

**BEFORE THE PUBLIC UTILITY COMMISSION
OF OREGON**

UE 335

IN THE MATTER OF)
)
PORTLAND GENERAL ELECTRIC)
COMPANY,)
)
REQUEST FOR A GENERAL RATE REVISION)

DIRECT TESTIMONY AND EXHIBITS OF

STEVE W. CHRISS

ON BEHALF OF

WAL-MART STORES, INC. AND SAM'S WEST, INC.

JUNE 6, 2018

Contents

Introduction	1
Purpose of Testimony and Summary of Recommendations	3
Cost of Service.....	7
Rate Spread.....	10
Schedule 83 and Schedule 85 Generation Rate Design and Decoupling	11
Table 1: Full Cost Generation Demand Charges for Schedule 83, Schedule 85 Secondary, and Schedule 85 Primary	16
Table 2: Intra-class Subsidy Paid or Received by Load Factor, PGE Proposed Generation Rates, Schedule 85 Secondary.	16
Table 3: Intra-class Subsidy Paid or Received by Load Factor, PGE Proposed Generation Rates and Walmart Proposed Generation Rates, Schedule 85 Secondary.....	21

Exhibits

Walmart/101: Witness Qualifications Statement

Walmart/102: Derivation of Full Cost Generation Demand Charge for Schedule 83, PGE
Proposed Revenue Requirement

Walmart/103: Derivation of Full Cost Generation Demand Charge for Schedule 85 Secondary,
PGE Proposed Revenue Requirement

Walmart/104: Derivation of Full Cost Generation Demand Charge for Schedule 85 Primary, PGE
Proposed Revenue Requirement

Walmart/105: Derivation of Full Cost Generation Demand Charge for Schedule 85 Primary, PGE
Proposed Revenue Requirement

1 **Introduction**

2 **Q. PLEASE STATE YOUR NAME, BUSINESS ADDRESS, AND OCCUPATION.**

3 A. My name is Steve W. Chriss. My business address is 2001 SE 10th St.,
4 Bentonville, AR 72716-0550. I am employed by Walmart Inc.¹ as Director, Energy
5 and Strategy Analysis.

6 **Q. ON WHOSE BEHALF ARE YOU TESTIFYING IN THIS DOCKET?**

7 A. I am testifying on behalf of Wal-Mart Stores, Inc. and Sam's West, Inc. (collectively,
8 "Walmart").

9 **Q. PLEASE DESCRIBE YOUR EDUCATION AND EXPERIENCE.**

10 A. In 2001, I completed a Master of Science in Agricultural Economics at Louisiana State
11 University. From 2001 to 2003, I was an Analyst and later a Senior Analyst at the
12 Houston office of Econ One Research, Inc., a Los Angeles-based consulting firm. My
13 duties included research and analysis on domestic and international energy and
14 regulatory issues. From 2003 to 2007, I was an Economist and later a Senior Utility
15 Analyst at the Public Utility Commission of Oregon in Salem, Oregon. My duties
16 included appearing as a witness for PUC Staff in electric, natural gas, and
17 telecommunications dockets. I joined the energy department at Walmart in July
18 2007 as Manager, State Rate Proceedings. I was promoted to Senior Manager,
19 Energy Regulatory Analysis, in June 2011. I was promoted to my current position in
20 October, 2016. My Witness Qualifications Statement is attached as Exhibit SWC-1.

¹ Effective February 1, 2018, Wal-Mart Stores, Inc. changed its corporate legal name to Walmart Inc.

1 **Q. HAVE YOU PREVIOUSLY SUBMITTED TESTIMONY BEFORE THE PUBLIC UTILITY**
2 **COMMISSION OF OREGON (“COMMISSION”)?**

3 A. Yes. I submitted testimony on behalf of Walmart in Docket Nos. UE 319, UE 217, UE
4 262, UE 263, UE 264, and UE 267 and on behalf of Staff in Docket Nos. UE 179, UE
5 180, UG 173, UM 1129, and UX 29.

6 **Q. HAVE YOU PREVIOUSLY SUBMITTED TESTIMONY BEFORE OTHER STATE**
7 **REGULATORY COMMISSIONS?**

8 A. Yes. I have submitted testimony in over 180 proceedings before 38 other utility
9 regulatory commissions. I have also submitted testimony before several Missouri
10 House and Senate Committees and the Kansas House Standing Committee on
11 Utilities and Telecommunications. My testimony has addressed topics including, but
12 not limited to, cost of service and rate design, return on equity (“ROE”), revenue
13 requirements, ratemaking policy, large customer renewable programs, qualifying
14 facility rates, telecommunications deregulation, resource certification, energy
15 efficiency/demand side management, fuel cost adjustment mechanisms, decoupling,
16 and the collection of cash earnings on construction work in progress (“CWIP”).

17 **Q. ARE YOU SPONSORING EXHIBITS IN YOUR TESTIMONY?**

18 A. Yes. I am sponsoring the exhibits listed in the Table of Contents.

1 **Q. PLEASE BRIEFLY DESCRIBE WALMART'S OPERATIONS IN OREGON.**

2 A. As shown on Walmart's website, Walmart operates 43 retail units and employs over
3 11,000 associates in Oregon. In fiscal year ending 2017, Walmart purchased \$665
4 million worth of goods and services from Oregon-based suppliers, supporting over
5 17,000 supplier jobs.²

6 **Q. PLEASE BRIEFLY DESCRIBE WALMART'S OPERATIONS WITHIN THE COMPANY'S**
7 **SERVICE TERRITORY.**

8 A. Walmart has 19 stores that take electric service from Portland General Electric
9 Company ("PGE" or "Company"), primarily on the Company's Schedule 85, Large
10 Nonresidential Standard Service (201 kW – 4,000 kW) ("Schedule 85") rate schedule.
11 Walmart also has several accounts on the Company's Schedule 83, Large
12 Nonresidential Standard Service (31 kW – 200 kW) ("Schedule 83") rate schedule

13
14 **Purpose of Testimony and Summary of Recommendations**

15 **Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?**

16 A. The purpose of my testimony is to respond to PGE's rate case filing and to provide
17 recommendations to assist the Commission in its thorough and careful consideration
18 of the customer impact of the Company's proposed rate increase.

² <http://corporate.walmart.com/our-story/locations/united-states#/united-states/oregon>

1 **Q. IN SETTING THE REVENUE REQUIREMENT, ROE, ALLOCATION, AND RATE DESIGN**
2 **CHANGES FOR THE COMPANY, SHOULD THE COMMISSION CONSIDER THE IMPACT**
3 **OF THE PROPOSED RATE INCREASE ON BUSINESS CUSTOMERS?**

4 A. Yes. Electricity is a significant operating cost for retailers such as Walmart. When
5 electric rates increase, the increased cost to retailers can put pressure on consumer
6 prices and on the other expenses required by a business to operate. The
7 Commission should thoroughly and carefully consider the impact on customers in
8 examining the requested revenue requirement and ROE, in addition to all other
9 facets of this case, to ensure that any increase in the Company's rates is the
10 minimum amount necessary to provide safe, adequate, and reliable service, while
11 also providing PGE the opportunity to recover its reasonable and prudent costs and
12 earn a reasonable return on its investment.

13 **Q. PLEASE SUMMARIZE WALMART'S RECOMMENDATIONS TO THE COMMISSION.**

14 A. Walmart's recommendations to the Commission are as follows:

- 15 1) Walmart does not oppose the Company's proposal to allocate generation
16 capacity cost using a four coincident peak ("4CP") allocator.
- 17 2) Walmart does not oppose the Company's proposal to allocate transmission
18 costs using a twelve coincident peak ("12CP") allocator.
- 19 3) Walmart does not take a position on the other facets of the Company's
20 proposed cost of service model at this time. However, to the extent that
21 alternative cost of service models or modifications to the Company's cost of
22 service model are proposed by other parties, Walmart reserves the right to

1 address such changes in accord with the Commission's procedures in this
2 docket.

3 4) For the purposes of this docket, at the Company's proposed revenue
4 requirement, Walmart does not oppose the Company's proposed rate
5 spread.

6 5) If the Commission determines that the appropriate revenue requirement is
7 less than that proposed by the Company, the Commission should start with
8 the Company's proposed rate spread and ensure that schedules that have a
9 Customer Impact Offset ("CIO") value of zero remain at zero.

10 6) For the purposes of this docket, Walmart proposes the following for setting
11 the generation rates for Schedules 83 and 85:

12 a) The Commission should require PGE to establish a \$/kW on peak
13 generation demand charge for Schedules 83 and 85 based on 25
14 percent of the full cost generation demand charge per the revenue
15 requirement and cost of service outcomes in this docket;

16 b) Walmart does not oppose maintaining the on-peak/off-peak
17 differential of 1.5 cents/kWh;

18 c) The Commission should reject the Company's proposal to include
19 Schedules 83 and 85 in the Sales Normalization Adjustment ("SNA") in
20 this docket and re-evaluate the necessity of inclusion of the schedules
21 in the next rate case;

- 1 d) If the Commission approves the inclusion of Schedules 83 and 85 in
2 the SNA, it should require PGE to set the decoupling rate on a \$/kW
3 on peak demand basis; and
- 4 e) To the extent the Commission adopts a demand charge for Schedules
5 83 and 85 and approves the inclusion of those schedules in the SNA,
6 the fixed cost energy charges for each schedule should be adjusted
7 downward to reflect the increased recovery of fixed generation costs
8 through the demand charge and decreased recovery of fixed
9 generation costs through the energy charges.

10 **Q. DOES THE FACT THAT YOU MAY NOT ADDRESS AN ISSUE OR POSITION**
11 **ADVOCATED BY THE COMPANY INDICATE WALMART'S SUPPORT?**

12 A. No. The fact that an issue is not addressed herein or in related filings should not be
13 construed as an endorsement of, agreement with, or consent to any filed position.

Cost of Service

Q. WHAT IS WALMART'S POSITION ON SETTING RATES BASED ON THE UTILITY'S COST OF SERVICE?

A. Walmart advocates that rates be set based on the utility's cost of service for each rate class. This produces equitable rates that reflect cost causation, send proper price signals, and minimize price distortions.

Q. WHAT IS YOUR GENERAL UNDERSTANDING OF THE COMPANY'S PROPOSED COST OF SERVICE STUDY?

A. My understanding is that the Company proposes a cost of service study based on the Company's marginal generation, transmission, distribution, customer, and street lighting costs. See PGE/1200/Macfarlane-Goodspeed/1/9-11.

Q. WHAT IS YOUR UNDERSTANDING OF THE PURPOSE OF GENERATION AND TRANSMISSION CAPACITY COST ALLOCATION?

A. Generation capacity cost allocation is the process of allocating to each customer class the fixed costs of a utility's generation assets. Likewise, transmission cost allocation is the process of allocating to each customer class the fixed costs of a utility's transmission assets. Fixed costs are defined as costs that do not vary with the level of output and must be paid even if there is no output.³

³ Pindyck, Robert S. and Daniel L. Rubinfeld, Microeconomics, 5th ed., 2001, page 206.

