

WISCONSIN ROADMAP TO NET ZERO BY 2050 RISE UP LIVE PODCAST – MREA ENERGY FAIR – SATURDAY JUNE 24, 2023 ANDREW KELL – POLICY DIRECTOR, RENEW WISCONSIN



THANK YOU MREA FOR ENERGY FAIR DIALOG OPPORTUNITIES!

<u>Right Now</u>: Rise Up! Live Podcast

- ... study technical results
- <u>Sunday 10am (White Flag tent):</u> Zero Carbon by 2050 – A Path for Wisconsin workshop
 - ... policy implementation
- Sunday 10:30am (Main Stage): Rise Up! Live Panel Discussion on clean energy issues
- Stop by RENEW's table for more info!





OUR ROADMAP FOR TODAY'S PODCAST

- How the study came to be
- 'Capacity expansion' modeling results
- 'Economic impacts' modeling results
- Deep dive: transmission & distribution clean energy resources
- Preview of planning and policies needed for zero carbon transmission (more in Sunday workshop)

Q&A





HOW WIZERO CARBON STUDY CAME TO BE









EVOLVED ENERGY RESEARCH





CAPACITY EXPANSION MODELING APPROACH

Scenarios Investigated

	Scer	nario	Description	What are we investigating?	
	Baseline VOLVED 100% Clean Electricity		No electricity or emissions policy, the way we consume energy remains similar to today	Setting a useful point of comparison to other scenarios What is the cost and impact on emissions of taking action only in electricity?	
EVOLVED ENERGY RESEARCH			Reaching 100% clean electricity but no economy-wide emissions policy		
) SCENARIOS	Net Zero Economy-Wide	100% clean electricity and economy-wide emissions policy. Aggressive electrification and efficiency of demand side energy consumption	With all resource options on the table, what is a least cost path to net zero in 2050 and what does the investment strategy look like?	
	NET ZERO	No Transmission Expansion	Transmission paths to other states cannot be expanded to access more out of state energy	How impactful is transmission expansion on overall costs and in state investments?	
		Accelerated Clean Electricity	Economy-wide emissions target and pushing to 100% clean electricity by 2040	How much more would it cost to push to 100% clean electricity faster?	
		Delayed Action	Delayed demand-side transformation, 15 years slower than Net Zero Economy-Wide	How important is pushing demand-side transformation on overall costs?	
		Limited Coal and Gas	No new gas, and coal retired by 2030	If near-term policy retired coal and prevented new gas investments what would be the impact?	





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CAPACITY EXPANSION MODEL LIMITATIONS

- Like most 'capacity expansion' models, limited modeling of 'behind-the-meter' resources
- Rooftop solar adoption had to be 'forced' into the model via external info
 - Will discuss Cadmus study
- Could not adequately model energy efficiency and demand response





SNASHOT OF RESULTS

- Electrification of most uses across 700 sectors leads to dramatic load growth
 - 166% load growth 2022-2050
- Requires unprecedented resource development
 - About 4x as much gen capacity compared to today
 - Much additional transmission;
 - 6 GW interties each from MN, IA, IL





RENEW WISCONSIN PRESENTATION

A DIVERSE CLEAN ENERGY PORTFOLIO FOR WISCONSIN NETZERO ECONOMY WIDE CAPACITY BY 2050 (IN GW)





ECONOMIC IMPACTS MODELING APPROACH



Figure 4 Wisconsin GSP results compared to baseline (%)



Figure 5 Employment impacts by industry compared to baseline (thousands)





COSTS & BENEFITS AT A GLANCE

Net Present Value of Investments	Health & Economic Benefits
Total direct investment costs: \$111.1 billion	\$2 to \$4.4 billion in avoided healthcare costs in 2050,
 Otility investments (Gen, Transmission, Batteries, etc.) Consumer investments (EVs, heat pumps, etc.) 	28 to 63 fewer deaths per million people from air pollution by 2050
 Total direct benefits (avoided fuel): \$110.6 billion Utility avoided fuels (coal, fossil gas) 	3% growth in WI GSP by 2050, Adding \$16 billion to WI's economy
Consumer avoided fuels (gasoline, fossil gas)	68,000 additional WI jobs
	Lower energy costs for WI residents



