

Sun-Powered Progress

STRENGTHENING NET METERING IN MINNESOTA



FRANK BATTEN SCHOOL
of LEADERSHIP *and* PUBLIC POLICY



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APPLIED POLICY PROJECT

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Honor Code

On my honor, as a student at the University of Virginia, I did not cheat nor receive unauthorized assistance for my Applied Policy Project.

Disclaimer

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Table of Contents

Glossary	3
Executive Summary	4
Introduction.....	5
Problem Statement.....	7
Client Orientation	7
Background	8
Alternatives	11
Criteria	14
Findings.....	16
Recommendation	23
Implementation.....	23
Conclusion	26
Bibliography.....	27

Glossary

AC	Alternating current
DC	Direct current
DG	Distributed generation
kWh	Kilowatt hours
MnSEIA	Minnesota Solar Energy Industries Association
mWh	Megawatt hours
NEM	Shorthand for net metering
PUC	Public utilities commission

Executive Summary

Residential solar energy expansion in Minnesota is critical to meet the 2040 100% carbon-free energy goal, in addition to decreasing our dependence on fossil fuels, and ultimately giving consumers more power over their energy use and lowering their monthly utility bills. Solar generation and capacity, while steadily growing in Minnesota over the past decade, is not at the pace required to reach the 2040 goal.

I explore one way to stimulate an expansion of residential solar energy adoption in Minnesota through enhanced net metering policy. Net metering is the process of generating solar on your property, consuming the energy you produce, and selling any excess energy back to the utility. There are several barriers that impede one's decision to 'go solar' and take advantage of net metering such as limits on the system size one can install, upfront costs, and charges on one's monthly bill that counteract savings. Why explore net metering? Research shows that it has a large positive impact on demand for rooftop solar and that demand is highly price elastic, meaning a small change in the price will have a large relative change in quantity demanded.

I identify three alternatives that address each of these barriers: 1) increase the system size to 200% of annual use from the current 120% to keep up with increasing energy demand thorough producing more energy and selling increased excess energy to the grid, 2) inclusive utility investment where the utility fronts the cost and is recouped over a number of years through a small fee on your monthly bill, and 3) the elimination of grid access charges as they are unnecessary, discriminatory against solar users, and do not result in a cost shift.

Through case studies, research, and prioritizing criteria important to MnSEIA – effectiveness, cost, feasibility, and equity – I determine that **alternative three: elimination of grid access charges** is the best option and is the recommended path forward for MnSEIA. While there are tradeoffs in recommending alternative three over the other two, such as the utilities purporting a cost shift to non-solar users, they have not shown data to back this up. Moreover, according to surveys, nearly 80% of people who are considering solar are seeking lower monthly bills. Eliminating grid access charges will ensure that there are no unnecessary or arbitrary charges that counteract solar's potential savings.

Finally, solar is one piece of the carbon-free energy sources that Minnesota must increase to reach its 2040 goal. It is a major economic driver in Minnesota, contributing to thousands of jobs and valued at nearly \$4 billion. This economic impact will only increase as we approach 2040, making it an even larger industry and more important to make acquiring solar conducive. To this point, Minnesotans who obtain solar with a strong net metering policy and the elimination of grid access charges will be able to lower their monthly energy bill (or completely offset it) and sell excess energy back to the grid for their neighbors to use. At its core, it is the best option that will help reach the 2040 goal, satisfy one of MnSEIA's key policy priorities, and allow Minnesotans to take their energy into their own hands.

Introduction

In 1983, Minnesota passed a law establishing net metering (*DSIRE*, n.d.). The law applies to all investor-owned utilities, municipal utilities, and electric cooperatives. Net metering at its core is the process where a distributed generation (DG) system powers the home or building where the solar panels are located first, then any excess energy not consumed is transferred back to the grid, purchased by utilities at average retail utility energy rate, and then sold by the utilities to other customers at the market rate. Figure 1 below shows how the average retail utility energy rate is calculated. Since its inception in the early 1980s, net metering has grown in popularity thanks to technology advancements, lower cost inputs, and beneficial subsidies/incentives. Figure 2 below shows the DG net metering process of a home solar system. According to Minnesota's PUC, as of December 31, 2023, there were 24,310 DG systems reported in Minnesota, with a vast majority of those being residential as opposed to utility or community solar (although no specific numbers mentioned) (*DER Data Dashboard / Public Utilities Commission*, n.d.).

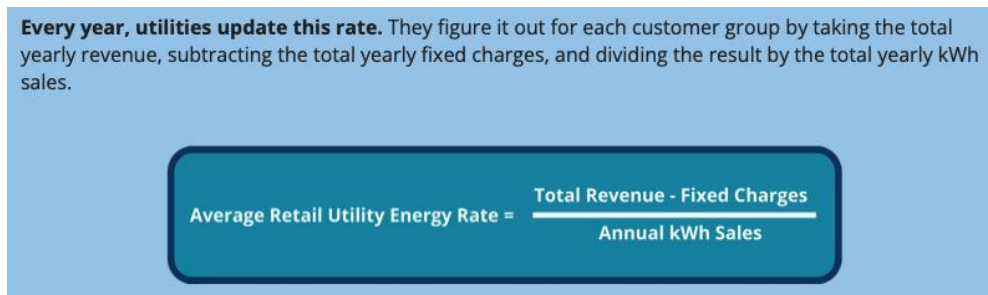


Figure 1: Calculation for utility purchase price of excess solar energy generated¹

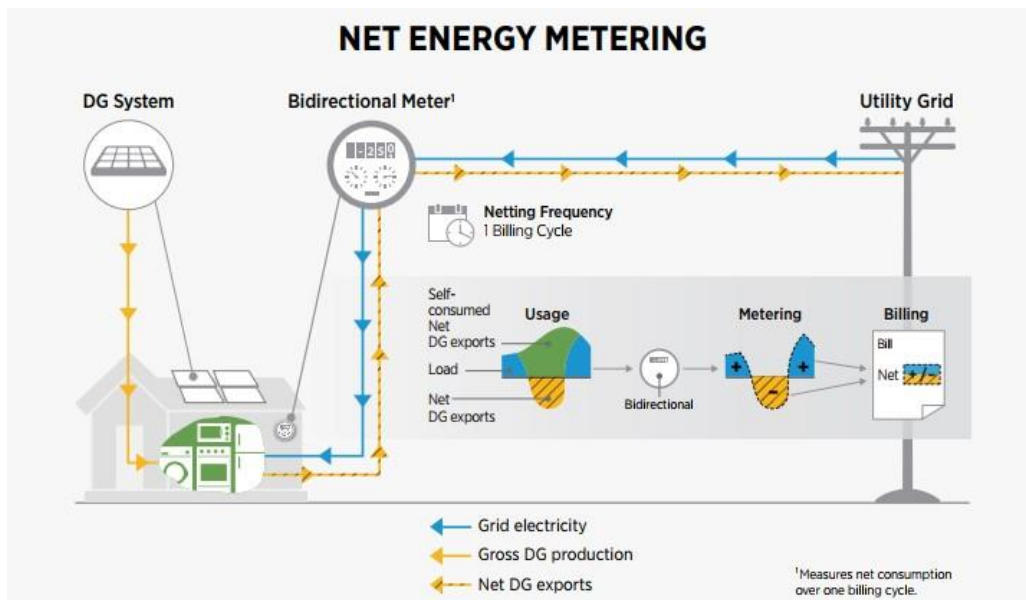
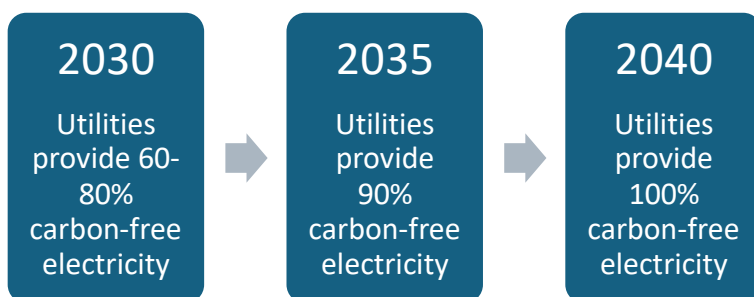


