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BEFORE THE  
PUBLIC SERVICE COMMISSION OF WISCONSIN

**Joint Application of Wisconsin Electric Power  
Company and Wisconsin Gas LLC, both d/b/a  
We Energies, to Conduct a Biennial Review  
Of Costs and Rates – Test Year 2015 Rates**

Docket 5-UR-107

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**DIRECT TESTIMONY OF MICHAEL J. VICKERMAN  
ON BEHALF OF RENEW WISCONSIN AND THE ENVIRONMENTAL LAW  
AND POLICY CENTER**

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**Q. Please state your name, occupation, and address.**

A. My name is Michael J. Vickerman. I am the Program and Policy Director of RENEW Wisconsin (RENEW). RENEW is a membership organization founded in 1991 that leads and represents businesses, organizations, and individuals who seek more clean renewable energy in Wisconsin. RENEW is located at 222 S. Hamilton St., Madison WI 53703.

**Q. Please describe your professional qualifications.**

A. Under my direction RENEW has advocated, and mobilized political support for, several pro-renewable policies adopted in the last 13 years, including the adoption in 2009 of uniform permitting standards for wind projects (SB 185) as well as the establishment in 1999 of Wisconsin's Renewable Portfolio Standard and a public benefits fund dedicated in part to renewable energy sources. I have been involved with many issues relating to renewable electricity, ranging from broad policy

1 mandates and customer-driven green pricing programs to such technical issues as  
2 renewable energy credit trading and wind generation permitting ordinances. I was  
3 RENEW's representative on the statewide Task Force on Energy Efficiency and  
4 Renewables, which Governor Doyle convened in September 2003, and served as  
5 co-chair of the Renewables Workgroup. In that capacity I developed and  
6 negotiated several renewable energy policy recommendations for consideration by  
7 the full Task Force. These were: (1) a successor Renewable Portfolio Standard  
8 (RPS) that would result in a 10% renewable energy content by 2015 and (2) a  
9 State of Wisconsin commitment to source 20% of the electricity it uses from  
10 renewable energy sources. Both recommendations were included in a consensus  
11 package of proposed policy changes that were subsequently incorporated into a  
12 bill (SB 459) that passed the Legislature and was signed into law in March 2006  
13 (2005 Act 141)

14 RENEW Wisconsin also spearheaded the Wind for Wisconsin coalition,  
15 whose campaign to establish uniform siting standards for wind energy systems  
16 resulted in the passage of 2009 Act 40. I am a member of the Wind Siting  
17 Council, a stakeholder body convened by the Public Service Commission  
18 ("Commission") to provide input and advice to the agency in shaping a statewide  
19 wind siting rule as required under 2009 Act 40.

20 I have testified in several Commission proceedings in recent years, including  
21 We Energies' applications to build its Blue Sky Green Field wind energy  
22 installation (6630-CE-294), its Glacier Hills wind energy installation (6630-CE-  
23 302), and its Rothschild Biomass generation installation (6630-CE-305); Northern

1 States Power-Wisconsin's application to convert its Bay Front 5 generator into a  
2 dedicated biomass unit (4220-CE-169); Wisconsin Power & Light's application to  
3 build the Nelson Dewey 3 coal-fired power station (6680-CE-170) and its Cedar  
4 Ridge wind energy installation (6680-CE-171); Forward Wind Energy's  
5 application to build a 200 MW wind energy installation (9300-CE-100);  
6 Wisconsin Public Service Corporation's 2005, 2006, 2008, 2010, 2012, 2013 and  
7 2014 rate cases (6690-UR-117, 6690-UR-118, 6690-UR-119, 6690-UR-120,  
8 6690-UR-122, and 6690-UR-123); Wisconsin Power & Light's 2005, 2006 and  
9 2008 rate cases (6680-UR-114, 6680-UR-115 and 6680-UR-116); We Energies'  
10 2005, 2007 and 2012 rate cases (05-UR-102, 05-UR-103 and 05-UR-106); and  
11 Madison Gas & Electric's 2010 rate case (3270-UR-117).

12  
13 **Q. What is the purpose of your testimony?**

14 A. The purpose of my testimony is to describe the harm that would occur to existing  
15 and prospective owners of solar generation in Wisconsin Electric Power Company  
16 (WEPCO) territory from the utility's proposals to overhaul its net metering  
17 service. As proposed, the new charges and service changes that existing and  
18 prospective customers would absorb will greatly impair the value proposition of  
19 solar self-generation going forward. The most obvious source of harm relevant to  
20 this rate case is the proposed capacity demand charge that will impair the  
21 economic performance of existing and future solar electric systems. Other  
22 proposed changes will augment the damage from the capacity demand charge,  
23 including the proposal to switch from annual netting of consumption and

1 generation to monthly netting. This will be especially onerous to existing  
2 customer-generators who had sized their PV systems in line with previously  
3 approved net metering tariffs. WEPCO's proposal to increase the monthly fixed  
4 charge and lower the energy rates for most customers will also result in lower  
5 savings from existing net metered generation systems. The overall effect of these  
6 proposals would be to substantially reduce solar installation activity in WEPCO  
7 territory, impairing the ability of customers to pursue a cost-effective self-  
8 generation option that provides demonstrable benefits to the utility electric system  
9 as well as to the system owner. Two factors will contribute to the anticipated  
10 winding down of customer-sited PV installations interconnected to WEPCO: (1)  
11 the economic penalties transmitted by the proposed charges and service  
12 restrictions and (2) diminishing customer trust in long-term economic  
13 arrangements with this utility, given its highly public proposal that would, if  
14 adopted, pull the economic rug out from customer-generators who invested  
15 significant sums of capital to supply themselves with clean energy.

16 In addition, I will address the parallel generation service proposed by  
17 WEPCO and analyze its shortcomings from the standpoint of a prospective biogas  
18 generator. As proposed, this tariff constitutes an insuperable barrier to future  
19 biogas projects.

