

**BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF COLORADO**

IN THE MATTER OF ADVICE NO. 1814- ELECTRIC OF PUBLIC SERVICE COMPANY OF COLORADO TO REVISE ITS COLORADO P.U.C. NO. 8 – ELECTRIC TARIFF TO REFLECT A MODIFIED SCHEDULE RE-TOU AND RELATED TARIFF CHANGES TO BE EFFECTIVE ON THIRTY-DAYS' NOTICE	Proceeding No. 19AL-0687E
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HEARING EXHIBIT NO. 501

ANSWER TESTIMONY AND ATTACHMENTS OF

TIM WOOLF

ON BEHALF OF

ENERGY OUTREACH COLORADO

April 24, 2020

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- Attachment TW-1: Resume of Tim Woolf
- Attachment TW-2: PSCo Response to EOC 1-9
- Attachment TW-3: New York Times. *Paying for Electric Power by the Time of Day.* June 9, 1990
- Attachment TW-4: PSCo Response to EOC 2-16, Attachment EOC 2-16, A.1
- Attachment TW-5: PSCo Response to EOC1-19, Attachment EOC1-19.A1
- Attachment TW-6: PSCo Response to EOC 4.7, Attachment EOC 4-7A.1
- Attachment TW-7: Excerpts from James Bonbright's *Principles of Public Utility Rates*
- Confidential Attachment TW-8: Excerpts of CONFIDENTIAL Workpaper - Bill Impact Analysis
- Attachment TW-9: PSCo Response to EOC 4-10

1 I. INTRODUCTION AND QUALIFICATIONS

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

5 Q Please describe Synapse Energy Economics.

6 **A** Synapse Energy Economics is a research and consulting firm specializing in
7 electricity industry regulation, planning and analysis. Synapse works for a variety
8 of clients, with an emphasis on consumer advocates, regulatory commissions, and
9 environmental advocates.

10 Q Please summarize your professional and educational experience.

11 A Before joining Synapse Energy Economics, I was a commissioner at the
12 Massachusetts Department of Public Utilities (DPU) for four years. In that
13 capacity, I was responsible for overseeing a substantial expansion of clean energy
14 policies, including significantly increased ratepayer-funded energy efficiency
15 programs; an update of the DPU energy efficiency guidelines; the implementation
16 of decoupled rates for electric and gas companies; the promulgation of net
17 metering regulations; review and approval of smart grid pilot programs; and
18 review and approval of long-term contracts for renewable power. I was also
19 responsible for overseeing a variety of other dockets before the Commission,
20 including several electric and gas utility rate cases.

Prior to being a commissioner at the Massachusetts DPU, I was employed as the Vice President at Synapse Energy Economics; a Manager at Tellus Institute; the Research Director at the Association for the Conservation of Energy; a Staff Economist at the Massachusetts Department of Public Utilities; and a Policy Analyst at the Massachusetts Executive Office of Energy Resources.

1 I hold a Masters in Business Administration from Boston University, a Diploma
2 in Economics from the London School of Economics, a BS in Mechanical
3 Engineering and a BA in English from Tufts University. My resume, attached as
4 **Attachment TW-1**, presents additional details of my professional and educational
5 experience.

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

7 **A** I am testifying on behalf of Energy Outreach Colorado (EOC), an independent,
8 non-profit organization in Colorado that works to help limited-income Coloradans
9 afford home energy.

10 **Q Have you testified previously before this Commission?**

11 **A** Yes. I provided testimony on behalf of EOC in PSCo's 2016 Phase II rate case
12 (proceeding 16AL-0048E).

13 **Q Why is EOC intervening in this docket?**

14 **A** EOC is a Colorado nonprofit corporation whose mission is to ensure that low-
15 income Colorado households can meet their home energy needs. EOC provides
16 bill assistance and funds energy efficiency measures for low-income customers to
17 this end. EOC is intervening in this docket to address Public Service Company's
18 (PSCo) proposed tariff revision. EOC Director of Advocacy, Andrew Bennett,
19 testifies further in his Answer Testimony concerning EOC's mission and the
20 importance of intervening in this proceeding.

21 **Q What is the purpose of your testimony?**

22 **A** My testimony addresses PSCo's plan to make the Modified RE-TOU rate
23 mandatory for residential customers. I show that this proposal would result in
24 customer distress and hardship, especially for low-income customers. I further

1 demonstrate that mandating TOU rates is virtually without precedent in other
2 states, that the Company has failed to adequately prepare its ratepayers for such a
3 drastic change, and that it has not shown that its plan for the Modified RE-TOU
4 rate is “prudent and in the public interest.”¹ I conclude with recommendations for
5 modifying the Company’s proposal to ensure that ratepayer interests are
6 protected.

7 **A. *Summary of Conclusions and Recommendations***

8 **Q Please summarize your primary conclusions.**

9 **A** If implemented gradually, with significant customer education and protections,
10 TOU rates have the potential to enhance fairness and efficiency, while
11 simultaneously promoting the state’s environmental objectives. EOC is generally
12 supportive of having a TOU rate option to meet these goals, as am I. However,
13 PSCo’s proposed implementation of the Modified RE-TOU rate structure is likely
14 to have the perverse result of turning customers against TOU rates by causing
15 significant customer confusion and backlash. In doing so, the Modified RE-TOU
16 rate would fail to achieve its otherwise commendable goals.

17 **Q Please summarize your recommendations.**

18 **A** I recommend that the Commission do the following:

- 19 • Not approve mandatory TOU rates at this time.
20 • Provide all customers with the option to opt-in to a TOU rate after they
21 have received a new smart meter under the Advanced Meter Infrastructure

¹ Non-Unanimous Comprehensive Settlement Agreement, Attachment A to Decision No. C16-1075, Proceeding Nos. 16AL-0048E, 16A-0055E, and 16A-0139E, p. 31 (hereinafter “Settlement Agreement”).

