
**SOAH DOCKET NO. 473-17-1764
PUC DOCKET NO. 46449**

**APPLICATION OF SOUTHWESTERN § BEFORE THE STATE OFFICE
ELECTRIC POWER COMPANY FOR § OF
AUTHORITY TO CHANGE RATES § ADMINISTRATIVE HEARINGS**

**CROSS-REBUTTAL TESTIMONY OF
MELISSA WHITED**

**ON BEHALF OF
SIERRA CLUB & DR. LAWRENCE BROUGH**

**Synapse Energy Economics, Inc.
Cambridge, Massachusetts**

May 19, 2017

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Exhibit MW-1: Resume of Melissa Whited

Exhibit MW-2: James Bonbright, *Principles of Public Utility Rates*, Columbia University Press (1961)

Exhibit MW-3: DRG bill impact analysis (prepared by Melissa Whited)

1 **I. INTRODUCTION AND QUALIFICATIONS**

2 **Q. Please state your name, title, and employer.**

3 A. My name is Melissa Whited. I am a Senior Associate at Synapse Energy Economics, Inc.,
4 located at 485 Massachusetts Avenue, Cambridge, MA 02139.

5 **Q. Please describe Synapse Energy Economics.**

6 A. Synapse Energy Economics is a research and consulting firm specializing in electricity
7 and gas industry regulation, planning, and analysis. Our work covers a range of issues,
8 including economic and technical assessments of demand-side and supply-side energy
9 resources; energy efficiency policies and programs; integrated resource planning;
10 electricity market modeling and assessment; renewable resource technologies and
11 policies; and climate change strategies. Synapse works for a wide range of clients,
12 including state attorneys general, offices of consumer advocates, trade associations,
13 public utility commissions, environmental advocates, the U.S. Environmental Protection
14 Agency (EPA), U.S. Department of Energy (DOE), U.S. Department of Justice, the
15 Federal Trade Commission, and the National Association of Regulatory Utility
16 Commissioners. Synapse has over 25 professional staff with extensive experience in the
17 electricity industry. One of my colleagues at Synapse, Rachel Wilson, has already
18 tendered expert testimony on behalf of Sierra Club and Dr. Lawrence Brough in this
19 matter.

20 **Q. Please summarize your professional and educational experience.**

21 A. I have six years of experience in economic research and consulting. At Synapse, I have
22 worked extensively on issues related to utility regulatory models, rate design, policies to

1 address distributed energy resources (DER), and market power. My recent publications
2 and presentations include: a report and webinar on the impacts of fixed charges; a
3 presentation on utility performance incentive mechanisms to the National Governor's
4 Association Learning Lab on New Utility Business Models; a presentation to the Utah
5 Net Energy Metering (NEM) Workgroup on rate design options to address net energy
6 metering; and a report on benefit-cost analysis for DERs filed in New York's Reforming
7 the Energy Vision proceeding. I have assisted in developing testimony or comments in
8 decoupling proceedings in Hawaii, Maine, and Nevada, and have analyzed rate design
9 issues pertaining to DERs for proceedings in New York, Utah, Nevada, Wisconsin,
10 Hawaii, and Maryland.

11 I hold a Master of Arts in Agricultural and Applied Economics and a Master of Science
12 in Environment and Resources, both from the University of Wisconsin-Madison. I have a
13 Bachelor of Arts from Southwestern University in Georgetown, Texas. Prior to rejoining
14 Synapse, I published in the *Journal of Regional Analysis and Policy* regarding the
15 economic impacts of water transfers in Texas, analyzed state water efficiency policies
16 while at the Wisconsin Public Service Commission, and conducted econometric analyses
17 of energy efficiency cost-effectiveness. I also testified before the Wisconsin Senate
18 Committee on Clean Energy regarding the economic impacts of clean transportation
19 options, and presented to the Wisconsin Public Service Commission regarding the state's
20 electricity demand response programs and potential.

21 The foregoing and additional background are detailed in my resume, attached hereto as
22 Exhibit MW-1.

1 **Q. Have you testified before the Public Utility Commission of Texas previously?**

2 A. No.

3 **Q. On whose behalf are you testifying in this case?**

4 A. I am testifying on behalf of joint intervenors the Sierra Club and Dr. Lawrence Brough.

5 **Q. What is the purpose of your testimony?**

6 A. The purpose of my testimony is to address the direct testimony provided in this matter by
7 William B. Abbott (“Abbott Testimony”), staff member of the Public Utility Commission
8 of Texas (“PUCT” or the “Commission”), regarding Southwestern Electric Power
9 Company’s (“SWEPCO” or the “Company”) proposed revisions to its Distributed
10 Renewable Generation (“DRG”) tariff. Specifically, I address Mr. Abbott’s unusual
11 recommendation that the Company’s proposed DRG tariff revisions apply not only to
12 new DRG customers but also to all those customers who currently take service under the
13 DRG tariff—in other words, to prohibit SWEPCO’s intention to grandfather existing
14 ratepayers who already invested in DRG based on the terms and rates of the existing
15 DRG tariff.

16 **II. SUMMARY OF CONCLUSIONS AND RECOMMENDATIONS**

17 **Q. Please summarize your testimony.**

18 A. I disagree with Mr. Abbott’s recommendation to prevent SWEPCO from grandfathering
19 current DRG customers into the existing tariff, for the following reasons:

-
- 1 1) Failure to grandfather customers would violate at least two widely-accepted
2 principles of rate design: the principle of gradualism, and the principle of
3 public acceptability and fairness.
- 4 2) SWEPCO has not established that DRG customers are being overpaid, as the
5 Company only considered average day-ahead energy prices in developing its
6 avoided cost estimates, which fails to account for many of the benefits—to
7 non-DRG customers as well as DRG customers—associated with distributed
8 generation.
- 9 3) The effect on non-DRG ratepayers of grandfathering the DRG tariff for
10 existing customers would be *de minimis* and practically unnoticeable, due to
11 the low penetration of distributed renewable generators in SWEPCO’s
12 territory, whereas the effect on DRG customers of not grandfathering would,
13 conversely, be substantial (and inequitable).

14 My testimony refrains from opining, meanwhile, on the purely legal questions—raised in
15 and disputed among the respective direct testimonies of Mr. Abbott,¹ Shawna Jones²
16 (SWEPCO), and William Marcus³ (Office of Public Utility Counsel (“OPUC”)), at
17 least—of whether 16 T.A.C. § 25.242 or any related statutory provision requires
18 SWEPCO’s proposed DRG revision and/or prohibits grandfathering, as a matter of law.

¹ See Direct Testimony of William B. Abbott at 19:1-15 (May 2, 2017).

² See Direct Testimony of Shawna G. Jones at 24:3-14 (Dec. 2016).

³ See Direct Testimony of William P. Marcus at 48:3–49:3 (Apr. 25, 2017).

1 **Q. Please summarize your recommendations.**

2 A. I recommend that the Commission allow customers currently taking service under
3 SWEPCO’s DRG tariff, as well as any customers who apply to interconnect prior to the
4 Commission’s decision in this proceeding, to maintain service under the current tariff and
5 thus not be subject to SWEPCO’s proposed DRG tariff revisions. I conclude that
6 grandfathering customers on current tariffs is just and reasonable, and an equitable
7 approach to ratemaking. Customers who invested in on-site renewable resources in
8 reliance on the current DRG tariff should not have the “rules of the game” changed on
9 them suddenly—a move that would threaten those consumers with financial harm from
10 being unable to recuperate their initial investment made in faith on the Commission’s
11 earlier approval of the existing DRG tariff.

12 I also recommend that a full assessment of avoided costs associated with DRG
13 generation—including line losses and avoided capacity costs (*e.g.*, avoided generation,
14 transmission, or distribution expenses)—be conducted prior to any revision of the DRG
15 tariff.