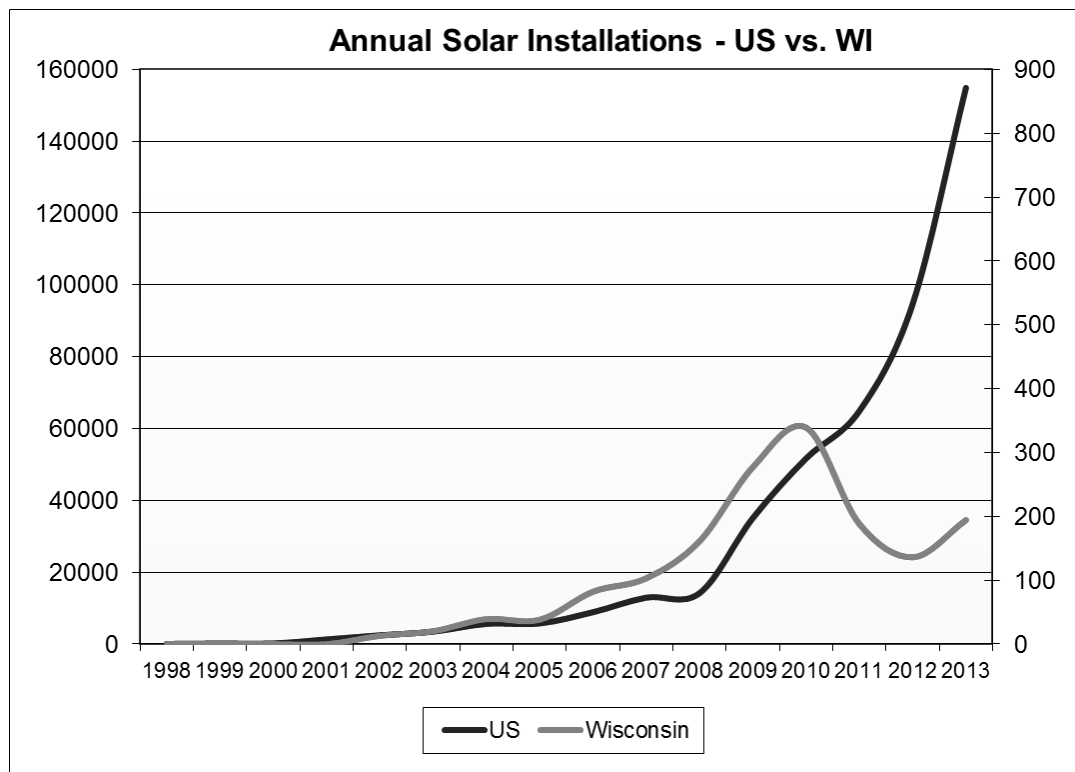
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21 **Q. What is RENEW's interest in this proceeding?**

22 A. RENEW's interest is to overcome the regulatory barriers that confront solar  
23 generating capacity in Wisconsin, which are clearly restraining growth in what

1 has become one of the fastest growing generating resources in the nation, and to  
2 put the state's solar market on a substantially faster growth track. Among  
3 generating resources, only natural gas surpassed solar in terms of electric capacity  
4 growth in 2013, according to a 2014 report issued by GTM Research and the  
5 Solar Energy Industries Association. In the first quarter of 2014, solar accounted  
6 for 74% of all generating capacity additions (1,330 MW of new PV). However, in  
7 recent years, Wisconsin's solar installation activity energy has lagged behind the  
8 rest of the nation. These diverging trends are depicted in the graph below, which  
9 compares Wisconsin installation data available from Focus on Energy with  
10 national data available from the Interstate Renewable Energy Council through  
11 2013.

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1           In 2013, approximately three MW of solar generating capacity came on  
2 line, increasing total solar PV generation in Wisconsin from 14 to 17 megawatts.  
3 With the exception of the 1 MW Jefferson Solar project that supplies electricity  
4 under a power purchase agreement to WPPI, utility customers are the driving  
5 force behind the expansion of solar generating capacity in Wisconsin.

6           The barriers that customer-generators face in Wisconsin began looming  
7 large in 2011 and persist to this day. These include:

- 8           • an on-again off-again incentive program for customer-sited renewables,
- 9           • a very unclear environment over access to third-party financing, and
- 10          • seemingly continuous changes to utility net metering tariffs coupled with new  
11 service restrictions designed to undermine the value proposition of behind-  
12 the-meter self-generation.

13          RENEW's interest extends to other renewable sources of distributed  
14 generation, including small wind and biogas. Biogas generation capacity in  
15 Wisconsin has grown substantially in recent years, fueled mainly by attractive  
16 buyback rates that locked in a 10- or 15-year stream payment. With the expiration  
17 of these special buyback rates in most utility territories, biogas development  
18 opportunities are now drying up.

19

20 **Q. Is there a new threat to customer-generators?**

21 A. Yes. Regressive rate redesign proposals from three of the five investor-owned  
22 utilities in Wisconsin would greatly reduce or eliminate the economic viability of  
23 customer self-generation (and energy efficiency measures, for that matter).

1 WEPCO is one of three electric providers proposing to significantly increase  
2 fixed customer charges and reduce volumetric energy rates. As discussed in  
3 greater detail below, this proposal would harm existing customer-generators as  
4 well as undermine customer confidence in the near-term availability of cost-  
5 effective applications of solar generation.

6 Where customer investment decisions are made on a mid- to long-term  
7 horizon, as they are with distributed generation (DG) and many efficiency  
8 projects, the policy ping-pong created by significant adjustments in rate design  
9 every two years adds a level of uncertainty and makes the state inhospitable to  
10 customer investments. Typically, a prospective customer evaluates a DG  
11 investment over a 25-year horizon. But by its very sweep and scope WEPCO's  
12 rate proposal cannot help but undermine customer confidence in the viability of  
13 self-generation with solar for 2015 and beyond, even before the Commission  
14 makes a decision on that proposal. The Commission's ratemaking decisions must  
15 provide a clear course that provides long-term rate design stability.

16

17 **Q. What percentage of net metered customers generate their electricity with**  
18 **solar technology?**

19 A. Solar accounts for more than 90% of the electricity produced today under a net  
20 metering service in Wisconsin. That percentage will continue to increase as solar  
21 generating equipment costs decline and flexible financing models become more  
22 commonplace. It is fair to say that solar has become the default resource option  
23 for customer-generators going forward.

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**Q. How many solar generators does WEPCO serve through its customer-generation accounts?**

A. According to the table below, which contains information derived from a number of data requests, there are 651 customer-generators producing electricity under the solar feed-in tariff CGS-PV (all solar), the net metering tariff serving customers above 20 kW, and the three net metering tariffs serving renewable energy systems up to 20 kW. RENEW estimates that approximately 95% (~610) are solar generators.

