Net Metering Policy in Wisconsin's Electric Cooperatives

By Bill Bailey, et al, Cheq Bay Renewables, September 2, 2020

Introduction

This rich history of cooperatives in our country is based upon neighbors joining together to accomplish what no individual could possibly manage. Electric cooperatives especially succeeded in electrifying rural America based upon this premise. As neighbors joined together so that everyone could benefit, they adopted the democratic model where all members could participate in the decision-making process and therefore all members would benefit. A fundamental precept of the democratic process is fairness and equitable outcomes for all in the long run. They understood for example that in order for all to benefit… some close to the power stations and electric corridors would enjoy the fruits of combined interest first, but in the end, all would share equally in the outcome. While outcomes are largely equal today after the basic infrastructure was in place, we still recognize inequality within the system regarding power outages and system upgrades. However, the fundamental trust members have in the system is that the cooperative will strive in its decision making to be as fair as possible.

The debate over fairness today includes the issue of net metering where individual investments by cooperative members (solar and wind energy generation) both benefit all members and to some extent these individual members are able to avoid the cost of supporting the infrastructure. The benefit for all from individual investment come to the cooperative by contribution to generating capacity often during peak usage times and therefore allow all members to benefit as the cooperative has to invest less in infrastructure and generating/purchasing power. The cost is largely due to a cooperative decision to keep "connect fees" sufficiently low so that low income members can access the grid for the very necessary means to survive in today's world. Because some of the true infrastructure cost is imbedded in the electric rate, neighbors who have installed alternative power generation technologies are able to avoid some of the true costs of infrastructure.

The debate regarding net metering is a critical one for cooperatives founded upon fairness and the answer is not easily come by. Arguments and decisions run the gamut from allowing alternative energy members to capture all the value of their investment and therefore passing the burden to their neighbors… to the neighbors through their cooperative enjoying essentially "free electricity" generated by the alternative energy neighbor and paying nothing for it. This issue is one cooperatives cannot avoid and challenges the very concept of "fairness" critical to the very nature of the cooperative movement itself. In order to come to some decision that both is fair and addresses the challenges cooperatives will face in a future where markets, technologies and sometimes obsolete infrastructures radically change operating environments, we must first explore the history, legal structures and legacies that have made cooperatives who they are today.

We will discuss how Wisconsin's electric cooperatives view net metering in relationship to federal and state law, while being fair to all their members. In this paper, we will go back 42 years to put net-metering in historical perspective, examine which legal jurisdictions Wisconsin's electric co-ops fall under, try to summarize the current cooperative policies and put the topic in modern context to see what the future may hold. Spoiler alert: Wisconsin's electric cooperatives are a diverse group and no one conclusion is going to fit or satisfy all, but in the cooperative spirit, they believe in working together (while retaining their autonomy).

We feel that Bayfield Electric Cooperative (BEC) and Dairyland Power Cooperative are uniquely positioned to be leaders in establishing forward-thinking policies for net metering and post-net metering. This document outlines successful approaches for consideration and provides recommendations and next steps.

History

Net metering is a billing mechanism that allows consumers [electric cooperative members] who generate electricity for their own use to bank their unused output with the local electric provider. Under a typical net metering arrangement, the member-generator will receive full credit for any exported electricity at the end of the billing period, so long as the customer's consumption exceeds generation within a defined period of time. Monthly net metering allows credits from solar generation during the daytime to be used at night or when it is cloudy over the monthly billing cycle, while annual net metering allows for credits to be rolled over to subsequent months. Both billings methods reset to zero or "true-up" either monthly or annually as the description implies.

