Memo: October 17, 2014
To: D. Todd Littlefield, policy-makers, utility & solar stakeholders
From: Kentucky Solar Energy Society (KySES)
Re: KySES proposal on expanded net-metering and related policies

On September 23rd many of us took part in a meeting with policy makers, utility representatives and solar industry stakeholders to discuss updates to Kentucky’s net-metering policy and related issues. We appreciate the opportunity to discuss issues that are critical to Kentucky’s future and our industry. As requested, we are pleased to share a description of our desired policy reforms, along with our rationale. We look forward to making progress together on these important issues.

I. Our Proposal

A. Raise the cap on the size of net-metered systems in Kentucky and give customers flexibility.
   - Expand the limit on the size of net-metered systems to at least 1,000 kW (or 1 MW).
   - Allow “virtual net-metering” so that individual customers with multiple meters or multiple customers within the same utility service area may share the credit for the electricity output of a single renewable energy system.

B. Reauthorize and strategically expand Kentucky’s tax credit for distributed renewable energy.
   - At a minimum, we urge the legislature to reauthorize Kentucky’s existing, limited tax credits for eligible renewable energy systems and energy efficiency measures. These credits are set to expire at the end of 2015. Current law establishes a state tax credit of $3 per installed watt of solar PV, but caps the value of the credit at $500 for residential and $1,000 for commercial customers.
   - To encourage job creation and private investment in communities that need it most, we propose a strategic expansion of the expiring state tax credits. A thoughtfully designed policy could target the most generous tax benefits to eligible systems installed in Kentucky’s economically distressed areas.¹ For example, solar PV systems installed in distressed communities could be eligible for a tax credit (or better yet, a rebate) of $1.50 per watt, with no cap on the size of the credit. And systems installed elsewhere in the state could receive a smaller but still meaningful tax credit, perhaps at a level of $1.00 per installed watt of solar PV, with no cap on the size of the credit.

C. Establish a Renewable and Efficiency Portfolio Standard in Kentucky.
   - We would welcome any opportunity to expand this stakeholder dialogue about net-metering policies to also explore workable approaches to a Renewable and Efficiency Portfolio Standard for Kentucky. Thirty states and the District of Columbia have already enacted such policies, which have been shown to drive job creation, protect ratepayers from steeply rising costs of fossil fuel energy, and generate health and environmental benefits while also ensuring affordable and reliable power.

¹ The definition of “economically distressed area” will need clarification, as different federal agencies define it slightly differently. See guidance provided by the Federal Highway Administration:
http://www.fhwa.dot.gov/economicrecovery/guidancedistressed.htm
II. Our rationale for expanded and more flexible net-metering

We define net-metering as an approach to utility billing that allows customers to receive a one-for-one credit for excess kilowatt-hours produced by an eligible distributed renewable energy system installed behind the meter. Customers with qualifying systems are only billed for their “net” energy use.

Kentucky’s 30 kW limit on the size of net-metered systems is a significant barrier to investment in distributed solar generation, especially by public, commercial and industrial utility customers. Kentucky’s cap should be raised to encourage job growth, allow Kentuckians greater choice in how we manage our energy costs, and contribute to a more diversified energy portfolio.

Kentucky should not delay in raising the net-metering cap. Every day that this cap exists is a day when Kentuckians cannot take advantage of the Federal Investment Tax Credit (ITC). That credit offsets 30% of installed system capital costs for eligible renewable systems – a significant benefit. The ITC is in place through the end of 2016, at which time it drops to 10%. Kentucky’s policy-makers should take swift action to remove unnecessary barriers to in-state investment in distributed renewable generation so that our residents and businesses can reap the same tax benefits that are currently flowing to Americans in states with more favorable renewable energy policies.

Many utilities contend that net-metering involves cross-subsidization, or a shift of costs from customers with net-metered systems to non-participating customers. Allowing larger net-metered systems, the argument goes, would only make the problem worse. However, our review of many studies indicates that net-metering has almost always been found to provide a net-benefit to non-participating ratepayers. And nearly every study we reviewed concludes that the benefits are largest for non-participating customers within the commercial sector. There are many reasons for this, including lower marginal retail rates for commercial customers and the minimal impact of distributed solar on the peak demand charges for many commercial businesses. Obviously, the underlying details of each business and each state’s and utility’s policies and rate structures matter a great deal in these assessments.