<b>Service</b>	<b>Service Type</b>	<b>Rate-based?</b>	<b>Second meter?</b>	<b>Open to new accounts?</b>	<b>No. of accounts</b>	<b>Capacity (in kW)</b>
CGS-PV	Feed-in tariff	No	Yes	No	180 (solar)	995.2
CGS-1	Net metering-all resources	Yes	Yes	Yes	19 (solar)	1,181.2
CGS-2	Net metering-all renewables	Yes	No	No	9	69.3
CGS-6	Net metering-all renewables	Yes	Yes	No	340	3,041.7
CGS-8	Net metering-all renewables	Yes	Yes	Yes	103	500.1
<b>Total</b>					<b>651</b>	<b>5,787.5</b>

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**Q. How much solar electricity is produced by systems taking service through these customer-generation tariffs?**

A. To simplify matters, I will assume that 95% of the output from customer-generators assigned to CGS-PV, CGS-2, CGS-6 and CGS-8 PV comes from solar PV. The 19 accounts listed under CGS-1 in the table above are all solar. The sum



1 total of generating capacity taking service under the aforementioned tariffs is  
2 5,787 kW. Taking 95% of that total and multiplying it by their estimated capacity  
3 (13%) and hours in a year (8,760 hours), the combined gross output comes to  
4 about 6.26 million kWh per year (6,260,723). Of that total, about 1,138,800 kWh  
5 are generated through the CGS-PV tariff connected to WEPCO's Energy for  
6 Tomorrow program. The above-market costs of that generation tranche are wholly  
7 absorbed by Energy for Tomorrow subscribers. Thus, the gross output from net  
8 metered solar systems should total about 5.12 million kWh (5,121 MWh) in  
9 2014, with a portion of that generation consumed on site and in real time. In its  
10 annual statement, WEPCO's 2013 sales to ultimate customers totaled 25,827,940  
11 MWh. If 2014 electricity sales to ultimate WEPCO customers equal last year's  
12 totals, then the electricity produced by net metered solar generators would account  
13 for one kWh for every 5,044 sold. Put another way, the percentage of gross net  
14 metered solar output to WEPCO's 2013 sales is .02%. This anemic level of  
15 penetration should be compared with the net metering caps established by law in  
16 other Midwestern states. In Illinois, the net metering cap is set at 5% of peak  
17 demand, whereas Michigan's law sets the ceiling at 1%. Clearly, the contribution  
18 from net metered solar generation to WEPCO's overall energy mix is de minimis,  
19 as is its impacts on rates, as admitted by company witness Rogers on page 54,  
20 lines 8 through 11.

21

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23

1 **Q. Is WEPCO seeing rapid growth in net metered solar generation?**

2 A. No. The CGS-8 rate is the only active net metering service available for new solar  
3 installations. Designed to succeed the CGS-2 and CGS-6 tariffs, the CGS-8 tariff  
4 was activated on January 1, 2013. In the 18 months that the CGS-8 tariff has been  
5 active, there have been 103 new solar installations, totaling 500 kW. With that  
6 data point, it is reasonable to assume that another 30-35 installations will be  
7 placed in service before the end of the year, adding about 150-175 kW of  
8 capacity, for a total of 650 to 675 kW in service by January 1, 2015. Thus, net  
9 metered solar is currently growing at the rate of about 325 to 340 kW per year,  
10 and gross output from new PV systems will average nearly 400,000 kWh per  
11 year. If present trends continue, gross net metered output would essentially double  
12 in 12 years, and its share of WEPCO's 2013 sales would rise in that time span to  
13 .04%. Given the likely growth path over the short-term, there is clearly no  
14 urgency to institute wholesale changes to WEPCO's net metering service,  
15 especially those that would have the effect of capping net metering at present  
16 levels.

17  
18 **Q. How is WEPCO planning to change its net metering service?**

19 A. As explained in direct testimony filed by Company witness Eric Rogers, WEPCO  
20 proposes to discontinue the net metering tariffs currently available to new  
21 renewable customer-generators (CGS-1 and CGS-8) at the end of December 2015  
22 and replace it with two tariffs (COGS-NM and COGS-NP) that will take effect  
23 January 1, 2016. All new customer-generators with systems up to 300 kW will be

1 placed in one of those tariffs. Net metered customer-generators from existing but  
2 closed net metering services (CGS-2 and CGS-6) will be transferred into the new  
3 tariffs on the aforementioned date, as will the wind generators currently producing  
4 energy under CGS-5 and the solar generators under CGS-PV when their 10-year  
5 contracts expire.

6 The proposed COGS-NM tariff contains a number of features that will  
7 directly affect existing customer-generators when they move into the new service.  
8 First and foremost would be a capacity demand charge set at \$3.794/month  
9 applied to solar and wind generators. This proposal is without precedent in the  
10 state of Wisconsin. No other net metered customer-generator in Wisconsin is  
11 currently subject to a capacity demand charge. None of the utilities' pending rate  
12 filings before the Commission have proposed a similar charge.

13 Like the still-active CGS-8 service, COGS-NM credits generation  
14 offsetting the customer's consumption at the retail energy rate. Unlike that  
15 service, the true-up period under COGS-NM will shift from an annual  
16 reconciliation to a monthly reconciliation. Kilowatt-hours not offsetting  
17 generation during that monthly period will be credited at the utility's energy-  
18 based avoided cost rate (4.245 cents/kWh).

19 The vast majority of kWh produced by a CGS-1, CGS-2, CGS-6 and  
20 CGS-8 customer are credited at the retail energy rate. Those customers whose PV  
21 systems supply most of their electricity used on-site will likely experience a  
22 double-whammy when they are transferred to the COGS-NM service, due to their  
23 unfamiliarity with a two-tiered rate, especially one that would reconcile

1 consumption and output on a monthly basis. Most are likely to see substantial  
2 increases to their monthly bills once the transfer is completed, as will CGS-1 and  
3 CGS-8 customers who supply all or nearly all of the electricity they use from their  
4 PV systems.

5 When the CGS-2, CGS-6 and CGS-8 customers are transferred to the  
6 COGS-NM service, they will be assessed a facilities charge amounting to  
7 approximately \$3.32 per month, or \$39.80/year. That corresponds to  
8 approximately 25 kWh of energy production per month, or 300 kWh/year.

