BEFORE THE MISSISSIPPI PUBLIC SERVICE COMMISSION

Docket No. 2021-AD-19

IN RE: ORDER ESTABLISHING DOCKET TO REVIEW THE EFFICACY AND FAIRNESS OF THE NET METERING AND INTERCONNECTION RULES

COMMENTS OF THE MISSISSIPPI SOLAR ENERGY SOCIETY, CHAPTER OF THE AMERICAN SOLAR ENERGY SOCIETY, ON COMMISSION'S ORDER SEEKING COMMENT

COMES NOW Mississippi Solar Energy Society (MSES), Chapter of the American Solar Energy Society, and pursuant to the Mississippi Public Service Commission's (PSC) Order Seeking Comment dated February 2, 2021, files these comments.

MSES appreciates the PSC providing the opportunity to comment on the efficacy, fairness, and functionality of the Mississippi Renewable Energy Net Metering Rule (Net Metering Rule) and the Mississippi Distributed Generator Interconnection Rule (Interconnection Rule).

The United States (U.S.) is embarking on a steady transition to renewable energy because it is cost-effective, more environmentally sound and assists in addressing serious Climate Change issues, has many benefits for the U.S.'s electrical production and grid systems, including diversification and decentralization of energy sources, system and grid stability, reliability, and resiliency. Since we all have roles to play in this endeavor, MSES appreciates and thanks the PSC for its efforts to entertain these comments regarding an important aspect of providing electrical power services in Mississippi and strengthening the opportunity for customer choice and for improving the economy, health, well-being, and quality of life in Mississippi.

MSES is responding to the PSC's questions in their order as requested by the PSC.

MPSC Questions:

1. Have the Net Metering and Interconnection Rules been effective in creating meaningful access to renewable self-supply opportunities for Mississippi Electric Customers?

A. No. The hybrid Net Metering and Interconnection Rules have not been effective in creating meaningful access to renewable self-supply opportunities for Mississippi electric customers. The Synapse Energy Economics, Inc. report for the Mississippi Public Service Commission (PSC) dated September 19, 2014, indicated that net metering would provide net benefits for Mississippi in almost all scenarios analyzed, but that little investment in renewable self-supply would occur without an investment return greater than retail rate.

The recommendations made in the Synapse report "Net Metering in Mississippi Costs, Benefits, and Policy Considerations Prepared for the Public Service Commission of Mississippi September 19, 2014" are still relevant today. These recommendations included:

> *"The [Synapse] analysis conducted and the results shown in this report reflect the potential costs and potential benefits that an illustrative net metering program could*

provide to Mississippians. From a Total Resource Cost perspective, solar net metered projects have the potential to provide a net benefit to Mississippi in nearly every scenario and sensitivity analyzed. These benefits will only be realized if customers invest in distributed generation resources. This may never happen if net metering participants are not expected to receive a reasonable rate of return on investment. Based on the results of the participant cost analysis, net metering participants in Mississippi would need to receive a rate beyond the average retail (variable) rate in order to pursue net metering."

The Synapse report indicated that the true value rate for renewable energy benefits would be $0.17/kWh.

As predicted by the Synapse report, the Acadian Consulting Group report to the PSC of March 12, 2019 noted that Mississippi ranked 42nd in states with installed Net Energy Metered (NEMs) customers and 47th in total number of NEMs across the U.S., reflecting the subsequent low investment in NEMs in Mississippi.

The latest data provided by the PSC available for the end of 2019 indicates Entergy MS had 97 Renewable Energy Net Metering Customers (RENMICs) (0.0215% of customer base) for 0.0325% of Peak System Demand (PSD), MS Power Co. had 194 RENMICs (0.0871% of customer base) for 0.1285% of PSD. Cooperative Energy had 405 Distributed Generation Customers (0.0937% of customer base) for 0.18674% of PSD. Cooperative Energy does not pay Distributed Generation Customers (DGCs) for an excess energy distributed to the grid. Tennessee Valley Authority had 94 DGCs. TVA has ceased adding customers to their Green Power Program and only pays existing DGCs the avoided cost rate published monthly, typically in the range of 2.5 cents/kWh. These statistics clearly indicate the current hybrid Net Metering and Interconnection Rule has not been effective in creating meaningful access to renewable self-supply opportunities for Mississippi electric customers.

The current hybrid net metering program discourages customers from investing in renewable energy since it makes economic analysis of the benefits and electric power savings customers may achieve nearly impossible to predict or calculate without extremely detailed power usage data of the customer. Distributed Generation Facility (DGF) providers and installers are thus unable to advise customers of the monthly bill savings thus discouraging customers from investing in DGFs.

2. What, if any, modification to the Net Metering and Interconnection Rules could meaningfully increase customer access to renewable self-supply?

A. In the PSC Order Adopting Net Metering Rule, Docket No. 2011-AD-2, dated December 3, 2015, the PSC stated:

"Mississippi Code Annotated Section 77-3-45 empowers this Commission to "prescribe, issue, amend and rescind such reasonable rules and regulations as may be reasonably

necessary or appropriate to carry out the provisions of this chapter." To that end, the Mississippi Legislature declared in Miss. Code Ann. Section 77-3-2 that it is "the policy of the State of Mississippi ... to provide fair regulation of public utilities in the interest of the public," "[t]o promote adequate, reliable and economical service to all citizens and residents of the state," [t]o provide just and reasonable rates ... consistent with long-term management and conservation of energy resources," "[t]o encourage and promote harmony between public utilities, their users and the environment," and [t]o foster the continued service of public utilities ... consistent with the level of service needed ... for the promotion of the general welfare." Additionally, the Legislature recently granted he Commission broad authority to promote economic development throughout the state.

[T]he Commission finds a need for net metering because such a program supports consumers' right to self-supply electricity as balanced by the need and right to connect to the grid, provides increased consumer choice and introduces innovation into a market dominated by monopolies, has the potential to put downward pressure on rates and provide benefits to all ratepayers, and constitutes a substantial step toward creating a viable solar market in Mississippi. ... By excluding self-supply from the definition of "public utility" in Miss. Code An. Section 77-3-3(d), the Public Utility Act impliedly recognizes that consumers have a right to generate electricity for their own use, which coexists with a right to connect to the grid as regulated by the Commission.

Net metering programs also have the potential to increase economic activity and job growth, and theoretically reduce the cost of compliance with future feral emissions regulation by promoting the use of renewable energy resources. Furthermore, as Synapse Energy Economics, Inc. concluded in its final report, "Distributed solar is expected to avoid costs associated with energy generation costs, future capacity investments, line losses over the transmission and distribution system, future investments in the transmission and distribution system, environmental compliance costs, and costs associated with risk.

[The] Commission may exercise jurisdiction over a cooperative relative to net metering. Also, PURPA neither expressly preempts state jurisdiction over net metering and interconnection standards nor necessarily presents a conflict between federal goals and state regulation. [The] Commission finds that so long as the distribution cooperatives ("EPA"s) that take service from the Tennessee Valley Authority ("TVA") continue to participate in a TVA sponsored net metering program, such cooperative satisfy these Rules. ... PURPA does not prohibit or preempt the Commission from adopting and requiring EPAs to implement net metering and interconnection standards pursuant to Commission authority under state law. ... [The] Commission finds that sol long as the TVA EPAs participate in a net metering program offered by TVA, such participation will be deemed to satisfy the purpose and requirements of the Commission's net metering and interconnection standards.

The Commission may not regulate "the rates for the sales and /or distribution ... [o]f electricity by ... electric power associations to the members thereof as consumers. The plain language of Section 77-3-5(b) excludes the Commission from setting rates on only

one side of the utility-consumer transaction, that is, sales of electricity by the EPA to its member as a consumer. Net metering, however, concerns the offsetting of self-generated electricity by the consumer and exporting of that self-generated electricity to the utility. Net metering thus concerns the opposite transaction from the exemption: accounting for electricity from the member to the EPA. By its very terms, the exemption of Section 77-3-5(b) does not apply to net metering and interconnection standards. Section 77-3-5(b) is also inapplicable because net metering does not constitute a sale of electricity by an EPA to its members. ... Because no sale of electricity takes place from the member to the EPA, Section 77-3-5(b) is inapplicable.

The net metering framework contained in the initial draft rule was based on one-channel billing with a carryover of excess energy from month to month for an annualized period. This 1:1 offset effectively would have compensated the generating customer for self-consumption energy at the utility's retail volumetric rate. Any excess energy credits remaining at the end of the annualized period would then have been subject to compensation at the avoided cost rate."

The MSES recommends the PSC adoption of Synapse's recommendation of $0.17/kWh or, at a minimum, a true 1:1 retail net metering policy. MSES recommends adjusting the rate structure to reflect the true value of solar and renewables as the PSC laid out in its original Order Adopting Net Metering Rule and that net metering rate be made permanent. True 1:1 retail net metering is consistent with the imperative of public utility commissions and energy service providers to maintain reliable, cost-effective service to all customers while protecting the rights of customers to generate their own energy in a manner that provides both EU system and public benefits, including environmental protection and economic development. As clearly implied by the PSC Order above, Distributed Generation Customers (DGCs) are not commercial power suppliers, have invested substantial amounts of money to install DGFs to supply some of their energy usage, and are entitled to the benefits of the power they produce on, at the least, a true 1:1 retail net metering basis. To not provide that means that the DGCs will be subsidizing non-DGCs and the EUs.

The most important change that the PSC can make to the current hybrid net metering program would be to adopt true 1:1 retail net metering. This one thing has more potential to encourage customer interest, access, and adoption of renewable self-supply than tax credits and other incentives. Therefore, true 1:1 retail net metering is absolutely essential in order to remove the current disincentives to investing in DGFs and to increase customer access to renewable self-supply. The true 1:1 retail net metering must be permanent so that investors will be willing to make investments in Mississippi. If the net metering rate is established as the 1:1 retail rate and made permanent, there will be no need for future studies to determine actual benefits which are expected to change over time. This will simplify the net metering program and provide for certainty in future investments by the private sector in all aspects of renewable energy projects, new companies, engineering firms, jobs, education and training programs, and manufacturing, distribution, and retail. Actual benefits of DGFs are anticipated to continue to exceed retail rates and thus future benefits analysis would be anticipated to continue to be an adder to the retail rate.