We further believe that net-metered distributed renewable energy systems should be treated like any other conservation measure that a customer may take behind the meter to reduce or shift energy consumption. For example, before installing solar panels on a home or business, an owner is likely to invest in new, energy efficient lighting, insulation, HVAC systems, refrigerators, motors or appliances. Those investments are paid for, if you will, by a reduction in the customer’s monthly energy and demand charges. Whether the investment is in energy efficiency or rooftop solar, the benefits of upgrades made behind the meter should be ‘credited’ to the customer at their retail rate for each kilowatt-hour of energy reduced (or generated).

This scenario would be different if homeowners or businesses were installing renewable energy systems that were sized to generate significantly more electricity than they consume annually. But there is no incentive for anyone to do so under a Kentucky net-metering contract, since the tariff simply allows customers to “bank” credits for excess kilowatt-hours produced. No one is likely to choose to install a far bigger system than they need, since they will never be in a position to claim those credits. And utilities in Kentucky are never required to cut anyone a check for excess electricity banked through net-metering, even when a customer closes the account.
Finally, allowing aggregated net-metering will greatly expand energy choices for Kentucky consumers who would otherwise not be in a position to participate in net-metering. Offering customers the flexibility to assign net-metering credits to another meter on their own property is a simple policy change that could have positive applications in rural Kentucky, where many farmers could choose to install solar panels on their barns if they were allowed to transfer the credits to their home meters. An even broader “virtual net-metering” policy could open up new opportunities for local governments and school systems, as well as for shopping mall and apartment complex owners and tenants. A broad virtual net-metering policy would allow more Kentucky residents, businesses and public institutions to invest in net-metered distributed renewable energy in ways that maximize efficiency and work best for their circumstances.

III. Overview of studies concluding that benefits to non-participating customers outweigh costs

Numerous recent studies have concluded that net-metered, distributed solar generation is a net benefit to non-participating ratepayers. Importantly, the benefits to non-participating customers have consistently been found to be biggest in the commercial and industrial sectors. Below are summaries of recent studies from six states. Also included are several meta-studies that looked at the different methodologies used by utilities, regulators, national labs and other stakeholders to assess the value of distributed solar.

**California:** A January 2014 study by Crossborder Energy looked at the benefits and costs of net-metering in California, which has 1400 MW of solar PV installed on homes and businesses under net-metering arrangements. “We conclude that the utilities concerns with the impacts of Net Energy Metering (NEM) on non-participating rate-payers are unfounded. Recent changes in residential rate design and updated models of the costs which the utilities avoid when they accept NEM power exported to their grids show that NEM does not produce a cost shift to non-participating ratepayers; instead it creates a small net benefit on average across the IOUs’ residential markets. NEM is even more cost-effective for non-participants in the commercial, industrial and institutional (C & I) market.”

**Arizona:** A May 2014 study by Crossborder Energy looked specifically at the question of costs and benefits of net-metering for non-participating customers in the service area of a utility known as Arizona Public Service. The study found that “The benefits exceed the costs by more than 50%, with a benefit / cost ratio of 1.54. The benefits also exceed the costs in both the residential and commercial markets considered individually. The study found that the benefits of net metering exceed costs by more than 50% in both residential and commercial markets.”

**Nevada:** As of December 2013, Nevada had 50 MW of installed, net-metered photovoltaic systems. A July 2014 study commissioned by the Nevada Public Utilities Commission from Energy and Environmental

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2 In 2013 the North Carolina Solar Center published a report called Aggregate Net Metering: Opportunities for Local Governments (http://www.icleiusa.org/action-center/aggregate-net-metering-opportunities-for-local-governments). This report summarizes various state laws that allow for aggregation of net-metering credits and looks closely at opportunities these policies create for public-sector solar projects. At the time it was written, 17 states had rules requiring utilities to allow some form of aggregate net-metering, out of the 43 states that allow net-metering.


Economics, Inc looked at a range of cost and benefit measures related to distributed renewable systems, including for participating customers, non-participating ratepayers, overall utility revenues, overall energy costs for state, and social benefits. The report states, “We estimate a total benefit...to non-participating ratepayers of $36 million during the systems’ lifetimes.”

**Colorado:** A December 2013 by Crossborder Energy analyzed claims put forward by a major utility, Public Service Company of Colorado, about the costs of distributed solar generation on non-participating customers. The report found that the utility’s analysis had not considered or had undervalued many well-researched benefits of distributed solar generation. The report concluded that distributed solar generation provides net benefits to the utility of $13.6 million per year.