1 (“AMI”) initiative. Customers opting in should receive bill protection for
2 one year in which they will pay the lower of the TOU rate or their regular
3 Schedule R rate each month.

4 • Provide customers who do not opt-in as they receive an AMI meter with a
5 “shadow bill” for at least a year that shows what they would have paid on
6 the TOU rate.

7 • Should the Commission determine that a default approach is preferable to
8 an opt-in approach, customers should not be defaulted onto the TOU rate
9 until at least one year following completion of the AMI roll-out.

10 Customers should also be provided with bill protection for at least one
11 year, and should always have the option to enroll in an alternative rate,
12 such as the existing inclining block rate design, and thus to opt out of the
13 TOU rate design.

14 • Require PSCo to investigate alternatives such as expanding demand
15 response programs or implementing Peak Time Rebates for customers
16 who opt out of the TOU rate option as necessary to achieve additional
17 emission reductions goals.

18 • Provide addition protections and measures for low-income customers, as
19 described further in the testimony of EOC Director of Advocacy Andrew
20 Bennett.

21 **II. THE COMPANY’S TARIFF REVISION PROPOSAL**

22 **Q What tariff changes does PSCo propose for the residential class?**

23 **A** PSCo has filed an advice letter proposing to move residential customers onto a
24 new rate, the Modified RE-TOU. The Modified RE-TOU rate includes three
25 summer rate periods (peak, shoulder, and off-peak) during the summer months,
26 and a single rate during the winter. In contrast to the current default rate, each

1 component rate of Modified RE-TOU will be flat, rather than inclining, and riders
2 will be applied as a percentage of base rates, rather than on a flat volumetric basis.

3 **Q Why has the Company proposed to move all residential customers to the**
4 **Modified RE-TOU rate?**

5 **A** The Modified RE-TOU rate is based on the RE-TOU rate that was piloted with a
6 trial group of ratepayers between 2017 and 2019, based on the terms of the non-
7 unanimous settlement agreement reached in the Company’s last rate case.² This
8 settlement was approved by the Commission in Order C16-1075. The Company’s
9 stated principle aim for deploying a TOU rate is to promote emissions reductions
10 by shifting customer load away from peak system hours.³ In its December 2019
11 advice letter, the Company seeks approval to make the Modified RE-TOU rate
12 mandatory for all residential customers with AMI.⁴

13 **Q. Isn’t it the Company’s position that the Settlement Agreement and Order C16-**
14 **1075 required it to propose a mandatory TOU rate for all customers?**

15 **A** Yes, Company witness Brooke Trammell states, “the Settlement requires Public
16 Service to file an advice letter in order for Schedule RE-TOU to become a
17 permanent and mandatory rate for all residential customers.”⁵ But that is not
18 accurate. In fact, the Settlement Agreement required the Company to conduct the
19 RE-TOU pilot to “determine whether a final RE-TOU rate for all residential
20 customers is prudent and in the public interest,”⁶ and to file an advice letter “to
21 inform the Commission whether the Schedule RE-TOU requires modification
22 prior to implementing the final RE-TOU rate design for all Residential customers,

² See Settlement Agreement, pp. 33-34.

³ Direct Testimony of Brooke Trammell, Hrg. Exhibit 101, p. 14 (hereinafter “Trammell”).

⁴ Trammell, 7

⁵ Trammell, 7.

⁶ Settlement Agreement, 31.

1 whether Schedule RE-TOU is working well as originally implemented, or
2 whether it should be discontinued.”⁷ For parties like EOC, the intention of the
3 settlement was to require an advice letter filing to assess if and how to proceed
4 with the RE-TOU schedule for residential customers, not that a mandatory rate
5 was rubber stamped. In fact, EOC would never have agreed to that. Parties
6 specifically reserved their right to offer recommendations to modify or
7 discontinue RE-TOU. The Order appears to mischaracterize the Settlement when
8 it states that the advice letter is “in order for Schedule RE-TOU to become a
9 permanent and mandatory rate for all residential customers.” This is certainly
10 contrary to the plain language of the Settlement. Importantly, the RE-TOU Pilot
11 permitted Pilot participants to opt-out in their first six months.⁸ Thus even under
12 a “mandatory” rate for all residential customers, as initially designed, the RE-
13 TOU rate design envisioned the ability for customers to opt out.

14 **Q What is the relationship between the Modified RE-TOU rate and the trial
15 rate, RE-TOU?**

16 **A** The proposed rate is similar in design to the RE-TOU rate, except that the RE-
17 TOU rate had a greater peak/off-peak differential and featured time-differentiated
18 energy rates in both summer and winter seasons.

19 **Q. What is the relationship between AMI and the Modified RE-TOU rate?**

20 **A** TOU rates require granular (at least hourly) data from interval meters to be
21 effective. The AMI program, as I understand it, requires smart meters to be
22 deployed to customers in all of PSCo’s electric service territory and associated

⁷ Settlement Agreement, 33.

⁸ PSCo Response to EOC 1-9, attached as **Attachment TW-2**.

1 wireless data collection infrastructure, referred to as the FAN system. In addition,
2 back of the house data gathering and analysis will be required.