DGFs should be designed to achieve the average annual power usage of the customer, and any excess energy carryover from month to month, year to year, until close out of a customer. At the close out point, the DGC should be paid at the utility's retail rate. DGCs should continue to be treated and billed just like non-DGCs in a non-discriminatory manner. The PSC must require full transparency and justification from EUs for any EU fixed charges and rate structures to avoid unjustified high fixed charges and other cost-shifting rate aspects.

As implied from above, the Legislature has charged the PSC with representing the public's interests in providing reliable, sustainable, economical, cost-effective electric power from EUs. DGFs will play an important role in the electric energy resource mix of the future. The PSC thus has a responsibility to educate the public. MSES recommends the PSC establish outreach programs to the public: schools, real estate developers, home builders, electrical engineering firms, DGF designers and installers, legislators, and the general public for education regarding DGFs for meeting energy goals and energy efficiency needs. Such educational programs will increase customer access to renewable self-supply. The PSC should also require EUs to address goals, education, programs, and support for DGFs in their Integrated Resource Plans (IRPs). DGFs should be prioritized in IRPs to achieve future electric power growth needs for Mississippi.

Many other public interest groups and state agencies have expressed support for true 1:1 net metering. The Solar Energy Industries Association (SEIA) recommends[1]:

- Customers have a right to reduce their consumption of grid-supplied electricity with energy efficiency, demand response, storage, or clean distributed generation. Thus, a customer should always receive the full retail price value for behind the meter choices that reduce grid-supplied energy consumption, whether installing energy efficiency measures, or consuming on-site generation.
- Solar rate design and compensation mechanisms should support customer economics to invest in solar that are sustainable, consistent with the full stream of values provided by the system, and fair to all stakeholders.
- Net energy metering is a proven mechanism for driving solar deployment, liked and understood by customers, and is preferred in most circumstances.
- Most studies have shown that the benefits of distributed solar generation equal or exceed costs to the utility or other customers where penetration is low. Assertions that current or future solar customers have shifted or will shift costs to others, and/or create new costs, must be demonstrated with valid, transparent data that reflects the values, avoided utility costs, and results of deploying solar at the distribution level, as well as the utility cost of providing service.

Study after study have shown that the value of renewable energy produced by DGCs is higher than the typical utility rate[2]. DGCs are actually subsidizing non-DGCs[3]. DGCs are not commercial power producers and should be treated as utility power producers. DGCs are typically designed to provide the annual power usage of the customer or less. The value of renewable energy produced by DGSs offsets utility distribution costs also. Numerous independent studies refute the claim that DGCs do not pay for grid costs and instead show that solar energy produced by DGCs reduces the cost of grid maintenance and operations for non-solar customers among other benefits. Examples of such studies regarding the value of solar produced energy are presented in the articles referenced above.

When you do the math correctly, the data shows that the benefits provided by local rooftop solar equal, or exceed, the costs to the utility or to other customers.

- California, Maine and Nevada have all conducted solar cost-benefit studies that show that "non-participants" actually benefit from net metering of solar customers.
- The benefits are even greater when one considers the quantifiable societal benefits of net metered distributed generation (DG), including the enhanced reliability and resiliency of the electric system, land use benefits, air quality benefits and local economic benefits.

Many states have commissioned specific cost-benefit studies on the value of solar and renewable energy. This page includes links to various studies across the country.

Solar Meta-studies

- Distributed Generation: Cost Analyses
- Solar Fact sheet - The Climate Reality Project
- Assessing the Value of Distributed Solar - Yale Center For Business and Environment
- Transitioning to Renewables: A cost-benefit Analysis of Solar Energy
- Distributed Generation Valuation and Compensation - U.S. Department of Energy
- Rooftop Solar: Net Metering is a Net Benefit - Brookings - 2016
- Shining Rewards: The Value of Rooftop Solar Power for Consumers and Society - Environment America & Frontier Group - 2016

State Solar Cost-Benefit Analyses

Arizona

- The Benefits and Costs of Solar Distributed Generation for Arizona Public Service - 2016
- The Benefits and Costs of Distributed Generation for Arizona Public Service - 2013
- 2013 Updated Solar PV Value Report - 2013
- Distributed Renewable Energy Operating Impacts and Valuation Study - 2009

Arkansas

- The Benefits and Costs of Net Metering Solar Distributed Generation on the System of Energy in Arkansas - 2017

California

- Benefit Cost Analysis of Solar Power over On-Grid Electricity for Residential Systems - 2016
- California Net Energy Metering Ratepayer Impacts Evaluation - 2013
- Evaluating the Benefits and Costs of Net Energy Metering in California - 2013
- Technical Potential for Local Distributed Photovoltaics in California, Preliminary Assessment - 2012
- California Solar Initiative Cost-Effectiveness Evaluation - 2011
- Quantifying the Benefits of Solar Power for California - 2005
- The Impact of Rate Design and Net Metering on the Bill Savings from Distributed PV for Residential Customers in California - 2010

Colorado

- Costs and Benefits of Distributed Solar Generation on the Public Service Company of Colorado System - 2013

Florida

- An Assessment of Renewable Electric Generating Technologies for Florida - Florida - 2003

Georgia

- Testimony before the Georgia Public Service Commission re: Georgia Power Company's Application for its 2013 Integrated Resource Plan
- A Framework for Determining The Costs and Benefits of Renewable Resources in Georgia - 2017

Hawaii

- Evaluation of Hawaii's Renewable Energy Policy and Procurement - 2014

Iowa

- CPR PV Valuation Methodology for Iowa - 2016

Louisiana

- LPSC Net Metering Report - 2015

Massachussetts

- Value of Distributed Generation-Solar PV in MA - 2015
- Massachusetts Net Metering and Solar Task Force Final Report to the Legislature - 2015

Maine

- Maine Distributed Solar Valuation Study - 2015

Michigan

- Solar Energy in Michigan: The Economic Impact of Distributed Generation on Non-Solar Customers - 2017
- CPR PV Valuation Methodology for Michigan - 2016
- NREL White Paper: The Value of Grid-Connected Photovoltaics in Michigan - 2012

Mississippi

- Net Metering in Mississippi: Costs, Benefits, and Policy Considerations - 2014

North Carolina

- Let The Sun Shine: A Solar PV Case Study
- The Benefits and Costs of Solar Generation for Electric Ratepayers in North Carolina - 2013

Nevada

- The Impacts of Changes to Nevada's Net Metering Policy on the Financial Performance and Adoption of Distributed PV
- Nevada Net Energy Metering Impacts Evaluation - 2014

New Jersey & Pennsylvania

- The Value of Distributed Solar Electric Generation to New Jersey and Pennsylvania - 2012

New York

- New York Solar Study: An Analysis of the Benefits and Costs of Increasing Generation From Photovoltaic Devices in New York - 2012
- Energy and Capacity Valuation of Photovoltaic Power Generation in New York - 2008

South Carolina

- South Carolina Act 236 Cost Shift and Cost of Service Analysis - 2015

Texas

- 2014 Value of Solar Executive Summary - 2014
- The Value of Distributed Solar Electric Generation to San Antonio - 2013
- The Value of Distributed Photovoltaics to Austin Energy and the City of Austin - 2006

Utah

- Value of Solar in Utah - 2014

Vermont

- Evaluation of Net Metering in Vermont Conducted Pursuant to Act 99 of 2014 - 2014

Virginia

- Analyzing the Costs and Benefits of Distributed Solar Generation in Virginia - 2014

Wisconsin

- CPR PV Valuation Methodology for Wisconsin - 2016

Other Value of Solar and Related Studies

- Changes in the Economic Value of Variable Generation at High Penetration Levels: A Pilot Case Study of California - 2012
- Designing Austin Energy's Solar Tariff Using a Distributed PV Calculator - 2012
- LBNL Putting the Potential Rate Impacts of Distributed Solar into Context - 2017
- Minnesota "Value of Solar" Methodology - 2014
- Value of Distributed Generation - Solar PV in RI - 2015
- New York Public Service Commission - Order Establishing A Benefit Analysis Cost Framework

Utilities have argued the DGFs increase utility costs that should be directly attributed to DGFs. *"As the use of rooftop solar and other DG systems increases, so, too, does the two-way flow of power on the electric distribution system. To ensure the safe and reliable delivery of electricity, an electric utility's distribution system must be able to safely manage and control the flow of two-way power. At the same time, electric utilities face integration challenges associated with the fluctuating levels of power created by variable wind and solar DG systems. Electric utilities must invest in their distribution systems to avoid overloading circuits, causing voltage regulation or power quality problems, or jeopardizing the safety of the public or utility employees. However, if net-metered customers do not contribute to the fixed costs of maintaining the grid and keeping it operating reliably, a utility's remaining customers will face higher rates to pay for these costs."* – Edison Electric Institute.

However, these technical and cost considerations spread across all users, residential, commercial, industrial, etc. and costs have always been uniformly distributed across all users by the utilities. It is therefore arbitrary that DGF customers should be singled out for specific cost allocations and the PSC should reject these arguments as only an endeavor to obstruct and discourage investment in DGSs. All utility costs should be adjusted over time to reflect the utilities true costs as they change over time and again spread those costs uniformly across all customers. *"Analysis by Crossborder Energy has shown that, on average, less than half of a solar energy system's output goes into the grid, and any excess solar electricity serves nearby customers' loads. This means few solar customers offset all of their usage and most customers do not zero their utility bills. Rather, DGCs both use and pay for the grid. A solar customer pays 100% retail rates for all energy consumed from the utility. For example, recent data shows in Arizona, the average DG customer pays around $71/month for their electric bill. In Colorado, the average DG customer pays around $50/month for their electric bill."* – Solar Energy Industries Association.