**North Carolina:** A November 2013 study by Crossborder Energy looked at the benefits and costs of solar generation for electric ratepayers in North Carolina. The report found, “Benefits of solar generation in North Carolina are equal or exceed ratepayer costs of solar resources, such that new solar resources will provide economic benefits for electric ratepayers in the state...Net metered distributed residential systems are at the low-end of benefits to non-participating ratepayers, while benefits exceed costs in commercial markets where marginal retail rates are lower...Benefits of wholesale solar are 40% larger than the costs, and the benefits of solar distributed generation (DG) are 30% greater.”

**Minnesota:** In April 2014, the Institute for Local Self Reliance produced a report on Minnesota’s recently adopted Value of Solar policy. At the time the report was written, a preliminary estimate of the value of solar for one major utility in the state, Xcel Energy, was 14.5 cents per kilowatt-hour, a few cents higher than the utility’s 11.5 cent per kWh residential retail rate. The methodology used to calculate this net benefit considered local capacity value, avoided transmission access and loses, environmental benefits, and other factors.

**Meta-study I:** The Rocky Mountain Institute released a second edition of a report entitled “A Review of Solar PV Benefit and Cost Studies” in September 2013. The report reviewed 16 value-of-solar studies done by utilities, national labs and other organizations between 2005 and 2013. The objective of the report was to assess best practices and gaps in the methodologies being used to assess the net benefits and costs of distributed solar generation. Key findings include: It is critical to be transparent about the assumptions, perspectives, sources and methodologies that inform any study. And there are significant methodological gaps about how to value distribution benefits, grid support services benefits, and financial, environmental, social, health, and security benefits. Of the 16 studies examined, the calculated benefits almost always exceed residential retail rates, implying that net-metering does not involve a subsidy by non-participating customers to solar customers. **Lastly, based on nearly all of these studies, the value of distributed solar generation within the commercial market was strongly positive for non-participating ratepayers.**

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5 [http://pucweb1.state.nv.us/PDF/AxImages/DOCKETS_2010_THRU_PRESENT/2013-7/39428.pdf](http://pucweb1.state.nv.us/PDF/AxImages/DOCKETS_2010_THRU_PRESENT/2013-7/39428.pdf)


was due to several factors, including the fact that net-metering typically has minimal impact on demand charges.9

**Meta-study II:** In 2012 the Solar America Board for Codes and Standards released a report entitled “A Generalized Approach to Assessing the Rate Impacts of Net Energy Metering.” This report provides a good overview of the debate in specific states over how to assess the value of net energy metering. It also makes specific recommendations of best practices to be used by policy-makers, regulators, utilities and other stakeholders seeking to assess the net value of distributed solar energy installed through a net energy metering framework.10

**Meta-study III:** In 2013 the Interstate Renewable Energy Council produced a report entitled “Regulators Guidebook to Assessing Benefits and Costs of Distributed Solar Generation.” It provides numerous specific recommendations to regulators about how to calculate the costs and benefits of net-metered distributed solar energy. The report builds on the findings of the RMI study and the recommendations of the Solar America Board for Codes and Standards (see both above).11

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9 [http://www.rmi.org/elab_empower](http://www.rmi.org/elab_empower)

10 [http://www.solarabcs.org/about/publications/reports/rateimpact/pdfs/rateimpact_full.pdf](http://www.solarabcs.org/about/publications/reports/rateimpact/pdfs/rateimpact_full.pdf)

IV. Evidence that KY’s net-metering policy is more restrictive than all of our neighboring and nearby states.

Kentucky’s net-metering cap of 30kW is significantly below the maximum size allowed by most states. Of the 43 states with net-metering policies, 23 allow systems of 1,000 kW or higher.

Here’s how Kentucky’s policy stacks up against nearby states and the District of Columbia:

- Ohio: no limit
- District of Columbia: 5,000 kW (but not to produce more than 120% of demand)
- West Virginia: 2,000 kW
- Maryland: 2,000 kW
- Florida: 2000 kW
- Indiana: 1,000 kW
- North Carolina: 1,000 kW
- Virginia: 500 kW
- Missouri: 100 kW
- Illinois: 40 kW
- Kentucky: 30 kW

Note: Tennessee: does not have a net-metering policy because TVA offers customers a feed-in tariff. That means TVA actually pays customers a premium for excess electricity generated by distributed solar electric systems. Kentuckians who are served by utilities in TVA’s network are potentially eligible to utilize TVA’s feed-in tariff.