3 **III. MANDATORY TOU RATES WOULD CAUSE CUSTOMER BACKLASH**

4 **Q Have other states implemented mandatory TOU rates?**

5 **A** Almost never to my knowledge. While time-of-use rates have become
6 increasingly common across North America and Europe, mandatory TOU rates
7 for residential customers are exceedingly rare.⁹ In the past, some states did
8 experiment with mandatory TOU rates, but all of those efforts were eventually
9 abandoned. For example, New York experimented with mandatory TOU rates in
10 the 1990s, but these resulted in “significant customer dissatisfaction,” and were
11 subsequently eliminated.¹⁰ Similarly, in Connecticut, Northeast Utilities’
12 mandatory TOU program “proved unsuccessful and unpopular,” and that “people
13 resented its mandatory nature.”¹¹ Given widespread customer consternation, the
14 commission allowed the utility to make the rate voluntary.¹²

15 **Q Does the fact that Fort Collins recently implemented mandatory TOU rates
16 imply that mandatory TOU rates would be successful for PSCo?**

17 **A** No. As Company witness Wishart notes in testimony, the municipal utility in Fort
18 Collins did recently implement mandatory TOU for its residential class, but this is

⁹ Hledik, R., A. Faruqui, and C. Warner. The National Landscape of Residential TOU Rates: A Preliminary Summary. The Brattle Group, November 2017, available at http://files.brattle.com/files/12658_the_national_landscape_of_residential_tou_rates_a_preliminary_summary.pdf

¹⁰ New York Public Service Commission, Case 97-E-1795. Proceeding on Motion of the Commission Concerning the Availability of Time-of-Use Rates for Residential Customers. “Order Instituting Proceeding and Directing the Filing of Plans and Proposed Tariff Amendments.” October 20, 1997. Pg. 2. [http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId=\[4CBDA228-3BAA-4C7A-92AE-7A99F79DC0F1\]](http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId=[4CBDA228-3BAA-4C7A-92AE-7A99F79DC0F1])

¹¹ New York Times. *Paying for Electric Power by the Time of Day*. June 9, 1990. attached as **Attachment TW-3.**

¹² *Ibid.*

1 the only contemporary example that I am aware of. Moreover, there are key
2 differences in the nature of the utilities and the rate design that cut against a
3 comparison of Fort Collins' TOU rate to PSCo's proposal here, or any suggestion
4 that Fort Collins' experience could be easily translated to PSCo.

5 First, unlike Public Service Company – a large investor-owned utility with a
6 statewide territory and nearly 1.5 million residential customers– Fort Collins is a
7 much smaller not-for-profit public entity. Second, Fort Collins's status as a
8 municipality increases its ability to identify those most likely to be harmed by
9 mandatory TOU rates, and to undertake a broad range of interventions to protect
10 more vulnerable customers. For example, Fort Collins implemented an income-
11 based discount that has resulted in no low-income customer paying more than
12 they had previously.¹³ Third, the TOU rate implemented by Fort Collins is unlike
13 the one proposed in this proceeding. Fort Collins has an *inclining block* rate,
14 similar to PSCo's Schedule R, which means that lower-use customers experience
15 lower average rates than higher-use customers.

16 **Q How have jurisdictions typically implemented TOU rates?**

17 **A** TOU rates are typically implemented on either an opt-in or an opt-out (default)
18 basis. Opt-in rollouts are much more common. Two examples of jurisdictions that
19 have made time-of-use rates the default option for residential customers while
20 allowing customers to opt-out are California and Ontario.

¹³ Fort Collins City Council, Work Session Item: Residential Electric Time-of-Day (TOD) 12 Month Review, February 11, 2020
https://citydocs.fcgov.com/?cmd=convert&vid=72&docid=3432614&dt=AGENDA+ITEM++ELECTRIC+UTILITY+ENTERPRISE&doc_download_date=FEB-11-2020&ITEM_NUMBER=03

1 **Q Please describe how California has approached the transition to default TOU**
2 **rates.**

3 **A** The transition to time-of-use rates in California has been long, iterative, and
4 deliberate, beginning in earnest with a 2012 order from the Public Utilities
5 Commission initiating a rulemaking to consider the transition to time of use
6 rates.¹⁴ In 2015, the Commission issued a decision requiring the California IOUs
7 to begin the transition to TOU rates, and laying out specific requirements for the
8 utilities to fulfill in advance in order to determine the appropriate design of the
9 TOU rates, ensure customer acceptance, measure the environmental and cost
10 savings from load shifting, and identify customer classes who are not able to
11 respond and should remain on the tiered default rate.¹⁵

12 In laying out the schedule for the transition to default TOU rates, the California
13 commission specifically noted that “For a default TOU rate to be successful, the
14 design should be based on empirical evidence that supports both measurable
15 benefits of TOU on the grid, and the acceptance and understanding of TOU rates
16 by the residential customer.”¹⁶

17 **Q What steps did California take to determine the appropriate design of the**
18 **TOU rates, ensure customer acceptance, measure the savings from load**
19 **shifting, and identify customer classes who are not able to respond?**

20 **A** The Commission required the California IOUs to evaluate customer
21 responsiveness to time-varying rates, develop effective education and outreach

¹⁴ California Public Utilities Commission (CPUC). Rulemaking 12-06-013. Order Instituting a Rulemaking on the Commission’s Own Motion to Conduct a Comprehensive Examination of Investor Owned Electric Utilities’ Residential Rate Structures, the Transition to Time Varying and Dynamic Rates, and Other Statutory Obligations. Issued June 28, 2012.

http://docs.cpuc.ca.gov/PublishedDocs/WORD_PDF/FINAL_DECISION/169782.PDF

¹⁵ CPUC Decision 15-07-001, July 3, 2015, at 129.

<http://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M153/K110/153110321.PDF>

¹⁶ CPUC Decision 15-07-001, July 3, 2015, at 130.