16 **III. SUMMARY OF DIRECT TESTIMONY REGARDING DISTRIBUTED**
17 **RENEWABLE GENERATION**

18 **A. Summary of SWEPCO’s Proposal Regarding the DRG Tariff**

19 **Q. Please summarize SWEPCO’s current DRG tariff.**

20 A. Under the existing DRG tariff, in a word, customers with on-site generation are billed for
21 their electricity consumption net of their electricity generation at the rates and charges
22 under the Company’s standard rate schedule applicable to the customers. The customer’s

1 generated electricity is therefore valued at the full retail rate of electricity. If the customer
2 generates more electricity than it consumes in a month, the excess generation is carried
3 over and credited towards future billing periods.⁴

4 **Q. Please summarize SWEPCO’s proposed revisions to the DRG tariff.**

5 A. SWEPCO proposes to revise the DRG tariff so that customers’ generated electricity is
6 valued at the Company’s avoided cost of electricity. SWEPCO also proposes to stop
7 carrying over the customer’s excess generation credits to future billing periods. SWEPCO
8 proposes these revisions to better conform, supposedly, to the PUC’s rules (as the
9 Company understands them) regarding the purchase of customer-owned generation
10 outflows.⁵

11 **Q. Does SWEPCO propose to apply the revisions to customers who currently take
12 service on the DRG tariff?**

13 A. No. SWEPCO’s proposal would only apply to new DRG customers. The Company does
14 not propose to apply the tariff revisions to the customers currently on the DRG tariff (47
15 customers as of December 2016), thereby “grandfathering” those customers.⁶

16 **B. Summary of PUC Staff and OPUC Testimony Regarding DRG**

17 **Q. Did Commission staff provide testimony in this proceeding?**

18 A. Yes. On May 2, 2017, William Abbott, PUC staff member, filed testimony regarding
19 SWEPCO’s proposed rate changes.

⁴ See Direct Testimony of Shawna Jones at 22:17–23:19.

⁵ See Direct Testimony of Shawna Jones at 23:20–24:20 & Exhibit SGJ-3.

⁶ See Direct Testimony of Shawna Jones at 24:15-24.

1 **Q. Please summarize Mr. Abbott’s testimony regarding SWEPCO’s proposed revisions**
2 **to the DRG tariff.**

3 A. Mr. Abbott supports the proposed DRG tariff revisions and finds them reasonable except
4 for the proposal to grandfather customers currently on the existing DRG tariff. Mr.
5 Abbott recommends that SWEPCO’s proposal to grandfather current customers be
6 rejected, such that the proposed new tariff revisions apply to existing as well as future
7 DRG customers.

8 **Q. Why does Mr. Abbott argue that existing customers should be forced to take service**
9 **on the new tariff?**

10 A. Mr. Abbott argues that SWEPCO’s current DRG tariff “is inconsistent with cost
11 causation” because the credit includes “transmission capacity costs, distribution capacity
12 costs, and firm generation capacity costs in addition to the energy costs.”⁷ Mr. Abbott
13 contends that this essentially represents an over-payment that then must be recovered
14 from other ratepayers.

15 **Q. Did OPUC staff provide testimony in this proceeding?**

16 A. Yes. On April 25, 2017, William Marcus provided direct testimony on behalf of the
17 OPUC regarding SWEPCO’s proposed rate changes.

⁷ Direct Testimony of William Abbott, at 18:3-6; *see also id.* at 19:11-14 (“SWEPCO’s current practice involves purchasing significant portions of DRG-produced energy at the full retail rate, which is significantly above the avoided cost of energy. The costs of these purchases are eventually passed on to other ratepayers. This practice is not just and reasonable....”).

1 **Q. Please summarize Mr. Marcus’s testimony regarding SWEPCO’s proposed**
2 **revisions to the DRG tariff.**

3 A. Mr. Marcus recommends no change to SWEPCO's tariff. He argues that SWEPCO’s
4 proposal to value customer generation at avoided costs is not required by 16 T.A.C.
5 § 25.242(d)(1) as SWEPCO contends, because 16 T.A.C. § 25.242(d)(1) does not mandate
6 payments based on short-run avoided costs but instead allows other rates or payments.
7 Mr. Marcus highlights that SWEPCO’s proposed approach is inconsistent with its tariffs
8 in other states that it serves. Mr. Marcus also argues that SWEPCO has not evaluated the
9 impact of its proposed change on the distributed generation industry or solar customers
10 and argues that SWEPCO’s proposed change is likely to reduce future distributed
11 generation installations in Texas.⁸

12 **IV. DISCUSSION AND RECOMMENDATIONS**

13 **A. Prohibiting Grandfathering Would Be Contrary to Widely-Accepted Principles**
14 **of Rate Design**

15 **Q. What accepted ratemaking principles should guide the designing of rates, as a**
16 **general matter?**

17 A. In the seminal work *Principles of Public Utility Rates* (1961), Professor James Bonbright
18 discusses eight key criteria for a sound rate structure. These criteria are as follows:

- 19 1. The related, “practical” attributes of simplicity, understandability, public
20 acceptability, and feasibility of application.
21 2. Freedom from controversies as to proper interpretation.

⁸ Direct Testimony of William Marcus, at 48:14-50:11. Mr. Marcus references a report that I co-authored, which supports his conclusions. I provide additional analysis regarding the impacts of SWEPCO’s proposed rate design below.

-
- 1 3. Effectiveness in yielding total revenue requirements under the fair-return
2 standard.
- 3 4. Revenue stability from year to year.
- 4 5. Stability of the rates themselves, with a minimum of unexpected changes
5 seriously adverse to existing customers.
- 6 6. Fairness of the specific rates in the apportionment of total costs of service among
7 the different customers.
- 8 7. Avoidance of “undue discrimination” in rate relationships.
- 9 8. Efficiency of the rate classes and rate blocks in discouraging wasteful use of
10 service while promoting all justified types and amounts of use:
- 11 (a) in the control of the total amounts of service supplied by the company;
12 (b) in the control of the relative uses of alternative types of service.⁹

13 **Q. Are those principles widely recognized and used by public utilities commissions?**

14 A. Yes. The principles listed above have been recognized for many years across the nation.

15 **Q. Consistent with those principles, has SWEPCO proposed to grandfather customers**
16 **currently taking service on the existing DRG tariff?**

17 A. Yes, SWEPCO specifically requests that customers be grandfathered; SWEPCO does not
18 request that its proposed DRG tariff revisions apply to existing customers. Implicitly,
19 then, SWEPCO recognizes that grandfathering is appropriate and a fair approach to

⁹ James Bonbright, *Principles of Public Utility Rates*, Columbia University Press at 291 (1961), attached hereto as Exhibit MW-2.

1 ratemaking for current customers. Rather, it is PUCT Staff witness Mr. Abbott who
2 recommends that existing customers be subject to the proposed tariff modifications.

3 **Q. Would forcing existing customers to transition to a new DRG tariff, after having**
4 **chosen to invest in DRG in reliance on the existing tariff, comport with widely**
5 **accepted rate design principles?**

6 A. No, absolutely not. A failure to grandfather customers would violate two important
7 principles of rate design: (1) continuity of rates, also referred to as “gradualism,” and
8 (2) the “practical” attributes of public acceptability by being perceived as unfair.