Net metering originated in the United States and got its foothold in utility law when Congress passed the Public Utility Regulatory Policy Act (PURPA) in 1978, four years after the first energy crisis and one year before the second. The primary purpose of PURPA was to encourage energy conservation and to increase the supply of domestic and renewable energy. Congress realized it had neither the time nor expertise to specify all the rules and regulations to implement PURPA, so it delegated the rulemaking and implementation details to the Federal Energy Regulatory Commission (FERC). A few highlights of those rules are[1]:

- Utilities must purchase power from qualified producers of electricity
- Qualified producers include solar photovoltaics under 80 megawatts of capacity
- The rates are to be just and reasonable to other customers [members] of the utility, nondiscriminatory and in the public interest
- Utilities must provide sufficient data for the qualified producer to determine the fair price to be paid by the utility for the purchase of electricity
- Utilities must promulgate standard rates for purchases from qualified producers with a design capacity of 100 kilowatts or less

The Public Service Commission of Wisconsin (PSCW) adopted its own interpretation of FERC's rules in January of 1982. The PSCW established Net Energy Billing, which "refers to the practice of allowing the retail electric meters of SPPs [small power producers] whose electric generators are rated at or below a specific KW cutoff point to run backwards when their generators are producing surplus energy. The commission herein adopts a policy of net energy billing for SPPs rated at 20kW or less." [2] At the time, the PSCW believed that net energy billing was an inherently safer approach, in that it allowed the utility to act as the storage device, a preferable alternative to SPPs installing lead acid batteries in their homes.

A distinction is often made between net energy metering and net energy billing. In net energy billing, like net energy metering, users are able to offset retail electricity purchases, but net energy billing differs in that the value of *excess* energy fed into the grid is a different value then that purchased. The

[1] U.S. Department of Energy, Office of Scientific and Technical Information, https://www.osti.gov/biblio/6713387
[2] WPSC File # 05-ER-11 Letter order dated January 28, 1982

PSCW was clear that all utilities under its jurisdiction were to allow interconnection of renewable energy sources, but left it to the utilities to determine the value of the energy flowing in both directions through PSCW approved rate cases.

Regulations governing Wisconsin's electric cooperatives

The PSCW is responsible for regulating Wisconsin's public utilities. This includes municipal utilities, but not electric cooperatives, which are not publicly owned but rather are owned by their members. Wisconsin's electric cooperatives are, therefore, not under the jurisdiction of the PSCW and most of their activities are exempt from state regulation.[3] However, the electric co-ops have the option to, and frequently do voluntarily participate in PSCW regulations.

Electric cooperatives are regulated by the federal government, however, and are under the jurisdiction of FERC. The 1978 PURPA law and subsequent updates affect the cooperative's energy policy.

Current net metering policies of Wisconsin's Electric Cooperatives

There are 23 distribution electric cooperatives in Wisconsin and one generation and transmission cooperative, Dairyland Power Cooperative[4]. Eighteen of these distribution cooperatives are class A members of Dairyland Power Cooperative and get their power from Dairyland. The other five distribution cooperatives get their power from a variety of suppliers: Alliant Energy, Minnesota Power, and Wisconsin Public Service. Even though the cooperatives have much in common, they have a diverse set of policies and practices regarding distributed generation and net metering. They run the gamut from full net metering with annual true-up, to no net metering with the excess renewable energy exported to the grid compensated at the provider's avoided cost. Many wind up being a hybrid arrangement falling in between the two ends of the scale. The avoided cost in this context is calculated "as the monthly average Hourly Day Ahead Locational Marginal Price for energy ("DA LMP") to the [suppliers] node under the Midwest ISO ("MISO") capacity and energy markets tariff in effect at the time of the energy deliveries".[5]

Most Wisconsin cooperatives have their distributed generation policies available online, but not all. The following table summarizes the 23 cooperatives' net metering policy by category:

Description of net metering policy	Number of co-ops	Percentage
Full net metering, annual true-up	5	26%
Monthly true-up with excess generation compensated (price varies)	13	52%
No net metering, excess generation paid at supplier's avoided cost	4	17%
Unique tariff, net metering less distribution costs with coincidental demand charge, annual true-up	1	4%
Total	23	100%

[3] PSC of Wisconsin, Energy Regulation, https://psc.wi.gov/Pages/ForUtilities/Energy.aspx
[4] Wisconsin Electric Cooperatives association, https://www.weca.coop/electric-cooperative-memb
[5] Explanation of avoid cost from Dairyland Power Cooperative email

Within these general categories there are many variations. In summary, nearly 80% of the 23 Wisconsin distribution cooperatives have some form of net metering. Of Dairyland Power's 18 members, only two do not have net metering.