9

10 **Q. Is there a rule of thumb for gauging the impact of monthly netting on a solar**  
11 **customer's bill?**

12 A. Yes. A system that is sized to supply 95% of a customer's electrical requirements  
13 will typically produce more generation than is offset during the spring and fall  
14 shoulder seasons, when there is ample sunshine but little need for cooling. For  
15 those households, a shift from annual to monthly netting will reduce the economic  
16 value of that output by approximately 10-15%. To safely avoid the crediting of  
17 kWh at the avoided cost-based energy rate every month, a customer would need  
18 to size the system to supply no more than 60% of his or her annual electricity  
19 usage.

20

21 **Q. How would the capacity demand charge affect PV system economics?**

22 A. The effect of WEPCO's proposed capacity demand charge on PV system  
23 economics is relatively easy to model, and is quite pronounced. As applied to a 5

1 kW PV system that is optimized for energy production (43 degree tilt angle,  
2 south-facing, zero shading, no losses due to snow), the capacity demand charge  
3 will cost the system owner \$19.00/month, or \$228/year. A new 5 kW system built  
4 to supply 50% of a household's energy use should average about 6,000 kWh of  
5 annual output over its first five years. When multiplied by WEPCO's proposed  
6 Rg-1 rate of 13.5 cents/kWh, system output should gross about \$810 per year.  
7 This calculation assumes that every kWh produced is credited at the retail energy  
8 rate.

9           When the capacity demand charge is subtracted from the gross savings,  
10 the net value comes to \$582. This amounts to a loss of 28.1% on a percentage  
11 basis. The calculation above represents the best possible outcome with the  
12 proposed capacity demand charge. In installations where annual output would be  
13 affected by shading or suboptimal orientation, the effect of the capacity demand  
14 charge would be even more devastating to system economics. If shading reduces  
15 the output from that 5 kW PV system by 10%, resulting in the 5,400 kWh/year  
16 instead of 6,000 kWh/year, the gross drops to about \$729/year. But the capacity  
17 demand charge would deduct the same \$228 from the gross, resulting in a net  
18 value of \$501. This amounts to a loss of about 31.2% on a percentage basis. Put  
19 another way, for every \$10 of savings obtained by that 5 kW solar electric system,  
20 the utility would recapture \$3 from that customer via the capacity demand charge.

21           As applied to the above scenario, the \$39/year facilities charge would be  
22 slightly less than 5% of the \$810 gross annual savings. When the \$39/year  
23 facilities charge is added to the \$228/year capacity demand charge, the combined

1 annual deduction of \$267 amounts to a 33% reduction in savings. In other words,  
2 for every \$3.00 that would be saved by the customer's solar PV system in 2016,  
3 the two charges would recapture \$1.00 from that customer.

4 As presently structured, the capacity demand charge makes no allowance  
5 for system performance or age. The proposal assumes that a household with a 20  
6 year-old solar electric system is deriving the same amount of savings on their bills  
7 as would a customer with an installation in its first year of operation. There is no  
8 allowance under this proposal for degradation of output over time, which most  
9 authorities estimate to be 0.5% per annum, or 5% per decade. There is also no  
10 consideration in this proposal for system down-time occasioned by maintenance  
11 or repairs. As currently configured, the capacity demand charge will impose an  
12 increasingly larger economic burden on customer-generators as their PV systems  
13 age and produce incrementally fewer kWh each year.

14

15 **Q. How does the capacity demand charge compare with current Focus on**  
16 **Energy solar incentives available to residential and small commercial**  
17 **customers?**

18 A. Currently, Focus on Energy offers incentives of \$600/kW for solar electric  
19 systems owned by residential and small commercial customers. The maximum  
20 award, set at \$2,400, is available to PV systems that are four kilowatts or larger. If  
21 approved at \$3.794/kW, the capacity demand charge for a four kilowatt PV  
22 system would cost the owner \$45.52/kW/year. The owner of a four kW array  
23 installed in 2014 would see the value of that \$2,400 incentive completely negated

1 in 13 years and two months. However, if a solar owner had opted for a five kW  
2 PV array and received a \$2,400 Focus on Energy incentive, it would take only 10  
3 ½ years for the capacity demand charge to fully negate the incentive.

4

5 **Q. What would be the effect of these new charges coupled with the proposal to**  
6 **subject all customer-generators to a monthly netting regime?**

7 A. We Energies proposes to move existing PV system accounts to the COGS-NM  
8 tariff beginning in 2016. As noted earlier, none of those systems had been sized to  
9 the host customer's load with a monthly netting regime in mind. Many of these  
10 systems are sized to match, and in some cases, exceed, the customers' annual  
11 consumption. Beginning in 2016, a significant fraction of their output will be  
12 credited at the avoided cost-based energy rate instead of the customer's retail  
13 energy rate. As mentioned earlier, a system sized to match the customer's annual  
14 usage will produce more kWh in certain months than is consumed on-site. With  
15 those installations, the percentage of total kWh credited at the lower rate would  
16 range between 15% and 20%, resulting in a savings reduction between 10% and  
17 15% annually. When added to the 33% or higher reduction in bill savings caused  
18 by the capacity demand and facilities charges, the overall increase to these  
19 customers' bills would in many cases approach 50%.

20 While a prospective customer-generator could limit the economic harm  
21 from these proposed tariff features by downsizing the PV system to avoid the  
22 crediting of kWh at the avoided cost-based energy rate, existing customer-  
23 generators are unable to effect engineering adjustments once the system is

1 installed and operating. There is no question that this subset of customer-  
2 generators will absorb the greatest amount of economic harm under the new net  
3 metering services.

4

5 **Q. Has WEPCO provided adequate justification for transitioning from annual**  
6 **netting to monthly netting?**

7 A. Certainly not as applied to existing customer-generators, who have already sized  
8 their PV systems to maximize their return based on the tariffs available at the time  
9 of installation. The only way an existing customer-generator could limit the  
10 economic damage from monthly netting is to increase consumption so that it  
11 remains above generation for all 12 months of the year, even though that response  
12 defeats the purpose of investing in equipment intended to yield a steady stream of  
13 savings over time.

14 WEPCO has not provided an estimate of the revenues that such a  
15 transition would capture beginning in 2016. A back-of-the-envelope calculation  
16 would reveal that this number would be a pittance for a utility the size of  
17 WEPCO. If 10% of WEPCO's gross net metered solar generation--an estimated  
18 5,121,000 kWh in 2014, were to be credited at the avoided cost-based energy rate  
19 instead of the retail energy rate, the amount gained by crediting 512,000 kWh at  
20 4.2 cents/kWh instead of 13.9 cents would total close to \$50,000. It's worth  
21 remembering that this embarrassingly paltry sum represents recaptured savings of  
22 about \$25 to \$150 per year from nearly 660 customer-generators who have  
23 already paid for their solar electric systems.