1 **Q. DO A UTILITY’S FIXED GENERATION OR TRANSMISSION CAPACITY COSTS CHANGE**
2 **WITH CHANGES IN THE AMOUNT OF ELECTRICITY GENERATED?**

3 A. No. The utility’s fixed production capacity costs do not change with changes in the
4 amount of electricity generated. For example, if a baseload unit is not dispatched
5 and produces no energy, the fixed costs are not avoided by the utility or customers.
6 Generation units can be built and operated for different reasons, such as lower fuel
7 costs, peaking needs, or reliability, but the way in which a generation unit is
8 operated does not change the fact that the fixed costs are, in fact, fixed, and should
9 be treated as such in the generation capacity cost allocation.

10 **Q. WHAT IS YOUR UNDERSTANDING OF THE COMPANY’S PROPOSED METHODOLOGY**
11 **TO ALLOCATE GENERATION CAPACITY COSTS TO THE CUSTOMER CLASSES?**

12 A. My understanding is that the Company proposes to multiply the real levelized
13 annual capacity cost from the marginal cost of service study by the projected test-
14 period peak-hour load. The Company then proposes to allocate that generation
15 capacity cost to customer classes using a 4CP allocator based on the Company’s
16 January, July, August, and December peaks. See PGE/1300/Macfarlane-
17 Goodspeed/7/10-13.

1 **Q. WHAT IS YOUR UNDERSTANDING OF THE COMPANY’S PROPOSED METHODOLOGY**
2 **TO ALLOCATE TRANSMISSION COSTS AMONG THE CUSTOMER CLASSES?**

3 A. My understanding is that the Company proposes to allocate transmission costs to
4 the customer classes on the basis of each classes’ 12CP times the marginal unit cost
5 of transmission. *Id.*, 8/4-6.

6 **Q. DOES WALMART OPPOSE THE COMPANY’S PROPOSED GENERATION CAPACITY**
7 **COST AND TRANSMISSION COST ALLOCATIONS?**

8 A. No. The use of coincident peak allocators for generation capacity and transmission
9 costs properly reflects that these costs are incurred in order to meet customer
10 demands on the system.

11 **Q. DOES WALMART TAKE A POSITION ON THE OTHER FACETS OF THE COMPANY’S**
12 **PROPOSED COST OF SERVICE MODEL AT THIS TIME?**

13 A. No. However, to the extent that alternate cost of service models or modifications to
14 the Company’s model are proposed by other parties, Walmart reserves the right to
15 address any such proposals or changes in accord with the Commission’s procedures
16 in this docket.

Rate Spread

Q. HOW DOES THE COMPANY REPRESENT WHETHER RATES FOR A CUSTOMER CLASS ACCURATELY REFLECT THE UNDERLYING COST CAUSATION?

A. The Company does not represent this relationship through a metric per se, but instead employs the CIO in the rate design process to assign receipt or payment of a subsidy to a particular customer class. A positive CIO value means that the rate class is paying rates in excess of the costs incurred to serve that class, while a negative CIO means that the rate class is paying rates less than the costs incurred to serve that class. As such, those rate classes with a positive CIO are subsidizing the classes with a negative CIO.

Q. WHAT IS YOUR UNDERSTANDING OF THE COMPANY'S PROPOSED RATESPREAD?

A. My understanding is that, with two exceptions per previous stipulations and two ratemaking adjustments, the Company proposes to set the revenue requirements for each schedule at cost, such that for most classes the CIO equals zero. The proposed exceptions are (1) the application of a load following credit for Schedule 90 that is charged to all cost of service customers, with a limiter for Schedule 89 per a stipulation in UE 319, (2) CIO payments to Schedules 7 and 32 which are charged to Schedules 89/489/589 and 90/490/590, also per a stipulation in UE 319, and (3) ratemaking adjustments between Schedules 89 and 90 and ratemaking adjustments between the lighting schedules. See PGE/1300/Macfarlane-Goodspeed/4-6 and 9-10.

Q. HAVE YOU EXAMINED THE PROPOSED CIO AMOUNTS FOR SCHEDULES 83 AND 85?

1 A. Yes. The Company proposes a zero-value CIO for Schedules 83 and 85. *See*
2 PGE/1303/Macfarlane-Goodspeed/6-7 and 11.

3 **Q. WHAT IS WALMART'S RECOMMENDATION TO THE COMMISSION ON THIS ISSUE?**

4 A. For the purposes of this docket, at the Company's proposed revenue requirement,
5 Walmart does not oppose the Company's proposed revenue allocation.

6 **Q. WHAT IS YOUR RECOMMENDATION TO THE COMMISSION IF IT DETERMINES THAT**
7 **A LOWER REVENUE REQUIREMENT IS APPROPRIATE?**

8 A. If the Commission determines that the appropriate revenue requirement is less than
9 that proposed by the Company, the Commission should start with the Company's
10 proposed rate spread and ensure that schedules that have a proposed CIO value of
11 zero remain at zero.

12
13 **Schedule 83 and Schedule 85 Generation Rate Design and Decoupling**

14 **Q. WHAT IS YOUR UNDERSTANDING OF THE CURRENT STRUCTURE OF THE**
15 **GENERATION CHARGES FOR SCHEDULES 83 AND 85?**

16 A. My understanding of the current structure of the Schedules 83 and 85 is that
17 generation costs, including fixed costs, are recovered through on-peak and off-peak
18 \$/kWh energy charges, with the differential between those charges set at 1.5
19 cents/kWh. The Company does not currently employ a demand charge for the
20 recovery of fixed generation costs. *See* P.U.C. Oregon No. E-18, Thirteenth Revision
21 of Sheet No. 83-1 and Tenth Revision of Sheet No. 85-1.

1 **Q. DOES PGE PROPOSE CHANGES TO THE GENERATION RATE STRUCTURE FOR**
2 **SCHEDULES 83 AND 85?**

3 A. No. The Company proposes to keep the same on-peak and off-peak energy charge
4 structure. *See* PGE/1303/Macfarlane-Goodspeed/6-7.

5 **Q. DOES THE COMPANY PROVIDE AN EXPLANATION OF THE PRINCIPLES THEY**
6 **CONSIDERED FOR THE DESIGN OF RATES?**

7 A. Yes. The Company states that they considered the following principles:

- 8 1) Recover the total revenue requirement;
- 9 2) Provide revenue stability and predictability to the utility;
- 10 3) Provide rate stability and predictability to customers;
- 11 4) Reflect the cost of providing service;
- 12 5) Be fair;
- 13 6) Provide price signals to customers; and
- 14 7) Be simple and understandable. *See* PGE/1300/Macfarlane-Goodspeed/13-
15 14.

16 **Q. DO THE COMPANY'S CURRENT AND PROPOSED GENERATION RATES FOR**
17 **SCHEDULES 83 AND 85 REFLECT THE PRINCIPLES OUTLINED ABOVE?**

18 A. No, as the Company proposes to continue recovering 100 percent of the fixed
19 generation costs incurred to serve Schedule 83 and 85 customers through the
20 energy charge. This violates several of the principles outlined above, including rates
21 reflecting the cost of service, providing price signals to customers, and providing
22 revenue stability and predictability to the utility.

1 **Q. IS THE COLLECTION OF DEMAND-RELATED COSTS THROUGH AN ENERGY CHARGE**
2 **CONSISTENT WITH THE COMPANY’S CLASSIFICATION AND ALLOCATION OF**
3 **DEMAND-RELATED COSTS?**

4 A. No. In its class cost of service study and rate spread, the Company does not classify
5 or allocate any of its generation capacity costs on an energy basis. Rather, these
6 costs are incurred, and therefore classified and allocated, based on customer
7 demands. Costs should be collected in a manner which reflects how they are
8 incurred. As such, collecting fixed demand-related costs through energy charges
9 violates cost causation principles.

10 **Q. DOES THE RECOVERY OF DEMAND-RELATED COSTS THROUGH ENERGY CHARGES**
11 **DISADVANTAGE HIGHER LOAD FACTOR CUSTOMERS?**

12 A. Yes. The shift in demand-related costs from per kW demand charges to per kWh
13 energy charges results in a shift in demand cost responsibility from lower load factor
14 customers to higher load factor customers. This results in a misallocation of cost
15 responsibility as higher load factor customers overpay for the demand-related costs
16 incurred by the Company to serve them. In other words, higher load factor
17 customers are paying for a portion of the demand-related costs that are incurred to
18 serve lower load factor customers simply because of the manner in which the
19 Company collects those costs in rates.

20 **Q. CAN YOU PROVIDE A GENERAL ILLUSTRATION OF THIS SHIFT IN DEMAND COST**
21 **RESPONSIBILITY?**

22 A. Yes. Assume the following:

a) A utility has only two customers (Customer 1 and Customer 2), with individual peak demands of 20 kW for a total system load of 40 kW.

b) The annual revenue requirement or cost to the utility associated with the investment to serve the customers is \$2,000 which will be collected each year. Each customer is responsible for one-half ($\frac{1}{2}$) of the cost, or \$1,000 of demand-related or fixed costs.

c) Customer 1 has a monthly demand of 20 kW and a load factor of 60 percent and thus consumes 105,120 kWh/year ($20 \text{ kW} * 60\% * 8760 \text{ hours}$).

d) Customer 2 has a monthly demand of 20 kW and a load factor of 30 percent and thus consumes 52,560 kWh/year ($20 \text{ kW} * 30\% * 8760 \text{ hours}$).

Q. IF THE DEMAND-RELATED COSTS WERE CHARGED ON A PER KW BASIS, WHAT WOULD THE PER KW CHARGE BE?

A. The charge would be \$4.17 per kW-month ($\$2,000 / 40 \text{ kW} / 12 \text{ months}$). Each customer would then pay \$1,000 for the demand-related cost they impose on the system ($20 \text{ kW} * \$4.17/\text{kW} * 12$).

Q. IF THE DEMAND-RELATED COSTS WERE CHARGED ON A PER KWH BASIS, WHAT WOULD THE PER KWH CHARGE BE?

A. If customers were charged on the a per kWh basis, the energy charge would be 1.27 cents per kWh ($\$2,000 / 157,860 \text{ kWh}$), where the \$2,000 is the total cost and 157,860 kWh represents the total annual energy sales.

Q. WHAT WOULD EACH CUSTOMER PAY UNDER THE PER KWH CHARGE OF 1.27 CENTS PER KWH?

1 A. Customer 1, the customer with the higher load factor of 60 percent, would pay
2 \$1,333 ($\$0.0127/\text{kWh} * 105,120 \text{ kWh}$). Customer 2, the customer that has the lower
3 load factor would pay \$667 ($\$0.0127/\text{kWh} * 52,560 \text{ kWh}$).