9 **Q. Please describe how failure to grandfather existing customers would violate the**
10 **principle of gradualism.**

11 A. The principle of gradualism requires that rate changes be made gradually, “with a
12 minimum of unexpected changes seriously adverse to existing customers.”¹⁰ By contrast,
13 SWEPCO’s proposed tariff revision reduces the DRG compensation rate by
14 approximately 50 percent, which would lead to a substantial increase in existing DRG
15 customers’ monthly electricity bills.¹¹ For example, a residential customer with a 7 kW
16 system who consumes half of their generation on site and exports the rest would see their
17 bill increase by approximately 30 percent (\$130 annually) under the new rates.¹²

¹⁰ Bonbright, *Principles of Public Utility Rates*, at 291.

¹¹ See SWEPCO Response to Sierra Club RFI No. 2-7.a (Apr. 6, 2017) (providing avoided costs in the range of approximately 1.5 cents per kWh to approximately 3 cents per kWh based on 2016 SPP average day-ahead market prices). According to SWEPCO’s current residential tariff (Sheet No. IV-1), the current residential kilowatt-hour charge ranges from 3.38 cents per kWh (Nov-Apr over 600 kWh) to 5.88 cents per kWh (May-Oct). SWEPCO’s current tariff is available at <https://www.swepco.com/global/utilities/lib/docs/ratesandtariffs/Texas/TexasRateseffectivecycle1April201409-25-15.pdf>.

¹² This computation, illustrated in the workbook provided as Exhibit MW-3 hereto, is based on current SWEPCO residential rates; DRG export compensation rates provided in response to Sierra Club RFI 2-7 to SWEPCO; the

1 **Q. Please explain how failure to grandfather existing customers would violate the**
2 **principle of public acceptability.**

3 A. DRG customers have invested significant financial resources¹³ in on-site generation
4 capabilities based on the current DRG tariff, which was previously approved by the
5 Commission. Significant changes to the tariff—such as reducing the compensation by
6 approximately 50 percent, as proposed—would simply be unfair to existing customers.
7 Texas families and businesses who decided to invest their personal financial resources
8 based on an economic calculation that was sensible and affordable under a particular
9 Commission-approved tariff ought to be able to rely on the continuity of that tariff.

10 **Q. How have other states addressed grandfathering in the context of net energy**
11 **metering tariffs?**

12 A. States typically allow grandfathering in one form or another vis-à-vis net energy metering
13 tariffs. As recently reported in *Fortune*, “while solar rates around the U.S. are being
14 reexamined by state agencies, few regulators have actually changed the rates for existing

U.S. Department of Energy’s residential customer load profile for Lufkin, TX, available at
<http://en.openei.org/datasets/files/961/pub/EPLUS_TMY2_RESIDENTIAL_BASE/USA_TX_Lufkin.722446_TMY2.csv>; and solar generation data for a 7 kW system for Longview Gregg County, TX, available at
<<http://pvwatts.nrel.gov/pvwatts.php>>.

¹³ According to EIA data for SWEPCO, the average residential solar photovoltaic (“PV”) installation size is approximately 7 kW. Recently-reported median installed residential prices for PV in Texas are approximately \$3.40 per watt. After the 30 percent federal tax credit, this translates to approximately \$17,000 for a typical residential solar PV system in SWEPCO’s territory. See Form EIA-861M, available at <<https://www.eia.gov/electricity/data/eia861m/xls/f8262017.xlsx>>; Galen Barbose & Naïm Darghouth, *Tracking the Sun IX: The Installed Price of Residential and Non-Residential Photovoltaic Systems in the United States*, at Figure 18, Lawrence Berkeley National Lab (2016), available at <<https://emp.lbl.gov/publications/tracking-sun-ix-installed-price>>.

1 solar customers.”¹⁴ Examples of grandfathering for existing net energy metering
2 customers include California,¹⁵ Arizona,¹⁶ Hawaii,¹⁷ and Wisconsin,¹⁸ at the least.

3 **Q. Why do states typically allow grandfathering for net energy metering tariffs?**

4 A. One chief reason grandfathering is done is because failure to grandfather existing
5 customers is widely viewed as economically unfair to the customers who already
6 installed on-site generation.

7 For instance, when California ruled in favor of grandfathering, the Public Utilities
8 Commission of California stated that it was

9 persuaded that customers who invest in renewable distributed generation
10 systems and participate in existing [net energy metering] tariffs should at
11 least have an opportunity to recoup their initial investment in distributed
12 renewable generation. In addition, we find that adopting a transition period
13 that denies customer-generators the opportunity to realize their expected
14 benefits would not be in the public interest, to the extent that it could

¹⁴ Katie Fehrenbacher, *Why Nevada Brought Back Favorable Rates for Existing Solar Customers*, Fortune (Sep 16, 2016), available at <<http://fortune.com/2016/09/16/nevada-solar-grandfathering/>>.

¹⁵ Public Utilities Commission of the State of California, *Decision Establishing a Transition Period Pursuant to Assembly Bill 327 for Customers Enrolled in Net Energy Metering Tariffs*, Rulemaking 12-11-005, Decision 14-03-041, at 20 (Mar. 27, 2014), available at <<http://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M089/K386/89386131.PDF>>.

¹⁶ Arizona Corporation Commission, *In the Matter of the Commission's Investigation Value and Cost of Distributed Generation*, Docket No. E-00000J-14-0023, Decision No. 75859, at 156 (Jan. 3, 2017), available at <<http://docket.images.azcc.gov/0000176114.pdf>>.

¹⁷ Public Utilities Commission of the State of Hawaii, *In the Matter of Public Utilities Commission Instituting a Proceeding to Investigate Distributed Energy Resource Policies*, Docket No. 2014-0192, Decision and Order No. 33258, at 164 (Oct. 12, 2015), available at <<http://dms.puc.hawaii.gov/dms/DocumentViewer?pid=A1001001A15J13B15422F90464>>.

¹⁸ Public Service Commission of Wisconsin, *Application of Madison Gas and Electric Company for Authority to Change Electric and Natural Gas Rates*, Final Decision, 3270-UR-120, at 50 (Dec. 23, 2014), available at <<http://www.repowermadison.org/wp-content/uploads/2014/12/final-order-from-PSC-on-MGE-Scheme.2014-12-23.pdf>>.

1 undermine regulatory certainty and discourage future investment in
2 renewable distributed generation.¹⁹

3 To the same end, the Arizona Corporation Commission clarified that its decision to
4 grandfather existing customers was

5 not intended to shield customers with DG systems from generally applicable
6 rate design changes, such as changes for the basic service charge. It is,
7 instead, intended to preserve the expectations that customers with DG
8 systems may have relied upon when they chose to adopt DG technology.²⁰

9 **Q. Has any state ultimately prohibited grandfathering for net energy metering tariffs?**

10 A. Not to my knowledge, no. When a utility or regulatory body has initially required or
11 proposed to require existing DRG customers to move to a new rate, it has generated
12 significant controversy and negative press. A prominent example is Nevada.

13 **Q. Please briefly explain the history of net metering in Nevada.**

14 A. In July 2015, NV Energy²¹ filed an application for approval of new net energy metering
15 tariffs with the Public Utilities Commission of Nevada (“Nevada PUC”).²² In February

¹⁹ See Public Utilities Commission of the State of California, *Decision Establishing a Transition Period Pursuant to Assembly Bill 327 for Customers Enrolled in Net Energy Metering Tariffs*, Rulemaking 12-11-005, Decision 14-03-041, at 20 (Mar. 27, 2014), available at <http://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M089/K386/89386131.PDF>.

²⁰ Arizona Corporation Commission, *In the Matter of the Commission’s Investigation Value and Cost of Distributed Generation*, Docket No. E-00000J-14-0023, Decision No. 75859, at 156 (Jan. 3, 2017), available at <http://docket.images.azcc.gov/0000176114.pdf>.

²¹ Nevada Power Company and Sierra Pacific Power Company d/b/a NV Energy.