Figure 2: Net metering process²

¹ Source: <https://mn.gov/puc/activities/economic-analysis/distributed-energy/net-metering/>

² Source: *Id.*

A major driver in the importance of solar expansion is the government’s promise to citizens. In 2023, Minnesota Governor Tim Walz signed Senate File 4 (*SF 4 1st Engrossment - 93rd Legislature (2023 - 2024)*, n.d., p. 4) into law that establishes a carbon-free energy standard: 100% carbon-free electricity by 2040 (*Governor Walz Signs Bill Moving Minnesota to 100 Percent Clean Energy by 2040*, n.d.). Given its current rate of 4% solar energy produced in the state, Minnesota is not on track to meet this goal (Olson, 2023). Although solar energy has been steadily increasing in Minnesota, from 1% of all energy generated in 2017 to about 4% in 2023 (*U.S. Energy Information Administration - EIA - Independent Statistics and Analysis*, n.d.), this share needs to increase as we approach 2040 and aim to meet progress goals. These progress goals are outlined below.



Although the share of solar energy generated has been slowly increasing in Minnesota, the amount of solar installations has dramatically increased over the past decade or so. Figure 3 below shows annual solar installations by sector since 2014. Other areas, such as utility and community solar have the highest share of annual installations, while residential installs lag behind. This capacity gap is where a change in net metering policy aims to fill.

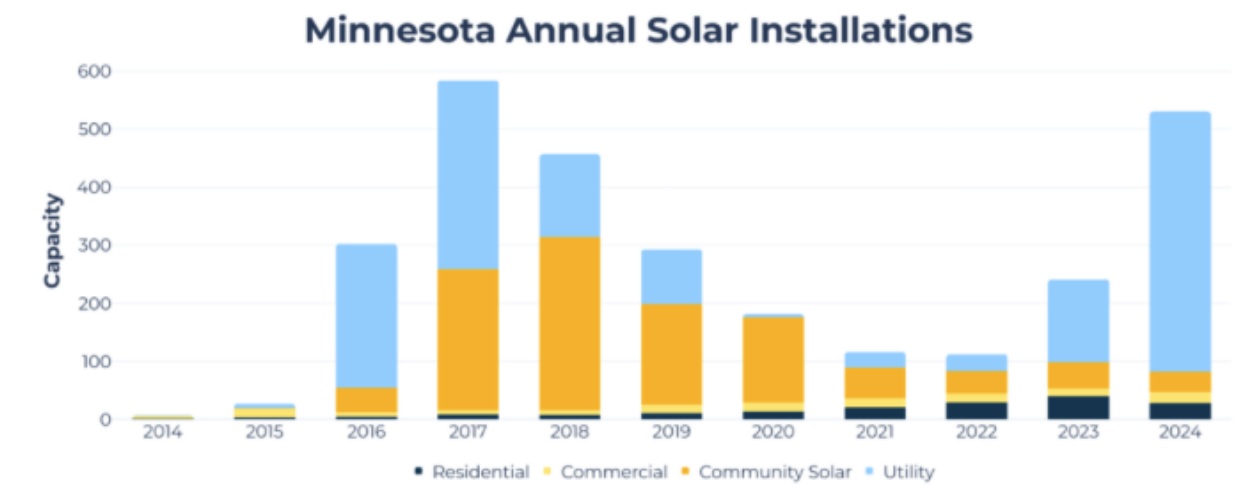


Figure 3: Annual solar installations³

³ Source: <https://seia.org/state-solar-policy/minnesota-solar/>

Minnesota's economic impact of solar energy provides context for the future growth and importance of incentivizing solar adoption. As of 2024, the solar industry in Minnesota contributes to nearly 5,000 direct jobs at over 160 companies. There are over 23,000 individual solar installations with over \$4.2 billion in total investment. Where we fall behind other states is our growth projection and ranking. Over the next five years, Minnesota is planning on installing around 2,600 mW of solar, which puts it at 24th out of 50. Taken together with the lower cost, increased availability, and technology advancement in solar, Minnesota has room to grow and fill its residential rooftop solar capacity.

Finally, the political context of solar energy support is also critical to understand. When the 2040 goal passed in 2023, Democrats held a trifecta in the Minnesota legislature and Governor's mansion. This is not to say Republicans in the legislature do not necessarily support solar expansion or the 2040 goal, however the bill passed along party lines in both chambers. During the 2025 legislative session, Republicans have supported bills hostile to net metering and carbon-free energy project investment in favor of free-market, government-free approaches (*Energy Committee Sends Proposed Solar Metering Changes to House Floor - Session Daily - Minnesota House of Representatives*, n.d.). There is no indication that Republicans will move away from hostility to a carbon-free energy future. There is also the issue of federal government tax incentives and subsidies that have enabled solar expansion, particularly through the Inflation Reduction Act, which are now in doubt. While it is too soon to confirm an impact, I acknowledge the impending challenges and offer that Minnesota, along with other states, will proceed ahead with their clean energy goals as best they can.

Problem Statement

Net metering is not meeting its potential to expand solar energy in Minnesota and enable more people to acquire residential rooftop solar energy systems. To expand solar energy production and consumption means removing barriers for new and existing customers. An enhancement of current net metering policy that expands solar energy adoption and generation would help Minnesota achieve its 2040 goal of 100% carbon-free energy production and use.

Client Orientation

MnSEIA is a member-driven 501(c)(6) nonprofit that promotes and protects Minnesota's solar and storage industries. They advocate in the state legislative and regulatory arenas in a unified and actionable way to move solar energy regulatory and policy forward (*MnSEIA's 2024 Legislative Session Recap* | MnSEIA, n.d.). MnSEIA does not represent the regulated monopoly utility provider, Xcel Energy, or co-op energy providers that facilitate net metering and services. MnSEIA represents generally smaller, third-party operators, from manufacturers to installers and everything in-between, at the legislature and through business advocacy and public relations.

MnSEIA's policy priorities (*Policy Priorities* / MnSEIA, n.d.) and mission (*Mission & History* / MnSEIA, n.d.) make clear their goal to support the 2040 clean energy target set out by Minnesota in several different ways. For example, the Solar for Schools program seeks to use on-site solar panels to save the school districts and tax payers money, as powering schools is the second highest cost for schools behind payroll (*Solar for Schools in Minnesota* / MnSEIA, n.d.). Another example of their advocacy efforts is what are called brightfields. These are former landfills, unfit for commercial or residential use, that are able to turn into solar fields to generate clean energy (*Minnesota Brightfields* / MnSEIA, n.d.). Their involvement and efforts will evolve to target specific areas of opportunity in Minnesota's current legislative and regulatory landscape to promote solar energy expansion and use.

MnSEIA has a vested interest in protecting, and even enhancing, current net metering policy. Opponents of net metering include the Minnesota Rural Electric Association (MREA) (Johnson, 2024), while the regulated monopolies like Xcel Energy and the PUC have not directly taken a side, but are anticipated to lean in favor of MREA's argument. They oppose current net metering policy because of its pricing structure and an alleged cost-shift to non-solar customers (among other things) and are working to weaken its impact.