The asserted impact of the "cost-shifting," if it exists, is far less than other cross subsidies typically found in utility rates, which charge the same rates to all residential customers, or to all similarly-sized commercial customers. Cost shifts, or "cross-subsidies," are inherent in rate design. Utilities and regulators that are truly concerned about such preferences should address all of these, rather than singling out DGCs.

Examples of such cost-shifting include:

- Multi-family subsidizes Single-family; an apartment building is served by a single transformer bank, and the utility never sees the individual demand of individual units – only the consolidated demands of the group. But a large apartment building, under high fixed

charge rate design, will pay much more than an otherwise identical-to-serve load (kw, kWh, hourly usage) at a hotel or office building served through a single meter.

- Customers served with (cheaper) overhead service subsidize customers served with (more expensive) underground service who actually receive more reliable service (storm outages)
- Urban customers subsidize suburban and rural customers; there are typically 500 customers per circuit-mile urban, 100 suburban, 10 rural.
- Customers with sporadic and generally off-peak demand usage who are served on demand charge rates (high-school stadium, large churches) subsidize customers with predominantly on-peak usage (office buildings) served on the same tariff.

The adoption of true 1:1 net metering may be the most rational measure for EUs to avoid paying DGCs the higher true value of renewable energy. Therefore, true 1:1 net metering may be the best compromise for simplicity to account for the true value of DG energy and the benefits provided by renewable energy sources to the utility, customer, community, and country.

MSES recommends the PSC follow the principles for Net Metering and Rate design as outlined by the Solar Energy Industries Association guidelines[1]:

> "This document provides a consensus view of solar advocates for regulators and stakeholders considering rate design and compensation for distributed solar generation, including potential alternatives to net energy metering. Traditional net energy metering (NEM) is fundamentally a bill credit that represents the full retail value of distributed electricity delivered to the distribution system and has been a critical policy for valuing and enabling distributed generation. As penetration of solar and other distributed energy resources increases, states and utilities have begun to examine, and in some cases implement, alternative rate and compensation mechanisms.
>
> The principles below are intended to be consistent with the imperative of public utility commissions and energy service providers to maintain reliable, cost-effective service to all customers while protecting the rights of customers to generate their own energy in a manner that provides both system and public benefits, including environmental protection and economic development.
>
> They provide high level criteria for the conditions under which states may wish to consider alternatives to NEM, and high level principles for what distributed solar compensation mechanisms should look like where alternatives to NEM are appropriately considered.
>
> Specifically, the SEIA has organized these recommendations into four sections:
>
> - Basic principles, foundational to considerations for considering rate design and compensation for distributed solar generation.
> - Criteria and Conditions for the Consideration of Alternatives to Net Energy Metering
> - Guiding Principles for Solar Rate Design, and
> - Guiding principles for Alternative Compensation

Basic Principles[1]

- Customers have a right to reduce their consumption of grid-supplied electricity with energy efficiency, demand response, storage, or clean distributed generation. Thus, a customer should always receive the full retail price value for behind the meter choices that reduce grid-supplied energy consumption, whether installing energy efficiency measures, or consuming on-site generation.
- Solar rate design and compensation mechanisms should support customer economics to invest in solar that are sustainable, consistent with the full stream of values provided by the system, and fair to all stakeholders.
- Net energy metering is a proven mechanism for driving solar deployment, liked and understood by customers, and is preferred in most circumstances.
- Most studies have shown that the benefits of distributed solar generation equal or exceed costs to the utility or other customers where penetration is low. Assertions that current or future solar customers have shifted or will shift costs to others, and/or create new costs, must be demonstrated with valid, transparent data that reflects the values, avoided utility costs, and results of deploying solar at the distribution level, as well as the utility cost of providing service.
    - A cost of service study that fails to consider the benefits of distributed solar generation (DSG) cannot establish a cost-shift.
    - Regulators should require an independent cost-benefit analysis before considering substantial rate design or compensation changes based on cost-shift assertions.
    - The benefits of existing distributed solar should be recognized when considering any asserted cost shift.
    - The time frame for review of costs and benefits must be on par with the life of the particular type of Distributed Energy Resources (DER) assets, e.g. 20-30 years, and be forward looking, not a snapshot of one year of sunk costs as is typical in a general rate case (GRC).
    - Regulators should seek to ensure in GRC, Integrated Resource Plans (IRP) and other relevant proceedings that future avoided costs found in cost/benefit studies related to DSG and other DER are *actually* avoided (e.g. the canceled PG&E transmission projects saving $200 million and the Brooklyn-Queens Demand Management project avoiding costly upgrades).
    - Since some level of quantifiable cross-subsidization is inherent in all rate design, particularly for large diverse classes, an independent finding of a *material* cost shift should be required before regulators authorize substantial changes to rates or rate design.
- Net metering can be accomplished through simple energy netting, or in combination with monetary compensation depending on the rate design:
    - For non-time differentiated residential and small commercial rates, i.e. rates based on energy consumed at any time, energy netting on a kWh basis over the billing period is good policy particularly at low to moderate penetration levels, and pending demonstration of a material impact.

    - For time-differentiated rates, monetary compensation is an accepted feature of some current NEM structures and may be necessary to preserve the full value of excess energy.
- Opportunities for retail customers and third party DSG and other DER developers to provide additional services (e.g. voltage & frequency regulation, VAR support) should be encouraged, especially in States moving towards a service oriented utility/regulatory model, though access to markets, and appropriate compensation mechanisms.
- Consideration of creating separate rate classes for customers that choose to utilize DER technologies must be based upon a factual demonstration of significantly different load and cost characteristics using publicly available actual data, and should generally be discouraged as potentially discriminatory.

Criteria and Conditions for the Consideration of Alternatives to Net Energy Metering

- Penetration level should be the leading threshold criteria for consideration of alternatives to NEM.
- Customers who installed solar under net metering should be grandfathered for a reasonable period of time. Customers have a reasonable expectation that rate structures (as opposed to rates themselves) will not change dramatically. Gradualism is an important rate design principle, and a gradual phase-in to any new compensation methodology should be provided at the end of the grandfathering period.
- Process: Early, i.e. pre-litigation, data collection and analysis under the guidance of the State Commission can provide opportunities for collaboration toward the development of a factual basis for future changes to rate designs, compensation, and other mechanisms.
- Simplicity, Gradualism, and Predictability: The simplicity of the NEM compensation mechanism facilitates customer adoption of distributed solar. Any future design should consider customer needs for simplicity and any changes should be applied gradually and predictably.
- Shadow billing and voluntary pilot programs to analyze opportunities to increase the benefits that net metered systems provide to the grid, and to assess the actual impacts of proposed changes (for example, time-of-use (TOU) pilot programs) should be considered before making substantial mandatory changes to compensation or rate design.
- Hold harmless policies should be in place for low-to-moderate income (LMI) customers.
- NEM imports & exports are generally netted monthly in most states, and trued up annually. More granular netting generally reduces solar customer economics, but may be worthy of consideration when penetration levels increase, or in conjunction with deployment of other DERs such as storage.

Guiding Principles for Solar Rate Design

- Rate design should seek to send clear price signals to customers that encourage sustainable, cost-effective investments in solar and complementary technologies.

- Rate designs should not create barriers to the deployment of distributed solar generation or DER technologies other than solar.
- Rate designs that provide greater incentives for DER technology deployment (e.g. more steeply inverted block rates) can be considered to encourage early adoption of efficiency, distributed generation and storage technologies.
- Rate designs that emphasize temporal cost-causation (time-varying, critical peak pricing and critical peak rebates) are generally consistent with solar deployment, and may be quite beneficial to customer and system alike when solar is integrated with DERs like storage or demand response.
- Rate designs that emphasize higher fixed (e.g. customer, service and facility or basic service) charges than necessary for recovery of strictly customer-related costs like service drop, billing, and metering, or quasi-fixed (e.g. mandatory residential demand) charges do not reflect cost causation, disproportionately impact low and moderate income customers, and should be discouraged.
- Regulatory review of rate design alternatives should consider impacts on low-income customers; e.g. utility fixed or quasi-fixed charge proposals usually put solar and efficiency technologies further out of reach of LMI customers.
- Any consideration of standby, backup or other supplemental charges for solar customers must (1) be consistent with PURPA requirements, (2) be based upon a customer's ability to control self-generation similar to a conventional fossil resource (e.g. diesel or natural gas), and (3) reflect the probability of customer generation unavailability in the development of any rates.

Guiding principles for Alternative Compensation

A fair value of solar (or "stacked benefit") compensation rate can be considered for distributed solar generation exports, at higher penetration levels. Such value should be determined taking into account both short term and long term (life of system) benefits of distributed solar generation.

Buy all/Sell all (BA/SA or "VOST") compensation approaches should be at the option of the retail customer, i.e. VOST should not be the only customer option. Critical considerations impacting system economics and the ability to finance include the frequency and effect of future changes to the value proposition. In addition, consideration must be given to the effect on customers of the lack of energy hedging (customer-generated solar energy does not offset the customer's utility-supplied energy).

Alternative Compensation methods should take into account the efficacy of integrating solar with other forms of DER (e.g. storage) in the grid of the future, assuring that barriers to new technologies are not created.

Solar specific surcharges such as installed capacity fees are discriminatory, generally unsupported by facts, and impede distributed solar generation system economics.