<http://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M153/K110/153110321.PDF>

1 plans, measure differences in impact by region and customer profile, and study
2 other aspects of rate design and implementation. Specifically, the IOUs were
3 required to:

- 4 1) Implement default rate pilots, in addition to opt-in pilots. The default trial
5 was specifically designed to address problems arising from self-selection
6 bias in the opt-in trial, and “to fine-tune customer education and test
7 system operability.”¹⁷
- 8 2) Conduct analysis regarding bill impacts on vulnerable customers and their
9 ability to shift load.¹⁸
- 10 3) Establish a Marketing, Education, and Outreach (ME&O) working group;
11 hire a consultant to advise the working group on appropriate metrics,
12 goals, and strategies; and deliver a comprehensive ME&O plan that
13 including a vision, metrics, timeline, and budgets through the
14 implementation of default TOU rates.¹⁹
- 15 4) Provide significant information and support to customers well in advance
16 of the transition to default rates, including:²⁰

¹⁷ CPUC Decision 15-07-001, July 3, 2015, at 170.
<http://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M153/K110/153110321.PDF>

¹⁸ The Commission found that economically vulnerable customers in hot climate zones may be more likely than other customers to experience high summer bill impacts on a TOU rate while being unable to shift their energy usage patterns to mitigate these negative bill impacts. In order to ensure that economically vulnerable customers do not experience unreasonable economic hardship on TOU rates, the Commission in D.17-09-036 excluded customers eligible to receive income-based assistance in hot climate zones from being defaulted to TOU.

¹⁹ CPUC Decision 17-12-023 in docket R.12-06-013, December 20, 2017, at 3-4.
<http://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M201/K231/201231862.PDF>

²⁰ CPUC Decision 17-12-023 in docket R.12-06-013, December 20, 2017, at 10.
<http://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M201/K231/201231862.PDF>

- 1 a. A bill comparison tools to allow customers to choose the rate
2 schedule that best meets their needs

3 b. Information that will help potential benefiters opt-in to TOU rates
4 ahead of default and enroll said customers

5 c. Information to help structural non-benefiters understand what
6 actions to take to mitigate bill impacts, and information on how to
7 opt-out to other rate options (such as the inclining block rate) for
8 structural non-benefiters who are unable to shift load sufficiently.²¹

9 In addition, the Commission required the IOUs to offer multiple rate options to
10 customers, including an inclining block (non-TOU) rate, and provide bill
11 protection (hold harmless provision) for a year.

12 **Q Has California's transition to default TOU been considered successful?**

13 **A** Yes, so far. To date, only San Diego Gas & Electric (SDG&E) has transitioned a
14 significant number of its customers to default TOU rates. Although the transition
15 is not yet complete, as of Q4 2019 approximately 89% of SDG&E's customers
16 are enrolled on one of the utility's TOU pricing plans.²² Further, customers have

²¹ CPUC Decision 17-12-023 in docket R.12-06-013, December 20, 2017, at 10.

<http://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M201/K231/201231862.PDF>

²² SDG&E reports that approximately 665,900 residential customers are on one of its nine TOU pricing plans, out of approximately 750,000 customers that it plans to transition to a TOU plan. *See:* San Diego Gas & Electric Company Quarterly Report On Progress Of Residential Rate Reform, Rulemaking 12-06-013, February 3, 2020.

<http://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M329/K656/329656588.PDF>

1 demonstrated an increased understanding of their rate options and an
2 understanding of how energy use can impact their bills.²³

3 **Q What are your general concerns about making the Modified RE-TOU a**
4 **mandatory rate?**

5 **A** In short, the shift to TOU rates is a significant departure from the current rate
6 design and is likely to mean that PSCo's customers will face a more complicated
7 billing structure that many are not ready to handle. I am concerned that customers
8 in PSCo's territory have limited understanding of their current rates and historical
9 consumption behavior, and that an abrupt transition to a TOU rate is likely to
10 result in adverse bill effects for many customers and customer backlash.

11 **Q Why do you suggest that PSCo's customers have limited understanding of**
12 **the current rate design?**

13 **A** I base this observation on the results of the recent focus groups led by the Shelton
14 Group. According to these results, few of the surveyed customers understood the
15 current rate design: "One or two people in each group said they understand the
16 tiered structure of costs in the current bill.... More often, participants seemed
17 unaware of how their electricity cost was determined."²⁴

18 Even worse, PSCo's customers do not generally have data on their own usage
19 patterns. The Company intends to transition customers to the new TOU rate as
20 soon as customers receive AMI, so these customers will not have access to any
21 historical data prior to being shifted to the new rate. Even the Company does not
22 have historical hourly usage data for its residential customers that will be

²³ San Diego Gas & Electric Company Quarterly Report On Progress Of Residential Rate Reform, Rulemaking 12-06-013, February 3, 2020.

<http://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M329/K656/329656588.PDF>

²⁴ PSCo Response to EOC 2-16, Attachment EOC 2-16, A.1, Shelton Grp, Xcel TOU and Demand Rate Plan Focus Groups Final Report, January 27, 2017, slide 9, attached as **Attachment TW-4**.

1 transitioned to Modified RE-TOU.²⁵ To ensure that TOU rates are effectively
2 implemented, the Company must ensure that customers understand both the rate
3 and their consumption behavior.