²² See Nevada Power Company d/b/a NV Energy, *Application of Nevada Power Company D/B/A NV Energy for Approval of a Cost-Of-Service Study and Net Metering Tariffs*, Docket No. 15-07041, Original Filing (Jul. 31, 2015), available at http://pucweb1.state.nv.us/PDF/AxImages/DOCKETS_2015_THRU_PRESENT/2015-7/4399.pdf; Sierra Pacific Power Company d/b/a NV Energy, *Application of Sierra Pacific Power Company d/b/a NV Energy for Approval of a Cost-of-Service Study and Net Metering Tariffs*, Docket No. 15-07042, Original Filing (Jul. 31, 2015), available at http://pucweb1.state.nv.us/PDF/AxImages/DOCKETS_2015_THRU_PRESENT/2015-7/4402.pdf.

1 2016, the Nevada PUC issued a final order that approved the application with
2 modifications, and specifically did not allow grandfathering for existing net energy
3 metering customers, but instead allowed for a gradual transition to a revised rate structure
4 for all NEM customers.²³

5 **Q. How was the Nevada PUC’s decision received by stakeholders and the public?**

6 A. Following the Nevada PUC’s February 2016 order, customers, politicians, and others
7 widely criticized the decision and advocated for grandfathering. The case gained
8 publicity nationwide, and was extensively reported on by high-profile publications
9 including articles in *Fortune*, *USA Today*, and others. As part of the backlash:

- 10 • the Nevada PUC was sued by TASC (a solar advocacy group),²⁴
- 11 • a class-action lawsuit was filed against NV Energy,²⁵
- 12 • customers organized protests,²⁶ and
- 13 • solar developers exited the state, causing substantial job losses.²⁷

²³ Public Utilities Commission of Nevada, Modified Final Order, *Application of Nevada Power Company D/B/A NV Energy for Approval of a Cost-Of-Service Study and Net Metering Tariffs*, Docket No. 15-07041, and *Application of Sierra Pacific Power Company d/b/a NV Energy for Approval of a Cost-of-Service Study and Net Metering Tariffs*, Docket No. 15-07042, at 152-62 (Feb. 12, 2016), available at http://pucweb1.state.nv.us/PDF/AxImages/DOCKETS_2015_THRU_PRESENT/2015-7/9692.pdf.

²⁴ Krysti Shallenberger, *TASC sues Nevada PUC to overturn net metering decision*, Utility Dive (Mar. 22, 2016), available at <http://www.utilitydive.com/news/tasc-sues-nevada-puc-to-overturn-net-metering-decision/416087/>.

²⁵ Katie Fehrenbacher, *Angry Nevada Solar Customers Sue Over New Fees*, *Fortune* (Jan 19, 2016), available at <http://fortune.com/2016/01/19/nevada-solar-battle-lawsuit/>.

²⁶ Katie Fehrenbacher, *Nevada’s New Solar Feed Have People Furious*, *Fortune* (Jan 14, 2016), available at <http://fortune.com/2016/01/14/nevada-solar-battleground/>.

1 In addition, politicians ranging from Senate Minority Leader Harry Reid to Governor
2 Sandoval became involved in the debate. Senate Minority Leader Harry Reid stated,
3 “Left unchanged, the repercussions of this decision will continue to be a black mark on
4 Nevada’s reputation and will imperil job creation and innovation in the Silver State....
5 The need for Nevada to get this policy correct is more pressing than ever.”²⁸

6 In view of that backlash over the unfairness to existing DRG customers, Governor Brian
7 Sandoval of Nevada issued Executive Order 2016-04, initiating the New Energy Industry
8 Task Force to come to a resolution.²⁹

9 **Q. What was the result of the Governor’s Task Force?**

10 A. The task force ultimately recommended grandfathering for 20 years, stating that such an
11 approach “will provide a reasonable amount of time to recoup the investment of these
12 systems.”³⁰

13 **Q. What was the outcome of the lawsuit brought against the Nevada PUC?**

14 A. The district court ultimately overturned the higher rates for existing rooftop solar
15 customers approved by the Nevada PUC, finding that the proposal to reduce net metering

²⁷ Krysti Shallenberger, *Sunrun exists Nevada after net metering decision*, Utility Dive (Jan 7, 2016), available at <http://www.utilitydive.com/news/sunrun-exits-nevada-after-net-metering-decision/411728/>.

²⁸ Jason Hidalgo, *Nevada regulators unanimously approve rooftop solar grandfathering deal*, USA Today (Sept. 13, 2016, updated Sept. 16, 2016), available at <https://www.usatoday.com/story/money/business/2016/09/13/nv-energy-solarcity-deal-grandfather-residential-rooftop-solar-customers/90306788/>.

²⁹ Nevada Governor Brian Sandoval, Executive Order 2016-04 (2014), available at http://gov.nv.gov/News-and-Media/Executive-Orders/2016/EO_-2016-04-New-Energy-Task-Force/.

³⁰ New Energy Industry Task Force, Final Recommendations (Sept. 30, 2016), available at [http://energy.nv.gov/uploadedFiles/energynvgov/content/Programs/NEITF%20Final%20Recommendations\(1\).pdf](http://energy.nv.gov/uploadedFiles/energynvgov/content/Programs/NEITF%20Final%20Recommendations(1).pdf).

1 compensation and increase fixed charges for existing rooftop solar customers was a
2 “denial of fairness and due process through inadequate notice.”³¹

3 **Q. How was the grandfathering debate finally resolved?**

4 A. In July 2016, NV Energy, Nevada PUC staff, the state’s consumer advocate, and
5 SolarCity submitted a settlement agreement to the Nevada PUC for review and approval
6 that established separate rates for grandfathered private generation customers. The
7 Nevada PUC approved the settlement in September 2016, thereby instituting
8 grandfathering for NEM customers in the state of Nevada, putting an end to a year of
9 heated debate.³²

10 **Q. Is the Nevada experience relevant to Texas?**

11 A. Yes. The Nevada experience demonstrates that failure to grandfather existing customers
12 is widely regarded as unfair to customers, in contravention of accepted rate design
13 principles, and would likely generate significant controversy.

³¹ *Vote Solar v. Pub. Utils. Comm’n of Nevada* (Nev. 1st Dist.), Order at 12 (Sept. 12, 2016), available at http://earthjustice.org/sites/default/files/files/NEM%20Appeal%20Decision_0.pdf; see also Peter Maloney, *Nevada court overturns fixed charges, lower net metering rates for existing solar customers*, Utility Dive (Sept. 15, 2016), available at <http://www.utilitydive.com/news/nevada-court-overturns-fixed-charges-lower-net-metering-rates-for-existing/426302/>.

³² Public Utilities Commission of Nevada, *Application of Nevada Power Company d/b/a NV Energy filed under Advice Letter No. 466 to revise Tariff No. 1-B to modify Net Metering Rider-A Schedule NMR-A to establish separate rates for grandfathered private generation customers*, Docket No. 16-07028, and *Application of Sierra Pacific Power Company d/b/a NV Energy filed under Advice Letter No. 585-E to revise Tariff No. 1 to modify Net Metering Rider-A Schedule NMR-A to establish separate rates for grandfathered private generation customers*, Docket No. 16-07029, Order (Sept. 16, 2016), available at http://pucweb1.state.nv.us/PDF/AxImages/DOCKETS_2015_THRU_PRESENT/2016-7/15119.pdf.