MnSEIA does not have the authority or ability to implement changes on their own, and regardless of which solution is the ultimately recommended, they are relying on the legislature, regulators, utility providers, or a combination of these three entities to implement the alternative. This presents severe implementation challenges, as there will be winners and losers of each alternative (tradeoffs and implementation challenges are mentioned below). However, enhancing net metering policy is crucial to meet the moment and expand solar energy for more Minnesotans in order to reach climate goals by 2040.

Background

For background context, we explore why solar, and strong net metering policy is important, public perception of solar, and net metering's benefits through academic literature, case studies, and other examples.

Why Solar and Net Metering are Important

Solar energy, and therefore net metering, increase grid reliability and reduces strain on the grid particularly during peak times (*Net Metering*, n.d.). Net metering enables consumption at the point of generation which both prevents transmission loss of energy via power lines and decreases solar customers' demand on obtaining energy from the grid. This smoother demand curve allows utilities to focus on non-solar customers and manage their load more efficiently. The Brookings Institution finds that cost-benefit analyses from utilities, think tanks, and academics consistently show that net metering is a net benefit for solar users, utilities, and non-solar users (*Rooftop Solar*, n.d.). Moreover, studies show net metering has a large, positive impact on demand for rooftop solar, and in some cases, doubling of demand (Ros & Sai, 2023).

Furthermore, increased solar adoption enables us to decrease reliance on fossil fuels, which account for over 75% of global greenhouse gases and close to 90% of all carbon dioxide emissions (Nations, n.d.). Finally, solar energy provides an opportunity for individuals to take their energy generation and consumption into their own hands, allowing for a future energy democracy, instead of the regulated monopoly marketplace that has persisted for decades.

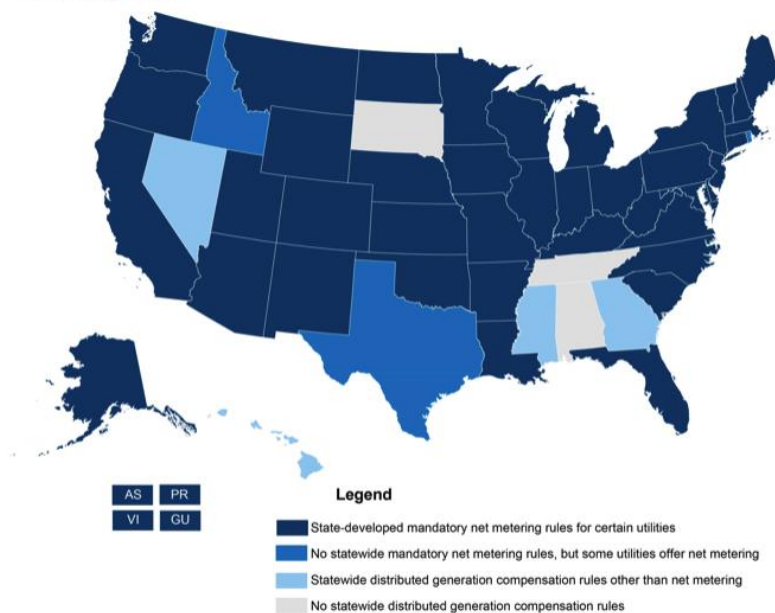
Attitudes

If we look purely at what American's support in terms of energy production and expansion, the data is clear. According to survey data from Pew Research, a majority of Americans, 64%, support expanding solar (along with wind and hydrogen) compared to 35% who support expanding oil, gas and coal (Kennedy, 2024). However, Karasmanaki & Tsantopolous (2021) perform a literature review of attitude toward all renewable energy types (wind, solar, hydro, etc.) and find misalignment between public attitudes toward specific renewable energy projects (i.e. something local) versus renewable energy transition overall (i.e. the idea of renewable energy) (Karasmanaki & Tsantopoulos, 2021). The irony is people generally are not thrilled with projects in their backyard (i.e. NIMBY) yet still support the idea of addressing climate change through these same projects. This begs the question, what can be done in terms of public attitudes to increase solar energy uptake at a local level in Minnesota? My first thought is public information campaigns or behavioral psychological nudges to inform people of net metering's benefits. When looking at similar modes of renewable energy, Lindvall et al. (2024) found that respondents' attitudes toward wind power in Sweden was shaped by ideological views, environmental concern, and low trust in government (Lindvall et al., 2024). They claim that collectively distributed financial benefits increase support for wind energy, and personally distributed financial benefits are the best method to influence ideological resistance.

Academic Research

Academic research into domestic and international solar expansion efforts and net metering offers insights into its successes and challenges. A Brookings Institution study of net metering policies across the United States argues that PUCs need to take their policies seriously as strong net metering benefits all rate payers (whether they have solar or not). Specifically, a case study in Nevada found that the local utility lobbied their PUC to dramatically decrease net metering payments, which led to the top three solar panel providers to leave Nevada, and a 92% drop in solar installation permits. After analyzing the data, they find, "Increasingly it [national literature] concludes— whether conducted by PUCs, national labs, or academics — that the economic benefits of net metering actually outweigh the costs and impose no significant cost increase for non-solar customers. Far from a net cost, net metering is in most cases a net benefit—for the utility and for non-solar rate-payers." (*Rooftop Solar*, n.d.) Figure 4 below from their study provides important context on the expansion and popularity of net metering rules in the United States.

41 States, DC, and four U.S. territories have mandatory net metering rules



Source: "The 50 States of Solar," by NC Clean Energy Technology Center and Meisler Consultants Group

B Metropolitan Policy Program
at BROOKINGS

Figure 4: Net metering rules in the U.S.⁴

Timilsina et al. (2021) find that in the last several years, solar energy has seen a decrease in price that enables the market to demand more solar energy compared to traditional, 'dirty' forms of energy (Tabassum et al., 2021). However, they also find there is an additional government force that has benefited the solar industry's expansion: fiscal and regulatory incentives like tax credits & exemptions, preferential interest rates, and voluntary green power programs. These in Minnesota would involve costly government action in order to change attitudes and enable increased demand. Net metering on the other hand, offers the consumer an option to obtain solar through non-governmental incentives like bill offsetting and additional income through selling excess energy back to the utility.

When looking at other peer countries to the United States, Inderberg et al. (2018) describes analysis of prosuming (households that store excess solar to use at home rather than send back to the grid to distribute) from Germany, Norway, and the United Kingdom (Inderberg et al., 2018). This study looks at factors that contributed to uptake of home solar energy from 1990-2017. The study finds that, "changes in support schemes have been influential for the development of prosuming in all three countries; access to information and the presence of a third-party market have also been important. There are indications of differences elsewhere in the domestic context. For Germany and the UK, decarbonization has been a significant driving force for policy, unlike in Norway, where a boost in prosuming is now underway. While all three countries show similar early interactions between market and regulatory provisions, different

⁴ Source: <https://www.brookings.edu/articles/rooftop-solar-net-metering-is-a-net-benefit/>

national policy drivers indicate that different national prosumer pathways are possible.” Prosuming is not as popular in the United States, and specifically in Minnesota, because of storage costs, rules, and efficiency. Net metering solves for this by purchasing excess energy so that a household does not have to store it on premises. However, the access to information and access to third-party markets seen in the study could be applicable in Minnesota to expand solar energy uptake.

Alternatives

Before outlining potential alternatives, it is crucial to understand MnSEIA’s role in the solar energy space, their limitations, and how they can best solve their policy problem. If you recall, MnSEIA is a member-driven, advocacy organization that lobbies on behalf of over 145 solar energy companies in Minnesota. This means they do not have the power or authority to implement solutions directly and will likely be using this report and other relevant information as an advocacy tool with the legislature, regulators, and the community. They build key stakeholder relationships throughout Minnesota with utility providers, elected officials, regulators’ offices, solar companies, and in communities they operate.