4 **Q Why do you suggest that implementing mandatory TOU rates will provoke
5 customer backlash?**

6 This judgment is based on the historical experience with mandatory TOU rates
7 and supported by findings from the recent focus groups. As I mentioned before,
8 New York's experiment with mandatory TOU rates ended in rollback, in part due
9 to customer dissatisfaction.²⁶ In Connecticut, an even earlier foray into mandatory
10 TOU rates drew widespread protest from customers and similarly resulted in a
11 shift to optional rates.²⁷

12 Similar results can be expected in PSCo's territory based on the results of the
13 focus groups. Participants in the focus groups reported that they expected that the
14 Company would continue to provide them with choice in rates and would help
15 them to choose their rates based upon their historical usage patterns. When
16 participants were informed that the Company did not have their usage data, most
17 were "flabbergasted."²⁸ EOC Director of Advocacy Andrew Bennett discusses
18 some recent public comments that also state the very real concerns many
19 customers have about being forced onto a new rate, and without sufficient options
20 and/or information on how to easily adjust.

²⁵ Until the Company has installed an AMI meter, it will not know the hourly load for most residential customers. Focus group participants were told that the Company does not have hourly load data. *See Attachment TW-4, slide 24.*

²⁶ Case 97-E-1795. Proceeding on Motion of the Commission Concerning the Availability of Time-of-Use Rates for Residential Customers. "Order Instituting Proceeding and Directing the Filing of Plans and Proposed Tariff Amendments." October 20, 1997. Pg. 2.

²⁷ Attachment TW-3, Page. 48.

²⁸ Attachment TW-4, slide 24.

1 **Q Are mandatory TOU rates necessary to achieve emissions reductions?**

2 **A** No. The Company is likely to achieve a high degree of customer participation
3 even if customers are provided with the option to opt out. Based on a study by
4 Lawrence Berkeley National Laboratory (LBNL), the Company anticipates that
5 TOU rate opt-out rates would only reach approximately 4%.²⁹ With such low
6 opt-out rates, the Company would still be able to achieve substantial emissions
7 savings, since 96% of customers would likely remain on the TOU rate. Moreover,
8 effective rate design requires balancing multiple priorities. The Company's
9 attempt to prioritize emissions reductions over other considerations does not
10 comport with widely accepted rate design principles, as I discuss further below.

11 **Q Are there other options for addressing emissions reductions?**

12 **A** Yes. Should additional emissions reductions be desired under an opt-in or opt-out
13 approach to TOU rates, the Company could target additional emissions reductions
14 through other channels. These options include:

- 15 1. Expanding its existing demand response programs for residential
16 customers;
- 17 2. Enrolling customers in Peak Time Rebate programs that provide
18 incentives (in the form of bill credits) for reducing load, but do not
19 disproportionately penalize customers who cannot shift load; and
- 20 3. Expanding its existing programs for distributed solar, transportation
21 electrification, and procurement of utility-scale renewables.

²⁹ PSCo Response to EOC1-19, and Attachment EOC1-19.A1, page 34, attached as **Attachment TW-5**.

1 **Q Please explain the current status of PSCo's residential demand response**
2 **programs, and how you believe they can be improved.**

3 **A** The Company operates the "Saver's Switch" program, which offers residential
4 customers with central AC an annual rebate on their bill in exchange for allowing
5 the Company to control their AC during times of peak demand. In addition, the
6 Company operates the "AC Rewards" program, which uses smart communicating
7 thermostats for reducing AC load during control events. These programs have the
8 ability to control considerable amounts of load. For example, the Company
9 reports that Saver's Switch resulted in approximately 200 MW of peak hour load
10 reductions in 2018 and 2019.³⁰

11 However, according to the Company's Demand-Side Management Annual Status
12 Report for 2018, enrollments in both Saver's Switch and AC Rewards "were
13 significantly below projections" and both offerings' demand response
14 achievements and spending levels were substantially less than forecasted.³¹ I
15 recommend that these programs be examined to determine how to increase
16 enrollments and improve customer engagement.

17 **Q Please explain what you mean by "Peak Time Rebate programs."**

18 **A** A peak time rebate program enables customers to earn a financial reward for
19 reducing energy during a few critical event hours each year, instead of being
20 subject to a higher rate. The number of event days is usually capped for a calendar
21 year and is linked to conditions such as system reliability concerns or very high
22 supply prices.

³⁰ PSCo Response to EOC 4.7, Attachment EOC 4-7A.1, **Attachment TW-6**.

³¹ Public Service Company of Colorado. Demand-Side Management Annual Status Report for 2018,
Proceeding No. 16A-0512EG, April 1, 2019, at 86. https://www.xcelenergy.com/staticfiles/xe-responsive/Company/Rates%20&%20Regulations/Public%20Service%20Company%202018%20DSM%20Annual%20Status%20Report_FINAL.pdf

1 **Q Do you have any estimate of the costs of expanding demand response**
2 **programs or including Peak Time Rebates in the Company's DSM Plan?**

3 **A** Not at this time. Specific reasons for the low enrollment levels in the Company's
4 residential demand response programs were not discussed in the Company's 2018
5 DSM status report, nor were estimates provided for how much marketing and
6 education would need to be increased in order to expand enrollment levels, or
7 how much incentives would need to be increased to attract greater participation.

8 For Peak Time Rebates, the cost will be related to the expected participation
9 levels. I recommend that the costs for both expanded residential air conditioning
10 programs and Peak Time Rebates be explored more in the Company's next DSM
11 Plan, which I understand will be filed this summer (2020).

12 **IV. THE COMPANY'S PROPOSAL VIOLATES THE CORE PRINCIPLES**
13 **OF RATE DESIGN**

14 **Q What are the core ratemaking principles that should be considered when**
15 **designing rates?**

16 **A** In his seminal work, *Principles of Public Utility Rates*, Professor James Bonbright
17 discusses eight key criteria for a sound rate structure.³² These criteria are as
18 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.
- 22 3. Effectiveness in yielding total revenue requirements under the fair-return
23 standard.