ADDITIONAL AVOIDED CO2 BENEFITS

1.25 billion cumulative metric tons avoided in Net Zero Economy Wide scenario

- 'Low' value from Wisconsin Focus on Energy evaluation report assumption
- 'Medium' value from current federal government agency assumption
- 'High' value from EPA assessment of social cost of carbon

BENEFIT OF AVOIDED CARBON DIOXIDE EMISSIONS								
SCENARIO	LOW (\$15 PER TON)	MEDIUM (\$51 PER TON)	HIGH (\$190 PER TON)					
Net Zero Economy-wide	\$12,782,584,067.52	\$43,460,785,829.56	\$161,912,731,521.89					
100% Clean Electricity	\$2,691,784,097.10	\$9,152,065,930.13	\$34,095,931,896.58					



LET'S REVISIT WI 2050 CLEAN ENERGY PORTFOLIO AND DISCUSS TRANSMISSION LEVEL AND DISTRIBUTION LEVEL RESOURCES

NETZERO ECONOMY WIDE CAPACITY BY 2050 (IN GW)



SCONSIN *Most of these resources would be behind the customer's meter.

RENEW

TRANSMISSION CONSTRAINTS: MARKET CONGESTION & RELIABILITY ISSUES

- Cause severe wholesale price volatility
- Cause 'trapped generation' and need to 'curtail' clean energy
 - Limits emissions reductions
 - Hinder clean energy economics
- Severe price contrast (red against blue) may indicate congestion areas that can be relieved by transmission



From MISO Independent Market Monitor presentation (June 2023)



MISO LONG RANGE TRANSMISSION PLANNING

- MISO assessing locational need for transmission in 'tranches'
- Tranche 1 approved by MISO Board July 2022
- MISO working with stakeholders on tranches 2-4
- Projects will come before state commissions per authorization processes
- Wisconsin process called Certificate for Public Convenience and Necessity



From 'MISO's Response to the Reliability Imperative' Report (January 2023)



A LOOK AT ROOFTOP SOLAR POTENTIAL IN WISCONSIN

Results of '2021 Rooftop Solar Potential' Study

- Report prepared by Cadmus for Focus on Energy, by request of Public Service Commission
- Zero Carbon study extrapolated 2034 'Economically Feasible Potential' results to get to 2,500 MW of rooftop solar by 2050

WI Rooftop Solar Study Outcomes							
	Nameplate Capacity (MW)						
Primary Assumption	2020	2034					
Technical Potential Economically-feasible Potential (Statewide Net Metering)	105	38,898 839					
Simulated Market Adoption Potential		623					



Chart from '2021 Rooftop Solar Potential Study'

- Statewide Net Metering Policy largest drive of economically feasible rooftop solar potential
- More about policies and implementation tomorrow @ my 10am workshop

Rooftop Solar PV Potential Scenarios – MW (Nameplate)





PREVIEW OF WISCONSIN POLICIES NEEDED FOR ZERO CARBON TRANSITION

ASSOCIATED POLICY

Require independent economic analyses of each coal power plant to understand optimal retirement dates.

Pass legislation requiring a formal Integrated Resource Planning process developed by the PSC.

Complete revisions of PSC Admin Code 119 (Interconnection Rules) and develop a Performance Incentive Mechanism to support interconnection requests.





POLICIES NEEDED CONTINUED...

ASSOCIATED POLICY

ENEW

Clarify, in ongoing or future dockets, that third-party financing of renewable resources is allowed under Wisconsin law, and require uniform standardized contracts for Qualifying Facilities.

Create and implement consistent net metering tariffs across utilities that support the integration of customer sited renewable resources. The PSC should also clarify eligibility for 'submetering' that allows owners of multifamily buildings to install clean energy resources for the benefit of all renters within those buildings.

The state legislature should also pass Community Solar legislation and codify the legality of third-party charging of EVs.

Pass legislation that doubles the funding for the statewide Focus on Energy program.







DISCUSSION AND Q&A RENEWWISCONSIN.ORG/NETZEROWI