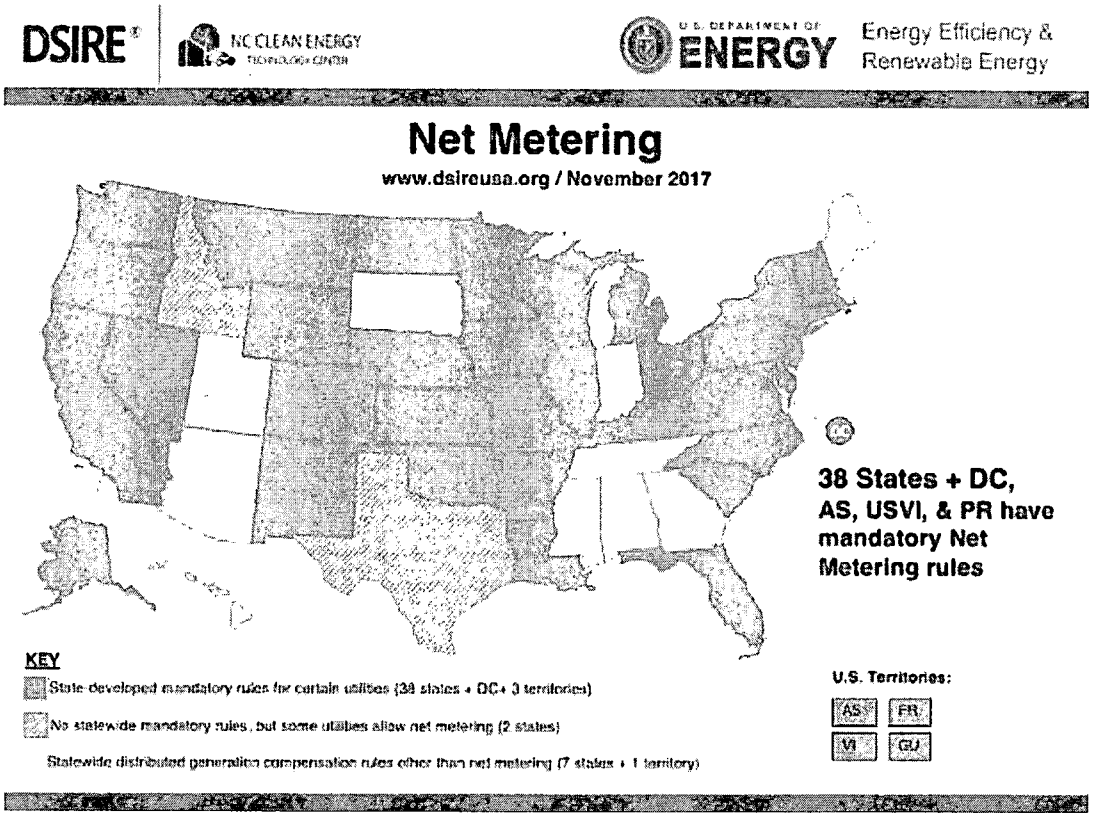
[1] The Criteria and Principles herein do not distinguish between regulated and restructured states. However, rate designs, cost allocation methods, avoided costs and cost/benefit analyses must recognize whether the utility is distribution-only or vertically integrated."

True Net Metering is available in the Majority of States and Cities

Net metering is undoubtedly one of the most successful solar incentives in the United States. However, states are at varying levels of energy sophistication, and while many states have passed net metering policies, support and availability vary widely from state to state.

31 states out of 50 states in the U.S. have adopted or have previously adopted true net metering at retail rates as shown in the table below. This demonstrates that the majority of states have in essence disagreed with the arguments of cost shifting as postulated by the Institute for Electric Innovation, and have recognized the value of renewable energy behind the meter for customers. Anything less is therefore a political decision adopted at the pressure of the utilities to try to discourage the adoption of solar energy systems behind the meter by residential, commercial, and industrial customers.

Net metering is technically mandated in 38 states, and Washington D.C. In addition, major utility companies in Idaho and Texas offer net metering to their solar customers without being mandated to do so.



The following table shows what states offer the various types of net metering and which have alternative programs as of June 2020:

State	Full-retail net metering	Avoided cost net metering	Alternative program
Alabama	No	No	No
Alaska	Yes	No	No
Arizona	No	No	Yes
Arkansas	Yes	No	No
California	Yes	No	No
Colorado	Yes	No	No
Connecticut	Yes	No	No
Delaware	Yes	No	No
Florida	Yes	No	No
Georgia	No	Yes	No
Hawaii	No	No	Yes
Idaho	Yes*	No	No
Illinois	Yes	No	No
Indiana	Yes	No	No
Iowa	Yes	No	No
Kansas	Yes	No	No
Kentucky	No	No	Yes
Louisiana	No	No	Yes
Maine	Yes	No	No
Maryland	Yes	No	No
Massachusetts	Yes	No	No
Michigan	No	No	Yes
Minnesota	Yes	No	No
Mississippi	No	Yes	No
Missouri	No	Yes	No
Montana	Yes	No	No
Nebraska	No	Yes	No
Nevada	No	No	Yes
New Hampshire	Yes	No	No
New Jersey	Yes	No	No
New Mexico	Yes	No	No
New York	Yes	No	No
North Carolina	Yes	No	No
North Dakota	No	Yes	No
Ohio	Yes	No	No

State	Full-retail net metering	Avoided cost net metering	Alternative program
Oklahoma	No	No	Yes
Oregon	Yes	No	No
Pennsylvania	Yes	No	No
Rhode Island	No	Yes	No
South Carolina	No	No	Yes
South Dakota	No	No	No
Tennessee	No	No	No
Texas	Yes*	No	No
Utah	Yes	No	No
Vermont	Yes	No	No
Virginia	Yes	No	No
Washington	Yes	No	No
Wisconsin	No	No	Yes
West Virginia	Yes	No	No
Wyoming	No	No	Yes

**Major investor-owned utilities in these states offer full retail net metering even though there is no state mandate requiring them to do so.*

Reasons that True Net Metering is appropriate:

- PURPA clearly mandates true net metering. Energy Policy Act of 2005, Section 1251, Paragraph (11): NET METERING.-Each electric utility shall make available upon request net metering service to any electric customer that the electric utility serves. For purposes of this paragraph, the term "net metering service" means service to an electric consumer under which electric energy generated by that electric consumer from an eligible on-site generating facility and delivered to the local distribution facilities may be used to OFFSET electric energy provided by the electric utility to the electric consumer during the applicable billing period. The term offset clearly defines and specifies that the electric power generated by the consumer is to be accounted for in a one to one ratio related to the retail price of electric power provided by the electric utility, or True Net Metering in other words. The term that each electric utility "SHALL" make available net metering means that electric utilities must, have to, and are required to provide True Net Metering to electric consumers that generate electric from on-site generating facilities.
- There is no "subsidizing" of net metered systems by the general customers of the utility. If a net metered customer sends excess power to the utility grid, the utility sells that power to customers on the grid at retail rates including service charges and distribution system costs. If the net metered customer is not paid the retail rate, then the net metered customer is subsiding the utility and non-metered customers.
- Residential, Commercial, and Industrial facilities that use Solar PV behind the meter are not commercial power producers and should not be treated as such.

- Facilities that utilize Solar PV behind the meter have privately capitalized the investment assets by the facility.
- Residential, Commercial, and Industrial facilities that utilize Solar PV behind the meter is similar to facilities that invest in assets to reduce electricity usage by conserving energy and utilizing energy efficiently, such as investing in and installing more efficient lighting, heating equipment, insulation, etc., should not be penalized for conserving electricity. Customers should not be charged for reducing the amount of electricity that they use.
- There is no "cost-shifting" by Solar PV customers of costs by non-solar customers to solar customers. In fact, any metering program that is not true net metering is a "cost-shifting" by the Solar PV customers to the non-solar customers.
- Singling our Solar PV as not paying for transmission or distribution costs as cost-shifting is illogical, incorrect, and improper. There are no allocations of distribution costs to any groups of customers. If there were a concern for distribution cost allocation, charges should then be established based on distance and other distribution costs for customers further from the source of power. All distribution costs are combined and uniformly spread across all users. The Solar PV customer pays for the distribution system just as all other customers.
- If utilities are concerned about cost-shifting, they should propose eliminating block rates for power usage that favor the large power users and are regressive on low-income power users. Block rates should be reversed to benefit the low-income power users or eliminated entirely if cost shifting is a concern.
- Electrons (watts) pumped into the utility grid by Solar PV customers as sold by the utility to the customers just down the street for which the power utility charges retail rate, offsetting power the utility needs to generate. Therefore, paying a Solar PV Customer less than the retail rate is a subsidy to the utility.
- Power provided by Solar PV Customers is a benefit to the utility as it helps to stabilize the power grid, frequency and voltage, and offsets power needed to be generated or purchased by the utility and often occurs during peak power timeframe.
- Power provided by Solar PV Customers is a benefit to the utility as it helps to offset fossil fuel power generation reducing air pollution of particulate matter, smog, smoke, excessive carbon dioxide, nitrogen oxides, sulfur oxides, mercury, lead, arsenic, and other toxic metals, odors and irritating chemicals, thus providing environmental and health benefits.
- Power provided by Solar PV Customers is a benefit to society in providing less expensive power and diversity of power generating sources, energy efficiency, energy conservation, home-grown energy, reduction of resource usage, less dependence on foreign sources, increased jobs, businesses, industries, and increased economic growth.
- The value of Solar Energy is greater than for fossil fuels; thus paying the avoided cost rate of wholesale power generated from fossil fuels subsidies fossil fuel generation and defeats achieving lowest cost energy resources and using renewable fuels to achieve climate change goals and environmental benefits.
- Energy Efficiency programs have been required to be paid for by all customers; why is solar energy singled out to be treated differently than spreading the cost for EE programs and distribution systems?
- Block power rates for high energy users is a cost shifting subsidy that far outweighs any considerations of "so-called" cost shifting for solar energy customers; eliminate block rate

subsidies to large power users. This also makes sure that capital resources are properly allocated in that the products that require high power requirements reflect the true costs to society and the environment and capitalism can then select the best product or approach through supply and demand.