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**Q. Could solar generators avoid these charges by opting for the COGS-NP (non-purchase) service?**

A. Under the proposed COGS-NP service, which credits customers for offsetting energy use at the retail energy rate but does not credit customers at all for any electricity that may be exported to the grid, customer-generators would keep their existing meters and therefore avoid the facilities charge associated with the second meter. However, customers offsetting electricity use with solar or wind systems would still be subject to the \$3.794/kW capacity demand charge, even though their generation does nothing more than offset their energy use.

The COGS-NP tariff is configured to credit customer-sited generation only to the extent it offsets consumption. It is interesting to note that while there are many pathways available to customers to reduce their electricity use, only the COGS-NP tariff carries the additional economic burden of a capacity demand charge. WEPCO’s testimony does not include a rationale for imposing a capacity demand charge on PV systems used for offsetting energy use only. Why does this option warrant a substantial penalty while other pathways to reduced usage are not burdened in this manner? WEPCO does not propose imposing capacity demand charges on non-demand-metered customers whose energy usage has declined in recent years, whether from intentional actions such as swapping out older appliances for more efficient models or from changing life circumstances, such as children leaving the household or extended absences caused by family emergencies elsewhere. If the economic value of an on-site PV system is fully

1 internalized as a result of tariff requirements, then it should not matter to the  
2 utility how the reduction in consumption is achieved. There is no logical  
3 consistency to subjecting pure self-generation to a capacity demand charge if  
4 demand-reducing actions such as substituting ceiling fans for central air-  
5 conditioning are exempt from such a charge. The proposed capacity demand  
6 charge is arbitrary and discriminatory in singling out customers with DG for extra  
7 charges. Given the extremely small amount of revenue it would generate, one can  
8 only conclude that the utility is proposing this charge simply to discourage and  
9 penalize customer generation, which conflicts with Wisconsin's Energy Priorities  
10 law.

11

12 **Q. Are there any other features in WEPCO's filing that will adversely affect the**  
13 **economic return to customers from on-site solar generation?**

14 A. Yes. WEPCO proposes to increase the fixed monthly charges for residential and  
15 small commercial customers while lowering their energy rates from 13.9  
16 cents/kWh to 13.5 cents/kWh, a nearly 3% decrease beginning January 1, 2015.  
17 From that date forward, the economic value of the savings created by the solar  
18 electric system will be cut by 3%.

19

20 **Q. How will the rate redesign proposed for 2015 hurt the solar energy**  
21 **marketplace in WEPCO territory going forward?**

22 A. The rate redesign undermines a central premise supporting the solar marketplace,  
23 which is that as energy costs increase, so too do energy rates. And as customers

1 use more electricity—both demand and energy—which increases costs for load-  
2 serving entities in the mid- to long-term, it is appropriate for utilities to design  
3 their rates to ensure that those customers causing the increased costs pay more of  
4 the increased costs. That has been the long-term policy in Wisconsin (and many  
5 other states), so the reasonable expectation of its continuation provided solar  
6 owners and installers with reliable estimates of a particular system’s economic  
7 performance over time. A massive policy change—such as WEPCO’s proposal  
8 to shift its sunk costs into pro-rata monthly charges rather than according to  
9 demand and energy use that caused WEPCO to incur those costs—depends not  
10 only decades of established practice but the investment expectations of customers,  
11 including solar PV owners.

12 In recent years, a growing number of customer-generators have been able  
13 to acquire financing from credit unions and other sources of capital for their PV  
14 systems. Up until now, these lenders were confident that electric rates would not  
15 decline over the terms of the loans extended to these system owners. However,  
16 should the Commission grant the utilities’ request to socialize energy costs in  
17 Wisconsin by shifting the utility companies’ costs from volumetric rates to per-  
18 customer fixed monthly charges regardless of each customer’s use, it’s highly  
19 likely that lenders will withdraw their capital from this sector, further shrinking  
20 the pool of customers able to pursue a solar energy installation. As a result, We  
21 Energies’ proposal will disproportionately affect lower income individuals and  
22 small businesses.

23

1 **Q. Can you quantify the cumulative economic impacts that would result from**  
 2 **Commission approval of all the elements in WEPCO’s rate filing that pertain**  
 3 **to customer-sited solar generation?**

4 A. Yes. In the tables below I have modeled two different scenarios involving existing  
 5 owners of a five kW PV system installed in 2013. The first scenario assumes that  
 6 the system will generate one-half of the 12,000 kWh consumed by that household  
 7 each year. Under that scenario, all kWh produced by that system would be  
 8 credited at the 2016 retail energy rate. This is the best case scenario for a PV  
 9 system owner under the proposed COGS-NM service.

<b>Five kW system installed in 2013 – output equivalent to 50% annual usage (2016 output - 6000 kWh)</b>	<b>Itemized reduction (2016)</b>	<b>Cumulative reductions (2016)</b>
Gross savings in 2014		\$834
Net savings in 2014		\$834
Deduct 3% decline in 2015-2016 energy rates from 13.9 cents/kWh to 13.5 cents/kWh	\$25	\$809
Deduct capacity demand charge	\$228	\$581
Deduct facilities (metering) charge	\$39	\$542
Net reduction in savings from 2014 to 2016		\$292
Percentage reduction		35%

10

11 In the table below, the PV system supplies 95% of the electricity used by  
 12 this household. Under this assumption, it is highly likely that monthly generation  
 13 totals will exceed monthly consumption totals during the shoulder season months.  
 14 For this exercise, we assumed that 1,000 kWh of the 6,000 kWh produced in 2016

1 would be credited at the lower avoided cost-based energy rate. The results of the  
 2 table below are indicative of what many system owners would actually experience  
 3 if the Commission approved WEPCO's filing without modification.