Through background research, interviewing key stakeholders and industry experts, and MnSEIA’s priorities, I have analyzed three potential alternatives below that would positively alter net metering with the goal of expanding solar energy. MnSEIA sees these as priorities to enhance net metering policy during this and subsequent legislative sessions. I outline the alternatives’ impact, examples of implementation elsewhere, and who/how MnSEIA would advocate for the respective alternative. Taken individually, each alternative would theoretically make incremental progress on the expansion of solar energy by improving current net metering policy. Taken together, they represent a potential dramatic shift in the ability for more Minnesotans to obtain solar energy, with opportunities to eliminate/lower their monthly electric bill and generate a new income stream.

Alternative One: Increase System Capacity Limit

In Minnesota, and many other states, there is a limit on the amount of solar generation one can install via solar panels on their property. The limit is 120% of the annual energy consumed on the property or at the meter, based on an analysis of your energy consumed during the previous 12-month period. Increasing the capacity limit would mean existing customers could resize their current system and new customers could purchase a larger system from the outset. Regardless of the scenario, a customer would be able to generate more solar energy and therefore offset their monthly utility bill and in theory sell more excess energy back to the utilities.

Proponents of the size limit argue that it is necessary to prevent energy overproduction, which would lower the rate that utilities will purchase excess energy and create storage issues, and to ensure that customers’ energy needs are aligned with the number of solar panels they install. However, allowing more than 120% of energy used or removing the limit entirely could incentivize potential solar energy users that are on the fence. If customers are allowed to

generate more energy than before, there will be more clean energy to sell back to the grid which is utilized by their community and offer potentially more higher revenue streams by selling higher amounts of excess energy. Moreover, a higher capacity limit will compliment increasing household energy demand and consumption (*U.S. Energy Consumption Increases between 0% and 15% by 2050 - U.S. Energy Information Administration (EIA)*, n.d.).

We can look to states where the limit has already been adjusted. In 2021, Colorado lifted the allowable capacity of consumer renewable energy generation from 120% to 200% (Public Utilities Commission Encourage Renewable Energy Generation, n.d.). The U.S. Energy Information Administration (EIA) states that in 2023, consumer-sited solar generated more than 40% of the state's solar generation and continues to grow (*Colorado Profile*, n.d.). Similarly, Maryland Code establishes the capacity limit at 200% annual energy consumption for households (*Net Metering in Maryland*, n.d.). In 2023, solar generation was five times greater than in 2015, with small-scale, consumer-sited solar generation leading the way (*U.S. Energy Information Administration - EIA - Independent Statistics and Analysis*, n.d.). The Washington, D.C. PUC also issued a ruling in 2020 that raises the capacity limit 20% every year over five years until it reaches 200% (*DC Citizen Wins Increase in Rooftop Solar Limit to 200% of Past Usage*, 2020). However, the results of the increase have not been measured but it indicates that an increase in the limit is possible without adjusting other net metering factors like the utility purchase rate.

The impact of increasing or removing the capacity limit would both increase clean energy generated, helping to reach the 2040 goal on schedule, and offer more incentive for potential solar energy customers via an increased revenue stream with more energy excess energy generated for sale. To increase or remove the system size capacity limit, MnSEIA would lobby the state legislature and PUC to either adjust or remove the current limit or end enforcement of the limit. The cost to increase a system would fall onto the customer themselves, while capacity increase, storage, and increased amount of energy purchased would fall onto the utilities. If you build a larger solar system on your property, you are responsible for the additional cost but in theory this negated through lower or no monthly utility bill.

Alternative Two: Inclusive Utility Investment

Inclusive utility investment (IUI) aims to address the upfront cost challenge of acquiring solar energy systems. A new 5kW residential solar install in Minnesota can cost around \$15,000 before tax incentives (*Minnesota Solar Panel Cost*, n.d.), but the cost can range from \$10,000 to \$35,000 depending on size, quality, and other factors. The upfront cost can be an enormous barrier for middle- and lower-income households to obtain solar energy, and therefore generating and consuming clean energy. Tariffed-on bill programs, commonly referred to as 'inclusive utility investment,' is a program where a utility will cover the upfront capital cost of energy efficient upgrades to their home, including insulation, air sealing, LED lighting, and in some states, solar panels.

Several states run their own IUI programs including Arkansas, Kansas, North Carolina, and Missouri to varying degrees; some states focus more on smaller upgrades like air sealing, while

Arkansas will install solar panels on homes (US EPA, 2023). The utility recoups their initial investment through a fee on your monthly utility bill over a set period of time. Arkansas' IUI program states that "Energy savings are calculated to be more than your monthly payment so you still see a reduction in your energy bill" (*Ouachita Electric Cooperative - HELP PAYS (Pay As You Save - Energy Efficiency Program)*, n.d.). Ouachita Electric Cooperative in Arkansas saw their participation in commercial customers triple, an average of 20% savings, and half of their new customers were renters (Ouachita Electric Cooperative – Preliminary Results, 2016), meaning obtaining solar was not just limited to those who owned their home. Similarly, in Hawaii, IUI programs that included solar upgrades found increased access to clean energy upgrades, closed the access gap on racial and income disparities, and provided net energy monthly savings for users (*Report | Inclusive Financing Programs for Solar and Electrification | White Papers | EESI*, n.d.).

If the upfront capital costs to solar energy are what is keeping people from obtaining solar, removing that barrier through an inclusive utility investment program will encourage people of lower means to avoid the upfront cost and potential debt that comes with financing adding solar to their property. Moreover, like Arkansas' IUI program, Minnesota's potential IUI should allow for homeowners and renters alike to take advantage of the program so that homeownership is not an additional barrier to generating and using clean energy. To implement IUI, MnSEIA would need to convince the utilities to cover upfront costs of solar energy projects and work with the PUC to ensure enforcement and billing structures are in place to facilitate tariff-on bill repayment by customers. The cost to implement IUI would lie with the utilities to front the initial cost, but through a monthly fee paid by the customer, they would recoup their investment to pay off the solar system.

Alternative Three: Eliminate Grid Access charges

The elimination of grid access charges aims to address lowering customers' monthly energy bills. A utility has the authority under Minnesota law to charge distributed generation customer fees, or what are commonly referred to as 'grid access charges' (*Net Metering & Compensation / Public Utilities Commission*, n.d.). The idea is that a utility can charge solar customers to connect to and use their existing grid system and to fund maintenance so that there is no cost-shift to non-solar customers. Grid access charges are set by municipal and co-op utility providers, which means that charges are not universal in price nor application across the state, and in neighboring municipalities. One of the big problems here is that some utilities charge the fees, and others do not, which may lead to ambiguous bills or higher than expected quotes on a potential solar project, and other disparate effects.

In Kansas, the State Supreme Court held that the charges amounted to price discrimination and directed the Kansas Corporation Commission (KCC) to release an order removing the distributed generation pricing structure (*Kansas Corporation Commission - News Release 2-25-21*, n.d.). Arizona moved to scrap the grid access charges for their solar customers, however, in December 2024 their commission upheld the charges citing "parity and fairness of all ratepayers" (ACC

Reaffirms Grid Access Charge After Rehearing in 2024 APS Rate Case, n.d.).⁵ MnSEIA, and other solar advocates across the country, argue this charge is a prohibitive barrier and burden to solar customers, and there is no cost shift or impact with the removal or unenforced grid access fees like in Kansas. In Minnesota, the co-op utility providers and the Minnesota Rural Energy Association (MREA) disagrees and argue the charges are necessary but have not provided data to support this. Removing the grid access charges is one of MnSEIA's policy priorities to lowering barriers to expanding solar and ensuring that net metering's ability to lower monthly bills and creating additional income streams is fully realized for customers. MnSEIA would lobby the state legislature and regulators to change the language of existing net metering laws to remove grid access charges and convince the PUC that this is price discrimination with no cost shift to non-solar customers, opposing the Arizona decision.