In total, four cooperatives choose to meet the minimum standard required by FERC, that is, to interconnect small power producers and compensate energy delivered to the grid at their provider's "avoided cost". This is calculated monthly but is not a net amount. It was described by one cooperative employee as "two buckets", filling one with electricity flowing in and one with electricity draining out". If this is the minimum required, why do the majority of the cooperatives choose to do more?

Cooperatives operate under seven principles[6]. They set a foundation for cooperative's policy choices.

I. VOLUNTARY & OPEN MEMBERSHIP: Anyone can join a co-op—they don't discriminate based on gender, social, racial, political or religious factors.
II. DEMOCRATIC CONTROL: Members control their business by deciding how it's run and who leads it.
III. MEMBERS' ECONOMIC PARTICIPATION: All co-op members invest in their cooperative. This means people, not shareholders, benefit from a co-op's profits.
IV. AUTONOMY & INDEPENDENCE: When making business deals or raising money, co-ops never compromise their autonomy or democratic member control.
V. EDUCATION, TRAINING AND INFORMATION: Co-ops provide education, training and information so their members can contribute effectively to the success of their co-op.
VI. COOPERATION AMONG COOPERATIVES: Co-ops believe working together is the best strategy to empower their members and build a stronger co-op economy.
VII. CONCERN FOR COMMUNITY: Co-ops are community-minded. They contribute to the sustainable development of their communities by sourcing and investing locally.

Fairness to all members while allowing autonomy, are central themes, as well as concern for the community, education, cooperation and sustainable development. These standards guide all cooperatives but how they are implemented frequently depends on the political persuasion and world-view of the governing Boards.

The Controversy

Net metering has been controversial since its inception. It depends which side of the equation you are on, the utility or the small power producer (SPP).

There are obvious benefits for the SPP in terms of reduced electric bills, but besides that, some benefits are widespread and benefit everyone. Distributed generation reduces 1) the need for increased capacity from centralized power plants; 2) reduces usage and therefore strain on the transmission and feeder lines; 3) reduces energy losses from those lines; and 4) offers grid support, frequently during periods of peak summer demand. And, there are social and environmental benefits, often not

[6] National Cooperative Business Association: https://ncbaclusa.coop/resources/7-cooperative-principles/#:~:text=The%207%20Cooperative%20Principles.%201%201.%20Voluntary%20%26,5%205.%20Education%2C%20Training%20and%20Information.%20More%20items

accounted for in utility analysis, that make life better for everyone including improved public health, downstream jobs to aid the local economies, less water usage, and improved resiliency for the grid.

From the cooperatives' perspective, additional power generators from SPP's increase the complexity of power supply and pricing, and perceived risk of the traditional business model. But customer-owned distributed generation, at least in Wisconsin, is not widespread enough to make much of a financial dent in the corporate bottom line. As the impact of distributed generation becomes better understood, the new utility business model is about to embrace supplying the transportation industry with large quantities of electricity, potentially doubling their demand. Large investor owned utilities in Wisconsin no longer reject renewable energy; in fact, they are the ones installing and owning thousands of megawatts of renewable capacity.

Renewable energy is not the source of controversy here and the right to generate alternative energy and be compensated for it was established decades ago. Net metering is controversial, however, in terms of how to fairly compensate for the flow of electricity in both directions through the customer's or member's meter. Utilities commonly argue that SPP's electric bills are reduced too much so that they do not pay their fair share to use the grid. Even though customers/members pay a fixed monthly facility charge (or connection fee), most utilities' monthly fee does not cover all their fixed charges so they rely on some portion of kWh sales to cover operations, maintenance and overhead including capital costs. They add that net metering disproportionately discriminates against lower income members or customers who cannot afford renewable energy systems. Increasing the monthly facility charge would handicap lower-income members.