4 **Q. ARE THE RESULTING ENERGY BASED CHARGES REPRESENTATIVE OF THE**
5 **UNDERLYING COSTS?**

6 A. No. As can be seen in the example, if the Company collects its demand-related costs
7 through energy-based charges, it will over-collect from one customer and under-
8 collect from the other. Recall that each customer is responsible for causing \$1,000
9 of the annual fixed costs. Under the per kWh scenario, the utility would recover
10 \$333 more from the higher load factor customer, Customer 1, than its cost
11 responsibility and \$333 less from the lower load factor customer, Customer 2, than
12 its cost responsibility. In other words, Customer 1, would be subsidizing \$333 of
13 Customer 2's cost responsibility.

14 **Q. HAVE YOU CALCULATED THE ESTIMATED FULL COST GENERATION DEMAND**
15 **CHARGES FOR SCHEDULES 83 AND 85 AT THE COMPANY'S PROPOSED REVENUE**
16 **REQUIREMENT?**

17 A. Yes. Using the Company's proposed fixed charge energy rates for Schedules 83 and
18 85 listed in the Company's proposed Schedule 123, which include fixed generation
19 charges only, I calculated the full cost demand charges shown in Table 1. The fixed
20 charge energy rates included by the Company in proposed Schedule 123 are
21 \$39.15/MWh for Schedule 83, \$37.77/MWh for Schedule 85 Secondary, and
22 \$37.10/MWh for Schedule 85 Primary. See PGE/1301.

Table 1: Full Cost Generation Demand Charges for Schedule 83, Schedule 85 Secondary, and Schedule 85 Primary

Schedule	Full Cost Generation Demand Charge
Schedule 83	\$12.85/kW on peak demand
Schedule 85 Secondary	\$14.16/kW on peak demand
Schedule 85 Primary	\$14.62/kW on peak demand
Sources: Walmart/102, Walmart/103, and Walmart/104	

Q. HAVE YOU PERFORMED AN ESTIMATE OF THE INTRA-CLASS SUBSIDIES CONTAINED IN THE COMPANY'S GENERATION RATES FOR SCHEDULE 85 SECONDARY?

A. Yes. I recalculated Schedule 85 generation rates with the full cost demand charge shown in Table 1 and an on-peak/off-peak differential of 1.5 cents/kWh. I applied these rates using the Company's bill analysis structure from PGE/1302/Macfarlane-Goodspeed/9, which sorts customers by load factor and size. The subsidy paid or received per kWh is shown in Table 2.

Table 2: Intra-class Subsidy Paid or Received by Load Factor, PGE Proposed Generation Rates, Schedule 85 Secondary.

Load Factor	Subsidy Paid / (Received)
30%	(\$0.027)/kWh
50%	(\$0.001)/kWh
70%	\$0.010/kWh
90%	\$0.016/kWh
Sources: Walmart/105	

Q. DOES THE COMPANY'S PROPOSED GENERATION RATE DESIGN PROVIDE A CAPACITY PRICE SIGNAL FOR CUSTOMERS?

A. No. While the on-peak/off-peak energy cost differential can provide a price signal to use less energy during the on-peak period, it should not be construed as creating a price signal to allow a customer to implement measures to effectively address their

1 monthly peak demands or their contribution to the Company's peak demands. This
2 is largely due to the broad expanse of time defined as "on-peak," which is the hours
3 of 6:00 AM to 10:00 PM, Monday through Saturday. See P.U.C. Oregon No. E-18,
4 Thirteenth Revision of Sheet No. 83-1 and Tenth Revision of Sheet No. 85-1.

5 **Q. WOULD A GENERATION DEMAND CHARGE MAKE SCHEDULES 83 AND 85 LESS**
6 **UNDERSTANDABLE TO CUSTOMERS?**

7 A. No. Schedule 83 and 85 customers already pay three demand-based charges for
8 transmission and distribution costs. *Id.*

1 **Q. WOULD THE PROPER COLLECTION OF DEMAND-RELATED COSTS THROUGH A**
2 **DEMAND CHARGE PROVIDE BENEFITS TO THE COMPANY?**

3 A. Yes. By collecting more demand-related costs through the energy charge, the
4 Company could be more susceptible to weather-related and other fluctuations in
5 usage than it would be were those costs recovered through a demand charge. A
6 rate design that properly collects fixed costs through a \$/kW demand charge and
7 energy-related costs through \$/kWh variable charges should provide greater
8 revenue certainty and more stable utility earnings.

9 **Q. INSTEAD OF DEPLOYING COST-BASED RATE DESIGN TO ENSURE THE COMPANY**
10 **HAS AN OPPORTUNITY TO RECOVER ITS FIXED GENERATION COSTS, HAS THE**
11 **COMPANY PROPOSED AN ADDITIONAL DECOUPLING MECHANISM FOR SCHEDULES**
12 **83 AND 85?**

13 A. Yes. The Company proposes to include Schedules 83 and 85 in their Sales
14 Normalization Adjustment ("SNA") mechanism in "order to explore the ramifications
15 of revenue-per-customer decoupling for large non-residential customers." See
16 PGE/1300/Macfarlane-Goodspeed/30/5-8. The mechanism uses the fixed charge
17 energy rates discussed earlier in this section, which are \$39.15/MWh for Schedule
18 83, \$37.77/MWh for Schedule 85 Secondary, and \$37.10/MWh for Schedule 85
19 Primary. See PGE/1301.

1 **Q. IS ADDRESSING FIXED COST RECOVERY THROUGH RATE DESIGN SUPERIOR TO**
2 **DECOUPLING THROUGH A RATE ADJUSTMENT MECHANISM?**

3 A. Yes. Addressing fixed cost recovery through a rate design approach is superior for
4 two primary reasons. First, the rate design approach allows the Company the
5 opportunity to create rates that reflect the Company's cost of service and correctly
6 account for cost causation. As I state earlier in this testimony, creating rates that
7 reflect the cost of service will minimize inter-class and intra-class subsidies and send
8 correct price signals to customers in addition to reducing the Company's reliance of
9 kWh energy sales to recover their fixed costs.

10 **Q. WHAT IS THE SECOND REASON WHY ADDRESSING FIXED COST RECOVERY**
11 **THROUGH RATE DESIGN IS SUPERIOR TO DECOUPLING THROUGH A RATE**
12 **ADJUSTMENT MECHANISM?**

13 A. Rate design is an *ex ante* process – that is, the price for service is set in advance of a
14 customer's activities. With *ex ante* ratemaking, customers have the benefit of
15 complete information related to the bill impacts of the deployment of behind the
16 meter technologies. A decoupling rate adjustment is an *ex post* accounting
17 adjustment – that is, the decoupling rate is set after the usage is determined – that
18 reflects the Company's ability to recover its cost, not a price that reflects the
19 Company's cost to serve. Additionally, the Company proposes a per kWh decoupling
20 rate, which doubles down on the recovery of fixed costs on a volumetric charge.

Q. WHAT IS WALMART'S RECOMMENDATION ON THIS ISSUE?

A. For the purposes of this docket, Walmart proposes the following for setting the generation rates for Schedules 83 and 85:

- 1) The Commission should require PGE to establish a \$/kW on peak generation demand charge for Schedules 83 and 85 based on 25 percent of the full cost generation demand charge per the revenue requirement and cost of service outcomes in this docket;
- 2) Walmart does not oppose maintaining the on-peak/off-peak differential of 1.5 cents/kWh;
- 3) The Commission should reject the Company's proposal to include Schedules 83 and 85 in the SNA in this docket and re-evaluate the necessity of inclusion of the schedules in the next rate case;
- 4) If the Commission approves the inclusion of Schedules 83 and 85 in the SNA, it should require PGE to set the decoupling rate on a \$/kW on peak demand basis; and
- 5) To the extent the Commission adopts a demand charge for Schedules 83 and 85 and approves the inclusion of those schedules in the SNA, the fixed cost energy charges for each schedule should be adjusted downward to reflect the increased recovery of fixed generation costs through the demand charge and decreased recovery of fixed generation costs through the energy charges.

1 **Q. HAVE YOU CALCULATED ILLUSTRATIVE RATES OF THIS RATE DESIGN AT THE**
2 **COMPANY’S PROPOSED REVENUE REQUIREMENT?**

3 A. Yes, for Schedule 85 Secondary. At the Company’s proposed rate design, this would
4 result in an on-peak demand charge of \$3.54/kW, an on-peak energy charge of
5 \$0.05414/kWh, and an off-peak energy charge of \$0.03914/kWh. Additionally, the
6 fixed energy charge rate for the SNA would be \$28.33/MWh. See Walmart/105.

7 **Q. BY HOW MUCH WOULD THIS CHANGE REDUCE THE INTRA-CLASS SUBSIDY**
8 **DESCRIBED ABOVE?**

9 A. This change would reduce the intra-class subsidy by 25 percent at the levels shown
10 in Table 3.

**Table 3: Intra-class Subsidy Paid or Received by Load Factor, PGE Proposed
Generation Rates and Walmart Proposed Generation Rates, Schedule 85
Secondary.**

	PGE Proposed	Walmart Proposed
Load Factor	Subsidy Paid / (Received)	Subsidy Paid / (Received)
30%	(\$0.027)/kWh	(\$0.020)/kWh
50%	(\$0.0010)/kWh	(\$0.0008)/kWh
70%	\$0.010/kWh	\$0.008/kWh
90%	\$0.016/kWh	\$0.012/kWh

Sources: Walmart/105

11
12 **Q. DOES THIS CONCLUDE YOUR TESTIMONY?**

13 A. Yes.

Steve W. Chriss

Walmart, Inc.

Business Address: 2001 SE 10th Street, Bentonville, AR, 72716-0550

EXPERIENCE

July 2007 – Present

Wal-Mart Stores, Inc., Bentonville, AR

Director, Energy and Strategy Analysis (October 2016 – Present)

Senior Manager, Energy Regulatory Analysis (June 2011 – October 2016)

Manager, State Rate Proceedings (July 2007 – June 2011)

June 2003 – July 2007

Public Utility Commission of Oregon, Salem, OR

Senior Utility Analyst (February 2006 – July 2007)

Economist (June 2003 – February 2006)

January 2003 - May 2003

North Harris College, Houston, TX

Adjunct Instructor, Microeconomics

June 2001 - March 2003

Econ One Research, Inc., Houston, TX

Senior Analyst (October 2002 – March 2003)

Analyst (June 2001 – October 2002)

EDUCATION

2001

Louisiana State University

M.S., Agricultural Economics

1997-1998

University of Florida

Graduate Coursework, Agricultural Education
and Communication

1997

Texas A&M University

B.S., Agricultural Development

B.S., Horticulture

TESTIMONY BEFORE REGULATORY COMMISSIONS

2018

North Dakota Case No. PU-17-398: In the Matter of the Application of Otter Tail Power Company for Authority to Increase Rates for Electric Utility Service in North Dakota.

