per kWh	Increase/Decrease on Average Electric Bill		
LOCAL	Community Solar ("Solar One")	None	No Utility Cost- Savings Go to Solar Customers^		
Transmission	Remote Wind Power (Crystal Lake, IA)	\$0.0381	0.6475		
Transmission	MO Wind Power (Bluegrass, MO)	\$0.0337	0.3148		
LOCAL	Solar on Customer Homes (Net Metered^)	\$0.0197	0.0016		
LOCAL	Solar on Distribution Lines (Free Power^)	\$0.0025	0.0008		
LOCAL	Landsfill Gas Plant (Ameresco)	-\$0.0048	-0.0707		
LOCAL	Landfill Gas Plant (Columbia)	-\$0.0088	-0.1083		
	Totals		0.7857		
	2016 Report with 2015 Prices	Increase/Decrease Per kWh	Increase / Decrease on Average Electric Bill		
LOCAL	Community Solar ("Solar One")	None	No Utility Cost- Savings Go to Solar Customers		
Transmission	Remote Wind Power (Crystal Lake, IA.)	\$0.0391	0.6860		
Transmission	MO Wind Power (Bluegrass, MO)	\$0.0440	0.6724		
LOCAL	Landfill Gas Plant (Columbia - Not MISO)	\$0.0021	0.0206		
LOCAL	Solar on Customer Homes (Net Metered^)	\$0.0490	0.0118		
LOCAL	Solar on Distribution Lines (Free Power^)	\$0.0217	0.0052		
LOCAL	Solar on Distribution Lines - New Facility	\$0.0129	0.0031		
LOCAL	Landsfill Gas Plant (Ameresco - Not MISO)	-\$0.0086	-0.1393		
	Totals		1.2598		
Transmission	Transmission-Delivered Renewables	\$0.0387	2014-15 Average Cost Increase Above Wholesale Powe		
LOCAL	Locally Generated Renewables	\$0.0095	2014-15 Average Cost Increase Above Wholesale Powe		
	Transmission /Local Cost Ratio	407.1%			
	Data from: https://www.gocolumbiamo.com/Watera	ndLight/Documents/RenewReport.pdf			
	Data does not include impacts of a hybrid waste wood/co	oal plant power plant			
	^ Does not include energy savings realized by solar cu	ustomers/subscribers			
	*Solar and continuous generation during neak use hou	3/MWH			

2016 data used for above chart is no longer on line. The 2017 data is now available: <u>http://www.como.gov/WaterandLight/Documents/RenewReport.pdf</u>

[10c] Dollar for dollar, economic planning submitted in support of transmission **expansion planning** cannot compete with **right-sizing** our future needs through investment in non-transmission, end-user improvements*^*.

Even the most optimistic benefit to cost ratio projections*** developed by utility parties who would directly profit from transmission expansion are lower and in no manner are they guaranteed. The smaller, potential return from expansion depends on billions of dollars of spending and decades of unavoidable debt whether the facilities are used to potential or not.

In contrast, the *proven* benefits from energy efficiency and local power investment are not future estimates; they are measurements made by an unbiased party. Energy efficiency and local power investments are flexibly funded over time and do not place future debt on ratepayers ^*^ .

As noted in [7c], transmission costs increase as electricity use declines. The lower benefits estimated by the utility planners assume that future energy use will increase at the unfounded and significant rate of .8% per year [see 8a], whereas the Focus on Energy benefits have been computed from actual returns under existing, flat and declining use conditions.

Invoctment Bath		Assumed Future			
investment Fath	Residential Commercial Local Renewables		With Economic Impacts	Energy Use	
Focus on Energy 2015 Documented performance	3.33 : 1	3.93 : 1	1.18 : 1	6.7 : 1	Actual (Flat/Declining)
MISO 17 Transmission Expansion Lines Utility estimates	1.8 : 1	?	None	1.8 : 1	.8% / Year Growth

Focus on Energy cost to benefit ratios from pages 57 & 58, "Focus on Energy 2015 Evaluation Report Vo. 1" May 20, 2016

https://www.focusonenergy.com/sites/default/files/WI%20FOE%20CY%202015%20Volume%20I.pdf

^ See testimony filed by Powers Engineering in the Badger-Coulee proceeding, PSC Ref#224737 http://apps.psc.wi.gov/pages/viewdoc.htm?docid=224737

*** MISO's cost to benefit ratios from:

https://www.misoenergy.org/Library/Repository/Communication%20Material/One-Pagers/MVP%20Benefits%20-%20Total%20Footprint.pdf

[10d] Ton for Ton, CO2 reduction accountability submitted for expansion planning [see 9b] cannot compete with right-sizing our present and future needs with investment in non-transmission, end-user improvements. Utilities estimate that CO2 emissions with transmission expansion spending *would continue to increase* under all conditions they foresee unless unaccompanied by large increases in energy efficiency spending and a **\$50/ ton carbon tax in place.**

For 2015, the value of the CO2 emissions avoided through the WI's Focus on Energy program is reported to have a value of \$110 million. If the same avoided cost/ton figure used by utility planners for estimating transmission expansion benefits was applied to Focus on Energy CO2 reductions, the value of the CO2 reduction would surpass than \$360 million from a total program investment of \$97 million. The Focus on Energy program will also save Wisconsinites an estimated \$720 million in energy costs.

CADMUS



Table 21. Emissions Factors and Allowance Price

Service Fuel Type	CO ₂	NOx	SO ₂
Electric Emissions Factor (Tons/MWh)	0.8358	0.0007	0.0016
Gas Emissions Factor (Tons/MThm)	5.85	N/A	N/A
Allowance Price (\$/Ton)	\$15	\$97.50	\$3

The Evaluation Team obtained NO_x and SO₂ emissions allowance prices at the end of 2015 from the EPA's Cross State Air Pollution Rule (CSAPR).²¹ Because of the continued decline in and uncertainty surrounding forecasted NO_x and SO₂ allowance prices, the values used were the prices at the end of 2015 and were among the lowest prices reported during 2015. The Evaluation Team used the CO₂ emissions price in the PSC's Order, docket 5-FE-100 Ref#: 279739, which states, "For purposes of evaluating the Focus program during the 2015–2018 quadrennium, the value of avoided carbon emissions shall be \$15 per ton."²²

Table 22 lists the emissions benefits for all programs by segment.

Table 22. Total Program Emissions Benefits by Segment

Program Year	Residential	Nonresidential	Total
CY 2015 Emissions Benefits ¹	\$25,236,521	\$85,344,610	\$110,581,131

¹ Reported emissions impacts are based upon portfolio level modeling within AVERT and are not measure-or project-level specific.