The challenge is to compensate SPPs fairly without costs being shifting to non-solar members or vice versa. The ideal strategy for valuing renewable energy delivered to the grid would support both distributed generation and the grid equally.

This is not new problem and many states have much higher levels of distributed energy on their systems. How are they solving the problem?

Post net metering policy

Data should provide guidance as to when and how to develop alternatives to net metering. Both the Solar Energy Industries Association (SEIA)[7] and the National Association of Regulatory Utility Commissioners (NARUC)[8] agree that solar penetration levels should be the leading indicator of when to alter net metering policies. The national conversation suggests without any analytical support a 5% solar PV penetration to be that threshold although that number seems to be rather arbitrarily determined. It may have originated in 1996 when the California legislature required utilities to supply 5% of their peak load with solar energy.[9] More recently, California and Hawaii, who have much larger renewable energy penetrations, frequently have a 30% utilization before excess generation is

[7] https://www.seia.org/sites/default/files/NEM%20Future%20Principles_Final_6-7-17.pdf
[8] https://www.naruc.org/rate-design/
[9] https://www.utilitydive.com/news/study-shows-value-of-california-solar-with-statewide-implications/583185/?utm_source=Sailthru&utm_medium=email&utm_campaign=Issue:%202020-08-20%20Utility%20Dive%20Renewable%20Energy%20%5Bissue:29223%5D&utm_term=Utility%20Dive:%20Renewable%20Energy

curtailed[10]. In Europe during the summer of 2020 with changing energy patterns caused by Covid-19, peak hours have seen as high as 60% of capacity provided by renewable resources.[11] So, it seems the 5% solar threshold may not only have plenty of room for flexibility, but is a critical number as it sets the threshold where power structures could be impacted and good policy needs to be in place well before that threshold is reached. Given further research is needed to establish a reasonable threshold, yet the problem may very well be confronting us before we have a real answer… we should rely upon precedent set by others who have already faced the issue.

In 2017, Illinois passed its Future Energy Jobs Act that calls for planning for a net metering policy change when distributed solar capacity reaches 3% of a utility's peak demand and implementing that change when the threshold reaches 5%.[12] The Act goes on to describe the replacement tariff as a localized value-of-solar rate. *"The value of such rebates shall reflect the value of the distributed generation to the distribution system at the location at which it is interconnected, taking into account the geographic, time-based, and performance-based benefits, as well as technological capabilities and present and future grid needs."*[13] Note that Illinois values the solar generation at the location at which it is interconnected, at the distribution level, not at the generation level on the MISO market.

The first step for Wisconsin's cooperatives might be to track their peak demand and compare it to their distributed solar capacity to see where they are at. Then, implement an alternative net metering strategy when the predetermined penetration threshold is met. Changing net metering policy should not be based on fear of revenue loss or cost shifting from one member-group to another. Rather, when distributed generation reaches that pre-determined threshold, a new policy should be implemented. Below this threshold, the economic impact to the utility business model is insignificant and eliminating net metering discourages the growth of distributed generation. Increased solar generation is better for everyone, the member, the grid and the planet (more about this in the Value-of-Solar). Carbon reduction should not be a political issue. Similarly, a clean environment and healthy population should not be controversial.

Once the renewable threshold is met, the next step is to implement an alternative to net metering. Three basic alternatives are emerging and multiple variations exist within each:

1. **Net Billing**

   "Net billing pays the retail rate for customer [member]-consumed PV [renewable] generation and a below retail rate for exported generation".[14] The challenge with net billing is determining the below-retail export rate, that is, finding the sweet spot that is fair to all in a dynamic environment.

2. **Buy-all Sell-all**

[10] Dan Finn-Foley, Wood MacKenzie Research: https://readytalk.webcasts.com/viewer/event.jsp?ei=1353694&tp_key=f5266c2777
[11] Ibid.
[12] https://futureenergyjobsact.com/
[13] https://www.ilga.gov/legislation/ilcs/documents/022000050K16-107.6.htm
[14] Utility Dive: https://www.utilitydive.com/news/as-rooftop-solar-expands-states-grapple-with-successors-to-net-metering/531888/

As the name suggests, solar generation is measured at the source and the utility buys all the generation. All usage is metered separately and supplied by the utility. The details of what each rate is and the terms of the tariff or contract determine the attractiveness or repressiveness of this approach.