Virginia Case No. PUR-2017-00179: Application of Appalachian Power Company for Approval of an 100 Percent Renewable Energy Rider Pursuant to § 56-577 A 5 of the Code of Virginia.

Missouri Case No. ET-2018-0063: In the Matter of the Application of Union Electric Company d/b/a Ameren Missouri for Approval of 2017 Green Tariff.

New Mexico Case No. 17-00255-UT: In the Matter of Southwestern Public Service Company's Application for Revision of its Retail Rates Under Advice Notice No. 272.

Virginia Case No. PUR-2017-00157: Application of Virginia Electric and Power Company for Approval of 100 Percent Renewable Energy Tariffs for Residential and Non-Residential Customers.

Kansas Docket No. 18-KCPE-095-MER: In the Matter of the Application of Great Plains Energy Incorporated, Kansas City Power & Light Company, and Westar Energy, Inc. for Approval of the Merger of Westar Energy, Inc. and Great Plains Energy Incorporated.

North Carolina Docket No. E-7, Sub 1146: In the Matter of the Application of Duke Energy Carolinas, LLC for Adjustment of Rates and Charges Applicable to Electric Service in North Carolina.

Louisiana Docket No. U-34619: In Re: Application for Expedited Certification and Approval of the Acquisition of Certain Renewable Resources and the Construction of a Generation Tie Pursuant to the 1983 and/or/1994 General Orders.

Missouri Case No. EM-2018-0012: In the Matter of the Application of Great Plains Energy Incorporated for Approval of its Merger with Westar Energy, Inc.

2017

Arkansas Docket No. 17-038-U: In the Matter of the Application of Southwestern Electric Power Company for Approval to Acquire a Wind Generating Facility and to Construct a Dedicated Generation Tie Line.

Texas Docket No. 47461: Application of Southwestern Electric Power Company for Certificate of Convenience and Necessity Authorization and Related Relief for the Wind Catcher Energy Connection Project.

Oklahoma Cause No. PUD 201700267: Application of Public Service Company of Oklahoma for Approval of the Cost Recovery of the Wind Catcher Energy Connection Project; A Determination There is Need for the Project; Approval for Future Inclusion in Base Rates Cost Recovery of Prudent Costs Incurred by PSO for the Project; Approval of a Temporary Cost Recovery Rider; Approval of Certain Accounting Procedures Regarding Federal Production Tax Credits; Waiver of OAC 165:35-38-5(E); And Such Other Relief the Commission Deems PSO is Entitled.

Nevada Docket No. 17-06003: In the Matter of the Application of Nevada Power Company, d/b/a NV Energy, Filed Pursuant to NRS 704.110(3) and (4), Addressing Its Annual Revenue Requirement for General Rates Charged to All Classes of Customers.

North Carolina Docket No. E-2, Sub 1142: In the Matter of the Application of Duke Energy Progress, LLC for Adjustment of Rates and Charges Applicable to Electric Service in North Carolina.

Oklahoma Cause No. PUD 201700151: Application of Public Service Company of Oklahoma, an Oklahoma Corporation, for an Adjustment in its Rates and Charges and the Electric Service Rules, Regulations and Conditions of Service for Electric Service in the State of Oklahoma.

Kentucky Case No. 2017-00179: Electronic Application of Kentucky Power Company for (1) a General Adjustment of its Rates for Electric Service; (2) an Order Approving its 2017 Environmental Compliance Plan; (3) an Order Approving its Tariffs and Riders; (4) an Order Approving Accounting Practices to Establish Regulatory Assets and Liabilities; and (5) an Order Granting All Other Requested Relief.

New York Case No. 17-E-0238: Proceeding on Motion of the Commission as to the Rates, Charges, Rules, and Regulations of Niagara Mohawk Power Corporation for Electric and Gas Service.

Virginia Case No. PUR-2017-00060: Application of Virginia Electric and Power Company for Approval of 100 Percent Renewable Energy Tariffs Pursuant to §§ 56-577 A 5 and 56-234 of the Code of Virginia.

New Jersey Docket No. ER17030308: In the Matter of the Petition of Atlantic City Electric Company for Approval of Amendments to its Tariff to Provide for an Increase in Rates and Charges for Electric Service Pursuant to N.J.S.A. 48:2-21 and N.J.S.A. 48:2-21.1, for Approval of a Grid Resiliency Initiative and Cost Recovery Related Thereto, and for Other Appropriate Relief.

Texas Docket No. 46831: Application of El Paso Electric Company to Change Rates.

Oregon Docket No. UE 319: In the Matter of Portland General Electric Company, Request for a General Rate Revision.

New Mexico Case No. 16-00276-UT: In the Matter of the Application of Public Service Company of New Mexico for Revision of its Retail Electric Rates Pursuant to Advice No. 533.

Minnesota Docket No. E015/GR-16-664: In the Matter of the Application of Minnesota Power for Authority to Increase Rates for Electric Service in Minnesota.

Ohio Case No. 16-1852-EL-SSO: In the Matter of the Application of Ohio Power Company for Authority to Establish a Standard Service Offer Pursuant to §4928.143, Ohio Rev. Code, In the Form of an Electric Security Plan.

Texas Docket No. 46449: Application of Southwestern Electric Power Company for Authority to Change Rates.

Arkansas Docket No. 16-052-U: In the Matter of the Application of Oklahoma Gas and Electric Company for Approval of a General Change in Rates, Charges, and Tariffs.

Missouri Case No. EA-2016-0358: In the Matter of the Application of Grain Belt Express Clean Line LLC for a Certificate of Convenience and Necessity Authorizing it to Construct, Own, Operate, Control, Manage and Maintain a High Voltage, Direct Current Transmission Line and an Associated Converter Station Providing an Interconnection on the Maywood-Montgomery 345 kV Transmission Line.

Florida Docket No. 160186-Ei: In Re: Petition for Increase in Rates by Gulf Power Company.

2016

Missouri Case No. ER-2016-0179: In the Matter of Union Electric Company d/b/a Ameren Missouri Tariffs to Increase its Revenues for Electric Service.

Kansas Docket No. 16-KCPE-593-ACQ: In the Matter of the Joint Application of Great Plains Energy Incorporated, Kansas City Power & Light Company, and Westar Energy, Inc. for Approval of the Acquisition of Westar Energy, Inc. by Great Plains Energy Incorporated.

Missouri Case No. EA-2016-0208: In the Matter of the Application of Union Electric Company d/b/a Ameren Missouri for Permission and Approval and a Certificate of Public Convenience and Necessity Authorizing it to Offer a Pilot Distributed Solar Program and File Associated Tariff.

Utah Docket No. 16-035-T09: In the Matter of Rocky Mountain Power's Proposed Electric Service Schedule No. 34, Renewable Energy Tariff.

Pennsylvania Public Utility Commission Docket No. R-2016-2537359: Pennsylvania Public Utility Commission v. West Penn Power Company.

Pennsylvania Public Utility Commission Docket No. R-2016-2537352: Pennsylvania Public Utility Commission v. Pennsylvania Electric Company.

Pennsylvania Public Utility Commission Docket No. R-2016-2537355: Pennsylvania Public Utility Commission v. Pennsylvania Power Company.

Pennsylvania Public Utility Commission Docket No. R-2016-2537349: Pennsylvania Public Utility Commission v. Metropolitan Edison Company.

Michigan Case No. U-17990: In the Matter of the Application of Consumers Energy Company for Authority to Increase its Rates for the Generation and Distribution of Electricity and for Other Relief.

Florida Docket No. 160021-El: In Re: Petition for Rate Increase by Florida Power & Light Company.

Minnesota Docket No. E-002/GR-15-816: In the Matter of the Application of Northern States Power Company for Authority to Increase Rates for Electric Service in the State of Minnesota.

Colorado Public Utilities Commission Docket No. 16AL-0048E: Re: In the Matter of Advice Letter No. 1712-Electric Filed by Public Service Company of Colorado to Replace Colorado PUC No.7-Electric Tariff with Colorado PUC No. 8-Electric Tariff.

Colorado Public Utilities Commission Docket No. 16A-0055E: Re: In the Matter of the Application of Public Service Company of Colorado for Approval of its Solar*Connect Program.

Missouri Public Service Commission Case No. ER-2016-0023: In the Matter of the Empire District Electric Company of Joplin, Missouri for Authority to File Tariffs Increasing Rates for Electric Service Provided to Customers in the Missouri Service Area of the Company.

Georgia Public Service Commission Docket No. 40161: In Re: Georgia Power Company's 2016 Integrated Resource Plan and Application for Decertification of Plant Mitchell Units 3, 4A and 4B, Plant Kraft Unit 1 CT, and Intercession City CT.

Oklahoma Corporation Commission Cause No. PUD 201500273: In the Matter of Oklahoma Gas and Electric Company for an Order of the Commission Authorizing Applicant to Modify its Rates, Charges, and Tariffs for Retail Electric Service in Oklahoma.

New Mexico Case No. 15-00261-UT: In the Matter of the Application of Public Service Company of New Mexico for Revision of its Retail Electric Rates Pursuant to Advice Notice No. 513.

2015

Indiana Utility Regulatory Commission Cause No. 44688: Petition of Northern Indiana Public Service Company for Authority to Modify its Rates and Charges for Electric Utility Service and for Approval of: (1) Changes to its Electric Service Tariff Including a New Schedule of Rates and Charges and Changes to the General Rules and Regulations and Certain Riders; (2) Revised Depreciation Accrual Rates; (3) Inclusion in its Basic Rates and Charges of the Costs Associated with Certain Previously Approved Qualified Pollution Control Property, Clean Coal Technology, Clean Energy Projects and Federally Mandated Compliance Projects; and (4) Accounting Relief to Allow NIPSCO to Defer, as a Regulatory Asset or Liability, Certain Costs for Recovery in a Future Proceeding.

Public Utility Commission of Texas Docket No. 44941: Application of El Paso Electric Company to Change Rates.

Arizona Corporation Commission Docket No. E-04204A-15-0142: In the matter of the Application of UNS Electric, Inc. for the Establishment of Just and Reasonable Rates and Charges Designed to Realized a Reasonable Rate of Return on the Fair Value of the Properties of UNS Electric, Inc. Devoted to its Operations Throughout the State of Arizona, and for Related Approvals.

Rhode Island Public Utilities Commission Docket No. 4568: In Re: National Grid's Rate Design Plan.

Oklahoma Corporation Commission Cause No. PUD 201500208: Application of Public Service Company of Oklahoma, an Oklahoma Corporation, for an Adjustment in its Rates and Charges and the Electric Service Rules, Regulations and Conditions of Service for Electric Service in the State of Oklahoma.

Public Service Commission of Wisconsin Docket No. 4220-UR-121: Application of Northern States Power Company, A Wisconsin Corporation, for Authority to Adjust Electric and Natural Gas Rates.