³² Excerpts from James Bonbright's *Principles of Public Utility Rates* are attached as **Attachment TW-7**.

- 1 4. Revenue stability from year to year.
- 2 5. Stability of the rates themselves, with a minimum of unexpected changes
- 3 seriously adverse to existing customers.
- 4 6. Fairness of the specific rates in the appointment of total costs of service
- 5 among the different customers.
- 6 7. Avoidance of “undue discrimination” in rate relationships.
- 7 8. Efficiency of the rate classes and rate blocks in discouraging wasteful use
- 8 of service while promoting all justified types and amounts of use.

9 **Q Are these principles widely recognized and used by commissions?**

10 **A** Yes. The principles listed above have been recognized for many years across the
11 nation, including in Colorado. Indeed, they were cited by Commissioner
12 Ackermann in the Colorado Commission’s decision rejecting the Black Hills
13 Energy TOU pilot.³³

14 **Q Is PSCo’s plan for the Modified RE-TOU rate consistent with Bonbright’s
15 principles?**

16 **A** No. In the Black Hills decision, Commissioner Ackermann emphasized that TOU
17 rates could help to achieve the goals of fairness, efficiency, and understandability.
18 In order to achieve these goals, however, TOU rates must be implemented in a
19 manner that comports with Bonbright’s rate design principles.

³³ Decision No. C19-0590, Special Concurrence of Chairman Jeffery P. Ackermann in Proceeding No. 18A-0676E, at 12-13.

1 Q **Which principles does the Company's proposal violate?**

2 A First, the Company's proposed implementation of the Modified RE-TOU rate
3 would violate the principle of understandability. Specifically, the roll-out of the
4 rate structure would not be prefaced with the provision of data to help customers
5 understand their existing usage patterns, as the Company does not have such data
6 available. Nor would the Company be able to provide it, should a customer
7 request such data.

8 Second, the mandatory implementation of TOU rates without customer choice
9 will violate the "public acceptability" requirement, as customers do not generally
10 respond well to dramatic changes in rates and elimination of choice. This has been
11 borne out by the failure of mandatory TOU rates in Connecticut and New York,
12 and is evident in the focus group interviews conducted of PSCo customers.³⁴

13 Third, such an abrupt shift is inconsistent with Bonbright's principle of
14 gradualism, which requires that rates exhibit stability with "a minimum of
15 unexpected changes seriously adverse to customers." Instead, most customers
16 would be suddenly transferred to the new rate structure without adequate
17 education and information, and most of these customers would experience bill
18 increases.

19 Finally, I am concerned that the Company's proposal violates the notion of
20 fairness, as the Company's proposal removes the customer protections included in
21 the pilot and would cause the greatest bill increases for those least able to afford
22 it.

³⁴ The focus group report states that "There was concern (especially among the Low Income group), about either of these plans becoming the default pricing structure for all customers." One Low Income customer commented 'I think, whether real or perceived, it would be a huge mistake to take the idea of choice out of the customers hand.'" Attachment TW-4, slide 35.

1 **Q What do you recommend?**

2 **A** I recommend that the Commission reject the Company's proposal to implement
3 the Modified RE-TOU rate as a mandatory rate design for all residential
4 customers. Instead, the Commission should direct the Company to first work to
5 cultivate customer understanding – both of TOU rates, and of their own historical
6 consumption. To maintain gradualism, any transition to a new rate should occur in
7 stages with significant customer protections, particularly for low income
8 customers. I provide more comprehensive discussion of these points in my
9 recommendations.

10 **V. IMPACTS ON LOW-INCOME CUSTOMERS**

11 **Q How will the Modified RE-TOU rate impact low-income customers?**

12 **A** PSCo's proposal would disproportionately burden those who are least able to
13 afford bill increases. According to the Company's workpapers, 82% of low-
14 income customers will experience a bill increase under the Modified RE-TOU
15 rate schedule.³⁵ This is compared to 69% of the general population.³⁶

16 **Q How much are low-income customers' bills expected to increase?**

17 **A** For the 82% of low-income customers who experience a bill increase, their bills
18 are projected to rise by 3.6%,³⁷ which is also more than the increase projected for

³⁵ CONFIDENTIAL Workpaper - Bill Impact Analysis - R vs Modified RE-TOU Low Income, attached as **Confidential Attachment TW-8**. Note, because of the confidential nature of the attachment, it is saved as both Public (redacted) and Confidential Versions.

³⁶ Confidential Attachment TW-8, 19AL-0687E_CONFIDENTIAL Workpaper - Bill Impact Analysis - R vs Modified RE-TOU Control-Gen Pop and 19AL-0687E_CONFIDENTIAL Workpaper - Bill Impact Analysis - R vs Modified RE-TOU Treatment-Gen Pop.

³⁷ Confidential Attachment TW-8, CONFIDENTIAL Workpaper - Bill Impact Analysis - R vs Modified RE-TOU Low Income

1 the general population.³⁸ Note that this is an average increase; some will
2 experience higher increases and some lower.