3. Value-of-Solar

The value-of-solar is similar to buy-all sell-all. Minnesota championed this approach with its 2013 Omnibus Bill and is still adjusting and refining the details in 2020. Under the Minnesota value-of-solar tariff, customers buy all the electricity they use at retail rates and then receive a credit for their solar generation at the value-of-solar rate. When solar thresholds in a grid system are low, it is not as critical to get the value-of-solar or export rate exactly right, but as thresholds climb, a more complex and accurate attempt is needed to put a value on excess solar generation. The value-of-solar approach attempts to do that. Minnesota's value-of-solar tariff currently only applies to community solar projects. The evolution of the tariff is being watched nationally and could be extended to residential customers in the future.

As mentioned earlier, Illinois is also implementing the value-of-solar as its first rate-case governed by their 2017 Future Energy Jobs Act is reaching the predetermined 5% threshold.

Minnesota's formula to determine the value-of-solar is "based on the following 8 variables:

- **Avoided Generation Capacity Costs**
  - Assumes that solar will prevent utilities from having to build new power plants
- **Avoided Transmission Capacity Costs**
  - Estimates how much a utility will save on transmission costs when a customer installs solar
- **Avoided Fuel Costs**
  - Determines how much a utility would save in fuel costs over the course of 25 years. This assumes the price of fuel does not fluctuate over time
- **Avoided Environmental Costs**
  - The value of how much pollution is offset by installing a solar panel system, including carbon dioxide and non-carbon dioxide pollutants
- **Avoided Distributed Capacity Costs**
  - Considers how much money solar installations save utilities by preventing utilities from having to make distribution upgrades, like installing new transmission lines;
- **Avoided Variable Plant Operations and Maintenance Costs**
  - Estimates how much a utility saves on operations and maintenance costs that are affected by the amount of energy a power plants creates;
- **Avoided Fixed Plant Operations and Maintenance Costs**
  - Estimates how much a utility saves on annual costs that don't depend on how much energy a power plant is generating. This includes costs like regular annual power plant maintenance; and
- **Avoided Reserve Capacity Costs**
  - Assumes that solar projects will increase grid reliability by decreasing solar owners' reliance on the grid.

Each of the above variables is calculated by using the methods outlined in the MDOC's guidelines. The result of the variable calculations is then added to find the total Value of Solar rate." [15]

Austin Energy, the municipal electric utility serving the city of Austin, Texas also has an active value-of-solar tariff. They have a tiered rate structure with the lowest costs per kWh for small users and increases as usage increases. All energy used is billed at these rates while solar generation is valued at the value-of-solar rate. Currently the value-of-solar rate is 9.7 cents/kwh. Customers using less than 1000 kWh per month pay slightly less than this amount for electricity used.[16]

The value-of-solar tariff values the distributed generation for what it is, where it is, and when it is produced. It monetizes the value on several important attributes that have broader benefits:

a) Unlike electricity that is supplied from a distant central power source, the output originates in the distribution system (reduced transmission cost);
b) Exported output is likely to be used by the neighbor next door (reduced line loss);
c) The output does not use the nearest substation (reduced distribution costs);
d) The output doesn't pollute the air (environmental benefit);
e) The output makes the grid more resilient (increased reserve capacity);
f) The fuel for the generation is free.

The Value of Electricity

In the most simplistic and generalized terms, electricity has three market prices in the Wisconsin electric cooperative system: the wholesale price on the MISO market, valued at the generation companies node or point of interconnection (around 3 cents per kWh), the price at the distribution node (average around 7 cents per kWh), and the price at the cooperative members' meter (12-14 cents per kWh). All costs, except social and environmental costs, are included in these three prices and their value is reflected by the electricity's location in the system.