Arkansas Public Service Commission Docket No. 15-015-U: In the Matter of the Application of Entergy Arkansas, Inc. for Approval of Changes in Rates for Retail Electric Service.

New York Public Service Commission Case No. 15-E-0283: Proceeding on Motion of the Commission as to the Rates, Charges, Rules, and Regulations of New York State Electric & Gas Corporation for Electric Service.

New York Public Service Commission Case No. 15-G-0284: Proceeding on Motion of the Commission as to the Rates, Charges, Rules, and Regulations of New York State Electric & Gas Corporation for Gas Service.

New York Public Service Commission Case No. 15-E-0285: Proceeding on Motion of the Commission as to the Rates, Charges, Rules, and Regulations of Rochester Gas & Electric Corporation for Electric Service.

New York Public Service Commission Case No. 15-G-0286: Proceeding on Motion of the Commission as to the Rates, Charges, Rules, and Regulations of Rochester Gas & Electric Corporation for Gas Service.

Public Utilities Commission of Ohio Case No. 14-1693-EL-RDR: In the Matter of the Application Seeking Approval of Ohio Power Company's Proposal to Enter Into an Affiliate Power Purchase Agreement for Inclusion in the Power Purchase Agreement Rider.

Public Service Commission of Wisconsin Docket No. 6690-UR-124: Application of Wisconsin Public Service Corporation for Authority to Adjust Electric and Natural Gas Rates.

Arkansas Public Service Commission Docket No. 15-034-U: In the Matter of an Interim Rate Schedule of Oklahoma Gas and Electric Company Imposing a Surcharge to Recover All Investments and Expenses Incurred Through Compliance with Legislative or Administrative Rules, Regulations, or Requirements Relating to the Public Health, Safety or the Environment Under the Federal Clean Air Act for Certain of its Existing Generation Facilities.

Kansas Corporation Commission Docket No. 15-WSEE-115-RTS: In the Matter of the Application of Westar Energy, Inc. and Kansas Gas and Electric Company to Make Certain Changes in their Charges for Electric Service.

Michigan Public Service Commission Case No. U-17767: In the Matter of the Application of DTE Electric Company for Authority to Increase its Rates, Amend its Rate Schedules and Rules Governing the Distribution and Supply of Electric Energy, and for Miscellaneous Accounting Authority.

Public Utility Commission of Texas Docket No. 43695: Application of Southwestern Public Service Company for Authority to Change Rates.

Kansas Corporation Commission Docket No. 15-KCPE-116-RTS: In the Matter of the Application of Kansas City Power & Light Company to Make Certain Changes in its Charges for Electric Service.

Michigan Case No. U-17735: In the Matter of the Application of the Consumers Energy Company for Authority to Increase its Rates for the Generation and Distribution of Electricity and for Other Relief.

Kentucky Public Service Commission Case No. 2014-00396: Application of Kentucky Power Company for a General Adjustment of its Rates for Electric Service; (2) an Order Approving its 2014 Environmental Compliance Plan; (3) an Order Approving its Tariffs and Riders; and (4) an Order Granting All Other Required Approvals and Relief.

Kentucky Public Service Commission Case No. 2014-00371: In the Matter of the Application of Kentucky Utilities Company for an Adjustment of its Electric Rates.

Kentucky Public Service Commission Case No. 2014-00372: In the Matter of the Application of Louisville Gas and Electric Company for an Adjustment of its Electric and Gas Rates.

2014

Ohio Public Utilities Commission Case No. 14-1297-EL-SSO: In the Matter of the Application of Ohio Edison Company, The Cleveland Electric Illuminating Company and the Toledo Edison Company for Authority to Provide for a Standard Service Offer Pursuant to R.C. 4928.143 in the Form of an Electric Security Plan.

West Virginia Case No. 14-1152-E-42T: Appalachian Power Company and Wheeling Power Company, Both d/b/a American Electric Power, Joint Application for Rate Increases and Changes in Tariff Provisions.

Oklahoma Corporation Commission Cause No. PUD 201400229: In the Matter of the Application of Oklahoma Gas and Electric Company for Commission Authorization of a Plan to Comply with the Federal Clean Air Act and Cost Recovery; and for Approval of the Mustang Modernization Plan.

Missouri Public Service Commission Case No. ER-2014-0258: In the Matter of Union Electric Company d/b/a Ameren Missouri's Tariff to Increase its Revenues for Electric Service.

Pennsylvania Public Utility Commission Docket No. R-2014-2428742: Pennsylvania Public Utility Commission v. West Penn Power Company.

Pennsylvania Public Utility Commission Docket No. R-2014-2428743: Pennsylvania Public Utility Commission v. Pennsylvania Electric Company.

Pennsylvania Public Utility Commission Docket No. R-2014-2428744: Pennsylvania Public Utility Commission v. Pennsylvania Power Company.

Pennsylvania Public Utility Commission Docket No. R-2014-2428745: Pennsylvania Public Utility Commission v. Metropolitan Edison Company.

Washington Utilities and Transportation Commission Docket No. UE-141368: In the Matter of the Petition of Puget Sound Energy to Update Methodologies Used to Allocate Electric Cost of Service and For Electric Rate Design Purposes.

Washington Utilities and Transportation Commission Docket No. UE-140762: 2014 Pacific Power & Light Company General Rate Case.

West Virginia Public Service Commission Case No. 14-0702-E-42T: Monongahela Power Company and the Potomac Edison Company Rule 42T Tariff Filing to Increase Rates and Charges.

Ohio Public Utilities Commission Case No. 14-841-EL-SSO: In the Matter of the Application of Duke Energy Ohio for Authority to Establish a Standard Service Offer Pursuant to Section 4928.143, Revised Code, in the Form of Case No. 14-841-EL-SSO an Electric Security Plan, Accounting Modifications and Tariffs for Generation Service.

Colorado Public Utilities Commission Docket No. 14AL-0660E: Re: In the Matter of the Advice Letter No. 1672-Electric Filed by Public Service Company of Colorado to Revise its Colorado PUC No. 7-Electric Tariff to Implement a General Rate Schedule Adjustment and Other Rate Changes Effective July 18, 2014.

Maryland Case No. 9355: In the Matter of the Application of Baltimore Gas and Electric Company for Authority to Increase Existing Rates and Charges for Electric and Gas Service.

Mississippi Public Service Commission Docket No. 2014-UN-132: In Re: Notice of Intent of Entergy Mississippi, Inc. to Modernize Rates to Support Economic Development, Power Procurement, and Continued Investment.

Nevada Public Utilities Commission Docket No. 14-05004: Application of Nevada Power Company d/b/a NV Energy for Authority to Increase its Annual Revenue Requirement for General Rates Charged to All Classes of Electric Customers and for Relief Properly Related Thereto.

Utah Public Service Commission Docket No. 14-035-T02: In the Matter of Rocky Mountain Power's Proposed Electric Service Schedule No. 32, Service From Renewable Energy Facilities.

Florida Public Service Commission Docket No. 140002-EG: In Re: Energy Conservation Cost Recovery Clause.

Public Service Commission of Wisconsin Docket No. 6690-UR-123: Application of Wisconsin Public Service Corporation for Authority to Adjust Electric and Natural Gas Rates.

Connecticut Docket No. 14-05-06: Application of the Connecticut Light and Power Company to Amend its Rate Schedules.

Virginia Corporation Commission Case No. PUE-2014-00026: Application of Appalachian Power Company for a 2014 Biennial Review for the Provision of Generation, Distribution and Transmission Services Pursuant to § 56-585.1 A of the Code of Virginia.

Virginia Corporation Commission Case No. PUE-2014-00033: Application of Virginia Electric and Power Company to Revise its Fuel Factor Pursuant to Va. Code § 56-249.6.

Arizona Corporation Commission Docket No. E-01345A-11-0224 (Four Corners Phase): In the Matter of Arizona Public Service Company for a Hearing to Determine the Fair Value of Utility Property of the Company for Ratemaking Purposes, to Fix and Just and Reasonable Rate of Return Thereon, to Approve Rate Schedules Designed to Develop Such Return.

Minnesota Public Utilities Commission Docket No. E-002/GR-13-868: In the Matter of the Application of Northern States Power Company, for Authority to Increase Rates for Electric Service in Minnesota.

Utah Public Service Commission Docket No. 13-035-184: In the Matter of the Application of Rocky Mountain Power for Authority to Increase its Retail Electric Utility Service Rates in Utah and for Approval of its Proposed Electric Service Schedules and Electric Service Regulations.

Missouri Public Service Commission Case No. EC-2014-0224: In the Matter of Noranda Aluminum, Inc.'s Request for Revisions to Union Electric Company d/b/a Ameren Missouri's Large Transmission Service Tariff to Decrease its Rate for Electric Service.

Oklahoma Corporation Commission Cause No. PUD 201300217: Application of Public Service Company of Oklahoma to be in Compliance with Order No. 591185 Issued in Cause No. PUD 201100106 Which Requires a Base Rate Case to be Filed by PSO and the Resulting Adjustment in its Rates and Charges and Terms and Conditions of Service for Electric Service in the State of Oklahoma.

Public Utilities Commission of Ohio Case No. 13-2386-EL-SSO: In the Matter of the Application of Ohio Power Company for Authority to Establish a Standard Service Offer Pursuant to §4928.143, Ohio Rev. Code, in the Form of an Electric Security Plan.

2013

Oklahoma Corporation Commission Cause No. PUD 201300201: Application of Public Service Company of Oklahoma for Commission Authorization of a Standby and Supplemental Service Rate Schedule.

Georgia Public Service Commission Docket No. 36989: Georgia Power's 2013 Rate Case.

Florida Public Service Commission Docket No. 130140-El: Petition for Rate Increase by Gulf Power Company.

Public Utility Commission of Oregon Docket No. UE 267: In the Matter of PACIFICORP, dba PACIFIC POWER, Transition Adjustment, Five-Year Cost of Service Opt-Out.

Illinois Commerce Commission Docket No. 13-0387: Commonwealth Edison Company Tariff Filing to Present the Illinois Commerce Commission with an Opportunity to Consider Revenue Neutral Tariff Changes Related to Rate Design Authorized by Subsection 16-108.5 of the Public Utilities Act.

Iowa Utilities Board Docket No. RPU-2013-0004: In Re: MidAmerican Energy Company.

South Dakota Public Utilities Commission Docket No. EL12-061: In the Matter of the Application of Black Hills Power, Inc. for Authority to Increase its Electric Rates. (filed with confidential stipulation)

Kansas Corporation Commission Docket No. 13-WSEE-629-RTS: In the Matter of the Applications of Westar Energy, Inc. and Kansas Gas and Electric Company for Approval to Make Certain Changes in their Charges for Electric Service.

Public Utility Commission of Oregon Docket No. UE 263: In the Matter of PACIFICORP, dba PACIFIC POWER, Request for a General Rate Revision.