Why Status Quo Won't Work

MnSEIA has discussed an alternative where opponents agree to not move on a repeal bill or try to push for what they perceive as negative changes to current net metering policy. In this scenario, neither side is happy, but crucially, nobody is unhappy. While this alternative does not necessarily lower barriers to expanding solar which does not help people take advantage of net metering, it does not worsen the current environment which allows people to acquire solar and take advantage of net metering. This is not possible because opponents of net metering introduced a bill that would weaken its impacts and pricing structure. The status quo is no longer possible given this movement.

Criteria

When weighing the above alternatives against criteria to recommend the best path forward, we look for criteria that will clearly identify an alternative that will address the policy problem and achieve MnSEIA's goal of solar energy expansion. While I do not have the weights of the below criteria, I have outlined the order of importance at this point from most to least important. I have therefore established the following criteria to weigh against my alternatives: effectiveness, cost, feasibility, and equity.

Effectiveness

Determining effectiveness of a given alternative is essential in recommending a realistic and worthwhile alternative. If there is a cost (financial, political, or something else), the effectiveness and/or benefits from a successful outcome may outweigh potential costs or difficulties passing into law/changing regulation. For example, inclusive utility investment may be costly (at least in the short term) for utilities, but if solar energy uptake increases and the utilities recoup their investment over time, it would be worth pursuing this alternative for its effectiveness. The recommended alternative should clearly demonstrate its effectiveness of enhancing net metering policy which will expand solar energy generation and consumption.

⁵ It is important to note that this was not through the Arizona court system and two of the commissioners were not present to vote.

Feasibility

Feasibility captures a suite of potential barriers. Political, administrative, and community support are all encapsulated within the feasibility criteria. Particularly relevant this legislative session is political feasibility. The Minnesota legislature has been at a standstill since session began in early January because the House is lacking quorum (one House race is still outstanding and it is currently tied 67-67) with a special election postponed by a judge, and the unfortunate passing of a Democratic Senator left the Senate 33-33 until late January when Democrats won a special election (*Minnesota Senate Full Strength, House Still Lacking Quorum to Convene - League of Minnesota Cities*, n.d.). So, passing legislation with only partisan support is not likely to happen this session with a near equal split in both chambers. Administrative feasibility requires the PUC to change enforcement of rules, or the rules themselves. However, their mission is, “to create and maintain a regulatory environment that ensures safe, reliable and efficient utility services at fair and reasonable rates” (*Laws Statutes and Rules*, n.d.), which bodes well with MnSEIA’s goal to enhance net metering policy so all Minnesotans can fully utilize solar energy’s benefits. Finally, community support is key to building broad coalitions from potential customers who can help advocate for a potential alternative. Community support comes in many forms, from individuals to other advocacy groups, and solar users and non-solar users.

Cost

Cost, while not as important to my client as effectiveness, remains a key concern for alternatives that require action from government, utilities, or potential customers. However, cost can be lower priority if up front capital investment now results in future revenue streams that even out the balance sheet, whether for government, utilities, or customers. Moreover, if cost can be socialized among these three parties, then it may not be as important of a factor as opposed to the responsibility of one covering the cost. Additionally, if opponents to net metering purport that there is a cost but remain unwilling to prove it, I will not calculate this as a cost. But who ultimately bears a direct or indirect cost can make or break a potential alternative.

Equity

MnSEIA wants to ensure that a future “energy democracy” includes everyone. Ideally, solar energy expansion through an enhanced net metering policy alternative benefits urban and rural populations, low-income to high-income, every race, tribal status, background, homeowner and renter, etc. equitably. While solar energy expansion in general is important in reaching the 2040 goal, if certain populations are left out, they risk falling further behind in society, creating or worsening a new ‘in’ and ‘out’ group in the clean energy transition and furthering inequality. Equity should not be compromised; therefore, every alternative must provide equitable outcomes in solar energy expansion.

Findings

Background on Alternatives and Criterion

Here is a short breakdown of each criterion and how they are evaluated:

- Effectiveness: Each alternative will be measured on a scale of **low, medium, and high**, depending on its perceived level of residential solar energy expansion after the policy intervention based on case studies or similar examples.
- Cost: The alternatives include actions that may impose costs on government, utilities, or customers. Cost is also key in determining the level effectiveness of each alternative, meaning, if possible, cost effectiveness can be determined per person/system/year/etc. Cost effectiveness is dependent on each alternatives' amount of solar expansion after the policy intervention is implemented. Some costs, and therefore effectiveness, will be unknown in which case an estimate will be provided.
- Feasibility: Feasibility will be measured on a scale of **low, medium, and high**. Political, administrative, and community support are all encapsulated within the feasibility criteria.
 - Political: In the current legislative session, both chambers are nearly split equally down partisan lines, with Democrats narrowly edging out Republicans in the Senate, while the House is evenly split. Governor Tim Walz (D) tends to be inclined to support clean/renewable energy policy and goals, making him a key ally and stakeholder in the 2040 goal. Moreover, key interest groups such as the Sierra Club and utilities such as Blue Horizon Energy support MnSEIA's objective to expand solar through net metering policy interventions.
 - Administrative: Administrative feasibility can come from the regulator (PUC) or the administrative feasibility from the utilities themselves. Either the PUC or utility may be the enforcement mechanism or implementor, depending on the alternative policy.
 - Community: Community support can come from those who wish to use solar or current solar users. Their support is key for advocating for better pathways to acquire solar, and to actually follow through in acquiring solar once a policy intervention is implemented. Those opposed include the advocacy group Minnesota Rural Energy Association (MREA) and electric co-operative utility providers who currently charge for grid access.
- Equity: Equity should not be compromised; therefore, every alternative must provide equitable outcomes. Each alternatives' equity level will be measured on a scale of **low, medium, and high**, determined by case studies of similar policy interventions in other states or estimates, and improved access to solar energy.

Below is a detailed analysis of each alternative where MnSEIA's efforts are best positioned to focus on this and future legislative sessions, evaluated against each criterion. In the case where insufficient data is available or no analysis has been done previously, assumptions will be listed in further detail.

Alternative One: Increase or Remove System Size Capacity Limit

Minnesota, like many other states, has a solar system capacity rule that limits the amount of solar energy that a user may install to 120% of annual energy generation, typically based on data from the previous 12 months, adding in the 20% buffer for increased demand and selling excess energy back to the grid. If any solar power is generated above the 120% limit, utilities may purchase this excess energy at a lower rate than the agreed upon net metering rate. MnSEIA, among other solar advocates like the Institute for Local Self-Reliance (*Institute for Local Self-Reliance*, n.d.) argue that the limit is arbitrary and increasing it can be done safely and effectively.

Proponents of the limit argue that it is necessary to prevent overproduction, therefore lowering the rate that utilities will purchase excess energy and creating storage issues, and to ensure that customers' energy needs are aligned with the number of solar panels they install. However, allowing more than 120% of energy used or removing the limit entirely could incentivize potential solar energy users that are on the fence. If customers are allowed to generate more energy than before, there will be more clean energy to sell back to the grid which is utilized by their community and offer potentially more higher revenue streams by selling higher amounts of excess energy as energy demand increases.