4

<b>Five kW system installed in 2013 – output equivalent to 95% annual usage (2016 output - 6000 kWh)</b>	<b>Itemized reduction (2016)</b>	<b>Cumulative reduction (2016)</b>
Gross savings in 2014		\$834
Net savings in 2014	0	\$834
Deduct 3% decline in 2015-2016 energy rates	\$25	\$809
Deduct capacity demand charge	\$228	\$581
Deduct facilities (metering) charge (-\$39)	\$39	\$542
Deduct crediting of 1,000 kWh at avoided cost rate (4.2 cents/kWh instead of 13.9 cents/kWh)	\$97	\$445
Net reduction of savings from 2014 to 2016		\$389
Percentage reduction		47%

5

6 It is difficult to exaggerate the chilling effect that WEPCO's proposed  
 7 changes to its net metering service, in tandem with restructured rates, would have  
 8 on the solar market within its territory. That impact is already starting as more  
 9 prospective customers learn how the proposed charges and service modifications  
 10 would undermine the economics of on-site solar. Perhaps the most disturbing  
 11 feature of this proposal is the climate of instability, unreliability, and mistrust it  
 12 will create through abrupt service changes and the imposition of new fees and  
 13 charges, the sum total of which will enable WEPCO to recapture more than one-

1 third of the bill savings currently flowing to customer-generators. Existing  
2 system owners will emerge from this transition feeling harassed and punished,  
3 while prospective system owners will be scared away from pursuing their plans  
4 out of fear that WEPCO may institute even more draconian terms and conditions  
5 in the future. Through its intent to drastically change the established rules of the  
6 game for solar generation, WEPCO is effectively directing solar energy  
7 businesses to find another line of work, as well as putting prospective customers  
8 on notice that serious economic pain is coming their way if they invest in solar.  
9

10 **Q. Is WEPCO's energy valuation for net metering and parallel generation**  
11 **reasonable?**

12 A. Not under closer examination. For example, fuel costs at the 50 MW Rothschild  
13 Generating Station, a biomass cogeneration plant placed in service in late 2013,  
14 have averaged over \$10/MMBtu in 2014, according to the utility's monthly fuel  
15 cost reports (see table below). Rothschild has operated at a 25% capacity factor in  
16 2014, well below what one expects from a baseload plant. Perhaps WEPCO is  
17 limiting generation from Rothschild because of its high fuel costs. Electricity  
18 produced by DG systems and net metered solar systems enable the utility to ramp  
19 down generation at Rothschild, thus lowering the impact of that plant's high fuel  
20 costs on all customers. However, it is unreasonable to compensate parallel  
21 generators at only 4.2 cents when they help minimize production from a plant  
22 whose fuel costs are 2 ½ times as high.  
23

1  
2

<b>Rothschild Biomass Station – Statistics – 2014</b>				
<b>Month</b>	<b>Output (in MWH)</b>	<b>Capacity factor</b>	<b>Fuel price (cents/kWh)</b>	<b>Fuel cost</b>
January	7,013	36%	8.564	\$ 600,613
February	10,771	32%	11.443	\$1,232,522
March	9,383	22%	10.653	\$ 999,573
April	11,007	27%	9.699	\$1,067,611
May	8,468	20%	18.472	\$1,564,213
June	5,507	13%	10.862	\$ 598,177

3

4

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6

7

8

Another high-cost generator in WEPCO's system is Valley, a two-unit 272-MW coal-fired cogeneration plant in downtown Milwaukee. As is plain from the table below, Valley's fuel costs have averaged more than 5 cents/kWh in 2014. Note that Unit 1 was operational at all hours between January 1 and March 31 this year.

<b>Valley Cogeneration Station – Statistics - 2014</b>			
<b>Month</b>	<b>Output (in MWH)</b>	<b>Hours operated</b>	<b>Fuel price (cents/kWh)</b>
January	72,257	744 (Unit 1)	\$5.83
February	70,551	672 (Unit 1)	\$5.41
March	60,141	744 (Unit 1)	\$5.10
April	32,364	610 (Unit 1)	\$5.31
May	50,729	537 (Unit 2)	\$4.94
June	37,222	465 (Unit 1)	\$5.02

9

10 **Q. What is your response to WEPCO's proposed parallel generation service?**

11 A. WEPCO's distributed generation plans include the proposed creation of a direct-  
12 sales service (COGS-DS) for customers with generating capacity equal to or  
13 greater than 300 kilowatts. Under this service, all output from a DG system  
14 would be sold to WEPCO. Those generators who opt for a fixed price for their

1 output would be compensated at the same buyback rate that would be set for  
2 surplus generation produced under the COGS-NM tariff. The proposed buyback  
3 rate is 4.245 cents/kWh.

4 This proposal is unreasonable because it does not fairly compensate DG  
5 systems for the value of their generation. Deficiencies in the proposed rate  
6 include:

- 7 ■ Zero credit given to displacing power plants on WEPCO's generating system  
8 with the highest fuel costs (e.g., Rothschild);
- 9 ■ Zero credit given to the capacity value of the parallel generator's system; and
- 10 ■ Zero credit given to the fuel cost hedging value arising from the use of an  
11 energy source not purchased from another source.

12 At 4.245 cents/kWh the proposed direct-sales rate would not make whole the  
13 fuel costs borne by WEPCO in operating Rothschild or Valley this year during  
14 any of the six months covered by WEPCO's monthly fuel reports. Finally, it's  
15 worth noting that WEPCO could not justify building a new power plant if the sum  
16 total of its return on investment consisted of an energy rate based on average  
17 LMP's and a modest transmission adder.

18 For existing biogas generation owners interconnected to WEPCO, the  
19 proposed rate would not provide enough income to replace the most expensive  
20 components should they fail. If the COGS-DS service is approved, the ability of  
21 the existing six biogas generators to continue producing electricity after their  
22 existing energy sales contracts expire would be uncertain at best. In contrast, there



1 is no lack of certainty over the insufficiency of the COGS-DS tariff to support  
2 new renewable parallel generation.

3

4 **Q. Do you believe that WEPCO's proposed treatment of net metered customers**  
5 **is fair and reasonable?**

6 A. No I do not. The terms of service proposed in CGS-NM and CGS-NP squeeze net  
7 metered solar generators in two ways. First, they do not properly credit solar  
8 generators for the energy they produce during high demand periods when  
9 wholesale energy costs are higher than annual averages, nor do they attribute any  
10 value whatsoever for the generating capacity available at high-demand hours.

11 Nor is any credit extended for the environmental savings from generating  
12 electricity with a clean energy source like solar. Not crediting solar generators for  
13 these attributes that benefits other customers enables WEPCO to come up with an  
14 avoided cost calculation that is less than the production cost of many of its  
15 generators.