Above excerpt from Page 55, "Focus on Energy 2015 Evaluation Report," May 20, 2016 https://www.focusonenergy.com/sites/default/files/WI%20FOE%20CY%202015%20Volume%20I.pdf

[11a] After 1998 when the Wisconsin PSC stopped analyzing alternative spending options for new power plants... the state permitted a 42% increase in available generation by 2012 even though need for electricity increased only 11% by 2015. 42% is more than double the traditional amount of reserve capacity of 14-17%.



Data sources: U.S. Department of Energy, Energy Information Agency (EIA) 1990-2015 Existing Nameplate Net Summer Capacity Form EIA-860) <u>https://www.eia.gov/electricity/data/state/existcapacity_annual.xls</u>

Required spinning capacity derived from 1990-2015 Retail Sales of Electricity by State by Sector by Provider (EIA-861)

https://www.eia.gov/electricity/data/state/sales_annual.xlsx

[11b] After 1998 when the Wisconsin PSC stopped analyzing alternative spending options for new...expansion transmission lines and joined the MISO wholesale market in 2005, spending on regional expansion transmission sky-rocketed. By 2016 spending on regional transmission expansion lines was costing Wisconsin electric customers an average of more than \$400 million per year [Footnote 12] towards long term debt on previously permitted lines. Collectively for payment on power plant, transmission and other costs, Wisconsin electric rates rose 25 percent point between 1998 and 2015

GRAPHIC NEXT PAGE



Date Sources:

Transmission Expansion Costs: MISO presentation to Customers First! "Power Breakfast" event on February 16. 2017. [See footnote 12]

Transmission Investments, 2005-2014 Wisconsin Utility Financial records filed with WI Public Service Commission. No longer accessible online: https://psc.wi.gov/Pages/ForUtilities/Energy/UtilityFinancialReports.aspx

Annual WI Residential kWh Cost: 1990-2015 Average Price by State by Provider, Form EIA-861 <u>https://www.eia.gov/electricity/data/state/avgprice_annual.xlsx</u>

[12] Wisconsin Electric Customer Transmission Expansion costs from 2005 (when Wisconsin joined MISO) to 2016 averaged \$428 million per year according to powerpoint presentation made in February 2017 at the Customers First! Semi Annual Power Breakfast http://customersfirst.org/



These costs stem from six different kinds of billing mechanisms ranging from expansion transmission facilities that are paid for only by the customers that use them to expansion facilities that are "cost-shared" by customers across the MISO region incorporating all or parts of 15 Midwest and South Central states.

200820092010201120122013\$858\$37\$109\$1,356\$665\$285

2012 2013

2014 2015

\$252

\$306

2016

 MISO MTEP Planning Year
 2005
 2006
 2007
 2008
 2009

 Wisconsin Costs Million \$
 \$295
 \$517
 \$166
 \$858
 \$37

As a result, Wisconsin customers assume payment of such "cost-shared" expansion facilities built in other states including the designated, "Multi-Value Projects" of which 17 with construction costs of \$6.4 billion were designated by MISO in 2011. Included were three expansion high capacity projects slated for Wisconsin, Pleasant Prairie to Zion Energy Center; "Badger-Coulee;" and "Cardinal Hickory Creek." See following page regarding continuing utility interest in capital, expansion expenditures.

[13] Continuing High-Capacity Transmission Expansion Interests

At the time of this writing (July, 2017) regional utility interests under MISO discretionary transmission expansion planning is the process of compiling a very large group of transmission projects to be considered for "cost-sharing" status where high-interest, capital expensing costs would be collectively assumed by electric customers in North Dakota, South Dakota, Minnesota, Michigan, Wisconsin, Iowa, Illinois, Indiana, Missouri, Arkansas, Louisiana and Texas for the next 30-40 years.



Map from page 7, "MISO Regional TransmissionOverlay Study Update," May 25th, 2017 <u>http://bit.ly/New_MISO_Expansion_Lines_pg7</u>. Thinner red, blue and yellow lines are existing transmission facilities. Thicker, hashed and dotted lines are facilities utility interests have recommended for consideration for cost-sharing status.

In March 2017, Eighty-Five projects were brought forward by utility interests including 66 new transmission facilities located on lands where no high capacity lines exist today and 19 projects that would increase the size and capacity of existing transmission facilities.

MISO PRELIMINARY LIST – MAR 2017					
INCLUDED COST-SHARED EXPANSION FACILITIES					
	Number of Facilities				
New 765 kV Expansion Transmission Lines	4				
New 500 kV Expansion Transmission Lines	13				
New 345 kV Expansion Transmission Lines	42				
New 230 kV Expansion Transmission Lines	6				
New 115 kV Expansion Transmission Line	1				
Total of New Transmission Facilities	66				
Lingrado 400 HVDC Eacility	1				
Bobuild 245 kV facilities	2				
Rebuild 343 KV Identities	3 15				
increase capacity at Existing Facilities	15				
Total Facility Rebuilds and Upgrades	19				
Total Expansion Projects	85				
Data from,"Facilities List for Preliminary Overlays" March 17, 2017.					

It is unknown which or how many expansion transmission facilities utility interests will include in their final group of sought after projects, but given the price tag of \$6.4 Billion in construction expenses for the 17 projects sought in 2011, comprehensive costs including construction, financing, operation, maintenance and securitization for next group could easily exceed \$30 billion.

Of special note to midwestern electric customers and land owners, the discretionary selection of projects that become eligible for cost-sharing is never evaluated for need or customer spending priorities by impartial parties who would not participate directly or indirectly in monetary gain when projects are built. As electricity use and, indeed ,use of the electricity market is flat or in decline [see 2b] this lack of impartial evaluation could allow utility interests to qualify projects with very low *potential* of at least paying for their cost over 30-40 years of use, a requirement of most states. On June 14, 2007, utility interests discussed hypothetical projects qualifying for inclusion with long term, *potential* benefits that only slightly exceed cost based on assumptions they created. See, benefit to cost ratios in the range of 1.3:1 to 1:1.6 in "MTEP Futures Weighting and Criteria," http://bit.ly/MinimalPotentialBenefits MISO PAC 20170414.

The March 17th list of considered facilities drafted by utility interests contains five facilities for potential siting in Wisconsin. In the map below, substation to substation, magenta colored lines have been added to a map of existing transmission facilities showing the approximate locations of the considered facilities. In the case of the one, considered 345 kV line between Eau Claire and Sand Lake, two magenta locations have been marked, each adhering to an existing line fully or partially connecting these substations. Under Wisconsin law, routing that utilizes existing transmission facilities, state highways and trails is given higher priority.