Effectiveness: Effectiveness depends on uptake of the new limit. A survey of current solar users and those considering solar would offer insight into the uptake of larger systems. However, in theory, if new and existing users are able to generate more solar energy, customers will see financial incentive in selling this new excess energy back to the grid in addition to generating more clean energy to meet the 2040 goal. An analysis of solar energy expansion in places like Colorado, where the limit was increased to 200% in 2021 and in the following two years, consumer sited solar dominated the amount of solar produced in the state at 40% (*Colorado Profile*, n.d.), nearly doubling since 2020 (*Electricity Data Browser - Net Generation for All Sectors*, n.d.). This example, among others like Maryland and D.C., offers Minnesota a roadmap to increasing their limit. I offer that increasing or removing the capacity limit would measure as **medium** in terms of its effectiveness in expanding solar energy production if existing solar systems are expanded and new ones are built to the increased limit based on Colorado's data, and not high because only those with means and resources will likely be able to take advantage. To increase the size of one's solar system assumes the roof/structure space to do so, in addition to the financial investment required.

Cost: The cost for increasing or removing the capacity limit is currently **high** for consumers and utilities and ultimately depends on customers' intention to increase their existing size or new users building a larger size. It also depends on the variable sizing that customers could size up to (i.e., not everyone will increase size to 200%). There is no clear cost to the government to increasing the size limit beyond enforcement (which it already does for the 120% limit). Adding five additional panels that generate about 1kW of energy can cost on average \$6,000 (*Adding Solar Panels To An Existing System*, n.d.). There will also be a cost to the utilities who will purchase an increased amount of excess energy generated, although potentially with a threshold below the retail rate. In Minnesota, a net metering cap of 4% of annual retail electric

sales (2025 Xcel Energy Net Metering, n.d.) which would need to increase to match the increased energy generated. However, with increased energy demand over the coming years and decades, an excess amount of clean energy will be required regardless of cost to utilities.

Feasibility: Low

- Political: Minnesota, although politically divided, can look to peer states like Colorado who pioneered increasing the capacity limit to 200% (Public Utilities Commission Encourage Renewable Energy Generation, n.d.). MnSEIA and its allies would need to lobby the legislature for a change in the law which then the PUC would then enforce. Whether there is an appetite in the legislature this session for a change that scores low on effectiveness and may require additional studies of the impact from other states is unlikely.
- Administrative: With the increase in solar energy generated, utilities will be reluctant to pay even more for excess energy generated by an increased solar system size. As it is, some utilities try to pay less than the retail rate for the excess energy, leading to major backlash like in Nevada in 2017-2018 (Roberts, 2016).
- Community: As demand for energy increases (*Global Energy Perspective 2024* / McKinsey, n.d.) from rising populations, data centers/AI, electric appliances, and more, solar users will want to match that demand using their own production. Moreover, there are solar users who wish to increase the amount of solar they can generate on their property to increase their independence from the grid and generate/use more clean energy. Therefore, those who can afford to increase their current size or purchase a new, larger size system will be in favor, whereas if cost remains a barrier for solar adoption, they will be less impacted.

Equity: Equity for alternative one is difficult to measure, as it relies on the amount of uptake in resizing existing systems or the ability to pay for larger, new systems. Since it is not clear that this alternative lowers barriers for all people, especially those of low-to-medium income who may not be able to afford larger systems, equity is **low** without more data from places like Colorado and the details of solar uptake after the limit was increased. Although in general the amount of solar generated in places like Colorado and Maryland increased at a higher rate after the limit was increased, it is not clear that everyone was able to take advantage of the increase.

Recognizing the limited data and knowledge about increasing or removing the capacity limit, alternative one remains the most nebulous in its evaluation of the criteria but still an option that MnSEIA is open to pursue.

Alternative Two: Inclusive Utility Investment

Inclusive utility investment (IUI), also known as *tariffed-on-bill programs*, is the process where a utility will cover the upfront capital cost of energy efficient upgrades to their home, including insulation, air sealing, LED lighting, and in some states, solar panels. In return for the utility fronting the cost of the project, the customer typically signs a power purchasing agreement with the utility to utilize their services for a set period of time (e.g. 20 years) for any energy they

consume above their production amount. So, instead of customers taking out a private loan or putting cash down, IUI offers another pathway to clean energy for low-income households.

There are several assumptions about the inclusion and adoption of IUI in Minnesota for solar panel installations that dictate the effective, cost, and other criteria of this alternative. For starters, a 'standard' size solar installation on a single-family residential property is approximately 5kW (depending on demand). Moreover, we assume that the location of the home and position of the roof are suitable for solar panels (i.e., south facing, no-to-limited interference by trees or buildings, etc.). Finally, we will be utilizing an average cost of installation from a third-party estimator.

Effectiveness: IUI ranks **high** in its effectiveness in addressing solar energy expansion via net metering policy. A major barrier to installing solar energy on a residential home is the upfront cost (*Upfront Costs Are the Top Barriers to Solar Panel Adoption*, n.d.), so eliminating that cost will offer an enormous incentive for potential customers who were on the fence previously. Theoretically with IUI that covers solar projects, more people will install solar.

Cost: The cost for IUI would land on the utilities installing, powering, and maintaining the solar systems. As mentioned above, assuming a 5kW system, which is typical for an average single family home in the United States, you can expect this to cost in the range of \$12,000 - \$16,000, with the average install landing somewhere in the middle at \$14,718 before any incentives (*Minnesota Solar Panel Cost*, n.d.). This cost ranks **high** for the utilities as they bear the upfront cost and **low** for the user. The installed system is paid back to the utility via a fixed charge on monthly energy bills over a set number of years, recouping the cost of the installation for the utility. Essentially, this is a low-to-no interest loan from the utility. Therefore, financial risks can be mitigated and investments realized for both the utility and homeowner, leading to a cost-effective model of solar upgrades. The onus for grid service/ maintenance/administrative costs would likely land with the customers via the fixed charge, differing from grid access charges as we know them today where solar users fund their projects themselves while still paying the fixed fee.

Feasibility: Low

- Political: In an evenly partisan split legislature, the viability of passing a bill either exploring or beginning to fund a program to encourage utilities to take up solar IUI is unlikely this session due to budget deficit forecasts (*Minnesota's Budget Outlook Worsens in Both near, Long Term - Session Daily - Minnesota House of Representatives*, n.d.), and unknown in future sessions depending on the partisan split and outcome of the 2026 gubernatorial election. Additionally, it may not be the most popular option for the legislature to tell utilities, who wield exceptional monopoly power and are well resourced, that they need to spend large sums of money to cover the upfront costs of new solar projects when they frequently lobby for weakened net metering policies and against large expansion of solar (*Utilities Push Back against Growth of Rooftop Solar Panels*, 2022).

- **Administrative:** The administrative burden here lies with the utilities, not the legislature or PUC. Lobbying utilities to voluntarily implement IUI for solar is a tall order without incentives. Even with the 'loan' fully paid back via utility bills, it's in the utilities' interest to keep customers on non-distributed generated solar (i.e. coal, natural gas, etc.) which customers cannot generate themselves. So, encouraging more of their customers to go with a renewable energy option like solar is not going to be a popular move without incentives like grants or other funding mechanisms from the legislature
- **Community:** Potential customers put off by high upfront capital costs will likely be very supportive of an alternative path to acquiring solar without the financial burden. Furthermore, existing solar users can take advantage of increasing their system size to the capacity limit via IUI, securing new and existing users' support. Among single-family homes in the U.S., North Carolina Clean Energy Technology Center found that nearly 21 million households would benefit from going solar if there were low-cost options available (*Report*, n.d.).

Equity: IUI's equity ranks **high** because it removes significant financial barrier for lower-income households to make the move to solar. Moreover, with uncertainty over federal tax credits or other incentives previously in-place for solar, opening the IUI pathway may be the financial motive and right nudge to switch for lower-income people sooner rather than later.