Arkansas Public Service Commission Docket No. 13-028-U: In the Matter of the Application of Entergy Arkansas, Inc. for Approval of Changes in Rates for Retail Electric Service.

Virginia State Corporation Commission Docket No. PUE-2013-00020: Application of Virginia Electric and Power Company for a 2013 Biennial Review of the Rates, Terms, and Conditions for the Provision of Generation, Distribution, and Transmission Services Pursuant to § 56-585.1 A of the Code of Virginia.

Florida Public Service Commission Docket No. 130040-El: Petition for Rate Increase by Tampa Electric Company.

South Carolina Public Service Commission Docket No. 2013-59-E: Application of Duke Energy Carolinas, LLC, for Authority to Adjust and Increase Its Electric Rates and Charges.

Public Utility Commission of Oregon Docket No. UE 262: In the Matter of PORTLAND GENERAL ELECTRIC COMPANY, Request for a General Rate Revision.

New Jersey Board of Public Utilities Docket No. ER12111052: In the Matter of the Verified Petition of Jersey Central Power & Light Company For Review and Approval of Increases in and Other Adjustments to Its Rates and Charges For Electric Service, and For Approval of Other Proposed Tariff Revisions in Connection Therewith; and for Approval of an Accelerated Reliability Enhancement Program ("2012 Base Rate Filing")

North Carolina Utilities Commission Docket No. E-7, Sub 1026: In the Matter of the Application of Duke Energy Carolinas, LLC for Adjustment of Rates and Charges Applicable to Electric Service in North Carolina.

Public Utility Commission of Oregon Docket No. UE 264: PACIFICORP, dba PACIFIC POWER, 2014 Transition Adjustment Mechanism.

Public Utilities Commission of California Docket No. 12-12-002: Application of Pacific Gas and Electric Company for 2013 Rate Design Window Proceeding.

Public Utilities Commission of Ohio Docket Nos. 12-426-EL-SSO, 12-427-EL-ATA, 12-428-EL-AAM, 12-429-EL-WVR, and 12-672-EL-RDR: In the Matter of the Application of the Dayton Power and Light Company Approval of its Market Offer.

Minnesota Public Utilities Commission Docket No. E-002/GR-12-961: In the Matter of the Application of Northern States Power Company for Authority to Increase Rates for Electric Service in Minnesota.

North Carolina Utilities Commission Docket E-2, Sub 1023: In the Matter of Application of Progress Energy Carolinas, Inc. For Adjustment of Rates and Charges Applicable to Electric Service in North Carolina.

2012

Public Utility Commission of Texas Docket No. 40443: Application of Southwestern Electric Power Company for Authority to Change Rates and Reconcile Fuel Costs.

South Carolina Public Service Commission Docket No. 2012-218-E: Application of South Carolina Electric & Gas Company for Increases and Adjustments in Electric Rate Schedules and Tariffs and Request for Mid-Period Reduction in Base Rates for Fuel.

Kansas Corporation Commission Docket No. 12-KCPE-764-RTS: In the Matter of the Application of Kansas City Power & Light Company to Make Certain Changes in its Charges for Electric Service.

Kansas Corporation Commission Docket No. 12-GIMX-337-GIV: In the Matter of a General Investigation of Energy-Efficiency Policies for Utility Sponsored Energy Efficiency Programs.

Florida Public Service Commission Docket No. 120015-El: In Re: Petition for Rate Increase by Florida Power & Light Company.

California Public Utilities Commission Docket No. A.11-10-002: Application of San Diego Gas & Electric Company (U 902 E) for Authority to Update Marginal Costs, Cost Allocation, and Electric Rate Design.

Utah Public Service Commission Docket No. 11-035-200: In the Matter of the Application of Rocky Mountain Power for Authority to Increase its Retail Electric Utility Service Rates in Utah and for Approval of its Proposed Electric Service Schedules and Electric Service Regulations.

Virginia State Corporation Commission Case No. PUE-2012-00051: Application of Appalachian Power Company to Revise its Fuel Factor Pursuant to § 56-249.6 of the Code of Virginia.

Public Utilities Commission of Ohio Case Nos. 11-346-EL-SSO, 11-348-EL-SSO, 11-349-EL-AAM, and 11-350-EL-AAM: In the Matter of the Application of Columbus Southern Power Company and Ohio Power Company for Authority to Establish a Standard Service Offer Pursuant to Section 4928.143, Revised Code, in the Form on an Electric Security Plan and In the Matter of the Application of Columbus Southern Power Company and Ohio Power Company for Approval of Certain Accounting Authority.

New Jersey Board of Public Utilities Docket No. ER11080469: In the Matter of the Petition of Atlantic City Electric for Approval of Amendments to Its Tariff to Provide for an Increase in Rates and Charges for Electric Service Pursuant to N.J.S.A. 48:2-21 and N.J.S.A. 48:2-21.1 and For Other Appropriate Relief.

Public Utility Commission of Texas Docket No. 39896: Application of Entergy Texas, Inc. for Authority to Change Rates and Reconcile Fuel Costs.

Missouri Public Service Commission Case No. EO-2012-0009: In the Matter of KCP&L Greater Missouri Operations Notice of Intent to File an Application for Authority to Establish a Demand-Side Programs Investment Mechanism.

Colorado Public Utilities Commission Docket No. 11AL-947E: In the Matter of Advice Letter No. 1597-Electric Filed by Public Service Company of Colorado to Revise its Colorado PUC No. 7-Electric Tariff to Implement a General Rate Schedule Adjustment and Other Changes Effective December 23, 2011.

Illinois Commerce Commission Docket No. 11-0721: Commonwealth Edison Company Tariffs and Charges Submitted Pursuant to Section 16-108.5 of the Public Utilities Act.

Public Utility Commission of Texas Docket No. 38951: Application of Entergy Texas, Inc. for Approval of Competitive Generation Service tariff (Issues Severed from Docket No. 37744).

California Public Utilities Commission Docket No. A.11-06-007: Southern California Edison's General Rate Case, Phase 2.

2011

Arizona Corporation Commission Docket No. E-01345A-11-0224: In the Matter of Arizona Public Service Company for a Hearing to Determine the Fair Value of Utility Property of the Company for Ratemaking Purposes, to Fix and Just and Reasonable Rate of Return Thereon, to Approve Rate Schedules Designed to Develop Such Return.

Oklahoma Corporation Commission Cause No. PUD 201100087: In the Matter of the Application of Oklahoma Gas and Electric Company for an Order of the Commission Authorizing Applicant to Modify its Rates, Charges, and Tariffs for Retail Electric Service in Oklahoma.

South Carolina Public Service Commission Docket No. 2011-271-E: Application of Duke Energy Carolinas, LLC for Authority to Adjust and Increase its Electric Rates and Charges.

Pennsylvania Public Utility Commission Docket No. P-2011-2256365: Petition of PPL Electric Utilities Corporation for Approval to Implement Reconciliation Rider for Default Supply Service.

North Carolina Utilities Commission Docket No. E-7, Sub 989: In the Matter of Application of Duke Energy Carolinas, LLC for Adjustment of Rates and Charges Applicable to Electric Service in North Carolina.

Florida Public Service Commission Docket No. 110138: In Re: Petition for Increase in Rates by Gulf Power Company.

Public Utilities Commission of Nevada Docket No. 11-06006: In the Matter of the Application of Nevada Power Company, filed pursuant to NRS 704.110(3) for authority to increase its annual revenue requirement for general rates charged to all classes of customers to recover the costs of constructing the Harry Allen Combined Cycle plant and other generating, transmission, and distribution plant additions, to reflect changes in the cost of capital, depreciation rates and cost of service, and for relief properly related thereto.

North Carolina Utilities Commission Docket Nos. E-2, Sub 998 and E-7, Sub 986: In the Matter of the Application of Duke Energy Corporation and Progress Energy, Inc., to Engage in a Business Combination Transaction and to Address Regulatory Conditions and Codes of Conduct.

Public Utilities Commission of Ohio Case Nos. 11-346-EL-SSO, 11-348-EL-SSO, 11-349-EL-AAM, and 11-350-EL-AAM: In the Matter of the Application of Columbus Southern Power Company and Ohio Power Company for Authority to Establish a Standard Service Offer Pursuant to Section 4928.143, Revised Code, in the Form on an Electric Security Plan and In the Matter of the Application of Columbus Southern Power Company and Ohio Power Company for Approval of Certain Accounting Authority.

Virginia State Corporation Commission Case No. PUE-2011-00037: In the Matter of Appalachian Power Company for a 2011 Biennial Review of the Rates, Terms, and Conditions for the Provision of Generation, Distribution, and Transmission Services Pursuant to § 56-585.1 A of the Code of Virginia.

Illinois Commerce Commission Docket No. 11-0279 and 11-0282 (cons.): Ameren Illinois Company Proposed General Increase in Electric Delivery Service and Ameren Illinois Company Proposed General Increase in Gas Delivery Service.

Virginia State Corporation Commission Case No. PUE-2011-00045: Application of Virginia Electric and Power Company to Revise its Fuel Factor Pursuant to § 56-249.6 of the Code of Virginia.

Utah Public Service Commission Docket No. 10-035-124: In the Matter of the Application of Rocky Mountain Power for Authority to Increase its Retail Electric Utility Service Rates in Utah and for Approval of its Proposed Electric Service Schedules and Electric Service Regulations.

Maryland Public Utilities Commission Case No. 9249: In the Matter of the Application of Delmarva Power & Light for an Increase in its Retail Rates for the Distribution of Electric Energy.

Minnesota Public Utilities Commission Docket No. E002/GR-10-971: In the Matter of the Application of Northern States Power Company d/b/a Xcel Energy for Authority to Increase Rates for Electric Service in Minnesota.

Michigan Public Service Commission Case No. U-16472: In the Matter of the Detroit Edison Company for Authority to Increase its Rates, Amend its Rate Schedules and Rules Governing the Distribution and Supply of Electric Energy, and for Miscellaneous Accounting Authority.

2010

Public Utilities Commission of Ohio Docket No. 10-2586-EL-SSO: In the Matter of the Application of Duke Energy Ohio for Approval of a Market Rate Offer to Conduct a Competitive Bidding Process for Standard Service Offer Electric Generation Supply, Accounting Modifications, and Tariffs for Generation Service.

Colorado Public Utilities Commission Docket No. 10A-554EG: In the Matter of the Application of Public Service Company of Colorado for Approval of a Number of Strategic Issues Relating to its DSM Plan, Including Long-Term Electric Energy Savings Goals, and Incentives.

Public Service Commission of West Virginia Case No. 10-0699-E-42T: Appalachian Power Company and Wheeling Power Company Rule 42T Application to Increase Electric Rates.

Oklahoma Corporation Commission Cause No. PUD 201000050: Application of Public Service Company of Oklahoma, an Oklahoma Corporation, for an Adjustment in its Rates and Charges and Terms and Conditions of Service for Electric Service in the State of Oklahoma.