SEE WI MAP NEXT PAGE



Locations of the considered facilities above, in magenta, are very approximate. They are based on substations identified in the "Facilities list for Preliminary Overlays" available at

https://www.misoenergy.org/_layouts/MISO/ECM/Redirect.aspx?ID=247217

In the case of the considered 345 kV line between Eau Claire and Sand Lake, two magenta locations have been marked, each adhering to an existing line fully or partially connecting these substations. Under Wisconsin law, routing that utilizes existing transmission facilities, state highways and trails is given higher priority.

It is unknown which or how many expansion transmission facilities utility interests will include in their final group of sought-after projects, but given the price tag of \$6.4 Billion in construction expenses for the 17, cost-shared projects utilities sought in 2011, comprehensive costs including construction, financing, operation, maintenance and securitization for next group of projects in 13 states could easily exceed \$30 billion.

[14] From 2007 to 2012, as states collectively doubled their investments in Energy Efficiency,.. Had Wisconsin also been directed - by cost-benefit spending analysis - to double energy efficiency spending, our use today could be the same as it was in 1998. This reduction would have saved 1.6 years of electricity and associated CO2 emissions. At documented Focus on Energy program benefit rates, the alternative \$870 million over 17 years in rebate pools would have delivered more than \$3 billion in energy savings and more than \$10 billion in economic job creation.



Data Sources:

2014 Focus on Energy Evaluation - Volume 1 (FOEV1) https://www.focusonenergy.com/sites/default/files/Evaluation%20Report%202014%20-%20Volume%20I.pdf

2014 ACEEE State Energy Efficiency Score Card (ACEEE) http://aceee.org/sites/default/files/publications/researchreports/u1408.pdf

Calculation assumes flat energy use from 1998-2015 from increased investment in energy efficiency based on performance of 2014 \$58 million (FOEV1, Table 24, pg 28) and 2.51% / year inflation rate. Focus on Energy annual rebate pool resulting in .76% net incremental savings (ACEEE; Table 13, Page 31);

As influences on electricity kWh rates such as fuel cost and transmission congestion cost increased very modestly or declined, Wisconsin electric rates would have risen minimally if the alternative investment path in energy efficiency had been taken.



New transmission line would address changing energy needs

Dear Editor;

Across our region, the electricity landscape is changing at an unprecedented pace.

Old generation sources are being retired, while new sources take their place. Recently, more than 1,200 megawatts of generating capacity was removed from service in Iowa. A similar story is unfolding in Wisconsin, where just since November utilities have announced plans to remove more than 1,200 megawatts of coal-generated electricity production from the grid. Everything from economics to a desire for cost-competitive clean energy are changing the energy mix.

Wind energy is a growing source of replacement power, as developers build wind farms and expand generation capacity by thousands of megawatts. Those wind farms are located where the wind blows hardest, in Iowa and Minnesota. Utility-scale solar power is also becoming part of the energy mix.

Moving electricity from where it is generated to where it is needed requires a high-voltage connection. Electric transmission lines enable power to be transported long distances so customers can enjoy the reliability, economic and environmental benefits of this new generation.

That's what the Cardinal-Hickory Creek transmission line would accomplish. The line is part of a portfolio of projects that was identified through a regional planning process to respond to this changing energy landscape, improve electric reliability and expand access to lower-cost power. It is a final link in a system that extends from southwest Minnesota into Wisconsin and is a critical part of the region's response to these unprecedented energy changes. In the coming months, project developers American Transmission Co., Dairyland Power Cooperative and ITC Midwest will finalize applications to Iowa and Wisconsin regulators for permission to build the line.

Some people have questioned the need for this project by asserting that electricity usage is declining. This project has not and is not being proposed as a one-dimensional project. It is being proposed to improve electric reliability, access to lower-cost power and access to renewable resources that are increasingly costcompetitive. That said, the assertion that electricity usage is declining is not true. While the rate of growth has slowed, the Public Service Commission of Wisconsin and Energy Information Administration are predicting modest growth for the foreseeable future.

The changing energy landscape requires a strong infrastructure to meet the ever-increasing demands for reliable, sustainable and efficient electricity. In the distant future, energy efficiency and local generation may alter the energy system. But the region's utilities have a responsibility to ensure the system serves energy demands today and well into the future. This project helps ensure that the energy that communities need is available and affordable. This line would become part of the existing electric network. It is not a new form of energy delivery, but rather a part of the integrated system that has operated safely, reliably and in concert with the environment for years

Gregory Levesque, director of environmental and local relations, American Transmission Co.

Chuck Thompson, manager real estate and permitting, Dairyland Power Cooperative

Aaron Curtis, project manager, ITC Midwest

Dodgeville Chronicle, March 18, 2018

FROM ATC: Gets the facts about proposed transmission line

The developers of the Cardinal-Hickory Creek Transmission Line Project – American Transmission Co., Dairyland Power Cooperative and ITC Midwest – are finalizing applications to Iowa and Wisconsin regulators for permission to build the transmission line. The applications will include a significant amount of detailed information on the need, benefits and proposed routes for the project.

There has been some misinformation circulating about the project. Here are some facts about some of the many issues the regulatory applications will address:

Myth: The utilities do not need to demonstrate to the Public Service Commission of Wisconsin that this line is needed or provide a cost-benefit analysis.

Fact: The PSC requires utilities to submit significant data and studies, including a cost-benefit analysis, for new transmission line projects. Much of this information will be available on the PSC website after the application is filed. Additionally, project information has been publicly available for more than a year as part of the Rural Utilities Service's National Environmental Policy Act review process and the Midcontinent Independent Transmission System Operator's (MISO's) Multi-Value Project analysis. As the regional electric grid operator, MISO has conducted and posted regular reviews of this project and other MVPs on its website since 2011.

Myth: The line is too expensive and money would be better spent on energy efficiency.

Fact: Costs for the project will be shared by consumers across a multistate region, not just those in Wisconsin. In fact, Wisconsin electric customers will pay for 10 to 15 percent of the total cost. However, the economic benefits of this line are expected to outweigh project costs. MI-SO's most recent review of the MVPs, including Cardinal-Hickory Creek, reaffirmed that the benefits exceed the costs by improving access to lower-cost generation and reducing congestion on the system. While energy efficiency is an important energy issue,

it is a separate one. It does not solve the issues addressed by the project or deliver the same benefits.

Myth: Poles will be 180 to 200 feet tall.

Fact: A majority of structures for this project will be between 120 and 160 feet tall and spaced 750 to 1,000 feet apart.