3 **Q Why are these findings concerning?**

4 **A** Low-income customers are least able to afford bill increases. As Commissioner
5 Gavan recognized in the decision on the Black Hills Energy TOU pilot case, the
6 monthly electric bill for low- and moderate-income ratepayers may be “a
7 significant portion of a customer’s monthly discretionary spending.”³⁹ While
8 other participants in the trial showed that they could shift load off peak to mitigate
9 bills, low-income customers failed to do so – even though these customers had
10 opted-in and showed great enthusiasm regarding the potential to mitigate their
11 bills under the TOU rate.⁴⁰

12 **Q Why do low-income customers often struggle with shifting load?**

13 **A** There are many reasons why low-income customers are less able to shift load than
14 the general population. Low-income customers typically have lower load in
15 general and fewer technology options to help them manage load. Further, as
16 Commissioner Gavan noted in the Black Hills Energy TOU decision, these
17 customers “predominantly live in substandard housing stock that is often heated

³⁸ For the 69% of the general population who is projected to experience a bill increase, the increase is expected to be 3.0%. This was true for both the treatment and control groups as shown in 19AL-0687E_CONFIDENTIAL Workpaper - Bill Impact Analysis - R vs Modified RE-TOU Control-Gen Pop and 19AL-0687E_CONFIDENTIAL Workpaper - Bill Impact Analysis - R vs Modified RE-TOU Treatment-Gen Pop. See Confidential Attachment TW-8.

³⁹ Decision No. C19-0590, Special Concurrence of Commissioner John Gavan in Proceeding No. 18A-0676E, at 21.

⁴⁰ Low income customers enrolled in the pilot program were more interested in saving money on their bills through TOU rates than other customers (91% of low income ranked this as “most important” versus 73% of other customers). Synapse analysis of customer survey data provided in “Confidential Attachment VS_SWEEP1-21.A8 XCEL_TOU_Wave_2_Data_All_Rounds FINAL anonymized”. Despite this enthusiasm for reducing their bills, low income customers were “the only segment without a statistically significant reduction in on-peak consumption during either season.” Hrg. Exhibit 101, Attachment BAT-3_RE-TOU Evaluation Report 2 Final November 2019, page xi.

1 with baseboard electric heat in the winter and air-conditioned in the summer.
2 Deferring heating and cooling tasks to off-peak periods is simply not an option.
3 Load shifting is in most cases not possible for this demographic.”⁴¹ These issues
4 are addressed in greater detail in the testimony of EOC Director of Advocacy
5 Andrew Bennett.

6 **Q Has the Commission raised concerns about shifting low-income customers
7 onto TOU rates?**

8 **A** Yes. In the Black Hills Energy TOU pilot case, Commissioner Koncilja stated:
9 “With an opt-out program, no matter how effective the education, there are going
10 to be customers who will not be aware that they are on the new rates. This
11 inevitability, combined with EOC’s analysis of household income in Black Hills’
12 territory shows the potential for disaster.”⁴²

13 While the Commissioner was referring to an opt-out approach, the concerns
14 would only be magnified for the proposed mandatory TOU rate. It is worth noting
15 that even though the Black Hills pilot included a “hold harmless” provision for
16 low-income customers, this was apparently not enough to allay the concerns of
17 the Commission.

18 **VI. CONSUMER PROTECTIONS IN OTHER JURISDICTIONS**

19 **Q How have other jurisdictions protected customers when introducing TOU
20 rates?**

21 **A** As noted above, examples of mandatory TOU rates are exceedingly rare. In fact,
22 I am aware of no Public Utilities Commission that has approved a mandatory
23 TOU rate for all residential customers in recent history, having learned from the

⁴¹ Decision No. C19-0590, Special Concurrence of Commissioner John Gavan in Proceeding No. 18A-0676E, at 21.

⁴² *Id.* at 17, Special Concurrence of Commissioner Frances A. Koncilja.

1 failures of such rates in the 1990s. Instead, commissions protect customers by first
2 protecting customer choice. This means allowing customers to choose whether
3 they want to subscribe to TOU rates in the first place. While a select few
4 jurisdictions have introduced TOU rates or other time-varying rates as the default
5 option (with an opt-out provision), the majority have approved only opt-in rates.

6 **Q What customer protections have other jurisdictions implemented in
7 conjunction with default rates?**

8 The customer protections vary by jurisdiction, but California's approach to
9 implementing default TOU rates is instructive.⁴³ First, as described above,
10 California has adopted a gradual approach to phasing in default TOU rates, after a
11 period of opt-in TOU rates. California also conducted multiple pilots prior to
12 implementing TOU rates, including a default pilot where customers did not self-
13 select to participate in the pilot.

14 Second, California Public Utilities Code - PUC § 745 requires the following
15 protections for customers defaulted onto a TOU rate:

- 16 • A residential customer may not be transitioned to a default TOU rate schedule
17 unless that residential customer has been provided with at least one year of
18 interval usage data from an advanced meter and associated customer
19 education.
- 20 • A residential customer must be provided with one year of bill protection (i.e.,
21 a “hold harmless provision”) after being transitioned to a TOU rate. The bill
22 protection ensures that the total amount paid by the residential customer does

⁴³ Many of the below protections are codified in California Code, Public Utilities Code - PUC § 745, although some have been added by the Commission or proposed by the utilities themselves.

1 not exceed the amount that would have been paid under that customer's
2 previous rate schedule.

- 3 • At least once a year, each electric utility must provide residential customers
4 with a summary of available tariff options and with a calculation of expected
5 annual bill impacts under each available tariff.

6 • The California commission is required to ensure that TOU rates do not cause
7 unreasonable hardship for senior citizens or economically vulnerable
8 customers in hot climate zones.