1 **B. It Has Not Been Shown that DRG Customers Are Being Over-compensated**

2 **Q. Why does Mr. Abbott conclude that DRG customers are being overcompensated on**
3 **the existing DRG tariff?**

4 A. Mr. Abbott compares SWEPCO’s full retail energy rate to the avoided cost of energy and
5 concludes that, because the retail rate is greater than the avoided cost of energy, the
6 current DRG tariff overpays DRG customers for their energy production.³³

7 **Q. Has SWEPCO estimated the avoided cost of energy for the purposes of**
8 **compensating DRG customers?**

9 A. Yes. The Company proposes to compensate DRG customers at the average Southwest
10 Power Pool (“SPP”) day-ahead nodal market price, which in 2016 was approximately
11 2.5 cents per kilowatt-hour.³⁴

12 **Q. Do average day-ahead SPP energy market prices accurately reflect the avoided costs**
13 **provided by DRG customers?**

14 A. No. Distributed generation can provide a host of other benefits—including economic
15 benefits to other, non-DRG-participating customers—ranging from avoided line losses to
16 avoided capacity.³⁵ By way of illustration, when DRG customers’ generation reduces
17 system or local peak demand, that helps to avoid the need for additional generation,

³³ Direct Testimony of William Abbott at 18.

³⁴ SWEPCO Response to Sierra Club RFI No. 2-7.

³⁵ The *NARUC Manual on Distributed Energy Resources Rate Design and Compensation* lists 12 impacts that are typically considered when determining the value of distributed energy resources. See NARUC Staff Subcommittee on Rate Design, *NARUC Manual on Distributed Energy Resources Rate Design and Compensation* (Nov. 2016), available at <pubs.naruc.org/pub/19FDF48B-AA57-5160-DBA1-BE2E9C2F7EA0>. An example of a recent value of solar study is Melissa Whited et al., *Distributed Solar in the District of Columbia: Policy Options, Potential, Value of Solar, and Cost-Shifting*. *Synapse Energy Economics* (April 2017), available at <<http://www.synapse-energy.com/project/distributed-generation-potential-value-and-policies-washington-dc>>.

1 transmission, and/or distribution capacity investments—costly investments that all
2 ratepayers would otherwise have to bear.³⁶

3 **Q. Has the Company acknowledged that DRG customers can provide benefits other**
4 **than avoided energy?**

5 A. Yes. In response to Arkansas Public Service Commission questions in December 2016,
6 SWEPCO stated that “a net-metered customer has the potential to reduce their
7 contribution to system peak load, which results in a need for less capacity to serve that
8 customer.”³⁷ SWEPCO also noted that it includes a minimal level of net metered capacity
9 in its planning.³⁸

10 **Q. Should such avoided costs be considered when setting DRG rates in Texas?**

11 A. Yes. In fact, 16 T.A.C. § 25.242(i)(3) states that a variety of factors should be considered
12 when nonfirm power is purchased from qualifying facilities, including capacity costs and
13 line losses.

³⁶ For example, Austin Energy’s Residential Value of Solar Rider estimates the value of distributed solar by calculating the estimated avoided cost of energy, avoided cost of natural gas plant O&M, avoided cost of generation capacity, estimated savings in transmission and distribution costs, and avoided environmental compliance costs. Austin Energy’s value of solar assessment has ranged from \$0.097/kWh to \$0.128/kWh. See City of Austin, *Value of Solar Rider* (Nov 2016) available at <http://austinenenergy.com/wps/wcm/connect/c6c8ad20-ee8f-4d89-be36-2d6f7433edbd/ResidentialValueOfSolarRider.pdf?MOD=AJPERES>; Nic Jones and Norris, Ben. *The Value of Distributed Solar Electric Generation to San Antonio* (March 2013), available at <http://www.solarsanantonio.org/wp-content/uploads/2013/04/Value-of-Solar-at-San-Antonio-03-13-2013.pdf>.

³⁷ SWEPCO response to OPUC RFI 5-7, Attachment 1 at 7 (Mar. 16, 2017).

³⁸ SWEPCO response to OPUC RFI 5-7, Attachment 1 at 7.

1 **Q. Has the Company proposed to include or recognize such benefits in its revised DRG**
2 **tariff?**

3 A. No. The Company has only proposed to credit DRG customers only at the avoided costs
4 of energy based on SPP day-ahead market prices,³⁹ thus skewing the tariff by failing to
5 cognize other, systemic benefits conferred by the DRG customers' investments.

6 **Q. Does the Company's existing DRG tariff overpay DRG customers?**

7 A. The Company has failed to analyze or quantify avoided costs other than day-ahead
8 energy costs, as discussed herein. Without such analysis, it cannot be determined whether
9 the current DRG tariff results in overpayment to DRG customers, as Mr. Abbott asserts.

10 **Q. Could benefits accrue to non-DRG customers from the renewable energy generated**
11 **by DRG customers?**

12 A. Yes. Renewable resources can benefit all customers, not just the customers who have
13 installed renewable technology. As noted above, distributed generation can provide a
14 wide range of benefits to the entire electric system by reducing distribution costs,
15 transmission costs, purchases from wholesale electricity markets, and environmental
16 compliance costs. These benefits put downward pressure on electricity rates—for
17 everyone—and will reduce, eliminate, or even outweigh any cost-shifting that might
18 otherwise occur as a result of distributed generation.⁴⁰

³⁹ SWEPCO response to Sierra Club 2-7.

⁴⁰ See, e.g., Melissa Whited et al., *Distributed Solar in the District of Columbia: Policy Options, Potential, Value of Solar, and Cost-Shifting*, Synapse Energy Economics (April 2017), available at <<http://www.synapse-energy.com/sites/default/files/Distributed-Solar-in-DC-16-041.pdf>>; Tim Woolf et al., *Show Me the Numbers: A Framework for Balanced Distributed Solar Policies*, Synapse Energy Economics for Consumers Union (Nov. 2016), available at <http://www.synapse-energy.com/sites/default/files/Show-Me-the-Numbers-16-058_0.pdf>.

1 **C. Continuation of the Current DRG Tariff Would Have a *De Minimis* Impact on Non-**
2 **DRG Customers**

3 **Q. What is the impact on non-DRG customers of current DRG customers?**

4 A. There were only 47 customers currently on SWEPCO's DRG tariff, including 36
5 residential, two general service, and nine lighting and power customers, as of December
6 2016.⁴¹ Meanwhile, SWEPCO had approximately 184,600 customers in Texas, 149,000
7 of which were residential customers.⁴² That means that only about 0.024 percent of
8 residential customers are currently on SWEPCO's DRG tariff. There are so few
9 customers currently on SWEPCO's DRG tariff that the impact of these customers on
10 other ratepayers would be essentially nil. Thus, non-DRG customers would be unlikely
11 to notice any rate or bill impacts if current DRG customers are grandfathered.

12 Conversely, current DRG customers would experience significant negative bill impacts if
13 grandfathering were disallowed. Therefore, weighing the potential respective
14 hardships—or really, weighing an effective non-hardship (on non-DRG customers) in
15 one scenario versus a significant hardship (on DRG customers) in the other—militates
16 towards approving SWEPCO's proposal to grandfather current DRG customers.

⁴¹ Direct Testimony of Shawwna Jones at 24:16-19.

⁴² U.S. Energy Information Administration, Form EIA-861M (formerly EIA-826) detailed data, available at
<<https://www.eia.gov/electricity/data/eia861m/xls/f8262016.xls>>.

1 **V. SUMMARY OF RECOMMENDATIONS**

2 **Q. What are your recommendations?**

3 A. I recommend that the Commission allow customers who currently take service under
4 SWEPCO's existing DRG tariff, as well as any who may apply to interconnect prior to
5 the Commission's decision in this proceeding, to maintain service under the current tariff
6 rules and not be subject to SWEPCO's proposed DRG tariff revisions (if they are
7 approved).

8 I also recommend that, prior to revising the DRG tariff, the Company sponsor a full
9 assessment of avoided costs associated with DRG generation, including line losses and
10 avoided capacity costs.