12 http://www.dsireusa.org/documents/summarymaps/net_metering_map.pdf
V. Evidence that targeted state tax incentivizes for distributed renewable energy could encourage job growth and investment in places that need it most.\textsuperscript{13}

\textbf{Kentucky's Distressed Areas}

\textit{Economic and Social Indicators of Distress by Block Group Data from American Community Survey}

5-Year Estimate, 2007-2011

\begin{figure}[h]
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\includegraphics[width=\textwidth]{map1.png}
\caption{Map of distressed areas produced by outraGIS mapping, http://www.outragegis.com/about/}
\end{figure}

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{map2.png}
\caption{Kentucky Renewable Interconnections through 2013\textsuperscript{14}}
\end{figure}

\textsuperscript{13} Map of distressed areas produced by outraGIS mapping, http://www.outragegis.com/about/

\textsuperscript{14} Map of installed systems produced by Kenya Stump, KY Division of Renewable Energy.
VI. Evidence that Kentucky lags far behind nearby states in solar industry jobs.

Kentucky lags behind nearly all of our neighboring states in the number of solar industry jobs, including jobs in manufacturing, installation, research, and more. Below is a list of neighboring states’ recent rankings for solar industry jobs, according to the Solar Foundation: 15

Neighboring state rankings:

- Ohio: 3,800 solar industry jobs. Ranked 8th in the nation
- Tennessee: 2,800 solar industry jobs. Tied for 12th in nation
- Missouri: 2,800 solar industry jobs. Tied for 12th in the nation
- Illinois: 2,100 solar industry jobs. Ranked 19th in the nation
- Virginia: 1,900 solar industry jobs. Ranked 22nd in the nation
- Indiana: 1,500 solar industry jobs. Ranked 25th in the nation
- Kentucky: 640 solar industry jobs. Ranked 36th in the nation
- West Virginia: 370 solar industry jobs. Ranked 44th in the nation

Rankings of other nearby states:

- North Carolina: 3,100 solar industry jobs. Ranked 10th in the nation
- Georgia: 2,600 solar industry jobs. Ranked 16th in the nation

15 http://thesolarfoundation.org/solarstates
VII. A few notes about the Minnesota model of a “Value of Solar” Tariff

The much discussed “Minnesota approach” gives utilities the option of continuing under current net-metering policies or adopting a new Value of Solar tariff, using a methodology described by state law. Under a Value of Solar tariff, customers with PV systems pay the retail rate for all the energy they use, and the utility pays the customer for all the energy their renewable system generates, at a determined “value of solar” rate, which is locked in for each system for 25 years.

The Value of Solar approach is controversial among solar advocates and utilities alike. We have not looked at this model closely enough to understand the implications for Kentucky. However, it seems worth sharing a few things we have learned about this approach:

- There are concerns (and a pending legal case) that customers will have to pay income taxes on the payments they receive from utilities under a value of solar tariff.\(^\text{16}\)
- The value of solar methodology used by Minnesota adopts the US EPA’s value for avoided carbon emissions – the social cost of carbon. At $37 per metric ton of carbon, this is worth almost $.03 for every kilowatt-hour of natural gas generation displaced by rooftop solar in Minnesota.\(^\text{17}\)
- The Minnesota PUC found that grid costs of distributed solar systems “were essentially zero and would remain so until solar generation exceeds about 15 percent of the state’s power supply.”\(^\text{18}\)
- The Value of Solar tariff in Minnesota works essentially like a feed-in tariff, since the methodology used concluded that the value of rooftop solar is higher than the current retail rate of electricity.
- Although the initial calculations of the Value of Solar tariff in Minnesota pegged the value of solar above current retail rates, some utilities may see a benefit since using this approach locks in the price they will pay for 25 years. As retail electricity rates continue to rise, those locked in rates may be lower than what utilities would pay under a traditional net-metering contract. Plus, as utilities adjust their generation fleet into the future, there could then be lower avoided externalities, and the value of solar rate would correspondingly be reduced for systems built in future years.

VIII. Collaborators on this document

Josh Bills, jbills@maced.org
Robert Chatham, robert.chatham@gmail.com
Andrew McDonald, andyboeke@yahoo.com
Matt Partymiller, matt@solar-energy-solutions.com
Jack Barnett, wjbarnett@bellsouth.net
Lisa Abbott, lisa@kftc.org
Lane Boldman, lane@kyconservation.org
And the board of the Kentucky Solar Energy Society