- It may be rational to limit behind the meter solar energy to approximately the customer peak usage but oversizing slightly should be considered for expansion of PV systems to incorporate full future electrical usage for planned expansions for electric vehicles for example. This would also address the issue that behind the meter usage is not designed for the purpose of "providing power to the grid for sale" and thus such a customer is not to be treated as a power producer.
- Limitations of PV system size should also be related to the capacity of the distribution circuit on which the customer is located rather than on any arbitrary number of percentage of peak capacity.
- The electric utilities should not forget that they are entities established and enabled by the state to provide electrical power for the benefit of the public, and they serve the public interest, and have been given a monopoly over the service area by the state, and therefore should act in the public interest to incorporate net metered customers into the electric system.
- Net metering reduces strain on the grid. When a PV system sends excess energy into the grid through net metering, the exported energy is used to serve nearby customers' loads. Because your system is generating electricity near the point of consumption, there is less demand and strain on the grid's distribution and transmission infrastructure. It also minimizes energy loss that can happen through transmitting voltage over long distances from the power plant.
- Net metering provides substantial statewide economic benefits in terms of jobs, income and investment. Net metering increases demand for solar energy systems, which in turn creates jobs for the installers, electricians, and manufacturers who work in the solar supply chain. Today, the solar industry employs nearly 174,000 American workers in large part due to strong state net metering policies which have allowed the solar industry to thrive.
- Unfortunately, some utilities perceive net metering policies as lost revenue opportunities. In fact, net metering policies create a smoother demand curve for electricity and allow utilities to better manage their peak electricity loads. By encouraging generation near the point of consumption, net metering also reduces the strain on distribution systems and prevents losses in long-distance electricity transmission and distribution.

3. What, if any, modification to the Net Metering and Interconnection Rules would incentivize increase participation by both net metering customers and industry providers such as developers, designers, installers, and maintenance providers for distributed generation facilities?

A. Uniform, simple, straight-forward rules should be promulgated by the PSC for local Agencies Having Authority (AHJs) (i.e., county and city building and permit departments) for the review and approval of DG systems that all agencies across the state must follow would incentivize increased participation. AHJs trying to develop their own individual approval requirements is a significant inhibitor and discouragement adding wasted time and efforts, confusion, complexity, duplication, and unnecessary requirements. Most AHJs do not have the knowledge, capability,

resources, or time to develop their own approval rules. However, they could be allowed to have adders to the statewide rule if appropriate. Such uniformity would result in lower costs, more efficiency, and quicker delivery DGFs.

Uniform, simple, straight-forward rules should be promulgated by the PSC for utility reviews and final approval and commissioning of DGSs that all EUs, coops, and TVA must follow would help incentivize increased participation in DGFs. Each utility developing their own individual requirements is a significant inhibitor and discouragement adding wasted time and efforts, confusion, complexity, duplication, and unnecessary requirements. Such uniformity would result in lower costs, more efficiency, and quicker delivery DGFs.

The Solar Energy Industries Association has noted these problems with permitting and potential solutions[4]. The high cost of losing customers who are frustrated with long government or utility approval times. A one-week delay due to permitting, inspection, and interconnection processes results in a 5-10% client cancellation rate, driving up costs for other customers. The key to addressing these costs SEIA notes is to make solar installation straight-forward and routine while maintaining the safety and reliability of systems. Specifically, SEIA recommends:

- standardized online permitting and interconnection tools; and
- local implementation of instantaneous permitting for eligible installers on qualifying (i.e., non-complex) solar projects.

SEIA notes that NREL is developing a solar project software application, SolarAPP. Solar Automated Permit Processing (SolarAPP) seeks a fundamental reshaping of solar permitting at the federal, state, and local levels. Key elements of the proposed reformed process include:

- Developing a simple, standardized, online platform – to be provided to local governments at no cost to them – for installers to easily "register" qualifying systems with local government authorities; client cancellation rate, driving up costs for other customers.
- Establishing equipment standards and/or certified equipment lists for solar and storage projects installed through the proposed process.
- Creating – or refining existing – system design standards for qualifying solar projects.

Online and instant permitting not only saves dollars, it is common practice for many localities in the US. SEIA works with an AHJs whether or not they are already online. SEIA has built on examples from Nevada, Florida, California, South Carolina, Texas, New York and more. Several jurisdictions across these states provide instant permits after installers enter full design and component details. The SEIA system goes one step further by providing an inspection checklist to hold installers accountable to their approved application. When rooftop solar installation hurdles are simplified effectively, customers are happier and adoption rates go up. In turn, local governments benefit from greater resilience, flexibility, and localized economic development.

MSES recommends the PSC to adopt requirements for all utilities, cooperative energy suppliers, and local cooperative energy suppliers in the TVA area to have true 1:1 retail net metering. MSES recommends the PSC develop and establish standardized interconnection requests,

applications, fees, forms, and agreements for EUs to use as a minimum. MSES recommends the PSC develop and establish standardized commissioning requirements and tests, and certification of completion requirements and forms for EUs to use as a minimum. MSES also recommends the PSC to require EUs to prepare, publish, and provide their interconnection requirements, tests, and forms. MSES recommends the PSC utilize and build on the improved permitting programs being developed by NREL, SEIA, and other states. MSES recommends the PSC require EUs to utilize IREC's Model Interconnection Rules.[5]

4. What, if any, modifications to the Net Metering and Interconnection Rules should the Commission consider to increase low-income access to, and participation in, net metering?

A. The PSC should require utilities to adopt block rates favorable to low-income customers in conjunction with the true 1:1 net metering rule. Lower income customers typically use less energy than the average customer. Therefore, a lower block rate for less energy use would increase low-income customers better access to and participation in net metering. For example, a Florida utility provides a low rate for electricity usage less than 500 kWh/month, a slightly higher rate for 500 to 1000 kWh/m, and a higher rate for greater than 1000 kWh/m.

As alternative to the progressive block rate approach, the PSC could provide for a low-income customer rider to provide a higher net metering rate to low-income customers. However, the progressive block program is considered superior to the rate added in that utilities are not required to determine and document who is a low-income customer. To be eligible, a low-income DGC may be defined by the federal standard as having a household income that is 80% or below the area median income, or a specific percentage determined for Mississippi.

MSES recommends the PSC should require utilities to establish true virtual net energy metering (VNEM) for community solar projects. Cities and Counties are limited in being able to provide DGS benefits to their governmental buildings and parking lots as a result of the lack of virtual net energy metering capability.

MSES also recommends the PSC require EUs to establish shared renewable energy programs (Virtual Net Energy Meters - VNEMs) that would benefit low-income customers, renters, condominiums, multi-tenant, multi-metered properties, subdivisions, etc. through on-site DEFs and off-site DEFs. Examples of such programs are contained in the Interstate Renewable Energy Council's (IREC) web sites and that the state of Colorado has adopted.

MSES recommends the PSC require utilities to decouple utility-owed solar and wind farms from being lumped into the rest of the utility accounting and create a separate virtual community solar program that actually delivers savings attributable to the utility-owned solar and wind farms to low-end customers, rental complexes, commercial, and municipal and county agencies, etc. Entergy MS' community solar program actually costs customers more than the non-solar customer bills thus inhibiting investment in the program by low-income or any customers.

MSES recommends the PSC require EUs to create a program in which the utility provides DGFs to low-income customers and others through the development of an in-house utility DGF sales and installation force or through contracts with private installers. The EU could also rent the roof of customers. Such a program would expand utility response to customer demands and provide utility financial and environmental benefits of future growth, demand management, expanded services, power security, rapid response to grid outages, grid voltage stabilization, new sources of revenue, and benefit both the EU and low-income customer.

MSES recommends the PSC authorize private third-party owners of DGFs to install and own DEFs and sell renewable energy to low-income privately owned DGCs under Power Purchase Agreements (PPAs) or Leases and to offer low-interest zero down payment loans to low-income DECs.

MSES recommends the PSC require the EUs to create financing programs for low-income customers to install DGSs if they desire that then can be offset (paid for) in the customer's monthly bill. For example, Solar Massachusetts Renewable Target (SMART) program, Community Shared Solar enables customers to lower their bills through local projects without having to install solar panels on their property. The utility's proposed Solar Access Initiative aims to expand access by eliminating the need for customer credit checks through a new Solar Simplified Billing program. The utility also said it would launch a Solar Enrollment Program, designed to offer low-income customers a month-to-month subscription, no sign-up or cancellation fees, and an electricity bill discount of around $240 per year.[6]

5. What, if any, modifications to the Net Metering and Interconnection Rules should the Commission consider to better enable commercial and industrial enterprises to self-supply?

A. MSES recommends the PSC promulgate true 1:1 retail net metering to include commercial and industrial enterprises as well as third-party ownership through Power Purchase Agreements (PPAs) and Lease Agreements. In addition, the PSC should require EUs to establish reduced block rates for commercial and industrial DGFs or benefit riders to reflect the value of solar and the benefits it provides to the EU as well as the customer and the environment. EUs should address this in their Integrated Resource Plans (IRPs). VNEM would also be an incentive.

6. What, if any, modifications should be made to the annual reporting requirements of the current Net Metering Rule?

A. Requirements 1, 2, and 3 of the annual reporting contained in the PSC Rules may be removed after the adoption by the PSC of true 1:1 retail net metering which will simplify data collection and reporting requirements for the EUs. MSES recommends the PSC add a new requirement for the EU to report the annual net amount of energy either consumed or credited at retail rate at the close of a customer account for each DGC.

7. Should the Commission modify or remove the existing cap(s) on total installed net metering capacity?

A. All caps should be removed from the net metering program. Despite solar's spectacular growth over the last decade, it still makes up only 1.4% of the nation's total electricity mix. By 2020 solar is expected to represent close to 4% of total electricity generated. The studies done by the U.S. Department of Energy make very clear that our national grid is more than capable of accommodating much higher levels of solar, even with today's technologies. Massachusetts does not have a cap at all on residential DGSs, for example.