In summary, new infrastructure deserves close study, discussion and evaluation. This is why we announced the project in 2014, many years before filing an application. This line would become part of the existing electric network. It is not a new form of energy delivery, but rather a part of an integrated system that has operated safely, reliably and in concert with the environment for years. We help meet the electric needs of millions of customers across Iowa. Minnesota and Wisconsin. The ongoing operation, maintenance and upgrades to the grid have produced the reliable electric system we have today.

This vital network will become even stronger with the addition of this critical link.

Gregory Levesque, director of environmental and local relations, American Transmission Co. Chuck Thompson,

manager real estate and permitting, Dairyland Power Cooperative

integrated system that has operated 2/22/18 Aaron Curtis, project manager, safely, reliably and in concert with the Mount Horeb Mail ITC Midwest

. . .

	(MISC	2017 Membership Listing	ee		
1	Member Name	Company	Sector Affiliation	Mailing Address	Phone	Email	Standing Proxy
	Cynthia Crane	пс	Chair			ccrane@itctransco.com	n/a
	David Johnston	Indiana Utility Regulatory Commission	Vice Chair			djohnston@urc.in.gov	n/a
	Daniel Hall	Missouri PSC	State Regulatory	PO Box 360 Jefferson City, MO 65102	(573) 751-3243	daniel.hall@psc.mo.gov	
	Kent Feliks	AEP	Power Marketers			kdfeliks@aep.com	n/a
	Yarrow Etheredge	Entergy	Transmission Owners		(504) 576-6746	yethere@entergy.com	Drew Siebenaler
	Julie Voeck	NextEra Energy	Independent Power Producers	200 S. Executive Drive, Suite 101 Brookfield, WI 53005	414-475-1035	julie.voeck@nexteraenergy.com	n/a
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	Jennifer Easler	Office of Consumer Advocate	Public Consumer Group	1375 East Court Ave. Des Moines, IA 50319-0063	515-725-7224	jennifer.easler@oca.iowa.gov	John Long
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	Steve Leovy	WPPI Energy	Muni/Coop/TDU	1425 Corporate Center Dr. Sun Prairie, WI 53590-9109	608-834-4564	sleovy@wppienergy.org	Dan Alfred
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	Trent Carlson	Gridliance	Transmission Developers	18103 Pleasantwood Drive Spring, TX 77379	832-981-0101	tcarlson@gridliance.com	Greg Player

For-profit utility members who benefit from capital utility spending

Standing Prox 160 North LaSalle Street Sherina Edwards Illinois CC State Regulatory Suite C-800 Chicago, IL 60601 PO Box 360 sedwards@icc.illinois.gov Adam McKinnie Missouri PSC Jefferson City, MO 65102 (573) 353-5258 adam.mckinnie@psc.mo.gov State Regulatory PO Box 360 Jefferson City, MO 65102 Walt Cecil Missouri PSC State Regulatory 573-751-7527 walt.cecil@psc.mo.gov 610 N Whitney Way Madison, WI 53707 Don Neumeyer Wisconsin PSC State Regulatory 608-267-9304 Don.neumeyer@wisconsin.gov McNees Wallace & Nurick 21 East State Street, 17th Floor Columbus, OH 43215-4228 Brubaker and Associates 16690 Swingley Ridge Road, Suite 140 Coalition of Midwest 614-719-2844 Kevin Murray End Users murraykm@mwncmh.com Transmission Customers Representing TIEC, ABATE, IIEC Jim Dauphinais End Users 636-898-6725 id au phinais@consultbai.com Chesterfield, MO 63017 1945 W. Parnall Road Dan Alfred Jackson, MI 49201 517-788-0211 dan.alfred@cmsenergy.com Consumers Energy for profit 4000 Hadley Road Greg Player PSEG Transmission Developers South Plainfield, NJ 07080 908-412-7011 gregory.player@pseg.com 921 N. Washington Ave. Lansing, MI 48906 Michigan Citizens Against Rate Connie Groh Public Consumer Group 517-515-4644 cdgroh@liskeypllc.com Excess 1375 East Court Ave. Des Moines, IA 50319-0063 Office of Consumer Advocate John Long Public Consumer Group 515-725-7200 john.long@oca.iowa.gov 414 Nicollet Mall Minneapolis, MN 55401 Drew Siebenaler Xcel Transmission Owners 612-321-3195 andrew.w.siebenaler@xcelenergy.org MISO STAF P.O. Box 4202 Jeff Webb MISO Liaison Carmel, IN 46082-4202 317-249-5412 jwebb@misoenergy.org P.O. Box 4202 Amanda Jones MISO Stakeholder Relations Carmel, IN 46082-4202 317-249-5973 ajjones@misoenergy.org

Mount Horeb Mail – February 22, 2018 Above list:

https://old.misoenergy.org/Library/Repository/Meeting Material/Stakeholder/PAC/2017/2017 PAC Membership Listing.pdf

Since 2009, more than 10 proposals for new high voltage expansion transmission lines have been replaced by more cost effective solutions including accelerated use of **No-Wire Alternatives** based on targeted energy efficiency, load management, development of distributed generation and re-configuring of existing facilities.

Cancelled Transmission Expansion Project	States	Reason
Bonneville Power Administration I-5 Corridor Project	OR, WA	Replaced by No Wire Alternatives
Duke Energy Western Carolinas Modernization Line	NC, SC	Replaced by No Wire Alternatives / New technologies
Mark Twain 345 kV Line	MO	Reconfigured to use existing corridor
Mid-Atlantic Power Pathway (MAPP)	MD, DE	Replaced by Load Management/ New technologies
Mountain States Transmission Intertie in Montana (MSTI)	MT	Withdrawn due to public controversy in scoping stage
Potomac-Appalachian Transmission Highline (PATH)	WV, VA, DE	Withdrawn due to reduced load, utilized existing ROW
Rock Island Clean Line (Merchant Transmission Line)	IL, IA	Builder Denied Condemnation Right
SE Wisconsin NE Illinois Reinforcement Project	IL WI	Withdrawn due to reduced load
SWEPCO Kings River Project	AR	Withdrawn due to reduced load, utilized existing ROW
Tehachapi Renewable Transmission Project (500 kV)	CA	Communities succeeded in having facility buried

CA_ISO Board approves 2017-18 Transmission Plan, CRR rule changes Plan calls for canceling, modifying projects to avoid \$2.6 billion in costs

March 23, 2018 "[The plan] recommends the cancellation of 18 transmission projects and revisions of 21 other projects in Pacific Gas & Electric (PG&E) area and two in the San Diego Gas & Electric area, avoiding an estimated \$2.6 billion in future costs. The changes were mainly due to changes in local area load forecasts, and strongly influenced by energy efficiency programs and increasing levels of residential, rooftop solar generation. to avoid \$2.6 billion in future costs."