11 **Q. Does this conclude your direct testimony?**

12 A. Yes, it does.

SOAH DOCKET NO. 473-17-1764
PUC DOCKET NO. 46449

APPLICATION OF SOUTHWESTERN
ELECTRIC POWER COMPANY FOR
AUTHORITY TO CHANGE RATES

§
§
§
§
§

BEFORE THE STATE OFFICE
OF
ADMINISTRATIVE HEARINGS

AFFIDAVIT OF MELISSA WHITED FOR CROSS-REBUTTAL TESTIMONY

State of Massachusetts)
County of Middlesex)

Affiant Melissa Whited, being first duly sworn, states the following: I am of legal age and a resident of the State of Massachusetts. I certify that my Cross-Rebuttal Testimony and associated exhibits filed herewith on Friday, May 19, 2017, on behalf of the Sierra Club and Dr. Lawrence Brough, are true and correct to the best of my knowledge and belief after reasonable inquiry.

M. Whited
Melissa Whited

SUBSCRIBED AND SWORN to me, JANICE CONYERS, notary public, on this 19 day of May, 2017.



JANICE CONYERS
Notary Public
Commonwealth of Massachusetts
My Commission Expires
July 27, 2018

[Signature]
Notary Public for the State of Massachusetts

My Commission expires: 7/27/2018

EXHIBIT MW-1

Resume of Melissa Whited

Melissa Whited, Senior Associate

Synapse Energy Economics | 485 Massachusetts Avenue, Suite 2 | Cambridge, MA 02139 | 617-453-7024
mwhited@synapse-energy.com

PROFESSIONAL EXPERIENCE

Synapse Energy Economics, Cambridge MA. *Senior Associate, 2015 – present, Associate, 2012 – 2015*

Conduct research, author reports, and assist in preparation of expert testimony. Consult on issues related to distributed energy resources, rate design, cost-benefit analysis, integrated resource planning, utility regulation, water use and conservation, and market power.

University of Wisconsin - Madison, Department of Agricultural and Applied Economics, Madison, WI. *Teaching Assistant – Environmental Economics, 2011 – 2012*

Developed teaching materials and led discussions on cost-benefit analysis, carbon taxes and cap-and-trade programs, management of renewable and non-renewable resources, and other topics.

Public Service Commission of Wisconsin, Water Division, Madison, WI. *Program and Policy Analyst - Intern, Summer 2009*

Researched water conservation programs nationwide to develop a proposal for Wisconsin's state conservation program. Developed spreadsheet model to calculate avoided costs of water conservation in terms of energy savings and avoided emissions.

Synapse Energy Economics, Cambridge, MA. *Communications Manager, 2005 – 2008*

Developed technical proposals for state and federal agencies, environmental and public interest groups, and businesses. Edited reports on energy efficiency, integrated resource planning, greenhouse gas regulations, renewable resources, and other topics.

EDUCATION

University of Wisconsin, Madison, WI

Master of Arts in Agricultural and Applied Economics, 2012.

Certificate in Energy Analysis and Policy.

National Science Foundation Fellow.

University of Wisconsin, Madison, WI

Master of Science in Environment and Resources, 2010.

Certificate in Humans and the Global Environment (CHANGE).

Nelson Distinguished Fellowship.

Southwestern University, Georgetown, TX

Bachelor of Arts in International Studies, 2003.

Magna cum laude.

ADDITIONAL SKILLS

- Econometric Modeling – Linear and nonlinear modeling including time-series, panel data, logit, probit, and discrete choice regression analysis
- Nonmarket Valuation Methods for Environmental Goods – Hedonic valuation, travel cost method, and contingent valuation
- Cost-Benefit Analysis
- Input-Output Modeling for Regional Economic Analysis

FELLOWSHIPS AND AWARDS

- Winner, M. Jarvin Emerson Student Paper Competition, Journal of Regional Analysis and Policy, 2010
- Fellowship, National Science Foundation Integrative Graduate Education and Research Traineeship (IGERT), University of Wisconsin – Madison, 2009
- Nelson Distinguished Fellowship, University of Wisconsin – Madison, 2008

PUBLICATIONS

Whited, M., A. Horowitz, T. Vitolo, W. Ong, T. Woolf. 2017. *Distributed Solar in the District of Columbia: Policy Options, Potential, Value of Solar, and Cost-Shifting*. Synapse Energy Economics for the Office of the People’s Counsel for the District of Columbia.

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Lowry, M. N., T. Woolf, M. Whited, M. Makos. 2016. *Performance-Based Regulation in a High Distributed Energy Resources Future*. Pacific Economics Group Research and Synapse Energy Economics for Lawrence Berkley National Laboratory.

Woolf, T., M. Whited, A. Napoleon. 2015-2016. *Comments and Reply Comments in the New York Public Service Commission Case 14-M-0101: Reforming the Energy Vision*. Comments related to Staff’s (a) a benefit-costs analysis framework white paper, (b) ratemaking and utility business models white paper, and (c) Distributed System Implementation Plan guide. Prepared by Synapse Energy Economics on behalf of Natural Resources Defense Council and Pace Energy and Climate Center.

Luckow, P., B. Fagan, S. Fields, M. Whited. 2015. *Technical and Institutional Barriers to the Expansion of Wind and Solar Energy*. Synapse Energy Economics for Citizens’ Climate Lobby.

Wilson, R., M. Whited, S. Jackson, B. Biewald, E. A. Stanton. 2015. *Best Practices in Planning for Clean Power Plan Compliance*. Synapse Energy Economics for the National Association of State Utility Consumer Advocates.

Whited, M., T. Woolf, A. Napoleon. 2015. *Utility Performance Incentive Mechanisms: A Handbook for Regulators*. Synapse Energy Economics for the Western Interstate Energy Board.

Stanton, E. A., S. Jackson, B. Biewald, M. Whited. 2014. *Final Report: Implications of EPA's Proposed "Clean Power Plan."* Synapse Energy Economics for the National Association of State Utility Consumer Advocates.

Peterson, P., S. Fields, M. Whited. 2014. *Balancing Market Opportunities in the West: How participation in an expanded balancing market could save customers hundreds of millions of dollars*. Synapse Energy Economics for the Western Grid Group.

Woolf, T., M. Whited, E. Malone, T. Vitolo, R. Hornby. 2014. *Benefit-Cost Analysis for Distributed Energy Resources: A Framework for Accounting for All Relevant Costs and Benefits*. Synapse Energy Economics for the Advanced Energy Economy Institute.

Peterson, P., M. Whited, S. Fields. 2014. *Synapse Comments on FAST Proposals in ERCOT*. Synapse Energy Economics for Sierra Club.

Hornby, R., N. Brockway, M. Whited, S. Fields. 2014. *Time-Varying Rates in the District of Columbia*. Synapse Energy Economics for the Office of the People's Counsel for the District of Columbia, submitted to Public Service Commission of the District of Columbia in Formal Case No. 1114.

Peterson, P., M. Whited, S. Fields. 2014. *Demonstrating Resource Adequacy in ERCOT: Revisiting the ERCOT Capacity, Demand and Reserves Forecasts*. Synapse Energy Economics for Sierra Club – Lone Star Chapter.

Stanton, E. A., M. Whited, F. Ackerman. 2014. *Estimating the Cost of Saved Energy in Utility Efficiency Programs*. Synapse Energy Economics for the U.S Environmental Protection Agency.

Ackerman, F., M. Whited, P. Knight. 2014. "Would banning atrazine benefit farmers?" *International Journal of Occupational and Environmental Health* 20 (1): 61–70.

Ackerman, F., M. Whited, P. Knight. 2013. *Atrazine: Consider the Alternatives*. Synapse Energy Economics for Natural Resources Defense Council (NRDC).