The penetration of DGFs is so small in Mississippi now that a 3% cap will not be achieved for years. Caps have historically been set at a variety of amounts and increased over time in many cases by EUs. Caps have been requested by EUs on the supposition that at some point of DGF penetration too much revenue and profits loss will occur. However, the cap amounts appear to have been arbitrary set as a basis to limit EU revenue loss. Caps benefit the utility to be able to artificially and unnecessarily limit and discourage the installation of DGFs. They simply constitute a barrier and discouragement to customers who may want a DGF. They in fact mean that no net metering will be available to the affected DGCs and thus forcing the DGCs to subsidize the EU and non-DGF neighbors. This discourages access to and investment in DGFs. EUs already will review the impact of individual DGFs on the distribution grid system due to installation request of a DGF. This review is the more appropriate "cap". If DGFs are designed to essentially produce on annual average the amount of energy that the customer will use, then in all likelihood, the grid system is already sized to handle the power loads. The capacity of the local EU distribution facilities to accommodate the proposed DGF will already be reviewed in each application process.

MSES recommends the PSC remove caps from the Net Metering Rule and not establish any caps at this time. The PSC could review the issue of a need for a cap at its next 5-year interval review. Ultimately in the long run, it should clearly be established that all DGFs will receive retail net metering as a right, permanently, and EUs must adjust their rate making accordingly in the future and as appropriate. DGFs should be taken advantage of by EUs to the full extent as a goal. Rooftop DGFs should be taken advantage of to the extent possible in order to minimize usage of land resources both by EUs and private DGFs.

8. Should the Commission modify the timing or manner in which net metering customers are credited or compensated for excess energy exported to the grid?

A. Yes, MSES recommends the Commission should modify the timing or manner in which net metering customers are credited or compensated for excess energy exported to the grid. The adoption of true 1:1 net metering may easily be implemented with existing meters to provide carryover credit for excess energy distributed to the grid, if any, on a month-to-month basis, and and on a year-to-year basis until the customer closes the account. Any excess "net" energy at

the close out could be paid for at the utilities' retail rate. This will simplify the timing and manner of DGC compensation and make it more efficient and less costly.

9. What measures or mechanisms could most equitably reduce the up-front cost burdens faced by customers interested in self-supply through net metering?

A. MSES recommends the PSC require EUs to accept third-party contracts, PPAs, leases, low-interest loans, and loans with no upfront costs for DGCs.

10. What role, if any, should the Mississippi Public Utilities Staff serve in reviewing facilities studies for Level 2 and /or 3 interconnections?

A. The MSES recommends the PSC add a Section 102 under Chapter 10 to state the PSC will review Level 2 and 3 interconnections if requested by DGFs for any reason or for complaints for fairness, accuracy, and correctness. The PSC should also state that it may request and review any Level 1, 2, or 3 Interconnection.

11. In light of the Commission's recent approval of advanced metering infrastructure (AMI) for Entergy and Mississippi Power Company, are bi-directional meters still needed for effective net metering?

A. The adoption by the PSC of true 1:1 retail net metering would simplify the utility meter requirements. No new meters would actually be needed. This would simplify EU needs to implement new meters over time if they wish to track actual production from DGFs. This would lower costs to the DGCs and speed up approvals and installation of DGFs.

12. To the extent a commenter proposes a new or different compensation scheme, please explain how that proposal would directly affect a Mississippi customer's ability to self-supply. Answers to the question should include any relevant studies, surveys, financial modeling or other specific data-driven evidence supporting the position.

A. The world is going renewable energy. If Mississippi wants to keep up with the rest of the nation, be competitive, grow its economy, attract new businesses and industry, stop the brain drain and increase brain influx, it needs to adopt policies, enact legislation, and take actions to encourage the adoption and implementation of renewable energy across a broad spectrum of applications in the state. The MPSC has an extremely important role in representing utility customer demand for energy choice and adoption of policies to encourage DGFs and requirements to include DGFs appropriately in utility IRPs.

A new Princeton University study[7], Net-Zero America[8], indicates *"that if utilities and regulators help people put solar panels on their roofs and batteries in their garages wherever it made economic sense, Americans would spend $301 billion less on energy compared to business as usual. A comprehensive state-wide solar plan must include distributed solar on houses, buildings, parking lots, and small solar farm systems integrated into the utility grid, in addition to utility and commercial solar farms. Solar farms, although more cost effective from the utility's standpoint, is very land intensive. Therefore, land use balance is needed to avoid excessive land use for solar when urban and city areas with roof top solar can be integrated into the utility grid benefiting customer desires, utility needs and efficiency."*

"*The United States can set a course to net-zero carbon by midcentury if it can radically overhaul its energy generation, transport, building and industrial sectors over the next decade*", according to a major study from Princeton University. "*And while the pathways to reach this goal entail large-scale shifts to renewable energy, electric vehicles and electric heating, or to alternative fuels and carbon-capture technologies, the costs of doing so are only slightly higher than projected "business-as-usual" investments in energy infrastructure and could yield major value in economic growth and human health*." The report comes as President-elect Joe Biden is pressing for a major shift in federal energy and climate policy, including a $2 trillion clean energy and infrastructure spending plan. The Princeton study highlights the need for this kind of massive policy shift.

Its comprehensive modeling of the country's future energy pathways for decarbonization indicates that $2.5 trillion in additional investments will be needed over the next decade, on top of an estimated $9.4 trillion the country would be expected to invest in energy over the next decade under a "business-as-usual" pathway. But that massive investment would only equate to roughly $300 billion in additional energy costs over that time, or about a 3 percent increase compared to a pathway that failed to take on "concerted decarbonization efforts."

"*Net-zero pathways require spending a similar fraction of GDP that we spend on energy today, but we have to immediately shift investments toward new clean infrastructure instead of existing systems*," said Jesse Jenkins, a Princeton engineering professor at the Andlinger Center for Energy and the Environment and one of the lead authors of the study.

At the same time, the investments the study envisions could add half a million to 1 million new jobs over the next decade compared to its business-as-usual reference case. These investments could also reduce air pollution to levels that could prevent between 200,000 and 300,000 premature deaths over the next 30 years, avoiding $2 trillion to $3 trillion in economic losses.

"*Since getting to net-zero looks affordable*," Jenkins said, "*the next key question is, if we are going to do this, how do we want to do it?*"

Another study of how our future should look is presented in the study "Why Local Solar For All Costs Less - The Roadmap to the Lowest Cost Grid" prepared by Vibrant Clean Energy, LLC.[9]

"*Transitioning to a clean electric grid could actually cost less money and save us billions of dollars, create jobs, and result in a cleaner, more reliable grid across the United States[10]. We found that when you use better planning models and scale both local solar and storage, as well*

as utility-scale solar and wind, you maximize cost savings and unlock the path to the lowest cost grid. In fact, it could generate nearly half a trillion dollars in savings to ratepayers over the next 30 years.

We wanted to know what the grid would look like, and cost, if we stopped ignoring the benefits of DERs and optimized the integration of these resources through a better modeling process aimed at a true least-cost development plan for the entire grid. So we engaged Dr. Christopher Clack of Vibrant Clean Energy to apply his advanced and big-data friendly WIS:dom(R) model to the task. What we found surprised even us.

We had the model compare multiple scenarios: 1.) a "dumbed down" scenario that mimics traditional models by only considering and weighing cost impacts from a central transmission-level grid perspective; 2.) a scenario that integrated and optimized for distributed solar and storage assets located closer to the customers; and 3.) a scenario that sets a clean electricity target of 95% reduction in carbon emissions in each state by 2050 from 1990.

Not surprisingly, the model built a lot of solar, wind, and storage—over 1,000 GW (a terawatt) of solar and over 800 GW of wind by 2050. What surprised us was how and where it built these resources and why that accounted for hundreds of billions of dollars in potential savings.

The model found that by scaling local solar and storage at the distribution level and closer to customer load, we don't have to over-rely on the most expensive parts of the transmission system and under-utilize the distribution system as many traditional planners assume. The daily peaks that the system must ramp up and down to serve can be permanently and more cost-effectively managed by local solar assets, storage injections, and off-peak charging. These DERs cost-effectively reshape the load as seen by the large-scale grid, reducing bulk power system costs and smoothing volatility and variation in load across the system. This allows for a more efficient overall allocation of investments, and a more flexible and local electricity system through the addition of 247 GW of distributed solar and 160 GW of distributed storage by 2050.

Just by integrating and optimizing distributed solar and storage, we found potential for over $300 billion in grid savings. When we asked the model to also meet a 2050 clean electricity target, we found $473 billion in grid savings versus a clean electricity grid that doesn't scale distributed solar and storage. And finally, and most notably considering current discussions around President-elect Biden's clean electricity plans, the model found that a clean electricity grid that scales local solar and storage is $88 billion less expensive than maintaining the status quo. These savings are driven by reduced grid costs alone and do not include the massive societal benefits that also come with more local solar and storage.

On top of saving the grid lots of money, deploying more community and rooftop solar and storage will result in massive economic benefits, including jobs, and additional social and environmental indirect benefits. While this analysis didn't account for these indirect benefits in resource selection, the model did calculate that a clean electricity grid that scales local solar and storage would result in over two million jobs by 2050.

But you may ask: if we're seeing per unit costs for utility-scale solar and wind at less than five cents per kilowatt-hour, why not just build more of that and avoid the higher per-unit costs of

local solar and storage? Embedded within the results of this analysis, we found that the lowest cost bulk renewables are optimized when local solar and storage are optimized as well. Analyzing resources on their per unit cost alone is misguided and misleading, and when you run a better analysis that chooses resources based on their net cost to the entire system, you achieve the lowest cost system with a portfolio of resources with varying per unit costs. The sub five cent wind alone still requires the ramping of gas combustion turbines and additional transmission, and the local solar alone still requires capacity support from the bulk power system. But together, they can deploy the maximum efficient amount of bulk power and local power to deliver the lowest cost system for all.