16 Second, they overstate the costs associated with serving net metered  
17 customers. Customers who offset a portion of their energy bills with on-site  
18 generation are in no greater need for stand-by generation, to take one example,  
19 than customers who achieve significant energy savings through demand-side  
20 measures. Many of WEPCO's customer generators took advantage of Focus on  
21 Energy demand-side incentives and services to reduce their consumption, which  
22 they undertook in no small part to specify a smaller PV system size, resulting in

1 lower installation costs. Having gone through this process, these customers are  
2 likely to have a lower cost-causation profile than non-solar-owning customers.

3

4 **Q. Do you have any comments on witness Rogers' view that it is necessary to**  
5 **correct the price signals now even though DG customers make up a very**  
6 **small component of WPSC's customer base? (Direct-WEPCO WG-Rogers-**  
7 **54, lns 13-15)**

8 A. We agree with witness Rogers that DG customers constitute a tiny part of  
9 WEPCO's customer base. This may explain why WEPCO has made no attempt to  
10 actually quantify the energy or economic impacts that customer-generators may or  
11 may not impose on other customers, relying instead on conjecture built on faulty  
12 premises. There is no evidence, for example, that the cost to provide distribution  
13 infrastructure for customer-generators as backup is equal to a pro-rata share of all  
14 of WEPCO's costs, which are incurred to provide a different level service to those  
15 customers who provide none of their own needs. The result of an actual analysis  
16 would likely demonstrate that the impact from self-generating customers on other  
17 customers is negligible or nonexistent. Such an analysis would require WEPCO  
18 to identify what it considers to be the relevant costs and benefits of a particular  
19 DG source, something which it hasn't done. Because there are only 452 true net  
20 metered customers in its territory, it may not be even possible to calculate a rate  
21 impact on a utility that sold 25,827,940 MWH of electricity to ultimate customers  
22 in 2013. The amount of any purported impact would pale in comparison to such  
23 items as executive salaries and lobbying. The question the Commission should

1 ask here is whether an unknown (but admittedly negligible) rate impact to other  
2 customers justifies a 35-47% reduction in self-generating customers' expected  
3 economic return. WEPCO's proposal is even more unreasonable when you  
4 consider the fact that it entirely ignores the significant benefits that distributed  
5 generation confer to the electric system and other customers.

6 To show that net metered customer-generators, as a sub-class, impose a  
7 higher cost of service compared to the sum of their payments plus benefits  
8 conferred by them, WEPCO would need to run a detailed cost of service analysis  
9 specific to net metering customers as a subclass. They have not done so.

10 The formulation also assumes that there is no difference in the costs  
11 caused by net metered customer-generators compared with those caused by  
12 customers without net metered generation. While that is certainly not the case,  
13 and WEPCO would not credibly claim that every customer's cost causation per  
14 unit of energy consumption within a class is actually identical, that is the  
15 fundamental but unacknowledged assumption underlying claims of cost-shifting  
16 from net metering customers to others within that class.

17

18 **Q. In your direct testimony in 6690-UR-122 (PSC REF# 190062) and 6690-UR-**  
19 **123 (PSC REF# 213743), you referenced a State of Vermont study on net**  
20 **metering. What has happened since the publication of that study?**

21 A. As stated in my testimony filed in that rate proceeding, the Vermont Public  
22 Service Department issued a report dated January 15, 2013, titled "Evaluation of  
23 Net Metering in Vermont Conducted Pursuant to Act 125 of 2012" (PSC REF#

1 190066). The department was required under statute to determine whether net  
2 metered customers in Vermont are subsidized by other retail electric customers  
3 who do not have net metered generation. It's worth revisiting the report's  
4 concluding paragraph on cross-subsidization.

5 "The analysis presented in the preceding sections indicates that net  
6 metered systems do not impose a significant net cost to ratepayers who are  
7 not net metering participants. Net benefits from solar photovoltaic  
8 systems, which represent nearly 88% of net metered systems, are either  
9 positive or negative depending on the discount rate chosen and whether  
10 the value of non-internalized greenhouse gas emissions are included or not  
11 included respectively. There would be real long-term risk to ratepayers if  
12 decisions were made that assume no increase in the internalization of these  
13 costs of the 20-year analysis period for this study. Impacts on transmission  
14 and distribution infrastructure costs are a significant component of the  
15 value of net-metered systems. Solar PV has a much greater coincidence of  
16 generation with times of peak demand than does wind power; this results  
17 in more net benefits for solar PV than for wind...."  
18

19 Subsequent to the report's issuance, state lawmakers began drafting  
20 legislation to expand net metering in the Green Mountain State. Legislators  
21 worked closely with utility representatives and clean energy industry  
22 representatives to craft a bill that could achieve broad-based support among key  
23 constituencies that net metering legislation would affect. The result was a measure  
24 championed with equal vigor by utilities and clean energy interests. The bill was  
25 approved by both houses, including a unanimous vote in the Senate. Shortly  
26 thereafter, Governor Peter Shumlin enacted a new net metering law that raises the  
27 limit on net metering from 4% of an electric provider's peak load to 15%. All of  
28 the state's electric providers, including Green Mountain Power, supported the  
29 legislation that eventually became Vermont's new net metering law.  
30

1 **Q. Is the solar resource in Vermont substantially different than in areas served**  
2 **by WEPCO?**

3 A. No. The most populous city in WEPCO territory, Milwaukee, is very close in  
4 latitude (42.95) to the largest city in Vermont, Burlington, which is at latitude  
5 44.475. According to the NREL's PVWatts Calculator, a five kW system located  
6 in Milwaukee Mitchell International Airport will produce 6,007 kWh, about 8%  
7 more production than the same system installed in Burlington's airport, which  
8 will produce 5,562 kWh. The same system located at Outagamie County Airport  
9 in Appleton, Wisconsin (latitude 44.25), also in WEPCO territory, would produce  
10 5,613 kWh per year, according to the same program. (See Ex.-RENEW-  
11 Vickerman-1.)

12  
13 **Q. Are there examples of investor-owned utilities outside of Wisconsin that has**  
14 **lowered the barriers to customer-supported solar development in its**  
15 **territory?**

16 A. Yes. Colchester, Vermont-based Green Mountain Power (GMP), Vermont's  
17 largest electric provider, reserves a significant share of its resource portfolio for  
18 net metered solar generation and is commissioning construction of the state's  
19 largest solar array (2.3 MW) on a dormant landfill in Rutland. According to  
20 GMP's web site, "Stafford Hill is part of GMP's plan to create and inspire  
21 construction of enough solar to provide Rutland with the highest installed solar  
22 per capita of any city in the northeast."