Georgia Public Service Commission Docket No. 31958-U: In Re: Georgia Power Company's 2010 Rate Case.

Washington Utilities and Transportation Commission Docket No. UE-100749: 2010 Pacific Power & Light Company General Rate Case.

Colorado Public Utilities Commission Docket No. 10M-254E: In the Matter of Commission Consideration of Black Hills Energy's Plan in Compliance with House Bill 10-1365, "Clean Air-Clean Jobs Act."

Colorado Public Utilities Commission Docket No. 10M-245E: In the Matter of Commission Consideration of Public Service Company of Colorado Plan in Compliance with House Bill 10-1365, "Clean Air-Clean Jobs Act."

Public Service Commission of Utah Docket No. 09-035-15 *Phase II*: In the Matter of the Application of Rocky Mountain Power for Approval of its Proposed Energy Cost Adjustment Mechanism.

Public Utility Commission of Oregon Docket No. UE 217: In the Matter of PACIFICORP, dba PACIFIC POWER Request for a General Rate Revision.

Mississippi Public Service Commission Docket No. 2010-AD-57: In Re: Proposal of the Mississippi Public Service Commission to Possibly Amend Certain Rules of Practice and Procedure.

Indiana Utility Regulatory Commission Cause No. 43374: Verified Petition of Duke Energy Indiana, Inc. Requesting the Indiana Utility Regulatory Commission to Approve an Alternative Regulatory Plan Pursuant to Ind. Code § 8-1-2.5-1, *ET SEQ.*, for the Offering of Energy Efficiency Conservation, Demand Response, and Demand-Side Management Programs and Associated Rate Treatment Including Incentives Pursuant to a Revised Standard Contract Rider No. 66 in Accordance with Ind. Code §§ 8-1-2.5-1 *ET SEQ.* and 8-1-2-42 (a); Authority to Defer Program Costs Associated with its Energy Efficiency Portfolio of Programs; Authority to Implement New and Enhanced Energy Efficiency Programs, Including the Powershare® Program in its Energy Efficiency Portfolio of Programs; and Approval of a Modification of the Fuel Adjustment Clause Earnings and Expense Tests.

Public Utility Commission of Texas Docket No. 37744: Application of Entergy Texas, Inc. for Authority to Change Rates and to Reconcile Fuel Costs.

South Carolina Public Service Commission Docket No. 2009-489-E: Application of South Carolina Electric & Gas Company for Adjustments and Increases in Electric Rate Schedules and Tariffs.

Kentucky Public Service Commission Case No. 2009-00459: In the Matter of General Adjustments in Electric Rates of Kentucky Power Company.

Virginia State Corporation Commission Case No. PUE-2009-00125: For acquisition of natural gas facilities Pursuant to § 56-265.4:5 B of the Virginia Code.

Arkansas Public Service Commission Docket No. 10-010-U: In the Matter of a Notice of Inquiry Into Energy Efficiency.

Connecticut Department of Public Utility Control Docket No. 09-12-05: Application of the Connecticut Light and Power Company to Amend its Rate Schedules.

Arkansas Public Service Commission Docket No. 09-084-U: In the Matter of the Application of Entergy Arkansas, Inc. For Approval of Changes in Rates for Retail Electric Service.

Missouri Public Service Commission Docket No. ER-2010-0036: In the Matter of Union Electric Company d/b/a AmerenUE for Authority to File Tariffs Increasing Rates for Electric Service Provided to Customers in the Company's Missouri Service Area.

Public Service Commission of Delaware Docket No. 09-414: In the Matter of the Application of Delmarva Power & Light Company for an Increase in Electric Base Rates and Miscellaneous Tariff Charges.

2009

Virginia State Corporation Commission Case No. PUE-2009-00030: In the Matter of Appalachian Power Company for a Statutory Review of the Rates, Terms, and Conditions for the Provision of Generation, Distribution, and Transmission Services Pursuant to § 56-585.1 A of the Code of Virginia.

Public Service Commission of Utah Docket No. 09-035-15 *Phase I*: In the Matter of the Application of Rocky Mountain Power for Approval of its Proposed Energy Cost Adjustment Mechanism.

Public Service Commission of Utah Docket No. 09-035-23: In the Matter of the Application of Rocky Mountain Power for Authority To Increase its Retail Electric Utility Service Rates in Utah and for Approval of Its Proposed Electric Service Schedules and Electric Service Regulations.

Colorado Public Utilities Commission Docket No. 09AL-299E: Re: The Tariff Sheets Filed by Public Service Company of Colorado with Advice Letter No. 1535 – Electric.

Arkansas Public Service Commission Docket No. 09-008-U: In the Matter of the Application of Southwestern Electric Power Company for Approval of a General Change in Rates and Tariffs.

Oklahoma Corporation Commission Docket No. PUD 200800398: In the Matter of the Application of Oklahoma Gas and Electric Company for an Order of the Commission Authorizing Applicant to Modify its Rates, Charges, and Tariffs for Retail Electric Service in Oklahoma.

Public Utilities Commission of Nevada Docket No. 08-12002: In the Matter of the Application by Nevada Power Company d/b/a NV Energy, filed pursuant to NRS §704.110(3) and NRS §704.110(4) for authority to increase its annual revenue requirement for general rates charged to all classes of customers, begin to recover the costs of acquiring the Bighorn Power Plant, constructing the Clark Peak, Environmental

Retrofits and other generating, transmission and distribution plant additions, to reflect changes in cost of service and for relief properly related thereto.

New Mexico Public Regulation Commission Case No. 08-00024-UT: In the Matter of a Rulemaking to Revise NMPRC Rule 17.7.2 NMAC to Implement the Efficient Use of Energy Act.

Indiana Utility Regulatory Commission Cause No. 43580: Investigation by the Indiana Utility Regulatory Commission, of Smart Grid Investments and Smart Grid Information Issues Contained in 111(d) of the Public Utility Regulatory Policies Act of 1978 (16 U.S.C. § 2621(d)), as Amended by the Energy Independence and Security Act of 2007.

Louisiana Public Service Commission Docket No. U-30192 *Phase II (February 2009)*: Ex Parte, Application of Entergy Louisiana, LLC for Approval to Repower Little Gypsy Unit 3 Electric Generating Facility and for Authority to Commence Construction and for Certain Cost Protection and Cost Recovery.

South Carolina Public Service Commission Docket No. 2008-251-E: In the Matter of Progress Energy Carolinas, Inc.'s Application For the Establishment of Procedures to Encourage Investment in Energy Efficient Technologies; Energy Conservation Programs; And Incentives and Cost Recovery for Such Programs.

2008

Colorado Public Utilities Commission Docket No. 08A-366EG: In the Matter of the Application of Public Service Company of Colorado for approval of its electric and natural gas demand-side management (DSM) plan for calendar years 2009 and 2010 and to change its electric and gas DSM cost adjustment rates effective January 1, 2009, and for related waivers and authorizations.

Public Service Commission of Utah Docket No. 07-035-93: In the Matter of the Application of Rocky Mountain Power for Authority to Increase its Retail Electric Utility Service Rates in Utah and for Approval of its Proposed Electric Service Schedules and Electric Service Regulations, Consisting of a General Rate Increase of Approximately \$161.2 Million Per Year, and for Approval of a New Large Load Surcharge.

Indiana Utility Regulatory Commission Cause No. 43374: Petition of Duke Energy Indiana, Inc. Requesting the Indiana Utility Regulatory Commission Approve an Alternative Regulatory Plan for the Offering of Energy Efficiency, Conservation, Demand Response, and Demand-Side Management.

Public Utilities Commission of Nevada Docket No. 07-12001: In the Matter of the Application of Sierra Pacific Power Company for authority to increase its general rates charged to all classes of electric customers to reflect an increase in annual revenue requirement and for relief properly related thereto.

Louisiana Public Service Commission Docket No. U-30192 *Phase II*: Ex Parte, Application of Entergy Louisiana, LLC for Approval to Repower Little Gypsy Unit 3 Electric Generating Facility and for Authority to Commence Construction and for Certain Cost Protection and Cost Recovery.

Colorado Public Utilities Commission Docket No. 07A-420E: In the Matter of the Application of Public Service Company of Colorado For Authority to Implement and Enhanced Demand Side Management Cost Adjustment Mechanism to Include Current Cost Recovery and Incentives.

2007

Louisiana Public Service Commission Docket No. U-30192: Ex Parte, Application of Entergy Louisiana, LLC for Approval to Repower Little Gypsy Unit 3 Electric Generating Facility and for Authority to Commence Construction and for Certain Cost Protection and Cost Recovery.

Public Utility Commission of Oregon Docket No. UG 173: In the Matter of PUBLIC UTILITY COMMISSION OF OREGON Staff Request to Open an Investigation into the Earnings of Cascade Natural Gas.

2006

Public Utility Commission of Oregon Docket No. UE 180/UE 181/UE 184: In the Matter of PORTLAND GENERAL ELECTRIC COMPANY Request for a General Rate Revision.

Public Utility Commission of Oregon Docket No. UE 179: In the Matter of PACIFICORP, dba PACIFIC POWER AND LIGHT COMPANY Request for a general rate increase in the company's Oregon annual revenues.

Public Utility Commission of Oregon Docket No. UM 1129 *Phase II*: Investigation Related to Electric Utility Purchases From Qualifying Facilities.

2005

Public Utility Commission of Oregon Docket No. UM 1129 *Phase I Compliance*: Investigation Related to Electric Utility Purchases From Qualifying Facilities.

Public Utility Commission of Oregon Docket No. UX 29: In the Matter of QWEST CORPORATION Petition to Exempt from Regulation Qwest's Switched Business Services.

2004

Public Utility Commission of Oregon Docket No. UM 1129 *Phase I*: Investigation Related to Electric Utility Purchases From Qualifying Facilities.

TESTIMONY BEFORE LEGISLATIVE BODIES

2018

Regarding Missouri Senate Bill 564: Testimony before the Missouri Senate Committee on Commerce, Consumer Protection, Energy and the Environment, January 10, 2018.

2017

Regarding Missouri Senate Bill 190: Testimony before the Missouri Senate Committee on Commerce, Consumer Protection, Energy and the Environment, January 25, 2017.

2016

Regarding Missouri House Bill 1726: Testimony before the Missouri House Energy and Environment Committee, April 26, 2016.

2014

Regarding Kansas House Bill 2460: Testimony Before the Kansas House Standing Committee on Utilities and Telecommunications, February 12, 2014.

2012

Regarding Missouri House Bill 1488: Testimony Before the Missouri House Committee on Utilities, February 7, 2012.

2011

Regarding Missouri Senate Bills 50, 321, 359, and 406: Testimony Before the Missouri Senate Veterans' Affairs, Emerging Issues, Pensions, and Urban Affairs Committee, March 9, 2011.