Policymakers should apply the outputs of this advanced modeling to all energy policy decisions today. They should demand better planning and analysis that focuses on the most tangible solutions right away and let the data-driven results guide their decision making on everything from planning, to RPSs, to interconnection, equity, and local solar programs like community solar. They should also establish clear and consistent policies and programs that scale local solar and storage right now, because if we continue on our current trajectory of distributed solar and storage deployments, we will not be able to achieve the maximum cost savings uncovered by our analysis."

13. Should the Net Metering Rule incorporate uniform rules or standards applicable to community solar projects and, if so, in what way and to what extent?

A. Yes. MSES recommends the PSC establish a separate program with definitions and uniform standards and rules for shared solar projects and Community Solar Projects. Shared Solar and Community solar projects typically need virtual net metering (VNM). The availability of VNM is necessary for consumers who can't go solar themselves. Community solar is a good option for people and businesses who would otherwise be unable to take advantage of solar energy, either because they are unable to or simply don't want a system installed. As many as half of all consumers and businesses in the U.S. cannot have a solar panel system installed for various reasons, according to the recent report, Shared Solar, by the National Renewable Energy Laboratory (NREL) and Department of Energy (DOE)[11]. Approximately 25 states and the District of Columbia are currently active in offering Virtual Net Metering with community solar programs. Currently, the top community solar states that offer VNM include: California, Massachusetts, Vermont, Colorado, Minnesota, and New York. The PSC could model the community solar program after these states. Appendix A of the NREL report provides an excellent summary of various state policies and incentives for Shared Solar.

The Executive Summary of the NREL report states:

> *"This report provides a high-level overview of the current U.S. shared solar landscape and the impact that a given shared solar program's structure has on requiring federal securities oversight, as well as an estimate of market potential for U.S. shared solar deployment. Shared solar models allocate the electricity of a jointly owned or leased system to offset individual consumers' electricity bills, allowing multiple energy consumers to share the benefits of a single solar array.1 Despite tremendous growth in*

the U.S. solar market over the last decade, existing business models and regulatory environments have not been designed to provide access to a significant portion of potential PV system customers. As a result, the economic, environmental, and social benefits of distributed PV are not available to all consumers. Emerging business models for solar deployment have the potential to expand the solar market customer-base dramatically. Options such as offsite shared solar and arrays on multi-unit buildings can enable rapid, widespread market growth by increasing access to renewables on readily available sites, potentially lowering costs via economies of scale, pooling customer demand, and fostering business model and technical innovations. Fundamentally, these models remove the need for a spatial one-to-one mapping between distributed solar arrays and the energy consumers who receive their electricity or monetary benefits. The output of shared solar arrays can be divided among residential and commercial energy consumers lacking the necessary unshaded roof space to host a PV system of sufficient size, or divided among customers seeking more freedom, flexibility, and a potentially lower price. If federal, state, and local policies can institute a supportive regulatory environment, shared solar presents an area of tremendous potential growth for solar photovoltaics (PV), expanding the potential customer base to 100% of homes and businesses. We estimate that 49% of households are currently unable to host a PV system when excluding households that 1) do not own their building (i.e., renters), 2) do not have access to sufficient roof space (e.g., high-rise buildings, multi-unit housing), and/or 3) live in buildings with insufficient roof space to host a PV system. We also estimate that 48% of businesses are unable to host a PV system when excluding businesses that 1) operate in buildings with too many establishments to have access to sufficient roof space (e.g., malls), and/or 2) have insufficient roof space to host a PV system capable of supplying a sufficient amount of their energy demand. By opening the market to these customers, shared solar could represent 32%–49% of the distributed PV market in 2020, thereby leading to growing cumulative PV deployment growth in 2015–2020 of 5.5–11.0 GW, and representing $8.2–$16.3 billion of cumulative investment (Figure ES-1)."

Uniform rules or standards are thus important to establish incentives for community solar projects and to provide for clarity, efficiency, cost reduction, and implementation. Uniform rules or standards will eliminate multiple varying systems across the state inhibiting development of community solar projects and the need for local agencies and utilities and cooperatives to try to develop individual programs. Local agencies do not have the capacity, resources, and time to develop their own programs. Multiple programs and requirements will add to confusion and increased costs and time requirements by designers and installers to learn and address multiple local program requirements. Similar problems will occur if utilities and cooperatives develop their own programs.

The PSC should require that EUs and cooperatives decouple community solar projects using VNM from the overall utility rate structure creating the community solar project as its own cost center such that the billing rates to the community solar participants actually benefit from the lower cost of the solar project cost center. This will also benefit lower-income customers such

as low-income housing, rental units, subdivisions, apartments, condominiums, municipalities, and counties. It will also benefit all entities that do not have good solar resources on-site due to a variety of reasons but wish to utilize solar. This will open the door for private and well as utility projects to more efficiently serve their communities.

14. Should the Commission continue to condition a customer's receipt of the additional compensation allowed by the non-quantifiable benefits adder on the customer's voluntary transfer of their REC ownership?

A: No.

REC ownership by the customer is still an important incentive to encourage more access and investment in DGSs. A renewable energy certificate, or REC, is a market-based instrument that represents the property rights to the environmental, social and other non-power attributes of renewable electricity generation. RECs are the accepted legal instrument through which renewable energy generation and use claims are substantiated in the U.S. renewable energy market. REC ownership is a federal program right supported by case law that should not be usurped by a state program. Buying RECs is not equivalent to buying electricity. Instead, RECs represent the clean energy attributes of renewable electricity.

MSES recommends the PSC to not require the transfer of REC ownership to customers who are allowed the non-quantifiable benefits adder. In addition to the above, it is also clear from the lack of investment in DGSs by customers in Mississippi under the current hybrid net metering program that insufficient incentive exists for low-income customers. As recommended by the MSES that the PSC establish a true one-to-one retail net metering program, a change to this would still not be appropriate to require transfer of REC ownership.

However, a completely voluntary program for a customer to sell or otherwise transfer his RECs to the utility would be an acceptable program. Utilities should establish their own program for REC purchases to provide an easy program for customers of the utility to take advantage of RECs. MSES recommends the PSC require utilities and cooperatives to establish REC programs for their customers.

15. Should the Commission permit meter aggregation by a single net metering customer/owner?

A. Yes, MSES recommends the PSC allow or permit meter aggregation. Meter aggregation allows a single photovoltaic system to generate energy credits and offset multiple meters/loads. A meter aggregation program was implemented in 2014 by the California Public Utilities Commission (CPUC) and has provided beneficial opportunities for California's agricultural industry[12]. Benefits included:

- Offset multiple energy loads with a single solar system
- Provides great flexibility for system placement
- Offers potential decreased installation costs and improved ROI

- Allows agricultural, commercial, and residential accounts to be combined
- Allows for adjustments to your meter portfolio annually
- Energy generation credited at retail energy rates, including time-of-use energy pricing

Net Energy Metering Aggregation (NEMA) allows a single customer with multiple meters on the same property, or on adjacent or contiguous properties, to use renewable generation (e.g. solar panels) to serve the aggregated load behind all eligible meters and receive the benefits of NEMA. Criteria for NEMA includes:

- There is no maximum generator size; however, the system must be sized to the customer's recent annual load.
- Accounts have to be located on the same property as the renewable generator or on properties adjacent or contiguous to it.
- All of the properties have to be solely owned, leased or rented by the same customer of record who is listed on the bill.
- The same customer of record must be listed for each account.

Through NEMA's program, businesses with grid-tied solar can send their excess energy back to utilities and receive a credit on their account for their entire solar power production through California's Net Excess Generation (NEG) program. The meter with the solar system will use what power that solar system produces and send all excess power produced back into the power grid. At the end of each billing month, excess power is allocated to each eligible meter. By the end of 12 billing months from interconnection, all charges and credits are written in an annual "True-Up" statement. For agricultural and large commercial meters, charges and credits are reconciled monthly.

PG&E, SCE and SDG&E electricity customers may use a grid-interconnected solar or other renewable energy generation facilities of offset aggregated usage of up to 1 MW (Megawatt) from meters on contiguous parcels of property that they own or lease.

Businesses with more than one electric meter on contiguous parcels can benefit from meter aggregation. Likely beneficiaries include agricultural growers, schools, and industrial facilities with multiple meters. Meter aggregation can benefit municipalities and counties as they can aggregate loads from various government owned facilities [13]. Meter aggregation is thus a necessary tool in order to extend the access and availability of certain entities to be able participate in DGSs.

16. How could the Net Metering Rule most effectively and accurately incorporate new and developing distributed energy resources, such as battery storage?

A. MSES recommends the PSC modify the Net Metering Rule to incorporate general and generic provisions that allow for new and developing distributed energy resources including battery storage to be defined components of DGSs. Battery storage is becoming a common element in DGSs. Battery storage with DGSs will provide new additional benefits to grid stability and additional power resources for utilities. Electricity storage is included in Section 106 of Chapter 02 Definitions of Title 39.