1 Below is a roster of solar generating projects located in Rutland. Note that  
2 the projects consist of GMP-owned solar, shared solar and net metered solar.

<b>Name</b>	<b>kW</b>	<b>Status</b>
<u>GMP Creek Path Solar Farm</u>	150	on line
<u>College of St. Joseph Solar Farm</u>	93	on line
<u>Stafford Hill Solar Farm</u>	2500	in progress
<u>Solar Center at Rutland Regional</u>	140	on line
<u>Energy Innovation Center</u>	20	on line
<u>Otter Creek Solar Farm</u>	59	on line
<u>Renewable Education Center</u>	48	on line
Community Solar	145	on line
Customer Net Metering	631	on line

3  
4 In a Burlington Free Press article dated October 22, 2013, Green Mountain  
5 Power president and chief executive Mary Powell stated the following when her  
6 company was honored with a solar energy achievement award:

7 “While many utilities see solar generation as a threat to their business, we  
8 see solar as an opportunity to cost effectively fulfill customer wants and  
9 needs and support new jobs and businesses in our communities. Rather  
10 than fear solar, as many utilities appear to do, we embrace it.”  
11 (PSC REF# 213752)

12  
13 **Q. Are there any Midwest investor-owned utilities that have net metering  
14 policies similar to GMP?**

15 A. Among Midwestern electric providers, the investor-owned utility whose attitudes  
16 on solar and net metering bear the closest resemblance to GMP is Xcel Energy-  
17 Minnesota. In early August, Xcel Energy redesigned its Solar Rewards program,  
18 shifting from up-front capacity-based rebates in favor of a per-kWh adder of eight  
19 cents over a 10-year period. The adder supplements the net metering terms of

1 service between the host customer and Xcel, which apply to PV systems up to 20  
2 kW. GMP also offers a per-kWh adder to its net metered customers, which  
3 amounts to six cents/kWh. These policies do three important things. First, they  
4 provide a payment for generation based on the value the generation provides to  
5 the system as a whole based on where it is located and when it produces (rather  
6 than pretending that it is being generated during all hours and at a distant location  
7 on the transmission system, which is what buyback rates based on annual average  
8 LMPs assume). Second, it provides a sufficient time period of known price  
9 stability so that investment decisions can be determined from a known income  
10 stream. Third, it does not require an up-front capital outlay by the utility;  
11 investment risks and costs are borne by the developers.

12  
13 **Q. What is your response to WEPCO's insistence that the host customer must**  
14 **own the generating unit to qualify for net metering?**

15 A. WEPCO has stated that only customers who own 100% of a distributed  
16 generation system at the time of installation would qualify for net metering. This  
17 restriction would deprive customers of the ability to lease a PV system as opposed  
18 to owning it outright. Many customers who have good-to-excellent site  
19 characteristics for hosting a PV system, and would like that opportunity, cannot  
20 pursue that option because they cannot afford the up-front costs associated with  
21 PV ownership. WEPCO's ownership requirement would effectively restrict  
22 customer deployment of solar generation to relatively affluent individuals and  
23 thriving businesses. This restriction would have an exclusionary effect on

1 nonprofits—e.g., local and state governments, school districts, houses of worship,  
2 and nature centers--who by their very nature cannot take advantage of federal tax  
3 credits.

4           The legal basis for asserting this restriction in a tariff and enforcing it is  
5 unclear. It is Commission’s staff’s view, as expressed in an April 3, 2014, letter  
6 from PSC’s Chief Legal Counsel to Madison Gas & Electric that “a third party  
7 who owns plant or equipment for the purpose of providing electricity to the public  
8 is a ‘public utility ....’” However, the same memo tempers that statement by  
9 noting that that “it is unclear based on the current development of the law whether  
10 joint, temporary ownership of a facility by a third party with a customer would be  
11 considered holding public utility service out ‘to the public’”. (See Ex.-RENEW-  
12 Vickerman-2.) While I am not a lawyer, I understand that the Iowa Supreme  
13 Court has also recently determined that third-party financing of solar PV under a  
14 lease or power purchase agreement does not constitute a public utility service.  
15 Moreover, in discussing whether PSC 119 gives utilities the authority to deny  
16 interconnection to a third party owned system, the same memo states  
17 unequivocally that “the Commission’s rules do not allow an incumbent utility to  
18 refuse to interconnect a distributed generation resource because the utility knows  
19 or has reason to believe that a customer may not own the resource.” Thus, the  
20 legal authority enabling utilities to enforce this kind of restriction is absent from  
21 view. Until this legal question is settled, whether through legislation, a generic  
22 Commission proceeding or a judicial decision with statewide applicability,



1 WEPCO's ownership requirement language should not appear in a net metering  
2 tariff.

3

4 **Q. Do you have any recommendations to the Commission regarding WEPCO's**  
5 **net metering restructuring?**

6 A. WEPCO's request to redesign and impose new charges and restrictions to its net  
7 metering service should be rejected in its entirety. The utility has not  
8 demonstrated that its net metering tariffs, as currently constituted, result in any  
9 measurable economic harm to other customers. It has not demonstrated that there  
10 is a need to impose stand-by charges to net metered customers, nor has it  
11 demonstrated that these customers have the same cost-causation profile as non-net  
12 metered customers to warrant such a punitively high charge. It has failed to  
13 demonstrate why avoided cost-based buyback rates should be set at levels  
14 insufficient for operating some of its own power plants. It has failed to  
15 demonstrate a measurable harm from its current practice of annual true-ups which  
16 would require it to transition to trueing up consumption and output on a monthly  
17 basis. It has also failed to demonstrate why it is necessary, let alone legal, to insist  
18 that customers own their generating equipment. In stark contrast to WEPCO's  
19 filings, RENEW has rigorously quantified the adverse economic impacts that  
20 these proposed changes would inflict on current and prospective customer-  
21 generators from WEPCO's net metering overhaul. But the harm would extend  
22 beyond customer-generators past, present and future to other WEPCO customers  
23 who benefit from the addition of clean generating capacity to the utility system

1           which they don't have to pay for. We also second Witness Karl Rábago's  
2           recommendation that the Commission convene a specifically focused proceeding  
3           to fully address and understand those issues and consequences prior to accepting  
4           any utility proposals for dramatic changes in rate design.

5  
6   **Q.    Does this complete your direct testimony?**

7   **A.    Yes.**