Whited, M., F. Ackerman, S. Jackson. 2013. *Water Constraints on Energy Production: Altering our Current Collision Course*. Synapse Energy Economics for Civil Society Institute.

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Hurley, D., P. Peterson, M. Whited. 2013. *Demand Response as a Power System Resource: Program Designs, Performance, and Lessons Learned in the United States*. Synapse Energy Economics for Regulatory Assistance Project.

Whited, M., D. White, S. Jackson, P. Knight, E.A. Stanton. 2013. *Declining Markets for Montana Coal*. Synapse Energy Economics for Northern Plains Resource Council.

Woolf, T., M. Whited, T. Vitolo, K. Takahashi, D. White. 2012. *Indian Point Energy Center Replacement Analysis: A Plan for Replacing the Nuclear Plant with Clean, Sustainable, Energy Resources*. Synapse Energy Economics for National Resources Defense Council and Riverkeeper.

Whited, M., K. Charipar, G. Brown. *Demand Response Potential in Wisconsin*. Nelson Institute for Environmental Studies, Energy Analysis & Policy Capstone for the Wisconsin Public Service Commission.

Whited, M. 2010. "Economic Impacts of Irrigation Water Transfers in Uvalde County, Texas." *Journal of Regional Analysis and Policy* 40 (2): 160–170.

Grabow, M., M. Hahn and M. Whited. 2010. *Valuing Bicycling's Economic and Health Impacts in Wisconsin*. Nelson Institute for Environmental Studies, Center for Sustainability and the Global Environment (SAGE) for State Representative Spencer Black.

Whited, M., D. Bernhardt, R. Deitchman, C. Fuchsteiner, M. Kirby, M. Krueger, S. Locke, M. Mcmillen, H. Moussavi, T. Robinson, E. Schmitz, Z. Schuster, R. Smail, E. Stone, S. Van Egeren, H. Yoshida, Z. Zopp. 2009. *Implementing the Great Lakes Compact: Wisconsin Conservation and Efficiency Measures Report*. Department of Urban and Regional Planning, University of Wisconsin-Madison, Extension Report 2009-01.

Whited, M. 2009. *2009 Wisconsin Water Fact Sheet*. Public Service Commission of Wisconsin.

Whited, M. 2003. *Gender, Water, and Trade*. International Gender and Trade Network Washington, DC.

TESTIMONY

Massachusetts Department of Public Utilities (Docket No. 17-05): Direct testimony of Tim Woolf and Melissa Whited regarding performance-based regulation, the monthly minimum reliability contribution, storage pilots, and rate design in Eversource's petition for approval of rate increases and a performance-based ratemaking mechanism. On behalf of Sunrun and the Energy Freedom Coalition of America, LLC. April 28, 2017.

Public Utilities Commission of Hawaii (Docket No. 2015-0170): Direct testimony regarding Hawaiian Electric Light Company's proposed performance incentive mechanisms. On behalf of the Division of Consumer Advocacy. April 2017.

Massachusetts Department of Public Utilities (Docket No. 15-155): Joint direct and rebuttal testimony with T. Woolf regarding National Grid's rate design proposal. On behalf of Energy Freedom Coalition of America, LLC. March 18, 2016 and April 28, 2016.

Federal Energy Regulatory Commission (Docket No. EC13-93-000): Affidavit regarding potential market power resulting from the acquisition of Ameren generation by Dynegy. On behalf of Sierra Club. August 16, 2013.

Wisconsin Senate Committee on Clean Energy: Joint testimony with M. Grabow regarding the importance of clean transportation to Wisconsin's public health and economy. February 2010.

TESTIMONY ASSISTANCE

Colorado Public Utilities Commission (Proceeding No. 16AL-0048E): Answer testimony of Tim Woolf regarding Public Service Company of Colorado's rate design proposal. On behalf of Energy Outreach Colorado. June 6, 2016.

Nevada Public Utilities Commission (Docket Nos. 15-07041 and 15-07042): Direct testimony on NV Energy's application for approval of a cost of service study and net metering tariffs. On behalf of The Alliance for Solar Choice. October 27, 2015.

Missouri Public Service Commission (Case No. ER-2014-0370): Direct and surrebuttal testimony on the topic of Kansas City Power and Light's rate design proposal. On behalf of Sierra Club. April 16, 2015 and June 5, 2015.

Wisconsin Public Service Commission (Docket No. 05-UR-107): Direct and surrebuttal testimony of Rick Hornby regarding Wisconsin Electric Power Company rate case. On behalf of The Alliance for Solar Choice. August 28, 2014 and September 22, 2014.

Maine Public Utilities Commission (Docket No. 2013-00519): Direct testimony of Richard Hornby and Martin R. Cohen on GridSolar's smart grid coordinator petition. On behalf of the Maine Office of the Public Advocate. August 28, 2014.

Maine Public Utilities Commission (Docket No. 2013-00168): Direct and surrebuttal testimony of Tim Woolf regarding Central Maine Power's request for an alternative rate plan. December 12, 2013 and March 21, 2014.

Massachusetts Department of Public Utilities (Docket No. 14-04): Comments of Massachusetts Department of Energy Resources on investigation into time varying rates. On behalf of the Massachusetts Department of Energy Resources. March 10, 2014.

State of Nevada, Public Utilities Commission of Nevada (Docket No. 13-07021): Direct testimony of Frank Ackerman regarding the proposed merger of NV Energy, Inc. and MidAmerican Energy Holdings Company. On behalf of the Sierra Club. October 24, 2013.

PRESENTATIONS

Whited, M. 2016. "Energy Policy for the Future: Trends and Overview." Presentation to the National Conference of State Legislators' Capitol Forum, Washington, DC, December 8.

Whited, M. 2016. "Ratemaking for the Future: Trends and Considerations." Presentation to the Midwest Governors' Association, St. Paul, MN, July 14.

Whited, M. 2016. "Performance Based Regulation." Presentation to the NARUC Rate Design Subcommittee. September 12.

Whited, M. 2016. "Demand Charges: Impacts and Alternatives (A Skeptic's View)." EUCI 2nd Annual Residential Demand Charges Summit, Phoenix, AZ, June 7.

Whited, M. 2016. "Performance Incentive Mechanisms." Presentation to the National Governors Association, Wisconsin Workshop, Madison WI, March 29.

Whited, M., T. Woolf. 2016. "Caught in a Fix: The Problem with Fixed Charges for Electricity." Webinar presentation sponsored by Consumers Union, February.

Whited, M. 2015. "Performance Incentive Mechanisms." Presentation to the National Governors Association, Learning Lab on New Utility Business Models & the Electricity Market Structures of the Future, Boston, MA, July 28.

Whited, M. 2015. "Rate Design: Options for Addressing NEM Impacts." Presentation to the Utah Net Energy Metering Workgroup, Workshop 4, Salt Lake City, UT, July 8.

Whited, M. 2015. "Performance Incentive Mechanisms." Presentation to the e21 Initiative, St. Paul, MN, May 29.

Whited, M., F. Ackerman. 2013. "Water Constraints on Energy Production: Altering our Current Collision Course." Webinar presentation sponsored by Civil Society Institute, September 12.

Whited, M., G. Brown, K. Charipar. 2011. "Electricity Demand Response Programs and Potential in Wisconsin." Presentation to the Wisconsin Public Service Commission, April.

Whited, M. 2010. "Economic Impact of Irrigation Water Transfers in Uvalde County, Texas." Presentation at the Mid-Continent Regional Science Association's 41st Annual Conference/IMPLAN National User's 8th Biennial Conference in St. Louis, MO, June

Whited, M., M. Grabow, M. Hahn. 2009. "Valuing Bicycling's Economic and Health Impacts in Wisconsin." Presentation before the Governor's Coordinating Council on Bicycling, December.