AFFIDAVITS

2015

Supreme Court of Illinois, Docket No. 118129, Commonwealth Edison Company et al., respondents, v. Illinois Commerce Commission et al. (Illinois Competitive Energy Association et al., petitioners). Leave to appeal, Appellate Court, First District.

2011

Colorado Public Utilities Commission Docket No. 11M-951E: In the Matter of the Petition of Public Service Company of Colorado Pursuant to C.R.S. § 40-6-111(1)(d) for Interim Rate Relief Effective on or before January 21, 2012.

ENERGY INDUSTRY PUBLICATIONS AND PRESENTATIONS

Powering Ohio Report Release, Columbus, Ohio, May 29, 2018.

Panelist, The Past, Present, and Future of Renewable Energy: What Role Will PURPA, Mandates, and Collaboration Play as Renewables Become a Larger Part of Our Energy Mix?, 36th National Regulatory Conference, Williamsburg, Virginia, May 17, 2018.

Panelist, Sustainability Milestone Deep Dive Session, Walmart Global Sustainability Leaders Summit, Bentonville, Arkansas, April 18, 2018.

Panelist, The Customer's Voice, Tennessee Valley Authority Distribution Marketplace Forum, Murfreesboro, Tennessee, April 3, 2018.

Panelist, Getting to Yes with Large Customers to Meet Sustainability Goals, The Edison Foundation Institute for Electric Innovation Powering the People, March 7, 2018.

Panelist, The Corporate Quest for Renewables, 2018 NARUC Winter Policy Summit, Washington, D.C., February 13, 2018.

Panelist, Solar and Renewables, Touchstone Energy Cooperatives NET Conference 2018, St. Petersburg, Florida, February 6, 2018.

Panelist, Missouri Public Service Commission November 20, 2017 Workshop in File No. EW-2017-0245.

Panelist, Energy and Climate Change, 2017-18 Arkansas Law Review Symposium: Environmental Sustainability and Private Governance, Fayetteville, Arkansas, October 27, 2017.

Panelist, Customer – Electric Company – Regulator Panel, Edison Electric Institute Fall National Key Accounts Workshop, National Harbor, Maryland, October 12, 2017.

Panelist, What Do C&I Buyers Want, Solar Power International, Las Vegas, Nevada, September 12, 2017.

Panelist, Partnerships for a Sustainable Future, American Public Power Association National Conference, Orlando, Florida, June 20, 2017.

Panelist, Corporate Renewable Energy Buyers in the Southeast, SEARUC 2017, Greensboro, Georgia, June 12, 2017.

Panelist, Transitioning Away from Traditional Utilities, Utah Association of Energy Users Annual Conference, Salt Lake City, Utah, May 18, 2017.

Panelist, Regulatory Approaches for Integrating and Facilitating DERs, New Mexico State University Center for Public Utilities Advisory Council Current Issues 2017, Santa Fe, New Mexico, April 25, 2017.

Presenter, Advancing Renewables in the Midwest, Columbia, Missouri, April 24, 2017.

Panelist, Leveraging New Energy Technologies to Improve Service and Reliability, Edison Electric Institute Spring National Key Accounts Workshop, Phoenix, Arizona, April 11, 2017.

Panelist, Private Sector Demand for Renewable Power, Vanderbilt Law School, Nashville, Tennessee, April 4, 2017.

Panelist, Expanding Solar Market Opportunities, 2017 Solar Power Colorado, Denver, Colorado, March 15, 2017.

Panelist, Renewables: Are Business Models Keeping Up?, Touchstone Energy Cooperatives NET Conference 2017, San Diego, California, January 30, 2017.

Panelist, The Business Case for Clean Energy, Minnesota Conservative Energy Forum, St. Paul, Minnesota, October 26, 2016.

Panelist, M-RETS Stakeholder Summit, Minneapolis, Minnesota, October 5, 2016.

Panelist, 40th Governor's Conference on Energy & the Environment, Kentucky Energy and Environment Cabinet, Lexington, Kentucky, September 21, 2016.

Panelist, Trends in Customer Expectations, Wisconsin Public Utility Institute, Madison, Wisconsin, September 6, 2016.

Panelist, The Governor's Utah Energy Development Summit 2015, May 21, 2015.

Mock Trial Expert Witness, The Energy Bar Association State Commission Practice and Regulation Committee and Young Lawyers Committee and Environment, Energy and Natural Resources Section of the D.C. Bar, Mastering Your First (or Next) State Public Utility Commission Hearing, February 13, 2014.

Panelist, Customer Panel, Virginia State Bar 29th National Regulatory Conference, Williamsburg, Virginia, May 19, 2011.

Chriss, S. (2006). "Regulatory Incentives and Natural Gas Purchasing – Lessons from the Oregon Natural Gas Procurement Study." Presented at the 19th Annual Western Conference, Center for Research in Regulated Industries Advanced Workshop in Regulation and Competition, Monterey, California, June 29, 2006.

Chriss, S. (2005). "Public Utility Commission of Oregon Natural Gas Procurement Study." Public Utility Commission of Oregon, Salem, OR. Report published in June, 2005. Presented to the Public Utility Commission of Oregon at a special public meeting on August 1, 2005.

Chriss, S. and M. Radler (2003). "Report from Houston: Conference on Energy Deregulation and Restructuring." USAEE Dialogue, Vol. 11, No. 1, March, 2003.

Chriss, S., M. Dwyer, and B. Pulliam (2002). "Impacts of Lifting the Ban on ANS Exports on West Coast Crude Oil Prices: A Reconsideration of the Evidence." Presented at the 22nd USAEE/IAEE North American Conference, Vancouver, BC, Canada, October 6-8, 2002.

Contributed to chapter on power marketing: "Power System Operations and Electricity Markets," Fred I. Denny and David E. Dismukes, authors. Published by CRC Press, June 2002.

Contributed to "Moving to the Front Lines: The Economic Impact of the Independent Power Plant Development in Louisiana," David E. Dismukes, author. Published by the Louisiana State University Center for Energy Studies, October 2001.

Dismukes, D.E., D.V. Mesyanzhinov, E.A. Downer, S. Chriss, and J.M. Burke (2001). "Alaska Natural Gas In-State Demand Study." Anchorage: Alaska Department of Natural Resources.

Derivation of Full Cost Generation Demand Charge for Schedule 83, PGE Proposed Revenue Requirement

(1)		On-Peak Consumption	1,833,432	MWh
(2)		Off-Peak Consumption	920,290	MWh
(3)	(1) + (2)	Total Schedule Consumption	2,753,722	MWh
(4)	(4)	Fixed Charge Energy Rate	\$ 39.15	\$/MWh
(5)	(3) x (4)	Fixed Charge Revenue Requirement	\$ 107,808,216	
(6)		On-Peak Demand Used for Pricing	8,388,757	kW Demand
(7)	(5) / (6)	Full Cost Demand Charge	\$ 12.85	/kW

Sources:

PGE/1303/Macfarlane-Goodspeed/6
Proposed Schedule 123

Derivation of Full Cost Generation Demand Charge for Schedule 85 Secondary, PGE Proposed Revenue Requirement

(1)		On-Peak Consumption	1,429,075	MWh
(2)		Off-Peak Consumption	749,185	MWh
(3)	(1) + (2)	Total Schedule Consumption	2,178,260	MWh
(4)	(4)	Fixed Charge Energy Rate	\$ 37.77	\$/MWh
(5)	(3) x (4)	Fixed Charge Revenue Requirement	\$ 82,272,880	
(6)		On-Peak Demand Used for Pricing	5,809,281	kW Demand
(7)	(5) / (6)	Full Cost Demand Charge	\$ 14.16	/kW

Sources:

PGE/1303/Macfarlane-Goodspeed/6
Proposed Schedule 123

Derivation of Full Cost Generation Demand Charge for Schedule 85 Primary, PGE Proposed Revenue Requirement

(1)		On-Peak Consumption		370,985	MWh
(2)		Off-Peak Consumption		216,991	MWh
(3)	(1) + (2)	Total Schedule Consumption		587,976	MWh
(4)	(4)	Fixed Charge Energy Rate	\$	37.10	\$/MWh
(5)	(3) x (4)	Fixed Charge Revenue Requirement	\$	21,813,910	
(6)		On-Peak Demand Used for Pricing		1,491,793	kW Demand
(7)	(5) / (6)	Full Cost Demand Charge	\$	14.62	/kW

Sources:

PGE/1303/Macfarlane-Goodspeed/6
Proposed Schedule 123

Walmart/105
Chriss/4

Factor	kW	kWh	Current Prices		PGE Proposed Prices		Difference		On-Peak kWh	Off-Peak kWh	Current Generation			PGE Proposed Generation			Change Due to Generation	Non-Generation Change	Generation Rates, Full Cost Demand Charge					Subsidy Paid/(Received)		Walmart Proposed				Change from PGE Proposed					Subsidy Paid/(Received)		Total Bill Change									
											On-Peak	Off-Peak	Total	On-Peak	Off-Peak	Total			Demand	On-Peak	Off-Peak	Total	Demand			On-Peak	Off-Peak	Total	Demand	On-Peak	Off-Peak	Total														
											(5)	(6)	(7)	(8)	(9)	(10)			(11)	(12)	(13)	(14)	(15)			(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)					(25)	(26)	(27)	(28)	(29)	(30)	(31)	(32)
											(1)	(2)	(3)	(4)	(5)	(6)			(7)	(8)	(9)	(10)	(11)			(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)					(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	(31)	(32)															
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	(31)	(32)															
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	(31)	(32)															
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	(31)	(32)															
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	(31)	(32)															
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	(31)	(32)															
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	(31)	(32)															
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	(31)	(32)															
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	(31)	(32)															
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	(31)	(32)															
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	(31)	(32)															
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	(31)	(32)															
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	(31)	(32)															
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	(31)	(32)															
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	(31)	(32)															
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	(31)	(32)															
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	(31)	(32)															
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	(31)	(32)															
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	(31)	(32)															
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	(31)	(32)															
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	(31)	(32)															
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	(31)	(32)															
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	(31)	(32)															
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	(31)	(32)															
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	(31)	(32)															
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	(31)	(32)															
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	(31)	(32)															
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	(31)	(32)															
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	(31)	(32)															
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	(31)	(32)															
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	(31)	(32)															
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	(31)	(32)															
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	(31)	(32)															
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	(31)	(32)															
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	(31)	(32)															
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	(31)	(32)															
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	(31)	(32)															
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	(31)	(32)															
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	(31)	(32)															
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	(31)	(32)															
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	(31)	(32)															
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	(31)	(32)															
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	(31)	(32)															
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	(31)	(32)															
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	(31)	(32)															
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	(31)	(32)															
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	(31)	(32)															
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	(31)	(32)															
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	(31)	(32)															
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	(31)	(32)															
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	(31)	(32)															
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	(31)	(32)															
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	(3																