http://www.caiso.com/Documents/BoardApproves2017-18TransmissionPlan_CRRRuleChanges.pdf

Disappearing Demand is Real Issue for New Infrastructure Projects

-May 24, 2017 "On May 19, 2017 BPA decided to cancel the I-5 project citing non-wire alternatives including grid management and energy storage options as the most economical alternative. BPA stated, "The outcome is much bigger than a decision to build or not build this line: We are transforming how we plan for and manage our transmission system and commercial business practices, region-wide. Though not cited in the announcement, electric demand across most areas of the grid has slowed in recent years driven heavily by energy efficiency improvements including the rapid growth in LED lighting, demand management & behind-the-meter distributed generation. "

http://bit.ly/NTA_Instead_of_Transmission

2016 STATE OF THE MARKET REPORT FOR THE MISO ELECTRICITY MARKET

Table A1: Capacity, Energy Output and Price-Setting by Fuel Type

	U	Unforced Capacity			Energy	Output	Price Setting			
	Total (MW)	Share	(%)	Share (%)		SMP (%)		LMP (%)	
	2015	2016	2015	2016	2015	2016	2015	2016	2015	2016
Nuclear	12,432	12,432	9%	9%	16%	16%	0%	0%	0%	0%
Coal	59,181	53,471	42%	41%	50%	46%	62%	55%	95%	85%
Natural Gas	58,013	55,367	42%	42%	24%	27%	37%	44%	94%	85%
Oil	2,063	1,832	1%	1%	0%	0%	0%	0%	0%	0%
Hydro	3,603	3,478	3%	3%	1%	1%	1%	1%	2%	2%
Wind	2,412	2,796	2%	2%	7%	8%	1%	1%	45%	32%
Other	1,688	2,076	1%	2%	1%	2%	0%	0%	4%	3%
Total	139,391	131,452								

2015-2016

6 | 2016 State of the Market Report

ANALYTIC APPENDIX Prepared By Potomac Economics, pdf p.12 https://www.potomaceconomics.com/wp-content/uploads/2017/07/2016-SOM-Appendix_Final_7-17-17_final.pdf#page=12

Dear Wisconsin Legislator

Runaway Capital Utility Spending 1998-Present

A Simple Way to Better Alternatives

Prior to 1998, every time a Wisconsin utility wanted to build a new a power plant or expansion transmission line, utilities were required to prove to Wisconsin electric customers that their dollars would not be better spent on energy efficiency and local renewable power. In 1998, the PSC reasoned the process of producing head to head comparisons of costs and benefits for electric customers and decision makers to examine could be by-passed.

Seventeen years later, one can examine the official U.S. Department of Energy records for Wisconsin and observe how a modest investment in energy efficiency would have saved billions in lieu of unnecessary utility expansion.

From 1998 to 2015, our actual requirements for electricity grew a record low 11% while the PSC permitted utilities to increase available power generation a record 42%-- more than twice the reserve amount utilities have traditionally considered sufficient.



READ FULL ARTICLE SOUL eNewsletter July, 2017 http://bit.ly/DearLegislator eNewsletter



Best States for Energy

Energy Rank	State	Electricity Price	Power Grid Reliability	Renewable Energy Usage	
#1	The second secon	13	17	1	
#2	Washington	2	25	2	
#3	South Dakota	28	6	4	
#4	I Nebraska	17	1	10	
#5	Nowa	10	15	6	
#6	S North Dakota	15	3	11	
#7	Montana	14	30	5	
#8	Nevada	7	5	15	
#9	Mizona	34	2	21	
#10	Minnesota	32	14	12	
#11	S Idaho	4	43	7	
#12	Colorado	28	11	26	
#13	Illinois	23	8	35	
#14	Wisconsin	36	7	23	
US World	JS World & News Report 2018 State Energy Rankings https://www.usnews.com/news/best-states/rankings/infrastructure/energy				

(Minutes of Power Outages / Year)

MISO's Midwest Transmission Expansion Planning (MTEP) accounted for nearly half of the 300 kV and larger lines in planning, construction or recently completed in the U.S. according to 2016 National Reliability Corporations (NERC) Report on Form 411. <u>https://www.eia.gov/electricity/data/eia411/</u>



EXPANSION TRANSMISSION PLANNING BY "ISO" REGION 2016-2028

NERC also publishes load projections the "ISO" region have made which in the case of MISO for 2017-2017 is very low at .29% per year.



https://www.eia.gov/electricity/data/eia411/

E VALUES SH BJECT TO CH	OWN BELOW (IN Nominal \$) ARE INTENDED TO BE INDICATIVE ONLY, ARE BASED UPON MISI IANGE DEPENDING UPON ACTUAL PROJECT COSTS INCLUDING CONSTRUCTION WORK IN P	D PROJECTIONS, ARE NOT I ROGRESS, ACTUAL IN-SERV	NTENDED BY MISO TO BE RELI ICE DATES, AND ACTUAL ANN	ED UPON FOR SETTLEMENT UAL CHARGE RATES FOR TH	T OR RATEMAKING PURPOSES. RANSMISSION OWNERS	THE VALUES ARE		
gure 1. App	roved MVPs				(added for analysis)	(added for analysi		
Project ID Project Name		Geographic Location by TO Member System	Estimated In-Service Date	Estimated Project Cost (2016\$)	In Service Projects Jan 2018 (2016\$) [^]	Remaining Cost		
[1]	[2]	[3]	[4]	[5]	[^]			
1203	Brookings, SD - SE Twin Cities 345 kV	XEL/GRE/OTP/MRES/C MMPA (represents TO ownership)	3/26/2015	\$670,341,048	\$670,341,048			
2202	Reynolds to Greentown 765 kV line	Pioneer, NIPS	6/1/2018	\$388,419,373		\$388,419,373		
2220	Ellendale to Big Stone South	OTP, MDU	9/30/2019	\$319,670,000		\$319,670,000		
2221	Big Stone South to Brookings	OTP, NSP	12/31/2017	\$141,318,502	\$141,318,502			
2237	Pana - Mt. Zion - Kansas - Sugar Creek 345 kV line	ATXI	11/15/2019	\$422,910,795		\$422,910,795		
2239	Sidney to Rising 345 kV line	ATXI	9/1/2016	\$88,121,836	\$88,121,836			
2248	Adair - Ottumwa 345	AMMO, ITCM, MEC	12/15/2019	\$226,428,698		\$226,428,698		
2844	Pleasant Prairie-Zion Energy Center 345 kV line	ATC	12/6/2013	\$36,200,000	\$36,200,000			
3017	Palmyra Tap -Quincy-Meredosia - Ipava & Meredosia-Pawnee 345 kV Line	ATXI	11/15/2017	\$723,229,856		\$723,229,856		
3022	Fargo-Galesburg-Oak Grove 345 kV Line	ATXI, MEC	6/1/2018	\$203,732,183		\$203,732,183		
3127	N LaCrosse-N Madison-Cardinal -Spring Green - Dubuque area 345-kV	ATC, NSP, ITCM	12/31/2023	\$1,016,111,000		\$1,016,111,000		
3168	Michigan Thumb Wind Zone	ITC	12/31/2015	\$504,000,000	\$504,000,000			
3169	Pawnee to Pana - 345 kV Line	ATXI	12/31/2017	\$134,576,365		\$134,576,365		
3170	Adair-Palmyra Tap 345 kV Line	AMMO	12/15/2019	\$172,211,053		\$172,211,053		
3203	Reynolds to E. Winnamac to Burr Oak to Hiple 345 kV	NIPS	12/31/2019	\$388,000,000		\$388,000,000		
3205	Lakefield Jct Winnebago - Winco - Burt area & Sheldon - Burt Area - Webster 345 kV line	MEC, ITCM	6/1/2018	\$651,067,882		\$651,067,882		
3213	Winco to Hazelton 345 kV line	MEC, ITCM	12/31/2019	\$564,397,636		\$564,397,636		
			Total	\$6,650,736,227	\$1,439,981,386	\$5,210,754,841		
			Percentage of Charges in Calculated in Fig. 3		21.7%	78.3%		
	Above data from: https://cdn.misoenergy.org/Schedule%2026A%20Indicat	ive%20Annual%20Ch	arges106365.xlsx					
	^ MISO Transmission Expansion Plan (MTEP) In Service Project List 1/9/2018 https://cdn.misoenergy.org/MTEP%20In%20Service%20Projects106330.xlsx							