Alternative Three: Eliminate Grid Access Charges

Grid access charges, otherwise known as *distributed generation customer fees*, are monthly fixed charges on solar users' bills to recover costs not covered through their monthly bill. In essence, a utility has the authority to charge solar customers to connect to and use their existing grid and to fund maintenance so that the onus does not fully lie with non-solar customers. Homes that generate solar energy are likely to have a lower bill, if not a net-gain from selling excess energy generated back to the grid, than those who do not have solar. Therefore, utilities argue that these charges are necessary since customers are likely to pay little to nothing into the system for maintenance, repairs, upgrades, etc.

Grid access charges are set by municipal and co-op utility providers, which means that there are non-uniform charges for potential solar users across the state, and in neighboring municipalities. A major problem with charging for grid access is that only some utilities charge the fees, which may lead to ambiguous bills or higher than expected quotes on a potential solar project, and other disparate effects among solar customers. At its core, the grid access charge cuts into a major reason people go with solar – to save on their monthly energy bill.

While there is no definitive list that Minnesota's 60+ utility providers charge, we have a few example rates some utilities charge as of April 2021 via EQ Research (*Clean-Energy Research & Analysis*, n.d.) ranging from \$8 - \$12 per month at Otter Tail Power Company, Minnesota Power, and Xcel Energy. The charges also vary by state. For example, according to the same report, Xcel Energy charges Wisconsin residents \$17 per month just across the border from Minnesota. The charges can reach upwards of \$30 in some states (e.g., Mississippi, Hawaii).

Unless the utilities who charge for grid access can show definitive data that solar users must be charged a fee that pays for their connection to fund maintenance and other costs, the charge amounts to price discrimination. If not, there is a clear argument to be made that the charges to be price discrimination as was determined by the Kansas State Supreme Court (*Kansas Corporation Commission - News Release 2-25-21*, n.d.). MnSEIA, and other solar advocates across the country, argue this cost is a prohibitive barrier and burden to solar customers, and there is no cost shift or impact with the removal or unenforced grid access fees like Kansas decided.

Effectiveness: Since not every utility utilizes the charges for grid access and the charges themselves can range from a few dollars to upwards of \$30 per month. While upfront cost is a financial barrier, research shows that 4 out of 5 consumers who were interested in installing solar were doing so as a way to reduce their monthly bill (*Upfront Costs Are the Top Barriers to Solar Panel Adoption*, n.d.) strongly suggesting that a policy intervention that reduces the monthly bill would have the greatest impact on households' decision whether or not to install solar. Moreover, grid access charges are attributed to stalled rooftop solar adoption and failure in reaching clean energy goals (Post et al., n.d.). Therefore, this alternative scores **medium** on the effectiveness level due to its effect on lowering monthly bills for those who choose to go solar to offset their monthly energy bills.

Cost: The cost of this alternative depends on who is bearing it. For the solar user, there is no cost beyond potential charges for maintenance/administration. For the utility, there may be **no-to-low** cost since they have yet to show data proving these charges are necessary to recover costs not covered through a solar users' monthly bill (if they have one). The cost savings on the customer, however, can be relatively meaningful. For example, if the monthly charges below were instead saved by eliminating monthly grid access charges and put into a standard high-yield savings account at 3% interest, one would earn:

	One year	Five years	10 years
\$8	\$104.24	\$518.95	\$1,111.28
\$15	\$195.45	\$973.03	\$2,083.66
\$22	\$286.66	\$1,427.12	\$3,056.03

This savings is in addition to savings on lower monthly utility bills and selling any excess energy back to the grid. At scale for Minnesota's thousands of residential solar users, this savings and economic impact could result in higher levels of financial security, greater state tax revenue, and no clear economic impact to the utilities. This is seen through the numerous other co-operative utilities that do not charge for grid access on consumers monthly bills and do not decrease investment or increase their prices. If the goal for some solar users is to save money on their monthly energy bills, removing the grid access charge is another benefit on top of producing and consuming clean energy.

Feasibility: **Medium**

- Political: MnSEIA would need to advocate for a change in the law (Minn. Stat. 216B.164 Subd. 3(a)) (*Laws Statutes and Rules*, n.d.) to adjust/remove language that currently grants utilities the ability to charge for grid access. Since utilities are reluctant to disclose how these charges are calculated and if they are needed to recover costs, the legislature may be willing to adjust the language of the current law to *at a minimum* offer insight into how the grid access charges are calculated, but *ideally* into eliminating them.
- Administrative: Administrative feasibility, as borne by the utility in this case, is low, given utilities argue this charge is necessary to recover fixed costs not captured in customers' monthly bills. They will not be supportive overall of eliminating an additional revenue stream for them.
- Community: Recent legal action against grid access charges in Kansas and Arizona have shown that solar customers are not supportive of this charge as it treats them differently than non-solar users for choosing a cleaner and renewable energy option. Removing these charges increases parity and incentivizes acquiring solar to lower or eliminate monthly energy bills. Here, hedging against legal action and the legislature siding with the utilities to keep the charges in place, feasibility is medium.

Equity: The elimination of grid access charges scores **medium** on its level of equity. If the goal is to expand solar energy through enhanced net metering policy so that Minnesotans, regardless of income, background, location, etc., can take advantage of solar energy benefits, the removal of an additional charge on customers monthly energy bill. Research shows that a major hesitancy in those on the fence about going solar is lowering monthly bills. However, recognizing the limitations of eliminating grid access charges is important – the ones who benefit the most are those with solar already and those who can afford solar, meaning there is still a high bar to acquire solar and take advantage of alternative three.

Outcomes Matrix

OUTCOMES MATRIX		CRITERIA			
		EFFECTIVENESS	COST	FEASIBILITY	EQUITY
ALTERNATIVES	INCREASE CAPACITY SIZE LIMIT	MEDIUM	HIGH (CONSUMERS) LOW (UTILITIES/ GOVERNMENT)	LOW	LOW
	INCLUSIVE UTILITY INVESTMENT	HIGH	HIGH (UTILITIES) LOW (CUSTOMERS/ GOVERNMENT)	LOW	HIGH
	ELIMINATE GRID ACCESS CHARGES	MEDIUM	LOW (CUSTOMERS/ UTILITIES/ GOVERNMENT)	MEDIUM	MEDIUM

Recommendation

Based on analysis and review of each alternative, evaluated by the criteria, I recommend **Alternative Three: Eliminate Grid Access Charges** as the best path forward for MnSEIA to focus its efforts as it works to expand solar energy in Minnesota through enhanced net metering policy. It is likely that alternative three is the first step in several, including adopting alternatives one and two, in enhancing net metering policy to expand solar energy production and use in the coming years and decades. However, I find that alternative three is the best first step in this journey at this point in time. Although alternative three may have smaller impacts on the cost of installing new solar, its combination of medium level of cost-effectiveness, high feasibility in each component, and medium level of equity make it a compelling and realistic recommendation for solar energy expansion through enhanced net metering policy.

IUI requires significant cooperation from utilities and willingness to change business practices to invest upfront capital for solar projects, with payoffs potentially over several decades. It does not necessarily require legislative or regulatory action, but those could be potential incentives for utilities. Moreover, some smaller utilities may not have the capital on hand for effective IUI, limiting the effectiveness of solving the problem with long timelines on installing new solar.

Increasing or removing the 120% system capacity limit is difficult to measure effectiveness and cost, as not every solar user would be willing/able to increase their size due to cost. A potentially more effective and feasible alternative first step for this would be passing a bill to fund a study on the impact of increasing or removing the limit. However, a silver lining may be that there is likely a natural evolution toward increasing or removing the limit based on increased energy demand and approaching climate goals in the coming years. Either the legislature or regulator would be inclined to increase or remove the capacity limit under these circumstances, proving this recommendation unnecessary at this point in time.