Dairyland Power's position is that when power is put on the grid by a SPP, "the member cooperative continues to have all the other costs associated with delivering power (e.g. power delivery, administration). All members share equally/proportionately in those costs."[17] The value-of-solar attempts to identify those shared costs and distribute those costs equally. Simply saying that FERC and the Federal regulator's value at the MISO node is "fair" for electricity from a SPP, is illogical even if it satisfies the minimum legal requirement. *The value of electricity is time and location specific.*

Impact of Battery Storage

Another significant variable that is about to be incorporated into the solar value stream and will benefit cooperatives is the potential of energy storage. As technologies advance, and as distributed generation and the grid evolves towards greater interactivity, energy storage, and more specifically lithium ion battery storage, will add value to the value-of-solar. Time shifting will be key to increasing solar penetration *and* retaining its value by shifting dispatchable energy to peak demand times such as evenings when the sun starts to set. As solar penetration increases and the value-of-solar decreases

[15] Copied from: https://www.solarreviews.com/blog/minnesotas-value-of-solar-tariff
[16] Austin Energy VoS rate: https://austinenergy.com/ae/rates/residential-rates/value-of-solar-rate
[17] Copied from email communications with Dairyland Power Cooperative

because of its increased availability, battery storage will be the key to retaining its value. There is also a potential downside to the cooperative if the SPP perceives an unfair exchange relationship and they elect to take their business entirely off-grid to capture all value and denying the utility the essentially free resource.

Impact of Electric Vehicles

The transportation sector uses about 28% of all the energy consumed in the United States[18]. In the coming decades, as the transportation sector transitions away from petroleum fuels, the electric power sector has an expanding market and business opportunity to capitalize on this fundamental shift. As business models change to reflect current technologies, any revenue that may be lost because of net metering policy could be made up multiple times over by the increased demand for vehicle charging. In addition, millions of lithium-ion batteries storied in residential garages could become virtual power plants as energy is transferred, stored and dispatched through smart grid interfaces.

Case Study – Bayfield Electric Cooperative

Bayfield Electric Cooperative (BEC), located in northern Wisconsin has about 8500 members. In 2016 BEC installed a 300kW community solar garden. In 2018 and 2019 many members installed solar PV systems as part of the state's largest solar group buys. BEC now has approximately 90 solar installations totaling 540kW of solar capacity in addition to their solar garden, amounting to a total solar capacity of about 840kW on their distribution system. One might argue that the community garden is centralized and not distributed generation, but owing to its location within their distribution system, let's classify it as distributed generation for now. Their highest 2020 monthly peak demand from their supplier, Dairyland Power Cooperative, was 17,500kW in July. Their solar penetration is therefore 4.8% (840kW/17,500kW)[19].

Whether data driven or not, the BEC Board decided to change its net metering policy effective March 2020. Their prior policy was net metering at retail value with annual true-up. They grandfathered-in existing systems for five years, but all installations after that date are subject to the new policy of net energy billing and all exported solar generation put on the grid will be compensated at Dairyland Power Cooperative's avoided cost, currently about 2.9 cents per kWh.

The majority of the 90 members owning solar installations expressed concern about the policy change and many expressed those concerns at the BEC annual meeting. New solar installations in their service territory have declined. The Board's primary rationale for the policy change was a belief that the non-solar members were subsidizing the solar members, which is in terms of the rationale presented in this paper is partially true. Now, the solar members believe they are subsidizing the non-solar members, which is also true in terms of the rationale. In essence the Board's decision attempt to be fair simply transferred the burden from one set of members to another. We believe a fair answer to all parties is both appropriate and obtainable.

[18] U.S. Energy Information Administration: https://www.eia.gov/energyexplained/use-of-energy/transportation.php

[19] Solar capacity and peak demand confirmed by Bayfield Electric Cooperative

A fair and transparent value-of-solar is needed. Dairyland Power and BEC have stated they think compensating a solar member 2.9 cents/kWh for exported electricity is fair. The electricity then goes to the closest neighbor and BEC charges them 14 cents/kWh (summer rate). The solar generated electricity has replaced electricity that otherwise would have been purchased from Dairyland Power at 6-8 cents per kWh.