Indicative Multi-Value Project (MVP) Schedule 26-A Indicative Annual MVP Usage Rate for Approved MVPs

<u>Indicative</u> Annual MVP Charges for Approved MVPs by Wisconsin Utilities 2018-2037 (current charged data from Fig. 3)

UTILITY		CURRENT CHARGES 2018-2037 (Millions \$)	UTILITY	ESTIMATED CHARGES- ALL MVP LINES IN- SERVICE (Millions \$)
	WI Power & Light	\$515	WI Power & Light	\$2,379
	DairyLand Power	\$18	DairyLand Power	\$85
	Madison G&E	\$135	Madison G&E	\$625
	XCEL -Wisconsin	\$62	XCEL -Wisconsin	\$284
	WE Energies	\$1,269	WE Energies	\$5,863
	WI Public Service	\$550	WI Public Service	\$2,540
	WI Annual Averages	\$134,192,824		\$619,786,535
	WI 2018-2037 Total	\$2,034,477,431		\$9,396,491,430



Data from Multi-Value Project (MVP) Schedule 26-A Indicative (MISO Nov 2017) & MISO Transmission Expansion Plan (MTEP) In Service Project List 1/9/2018

Data from: https://cdn.misoenergy.org/Schedule%2026A%20Indicative%20Annual%20Charges106365.xlsx_and https://cdn.misoenergy.org/MTEP%20In%20Service%20Projects106330.xlsx_



WISCONSIN RATES vs. TRANSMISSION EXPANSION SPENDING



Rate data EIA Form 861; Transmission Expansion Spending, p. 9, Mid-Continent Independent System Operator (MISO) Overview, February 16, 2017, Customers First! Power Breakfast presentation

Rate data from EIA Form 861; <u>https://www.eia.gov/electricity/data/eia861/</u> MISO annual average "all-In" wholesale power costs from Potomac *State of the MISO Market Reports*, 2005-2017, <u>http://bit.ly/StateOfMISOMarketReports</u> Transmission Expansion Spending, p. 9, Mid-Continent Independent System Operator (MISO) Overview, February 16, 2017, Customers First! Power Breakfast presentation excerpted here: <u>http://soulwisconsin.org/Resources/FootnoteHarbour.pdf#page=27</u>

Electricity flow chart 2012



"In 2012 around 920 TWh of primary energy ... went into electricity generation in the UK. Due to conversion [in]efficiencies during electricity generation and losses during its transmission, 65% of this energy was lost – primarily as heat. With around 320 TWh reaching the end user, this equates to an overall supply efficiency of around 35%."

Chart From: www,sankey-diagrams.com/uk-electricity-generation-efficiency-2012/



Chart From: https://flowcharts.llnl.gov/content/assets/images/charts/Energy/Energy_2014_United-States_WI.png

Costs are mostly fixed

Non-Energy Charges Paid by a Typical Residential Customer on a Retail Tariff

Average Residential Customer:					
Non-Energy Charges as Percent of Typical Monthly Bill					
Average Monthly Usage (kWh)*	1000				
Average Monthly Bill (\$)*	\$110				
Typical Monthly Fixed Charges					
Ancillary/Balancing Services	\$1				
Transmission Systems	\$10				
Distribution Services	\$30				
Generation Capacity ^	\$19				
Total Fixed Charges for Customer	\$60				
Fixed Charges as Percent of Monthly Bill	55%				

*Based on Energy Information Administration (EIA) data, 2011

^The charge for capacity varies depending upon location. This is just an estimate. Source: Value of the grid to DG customers, IEE Issue Brief, Lisa Wood & Bob Borlick, Sept 2013

From *How Much Should Self-Generators Pay For The Grid?* https://breakingenergy.com/2013/11/26/how-much-should-self-generators-pay-for-the-grid/

RATE STRUCTURE impacts the financial viability of distributed energy systems. La Farge Municipal Utility customers and those of other municipal utilities have been working to make the financials pencil out for a large community solar array. However, they are challenged with the substantial monthly fixed system costs the utility must pay its power suppliers.

System costs typically include long-term payments on capital additions of power plants and transmission. These costs must be subtracted from what the utility can afford to pay for locally produced solar power. In La Farge, this lowers the economic value of the proposed solar facility effectively by one-third. Utilities in many states have argued for increasing fixed charges to recover system costs as energy use flattens. Given that higher fixed charges are almost always accompanied by lower energy rates, <u>studies</u> show that this rate design weakens the price signals that reward customer investments in energy efficiency and self-generation. Electricity customers and advocates maintain that designing rates primarily around recovering past infrastructure investments hampers autility's ability to respond to changes in load requirements and technological advances in a cost-effective manner.