That being said, eliminating grid access charges is the alternative that requires the least amount of time to implement and best satisfies all of the evaluative criteria. The cost savings to customers over time adds up to a non-trivial amount and the cost shift to the utility has not been proven. Removing grid access charges is one of MnSEIA's key policy priorities to lowering barriers to expanding solar and ensuring that net metering income generation is enhanced for new and existing customers and is currently the recommended path forward to focus its advocacy efforts.

Implementation

Below is a workflow for MnSEIA and partners to follow to ensure successful implementation of policy alternative three: eliminate grid access charges.

1. Identify and engage allies and key stakeholders
 - a. Other advocacy groups (e.g., Sierra Club, Vote Solar)
 - b. Solar companies (installers, manufacturers, etc.)

- c. Individual community solar and clean energy advocates, including current and prospective solar users.
- 2. Collect, analyze, and create presentable materials to advocate for alternative three
 - a. Solicit the utility providers to support their claims that grid access charges are necessary to support infrastructure and rebut their cost shift argument. If possible, coax utilities to overplay their hand and take advantage of public backlash.
 - b. Gather the discrepancy in grid access charges among Minnesota's utility providers (i.e., some charge, others do not, and rates vary).
 - c. Bring case studies (i.e., Kansas and Arizona) of grid access charge eliminations (and in Arizona's case, unpopularly brought back).
 - d. Survey Minnesota residents about attitudes in obtaining solar with and without projected cost of grid access charges.
- 3. Plan for during session and out of session
 - a. Minnesota's legislative session meets in regular session each biennium in odd-numbered years, with the first year of the biennium meeting from early January to mid-May, and the second year with an agreed upon start date and a typical end date earlier than May.
 - b. During session, work with legislative champions on timing to introduce bill and preparing hearing testimony for witnesses wanting to testify in support of the elimination. This preparation includes much of the research mentioned in step 2 and leveraging allies and stakeholders in step 1.
 - c. Out of session, MnSEIA and partners will focus on building and maintaining the legislative relationships through site visits and regular meetings to ensure that legislators are informed and up to date on the most recent data, case studies, and other key information regarding grid access charge harm to consumers in their districts.
- 4. Marketing and education campaign
 - a. Commission a study (private or via the legislature) showing that eliminating grid access charges make obtaining solar cheaper through lower monthly bills, without a cost shift to non-solar users or utilities.
 - b. Research shows that small nudges can alter people's behavior through subtle influences in everyday life. In this case, the use of behavioral economics to teach potential solar customers about the importance of transitioning to a clean energy source for sustainability purposes *and* financial incentives would overcome hesitation some may have about the initial financial investment solar requires.
 - c. Information asymmetry has been shown to produce inefficient market outcomes and cause potential harm to consumers who are uninformed or misinformed about a product they are purchasing. This same principle can be applied to grid access charges for existing and prospective customers. MnSEIA will produce marketing materials (graphics, advertisements, townhalls, etc.) to inform the public on the harm to consumers to create support for the elimination of grid access charges.

5. Identify and engage champions and detractors to mobilize support. During the 2025 MnSEIA has garnered support from key legislators on critical committees and organized several testifiers during hearings on related bills. Key legislative stakeholders:
 - a. Senator Frentz (D), Chair of the Senate Energy, Utilities, Environment, and Climate Change Committee (and lead author of the 2040 clean energy bill)
 - b. Senator Mathews (R), Ranking Member of the Senate Energy, Utilities, Environment, and Climate Change Committee
 - c. Representative Swedzinski (R), Chair of the House Energy Finance and Policy Committee
 - d. Representative Acomb, Ranking Member of the House Energy Finance and Policy Committee
 - e. Senator Murphy (D), Senate Majority Leader
 - f. Representative Demuth (R), Speaker of the House
6. Once grid access charge elimination bill (or amendment) passes and is signed into law, maintain relationships with key partners and be an engaged stakeholder for continued detractors.
 - a. Eliminating grid access charges is part of the overall objective and a small victory. To ensure that the legislation is not repealed or adjusted unfavorably in the future, MnSEIA will maintain and grow the key legislative relationships that brought success and stay up-to-date on data and case studies that supports their position.

The topline conclusion to a successful implementation effort is for MnSEIA to build and maintain a strong coalition of supporters and mobilize this group using the inertia created to

Challenges

Three obvious scenarios that would mean an unsuccessful implementation of the policy intervention of removing grid access charges:

1. Grid access charges are too low to convince people on the fence to switch to solar.
2. Grid access charge is repackaged as another type of fee.
3. Excess energy purchase rate is decreased from additional solar expansion.

Preventing or Overcoming Challenges

To prevent the policy intervention from failing to reach its goal, there are steps to take and consider right now for MnSEIA.

1. When advocating for the elimination of grid access charges, ensure that bill language expressly limits and regulates future fees to be only those necessary. For example, language in the bill will clearly state that grid access charges and similar billing procedures are not allowed unless a utility provides documentation that they have exhausted all other options to pay for valid grid maintenance (i.e., operational vs. capital investments or expansion) caused by solar users **OR** they are not discriminating against solar users by only charging them, like Kansas was able to prove in court.
2. Advocate for a legislative study to put into the record a durable, rigorous, and credible source that supports or confirms MnSEIA's position and the policy intervention. A study may be part of the bill that eliminates grid access charges, or a standalone piece of

legislation. If utility providers are confident in their argument that these fees are necessary (which they have not proven), they will in theory support a legislative study.

Conclusion

Solar expansion is a key piece of reaching the 2040 carbon-free energy goal in Minnesota. A strong net metering policy will foster an enticing and worthwhile investment for residential rooftop solar expansion beyond its current trajectory. The existing evidence, strong attitudes in favor of solar energy in the U.S., and government promises to transition to a clean energy economy make the case for solar energy expansion as a critical piece of the carbon-free energy transition and achieving Minnesota's 2040 goal.

While upfront cost and size capacity limits may be a factor to some people regarding their choice to adopt solar, these alternatives are not currently feasible. The research confirms that those on the fence or considering solar do so to lower their monthly energy bill. Therefore, the elimination of grid access charges is the best option to expand solar energy. There is a clear conclusion drawn from friendly and unfriendly net metering states: enticing and strong net metering policies increases solar energy adaption. Minnesota will follow in Kansas' footsteps in the removal of grid access charges as price discrimination. If they do not, they will fall into lessons we ought to have already learned in places like Arizona and Nevada.

Utilities have a responsibility to show there is a cost-shift to non-solar users. However, even if we take their argument to its conclusion, a cost shift to non-solar users for grid access would be outweighed by solar's benefits to utilities through lower demand (especially during peak times), increased grid reliability, and even offset when utilities sell excess solar energy to other consumers at the market rate.

I would be remiss not to mention the federal political environment and future of clean energy policy in the United States under the new presidential administration, including shifting federal priorities and reneged investments (i.e., via the Inflation Reduction Act). Minnesota still remains under Democratic control at the governor's mansion until 2026 and controls one chamber of the legislature, which bodes well for a stable path toward the 2040 goal in the short term. The long-term impact remains unstable and unclear, certainly at the federal level but also the state level to some degree as it hinges on upcoming elections. The broader impact of the 2024 election will likely become clearer in the coming months, but it is safe to assume that federal dollars (including tax incentives and subsidies) for solar will be lower than anticipated.

The ultimate goal for MnSEIA and myself is to expand solar energy in Minnesota in order to meet the 2040 100% carbon-free goal. Solar is good for all Minnesotans and will grow economically into a larger share of impact in the coming years and decades. The first step in increasing solar adoption and reaching the 2040 goal is the removal of grid access charges by Minnesota utilities.

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