Whited, M., D. Sheard. 2009. "Water Conservation Initiatives in Wisconsin." Presentation before the Waukesha County Water Conservation Coalition Municipal Water Conservation Subgroup, July.

Resume dated April 2017

EXHIBIT MW-2

**Excerpt: James Bonbright, *Principles of Public Utility Rates*,
Columbia University Press (1961)**

of principles, these chapters are mere essays on the nature of the more controversial, largely unresolved, problems rather than attempts at systematic development. All of them have one theme in common: the thesis that the most formidable obstacles to further progress in the theory of public utility rates are those raised by conflicting goals of rate-making policy.

CRITERIA OF A DESIRABLE RATE STRUCTURE

Throughout this study we have stressed the point that, while the ultimate purpose of rate theory is that of suggesting feasible *measures* of reasonable rates and rate relationships, an intelligent choice of these measures depends primarily on the accepted *objectives* of rate-making policy and secondarily on the need to minimize undesirable side effects of rates otherwise best designed to attain these objectives. No rational discussion, for example, of the relative merits of "cost of service" and "value of service" as measures of proper rates or rate relationships is possible without reference to the question what desirable results the rate maker hopes to secure, and what undesirable results he hopes to minimize, by a choice between or mixture of the two standards of measurement. Not only this: the very *meaning* to be attached to ambiguous, proposed measures such as those of "cost" or "value"—an ambiguity not completely removed by the addition of familiar adjuncts, such as "out-of-pocket" costs, or "marginal costs," or "average costs"—must be determined in the light of the purposes to be served by the public utility rates as instruments of economic policy. This is a commonplace; but it is a commonplace which, so far from being taken for granted, needs repeated emphasis.

What then, are the good attributes to be sought and the bad attributes to be avoided or minimized in the development of a sound rate structure? Many different answers have been suggested in the technical literature and in the reported opinions by courts and commissions; and a number of writers have summarized their answers in the form of a list of desirable attributes of a rate structure, comparable to the "canons of taxation" found in the treatises on public finance. The list that follows is fairly typical, although I have derived it from a variety of sources instead of relying on any

one presentation. The sequence of the eight items is not meant to suggest any order of relative importance.

1. The related, "practical" attributes of simplicity, understandability, public acceptability, and feasibility of application.
2. Freedom from controversies as to proper interpretation.
3. Effectiveness in yielding total revenue requirements under the fair-return standard.
4. Revenue stability from year to year.
5. Stability of the rates themselves, with a minimum of unexpected changes seriously adverse to existing customers. (Compare "The best tax is an old tax.")
6. Fairness of the specific rates in the apportionment of total costs of service among the different consumers.
7. Avoidance of "undue discrimination" in rate relationships.
8. Efficiency of the rate classes and rate blocks in discouraging wasteful use of service while promoting all justified types and amounts of use:
 - (a) in the control of the total amounts of service supplied by the company;
 - (b) in the control of the relative uses of alternative types of service (on-peak versus off-peak electricity, Pullman travel versus coach travel, single-party telephone service versus service from a multi-party line, etc.).

Lists of this nature are useful in reminding the rate maker of considerations that might otherwise escape his attention, and also useful in suggesting one important reason why problems of practical rate design do not readily yield to "scientific" principles of optimum pricing. But they are unqualified to serve as a base on which to build these principles because of their ambiguities (how, for example, does one define "undue discrimination"?), their overlapping character, and their failure to offer any rules of priority in the event of a conflict. For such a base, we must start with a simpler and more fundamental classification of rate-making objectives.

THREE PRIMARY CRITERIA

General principles of public utility rates and rate differentials are necessarily based on simplified assumptions both as to the objectives of rate-making policy and as to the factual circumstances un-

EXHIBIT MW-3

DRG bill impact analysis (prepared by Melissa Whited)

| EXPORT COMPENSATION | | GENERATION AND CONSUMPTION | | | | RATES | | | BILLS | | | |
|---------------------|--|----------------------------|--------------------------------------|-------------------|----------------------------------|-----------------------|----------------------|-----------------------------|-----------------|-----------------|--------------|--------------|
| Mo. | Proposed DRG Compensation for Exports Response to Sierra Club 2-7 \$/kWh | Mo. | Generation (kWh) 7 kW System Gen. | Consumption (kWh) | | Add'l DRG Monthly Fee | Energy Rate \$/kWh | | Bill - No PV | Bill with PV | Bill - No PV | Bill with PV |
| | | | | Current DRG | Net Consump. - Full Net Metering | | Net Consump. - No PV | Net Consump. - 50% exported | | | | |
| 1 | 20.58 | 1 | 450 | 1892 | 1442 | \$8.00 | \$0.0436 | \$0.0338 | \$77.82 | \$70.62 | \$77.82 | \$73.59 |
| 2 | 17.98 | 2 | 612 | 1522 | 910 | \$8.00 | \$0.0436 | \$0.0338 | \$65.30 | \$52.62 | \$65.30 | \$57.46 |
| 3 | 15.39 | 3 | 766 | 1127 | 361 | \$8.00 | \$0.0436 | \$0.0338 | \$51.98 | \$31.76 | \$51.98 | \$41.14 |
| 4 | 18.86 | 4 | 877 | 897 | 20 | \$8.00 | \$0.0436 | \$0.0338 | \$44.18 | \$16.86 | \$44.18 | \$27.70 |
| 5 | 18.35 | 5 | 979 | 1041 | 62 | \$8.00 | \$0.0588 | \$0.0588 | \$69.22 | \$19.67 | \$69.22 | \$39.46 |
| 6 | 26.25 | 6 | 985 | 1237 | 252 | \$8.00 | \$0.0588 | \$0.0588 | \$80.74 | \$30.84 | \$80.74 | \$46.86 |
| 7 | 27.83 | 7 | 1056 | 1426 | 370 | \$8.00 | \$0.0588 | \$0.0588 | \$91.81 | \$37.74 | \$91.81 | \$54.08 |
| 8 | 26.47 | 8 | 1018 | 1357 | 339 | \$8.00 | \$0.0588 | \$0.0588 | \$87.78 | \$35.94 | \$87.78 | \$52.39 |
| 9 | 28.24 | 9 | 870 | 1202 | 332 | \$8.00 | \$0.0588 | \$0.0588 | \$78.67 | \$35.53 | \$78.67 | \$48.81 |
| 10 | 29.01 | 10 | 823 | 1045 | 222 | \$8.00 | \$0.0588 | \$0.0588 | \$69.44 | \$29.06 | \$69.44 | \$41.31 |
| 11 | 24.14 | 11 | 652 | 904 | 252 | \$8.00 | \$0.0436 | \$0.0338 | \$44.44 | \$27.00 | \$44.44 | \$33.34 |
| 12 | 29.76 | 12 | 709 | 1615 | 906 | \$8.00 | \$0.0436 | \$0.0338 | \$68.47 | \$52.51 | \$68.47 | \$53.94 |
| | | | | | | | \$829.84 | \$440.14 | \$829.84 | \$570.09 | | |

Sources:
 Monthly Consumption Source: http://en.openei.org/datasets/files/961/pub/EPLUS_TMY2_RESIDENTIAL_BASE/USA_TX_Lufkin.722446_TMY2.csv
 Monthly Generation Source: <http://pwwatts.nrel.gov/pwwatts.php> for Longview Gregg County
 Rates: Current SWEPCO Residential Tariff and DRG Tariff

| | | |
|---------------------|-----------|-------------|
| Annual Savings | \$ 389.70 | \$ 259.75 |
| Change in Savings | | \$ (129.95) |
| % Change in Bill | | 30% |
| % Change in Savings | | -33% |