P. 12, Solar Energy Financing GUIDE Empowering Wisconsin Local Governments by Sherrie Gruder, UW-Extension, 2017

12 UW-EXTENSION Solar Energy Financing Guide - EMPOWERING WISCONSIN LOCAL GOVERNMENTS

Link to Guide <u>http://energyonwi.uwex.edu/sites/energyonwi/files/SolarEnergyFinancing.pdf</u> or email: <u>gruder@epd.engr.wisc.edu</u>

REVISED DIRECT TESTIMONY OF PETER LANZALOTTA IN OPPOSITION TO THE APPLICATION (REDACTED COPY)

It is helpful to put the \$130.54 million of potential slow growth benefits from Table 2 of total 40 year present value benefits from Badger-Coulee into perspective. For the slow growth scenario over 40 years and for the approximately 3 million Wisconsin retail electric customers,⁶ this reflects an average benefit of \$1.10 per customer per year or about 9 cents per customer per month. As requested by numerous municipalities and ratepayers,⁷ a clearer picture of the value of all potential benefits could be obtained from comprehensive cost-benefit analysis including comparable investments in no wire solutions such as energy efficiency and improvements to the low voltage system. Mr. William Powers is examining strategically locating distributed renewable power to extend the life of the aging low voltage facilities.

p. 7, Peter Lanzalotta - Direct, Badger-Coulee Docket 5-ce-142, WPSC http://apps.psc.wi.gov/pages/viewdoc.htm?docid=229027

Above from: http://apps.psc.wi.gov/pages/viewdoc.htm?docid=229027

WISCONSIN EXPANSION TRANSMISSION LINES 2007-2018

After American Transmission Company was created under Wisconsin statue in 2002 and following Wisconsin joining the Midwest electricity market in 2005, the company began rapid sequence of construction proposals including the following 7,345 kV lines and others with construction period costs ranging from \$2-6.8 million per mile. These amounts do not include operation, maintenance, high interest financing and security costs over the estimated 40 years of service.

WI PSC Docket	Year Installed	Expansion Transmission Line	Location	PSC Approved Construction- Only Cost (Millions)	Builders' Final Construction- Only Cost (Millions)	Cost Per Mile (Millions)	Miles	Cost Source
137-ce-113	2007	Arrowhead-Weston	Superior – Wausau	\$420.3	\$436.0	\$2.0	220	http://apps.psc.wi.gov/pages/viewdoc.htm?docid=108431
05-ce-142	2018	Badger-Coulee	La Crosse -Madison	\$581.4	-	\$3.2	180	http://bit.ly/CapX2020-H-LaX-Cost
137-ce-149	2010	Paddock-Rockdale	IL- Madison	\$132.7	\$116.3	\$3.3	35	http://apps.psc.wi.gov/pages/viewdoc.htm?docid=173322
05-ce-136	2016	CapX2020	MN – La Crosse	\$507.0	\$485.0	\$3.8	128	http://apps.psc.wi.gov/pages/viewdoc.htm?docid=293910
137-ce-147	2012	Madison Beltline	Rockdale- Middleton	\$219.0	\$154.5	\$4.8	32	http://apps.psc.wi.gov/pages/viewdoc.htm?docid=236248
137-ce-166	2018	Bay Lake	Appleton-Morgan	\$327.7	-	\$5.7	58	http://apps.psc.wi.gov/pages/viewdoc.htm?docid=346612
137-ce-161	2013	Pleasant Valley- Zion	Kenosha – IL	\$31.6	\$36.2	\$6.7	5.4	http://apps.psc.wi.gov/pages/viewdoc.htm?docid=:225435



INTEREST IN MORE EXPANSION TRANSMISSION LINES ANNOUNCED TO WI PSC

See PSC Wisconsin, Strategic Energy Assessment 2024 – Draft, Map: p.39, Table A-1 p.100
 http://apps.psc.wi.gov/pages/viewdoc.htm?docid=341817
 Other expansion transmission projects that have been recently considered by regional utilities for WI and other Midwest states can be found on, pdf p.
 http://soulwisconsin.org/Resources/FootnoteHarbour.pdf#page=28

SEE WI MAP NEXT PAGE



ENERGY COST SAVINGS & ENVIRONMENTAL BENEFITS CLAIMED FIRST SEVEN EXPANSION TRANSMISSION LINES IN WISCONSIN 2007-2018

Below excepts from transmission builder publicity and application material including several from American Transmission Company's Project Websites <u>https://www.atc-projects.com/atc-projects/</u>

Pleasant Prairie-Zion Energ PROJECT STATUS: Completed and in service	Y Center "Provide savings for electric utilities and their customers.
Paddock-Rockdale PROJECT STATUS: Completed and in service	"The primary purpose of this high-voltage transmission line to the south is to give local distribution utilities improved access to participate in the wholesale electricity market – to purchase lower-cost electricity when prices are low and sell into the market when prices are high. The economic benefit of increased access can be passed on to end-use consumers."
Arrowhead-Weston Project PROJECT STATUS: Completed and in service	t "will provide access to lower-cost electricity passed on to consumers. The present value of the estimated savings over the 40-year life of the project is \$94 million Provides greater access to renewable power."
Bay Lake Project PROJECT STATUS: Under construction	"energy-cost savings for customersreduced congestion costsThe four futures are based upon key drivers such as load growth, renewable energy,
Badger Coulee PROJECT STATUS: Under construction	"Deliver economic savings for Wisconsin utilities and electric consumersgreater access to the wholesale electricity market with potential savings that can be passed on to electric consumersConnect to high-quality renewable resourcesEstablish another pathway for renewable energy into
Rockdale-West Middleton PROJECT STATUS: Completed and in service	"energy-cost savings for customersreduced congestion costs and losses to Wisconsin,may provide Wisconsin utilities with improved access to lower-cost renewable resources,"
CapX2020 Hampton-Rochester-La Crosse	"to ensure customers receive continued reliable, low cost electricitydriven by the need for significant infrastructure to support renewable energy generation development

WISCONSIN RATE ANNUAL PERCENTAGE RATE INCREASES 2006-2016

Wisconsi	in Average Residential Electric Rates							
Years	Increase	Cents / kWh	Cents / kWh					
2005-2006	8.80%	9.66	10.51					
2006-2007	3.43%	10.51	10.87					
2007-2008	5.89%	10.87	11.51					
2008-2009	3.74%	11.51	11.94					
2009-2010	5.95%	11.94	12.65					
2010-2011	2.92%	12.65	13.02					
2011-2012	1.31%	13.02	13.19					
2012-2013	2.73%	13.19	13.55					
2013-2014	0.89%	13.55	13.67					
2014-2015	3.22%	13.67	14.11					
2015-2016	-0.28%	14.11	14.07					
2006-2016 Average	3.51%							