Unfortunately, there is no value-of-solar precedent in Wisconsin. *It is time for there to be one*. Currently, 38% of the electricity generated in the United States is carbon-free[20], yet Dairyland Power's generation mix is only 24% carbon-free[21]. Instead of falling back on minimalist policy and falling behind national trends, BEC should work with Dairyland Power to establish forward-thinking carbon reduction goals and post net metering policy. BEC likely has one of the higher solar penetrations in Wisconsin and the other electric cooperatives will be looking to them for leadership. Right now, the leadership is not aligned with national trends to reduce carbon emissions and develop long-term strategies for integrating more distributed energy into their system.

Recommendations and Next Steps

- BEC collaborates with Dairyland Power to establish forward-thinking carbon reduction goals and post net metering policy drawing upon other successful models outlined in this document or established on the national stage
- Net metering should remain in place to encourage the growth of distributed generation until predetermined PV penetration thresholds are met. Once changed, existing PV systems should be grandfathered-in for a time period consistent with BEC's community solar garden or projected system life.
- Wisconsin electric cooperatives should monitor and measure their distributed solar generation capacity in relationship to their peak demand and establish an appropriate PV penetration threshold used to initiate change. The national conversation suggests without factual support that this threshold is when distributed solar capacity reaches 5% of a utility's peak demand. Research needs to be commissioned to more clearly understand future impacts so realistic plans can be implemented. Until that time, distributed solar capacity should be calculated based upon a true definition of distributed solar that does not include owned or explicitly managed solar properties by the utility.
- An alternate net-metering policy should be established once PV penetration thresholds are exceeded. The fair value-of-solar method is recommended and states like Minnesota and Illinois and Cities like Austin, Texas are doing the groundbreaking work for us.
    - Alternatively, a net billing strategy or buy-all sell-all tariff could work to replace net metering, but the rates need to be scrutinized often to capture changes in the utilities' cost structures while providing a reasonable return for member-generators, and take into consideration the time and place excess generation interconnects to the grid

[20] U.S. Energy Information Administration, "What Is U.S. Electricity Generation by Energy Source?" Accessed May 14, 2020. https://www.eia.gov/tools/faqs/faq.php?id=427&t=3

[21] Calculated from Dairyland Power Cooperative's website, January 2020 (since has been removed)

- Grid infrastructure needs to be continually upgraded and optimized using modern technologies to prepare for a more interactive grid that can take advantage of distributed energy resources including battery storage and electric vehicle charging

Conclusion

It's hard to fathom that only 75-80 years ago electricity was first brought into the homes of much of rural Wisconsin by our electric cooperatives - the first electric lights, pumps, motors, refrigerators. Can you imagine having to go back to ice boxes that actually use ice? Likewise, it was only about 25 years ago that the internet entered our homes, and, in the last decade, it has transformed the way our companies do business, how we communicate with each other, how we educate ourselves, pay our bills, and even how we shop. We feel uncomfortable even if we are without electricity, or our phone or tablet, for a few hours. Electricity in its rawest form is just the flow of electrons, but in its evolved form it is controlled circuitry that ultimately becomes artificial intelligence.

Net metering is a tool, an incentive, that has gotten us to where we are. It started out 40 years ago to encourage less reliance on foreign oil when solar PV systems cost more than ten times what they do today. Today, it is a policy that supports the production of clean energy by members to help mitigate the climate crisis. It's no longer viable only when it has completed its mission. When it has, a template like Minnesota's or Austin's value-of-solar will need to be in place.

Our Wisconsin electric cooperatives have an opportunity to thrive in the coming decades *and* encourage clean distributed energy. As we plug in our electric devices, automate our smart homes and drive on electrons instead of fumes, the co-ops are positioned to lead the transition in rural Wisconsin. Most of us just want the stuff to work so we can go on with our daily lives. Wisconsin's electric cooperatives will be there to make it happen.

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