"In the near future, the scale of the batteries serving U.S. power grids is set to explode, increasing from about 1.5 gigawatts today to tens or hundreds of gigawatts by 2030. These batteries will play a vital role in shifting intermittent wind and solar power from when it's produced to when it's needed and serving broader grid services needs on an increasingly decarbonizing grid. But as a resource that can both absorb and discharge energy at a moment's notice, batteries are very different from both dispatchable generators and intermittent wind and solar farms. That requires new technical and economic systems for managing and valuing them — and the grid operators that run wholesale electricity markets serving about two-thirds of the country are struggling to make those changes to keep up with the pace of growth." That's one of the key takeaways from a recent Energy Storage Association policy forum, where representatives of the country's regional transmission organizations (RTOs) and independent system operators (ISOs) joined storage industry groups and regulators to describe their work on energy storage integration. Richard Glick, the newly named chair of the Federal Energy Regulatory Commission, which regulates ISOs and RTOs, noted that storage is one of several new technologies facing barriers to full market participation that FERC is trying to eliminate. *"I think the commission has done a pretty good job on that over the past half-decade or so."* the Democrat said. *"FERC Order 841 has led to major new opportunities for energy storage to participate in wholesale energy, capacity and ancillary services markets, albeit at different paces and in different ways across ISOs and RTOs. FERC Order 2222 sets a similar path for distributed energy resources, including aggregated batteries."*[14]

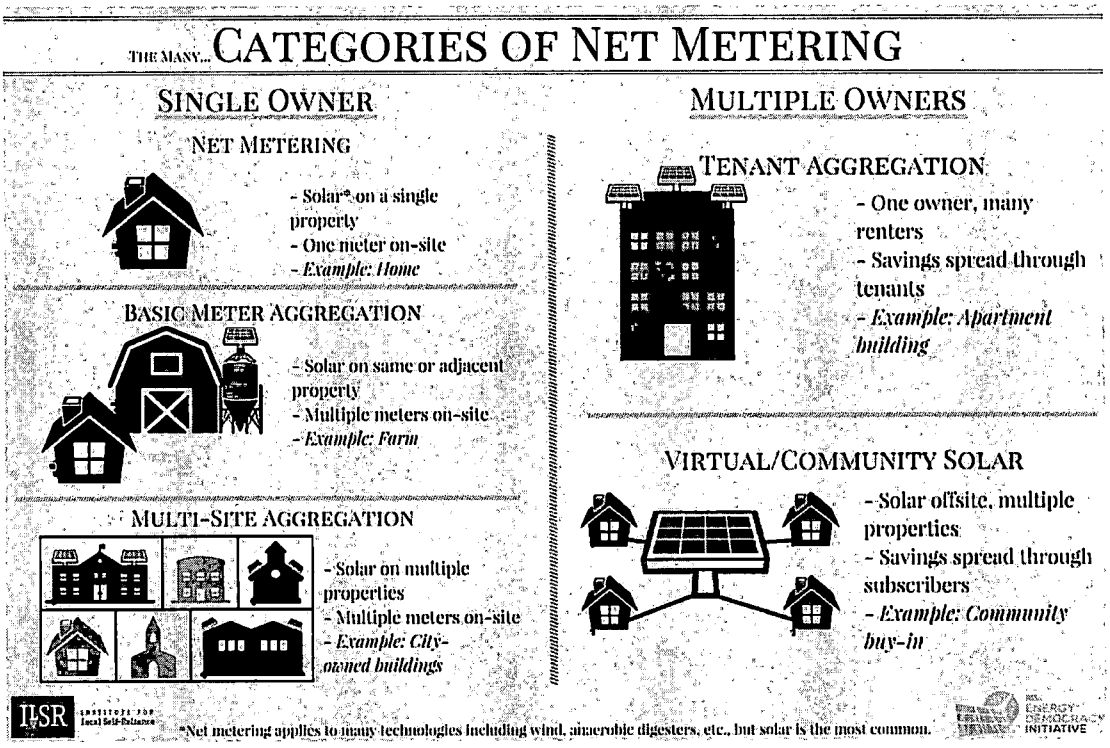
"Market power mitigation" rules, designed to prevent power plant owners from using their relatively high concentration of resources in an ISO's footprint to act in ways that shift prices in uncompetitive ways, can also be improperly applied to batteries that make up a fraction of today's markets, developers argue. These complications have been compounded by several orders passed by FERC's Republican majority under the Trump administration that have applied these market mitigation structures on state-subsidized resources, including batteries, in ways that have limited their ability to compete in capacity markets in PJM's 13-state territory and in downstate sections of NYISO's grid. Glick, who voted against these decisions, repeated his previously stated view that they are likely to be overturned by legal challenges. But he also noted that ISO and RTO stakeholders are working on market reform proposals that will need to account not just for resolving conflicts between state and federal jurisdiction over energy policy but also for finding ways to accommodate the shifting mix of resources that supply them. *"Our role is to make sure whatever market rules there are don't act as barriers."* he said.[15]

17. What role if any, should the Commission's Joint Solar Safety and Net Metering Working Group continue to serve going forward?

A. MSES recommends the Commission's Joint Solar Safety and Net Metering Working Group should continue to serve going forward. The role of the Group may be expanded to address any and all issues relevant to the development, implementation, and improvement of the Net Metering Program. The purpose of the Group should be expanded to entertain complaints and grievances and other customer issues as well as safety. The PSC should publish on an annual or more frequent basis the issues, findings, and actions to be taken by the PSC or other agencies to adequately address issues.

18. What measures and mechanisms should the Commission consider to better enable schools, state and local government bodies, and other non-profit or tax-exempt entities to participate in net metering?

A. MSES recommends that the PSC establish uniform standards and rules for schools, state and government bodies, and non-profits. The PSC should mandate that no entity may prohibit the type of energy source including DGFs that the customer desires. Meter aggregation can benefit state agencies, schools, municipalities and counties as they can aggregate loads from various government-owned facilities. Meter aggregation is a necessary tool in order to extend the access and availability to be able participate in DGSs for these entities.



Aggregate Net Metering (ANM) is one of the most powerful solar policy tools for local governments, opening up new opportunities for solar installations and project partners. Most states do not have standards for ANM, and those that do have widely varying rules. Complicated regulations or limiting rules can make it harder for local governments to utilize ANM arrangements. However, clear, fair policies can allow local governments to choose the best site for their solar projects, take advantage of economies of scale, and still benefit from net metering. Using the resources above, local governments can work with legislators, utilities commission staff, and other stakeholders to improve ANM options for all utility customers.

Final Comments

The Mississippi Solar Energy Society, Chapter of the American Solar Energy Society, again thanks the PSC for the opportunity to provide these comments to you for your consideration. In addition, MSES has also participated in the Community Intervenors Joint Red Line and the Mississippi Shared Renewable Energy Systems group efforts to provide recommended changes to the Net Metering Rule and the Interconnection Rule. MSES concurs in the proposed changes as minimum of considerations to strengthen the Net Metering Rule and the Interconnection Rule's efficacy, fairness, and functionality.

The hybrid Net Metering program enacted by the PSC has not been effective in promoting DGFs. The net effect is a policy that discourages customers from adopting solar and other renewable energy facilities behind the meter.

The world is going solar. If Mississippi wants to keep up with the rest of the nation, be competitive, grow its economy, attract new businesses and industry, stop the brain drain and increase brain influx, it needs to adopt policies, enact legislation, and take actions to encourage the adoption and implementation of solar and other renewable energy sources across a broad spectrum of applications in the state. The PSC has an extremely important role in representing utility customer demand for energy choice and adoption of policies to encourage DGSs and in enacting requirements for EUs to include DGFs in EU IRPs.

The PSC must encourage the Legislature to pass a law permanently establishing true 1:1 retail net metering for Mississippi and incentives for DGFs. The PSC should develop and recommend a Renewable Portfolio Standard (RPS) for Mississippi to the Mississippi Legislature. Many states are adopting RPS of 40 to 50% by 2035 and 100% by 2050.

MSES/ASES notes that a report by Rystad Energy indicates that in order to meet net zero or close to net zero carbon reduction to address climate change would require 13,412 square miles of PV panels, or approximately less than ½ of 1 percent (0.43%) of land area. As of February 2021, it is projected that EUs have 48,8 GW of solar PV covering 654 square miles and wind resources of 108 GW. Land scarcity for meeting the net zero goal clearly indicates that the future electric power system must include DGFs. Future planning should include utilizing all available and cost-effective rooftop systems and parking lot PV systems to be incorporated in EU grid systems.[16]

Rooftop solar not only helps to diversify and decentralize energy resources, and minimize land resources needed for solar, it also contributes to the grid by supplying electricity when its most needed. What CAISO, ISO New England, and NYSIO all agree is that rooftop solar comes to the rescue during these peak times. That bright summer sun that causes air conditioning usage to rise is also the time when solar panels perform their best. By supplying lots of solar electricity and shaving off the peak demand, as well as supplying backup battery banks, rooftop solar helps reduce those massive spikes in marginal electricity prices. Those costs get passed onto utility customers in the form of higher prices, so by lessening the severity and duration of price spikes, solar homeowners help to lower the cost of electricity for everybody.

In addition to the comments provided below, MSES respectively requests that the PSC provide an opportunity for intervenors to submit reply comments to respond to other party comments. MSES also supports the PSC holding a public hearing to allow for public comments on Net Metering and Interconnection Rules

MSES thanks the Commission for this opportunity to provide comments on the efficacy, fairness, and functionality of Mississippi's Net Metering and Interconnection Rules. The Commission's previously adopted Net Metering and Interconnection Rules provided an opportunity to test whether the Total Benefits of Distributed Generation compensation framework could spur significant investments in DG technologies and allow customers of all income levels to participate in net metering. Unfortunately, it did not work. DG adoption has been slow in Mississippi during a time when it has accelerated in states across the U.S. Further, it does not appear that any low-income customers have been able to take advantage of the promising Low-Income Benefits Adder, likely due to the overall low compensation rate underpinning the Total Benefits of Distributed Generation framework.

Accordingly, MSES respectfully requests the Commission adopt the proposed modifications to its Net Metering and Interconnection Rules discussed above, including but not limited to adopting a permanent retail-rate net metering program with a renewable energy benefits adder, enhancing provisions that allow low-income and community solar customers to better access net metering, removing other barriers that could limit future DGF growth, and updating interconnection procedures to ensure residential, commercial, and industrial customers can continue to interconnect in a timely manner. These changes would accelerate the growth of DG in Mississippi, allow more customers to benefit from DG, and bring more economic development, new business, and job creation to the state.

Respectfully submitted this 5th day of April, 2021.

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CERTIFICATE OF SERVICE

I, Caleb Dana, do hereby certify that in compliance with Chapter 6 of the Commission's Rules of Practice and Procedure:

1. An electronic copy of the filing has been filed with the Commission via e-mail to the following address: efile.psc@psc.state.ms.us.

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