Source: U.S. Energy Information Administration, Form EIA-861, "Annual Electric Power Industry Report." Link to download data:, <u>https://www.eia.gov/electricity/data/eia861/zip/f8612016.zip</u>

WISCONSIN CO2 EMISSIONS 2006-2016 (Metric Tons / Per Year)



Source: EIA State Carbon Dioxide Emissions Data https://www.eia.gov/environment/emissions/state/

WISCONSIN ELECTRICITY HISTORICAL USE & PEAK DEMAND

Statistical trends created from past 10 years



Source: EIA Form 861 https://www.eia.gov/electricity/data/eia861/



Source: Table 4. Assessment of Electric Demand and Supply Conditions, Monthly Non-Coincident Peak Demands, MW, WI PSC Strategic Energy Assessment 2024 (Draft) p.15 http://bit.ly/PSC_2024_Draft_SEA

CHC Applicants/MISO MTEP17 Planning Assumptions

All of the "energy futures" CHC transmission builders have designed assume that our use of electricity will suddenly reverse trend and then steadily increase at rates from .4% to .9% per year over the next 40 years.

Builders' publicity features' <u>net calculated</u>, potential savings of \$23.5 to \$350 million but fails to mention these amounts spread over the same, 40 year period. Over 3 million Wisconsin electric customers, these millions average 2-24 cents per customer per month are a literal, "drop in the bucket" compared to a \$50 to \$90 per month increase in average household electric bills at the end of the 40 year period to pay for additional expenses their planning assumes.

The economics and "energy planning" the builders are using for CHC are based on on-going, MISO Transmission Expansion Planning [MTEP]. This formulation, MTEP17, assumes billions in new, mostly natural gas power plants would be needed to keep up with a mandatory, increase in demand assumed even under the slowest growth, "Existing Fleet" future.

These new power plants are also justified by way the MTEP "futures" are designed by the utility interests in MISO. The futures negate marketplace competition from Non-Transmission Alternatives (notably energy efficiency and load management) by delaying these very cost effective options and subjecting them to, "Accelerated," least likely conditions including higher growth in energy use, region-wide renewable energy requirements and carbon taxing. These are some of the conditions utilities assume for the larger 24 cent potential NET reduction if Cardinal Hickory Creek is built. CHC builders do not study dollar prudent futures. Many states, for example, would opt to, instead, invest 60 cents per month to double energy efficiency rebate pools and produce a guaranteed .5% per year drop in energy use. Of course,this much smaller investment over 40 years would remove the need for many powers while maximizing energy savings and CO2 reductions.

The below figure illustrates the proportional costs of three MTEP17 futures with the associated, "drop in the bucket" pennies the applicants have attributed to Cardinal Hickory Creek



Sources and assumptions for above figure:

The \$23.5 to \$350.1 million in net calculated, potential savings are publicized without qualifications of the 40 year term or mention of net additions to electric bills in *Spring/Summer ATC Cardinal Hickory Creek Newsletter*, <u>https://www.cardinal-hickorycreek.com/wp-content/uploads/2018/06/C-HC-Newsletter-SpringSummer-2018-final.pdf</u>.

The figure selected three of the applicants' six futures as shown in Tables 37, 39 & 41 pdf p.70 *Planning Analysis for Cardinal – Hickory Creek Transmission Line Project*, REF#:341714 <u>http://bit.ly/CHC_plan_analysis</u>

The estimate 2 to 24 cents potential net savings per customer per month assumes 40 years and 3,046,187 Wisconsin customers from EIA FORM 861 2016 data,

The impacts of proposed expansion spending over 40 years on WI electric bills additions are based on conservative extrapolations of historical, 10 year Wisconsin rate increases which have averaged more than 3% per year. The projected monthly cost additions after 40 years does not account for likely increases in facility fees. The assumed growth in rates are: Existing Fleet: 1.5% per year increase; Policy Changes: 2.0% per year increase; Accelerated: 2.5% per year increase in rates;. The amounts are not inflation adjusted.

The assumed, faceplate generation additions under CHC applicants' adoption of MISO MTEP17 planning may be found Figure 5.2-2: Nameplate Capacity Additions in MTEP17 Futures on pdf p. 305, *Cardinal Hickory Creek, Appendix D Exhibit 1 Planning Analysis Document Appendices.* REF#:341716, <u>http://bit.ly/CHC_plan_append</u>

It is assumed that Wisconsin electric customers would assume costs for a share of these expenses. MTEP17 renewable energy additions per future are calculated as 50% solar and 50% wind construction using average capacity factors. Depicted generation additions are calculated as net, not faceplate, and reflect the resulting fuel mix of the added generation and energy savings only. Energy and Efficiency and Demand Response costs to ratepayers could not be not calculated with utility-supplied data and are excluded.

From these extrapolations it is possible to gain some sense of the amount of new generation utility interests are assuming would be needed under the growth and policy changes they design into their futures. Based on an estimated increase in net generation of 53,182 MW under the AT future by 2031 and MISO 2017 base generation of 174,724 MW (pdf p. 407, *Appendix D Exhibit 1 Planning Analysis Document Appendices* <u>http://bit.ly/CHC_plan_append</u>) applicants foresee an approximate 15% increase in mostly utility-scale generation assets for this accelerated future.

In its most recent *Strategic Energy Assessment*, the Public Service Commission of Wisconsin has conducted a fairly extensive examination of *Rate Metrics and Cost Drivers* starting on pdf p. 51 http://bit.ly/PSC_2024_Draft_SEA Data from Figure 25, *Eight-year Annual Growth, Rate of Revenue Requirement Components—Major IOUs (%)* is extracted and graphed below:

Wisconsin 2008-2016 Capital Utility Debt Additions*

Calculated from PSCW Annual Growth Rate of Capital Investment Revenue Requirements



Eight-year Annual Growth, Rate of Revenue Requirement Components—Major IOUs (%)



 Generation and distribution growth rate shows the increase in gross plant investment. This rate,, shows the recovery of that investment as depreciation expense, which is directly tied to new plant investment. [When the] Commission authorizes a projected amount of investment. [this becomes the] utility's revenue requirement.

FUEL COSTS DID NOT CONTRIBUTE TO 2008-02016 RATE INCREASES

Fuel represents the monitored fuel costs subject to reconciliation under Wis. Admin. Code § PSC 116.
 Transmission shows the growth in the Schedule 9 network transmission charges (see Figure 26).

 The return on equity growth rate presented ...eflects the growth in annual authorized returns on equity (ROE), weighted by each major IOU's net plant in service. The ROE reflects the Commission's authorized compensation to the utilities' investors for providing equity capital to the utilities.

SOUL of Wisconsin Contact us with questions and suggestions <u>info@soulwisconsin.org</u>

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