9 **Q Can you discuss briefly how one or more California utilities has complied**
10 **with these directives?**

11 **A** Yes. SDG&E's timeline involved targeted education and outreach activities
12 beginning in 2017 – approximately 18 months prior to beginning the transition to
13 default TOU.⁴⁴ Then, beginning more than a year in advance of the default TOU
14 roll-out, customers were provided with rate comparison mailers, which forecast
15 the estimated annual bill on each of the pricing options based on the customer's
16 last 12 months of usage and provided the actual annual bill for their current rate.⁴⁵
17 These rate comparisons are updated and provided to customers every six
18 months.⁴⁶

⁴⁴ SDG&E Advice Letter 2992-E-A, March 15, 2017. <http://regarchive.sdge.com/tm2/pdf/2992-E-A.pdf>

⁴⁵ SDG&E Advice Letter 2992-E, November 1, 2016. <http://regarchive.sdge.com/tm2/pdf/2992-E.pdf>

⁴⁶ San Diego Gas & Electric Company Quarterly Report On Progress Of Residential Rate Reform,
Rulemaking 12-06-013, February 3, 2020.

<http://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M329/K656/329656588.PDF>

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1 During their transition month, customers receive welcome information regarding
2 their new rate, and after the transition, customers continue to receive support
3 through After Care communications, including a Personalized Video email.⁴⁷

4 All customers receive bill protection (hold harmless provision) for one year, and
5 after 10 months on the TOU plan, customers receive notification that bill
6 protection is coming to an end.⁴⁸

7 Chart TW-1 below illustrates SDG&E's estimated timeline as of March 2017.⁴⁹

⁴⁷ San Diego Gas & Electric Company Quarterly Report On Progress Of Residential Rate Reform, Rulemaking 12-06-013, February 3, 2020.

<http://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M329/K656/329656588.PDF>

⁴⁸ San Diego Gas & Electric Company Quarterly Report On Progress Of Residential Rate Reform, Rulemaking 12-06-013, February 3, 2020.

<http://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M329/K656/329656588.PDF>

⁴⁹ SDG&E Advice Letter 2992-E-A, March 15, 2017. <http://regarchive.sdge.com/tm2/pdf/2992-E-A.pdf>

1 **Chart TW-1: SDG&E's Estimated Default TOU Roll-out Timeline**

TOU ME&O by Group		2017		2018		2019		2020			
Opt-in Pilot of 20,000		Opt-in TOU Pilot			Learnings						
					Default TOU Pilot			Learnings			
Default Pilot of 100,000											
Default of remaining residential customers	New electric rates are here based on when you use energy. SDG&E has solutions to help you succeed.							Rolling Default TOU			
Targeted ME&O to Vulnerable	Time of Use is coming. SDG&E can help you prepare.		Targeted ME&O to Vulnerable Customers								
Targeted ME&O to Structural Savers	You may be able to start saving money today.		Targeted ME&O to Structural Savers								
Targeted ME&O to All	We have solutions to help you be successful on TOU.					Targeted and Mass ME&O to default segments					
TOU ME&O by Phase		2017		2018		2019		2020			
Awareness	When you use energy matters. New rates are			Awareness							
Acknowledge	New rates are available. Soon all customers will need to choose their new rate.				Acknowledge						
Activation	SDG&E has tools to help you compare rates and be					Activation					
Agreement	Here's how to get the most from your TOU rate.						Agreement				
Bill/Rate Comparisons		2017		2018		2019		2020			
Rate Comparison Mailers	Here is a comparison of available rates										
	It's easy to compare and select rates										

2

3 Q **Do you have any estimates about the costs of providing bill protection to**
 4 **customers for a year in PSCo's territory?**

5 A The Company estimates that the average annual bill increase for general
 6 population customers who will not save money on the Modified RE-TOU rate
 7 will be \$17.09, and that this average bill increase will apply to 69% of general

1 population customers.⁵⁰ Assuming that this relationship holds for 1.5 million
2 residential customers, bill protection could cost approximately \$18 million for one
3 year.⁵¹

4 **Q Do you have any estimates about the costs of providing shadow billing to**
5 **PSCo customers for a year?**

6 **A** No, as the cost will depend on PSCo's billing system capabilities. However, I
7 recommend that if the Commission approves moving forward with AMI, it also
8 ensure that any billing system software is capable of providing shadow bills.

9 **Q Do you recommend that any of these customer protections be adopted for**
10 **TOU rates in Colorado?**

11 **A** Yes. First, I recommend that Colorado likewise implement TOU rates gradually,
12 beginning with opt-in TOU rates as advanced meters are rolled out, coupled with
13 a hold harmless provision for a year for any customer who decides to opt-in early.

14 Second, as data from the meters become available, all customers who have not
15 opted into TOU rates should receive information about TOU rates and what their
16 bill would have been on the TOU rate through what is referred to as a "shadow
17 bill." Customers not opting into the TOU rate early would begin to receive
18 shadow billing upon receiving an AMI meter, for at least a year before being
19 placed on any default rate design.

20 Third, not less than one year after completion of the meter roll-out for all
21 customers, default TOU rates could begin to be implemented, should the

⁵⁰ 19AL-0687E_CONFIDENTIAL Workpaper - Bill Impact Analysis - R vs Modified RE-TOU Control-Gen Pop and 19AL-0687E_CONFIDENTIAL Workpaper - Bill Impact Analysis - R vs Modified RE-TOU Treatment-Gen Pop.

⁵¹ 1,500,000 customers multiplied by 69% multiplied by \$17.09 = \$17,772,000.

1 Commission deem this approach to be better than an ongoing opt-in approach.
2 This approach should allow for at least a year following AMI meter roll-out
3 completion so as not to disadvantage customers who move during the year.⁵²
4 However, customers should be provided with bill protection for at least one year,
5 and customers should always have the option to enroll in an alternative rate, such
6 as the existing inclining block rate. The Company should also be required to
7 provide customers with information regarding their rate options on an annual
8 basis.

9 Fourth, if the Commission approves default TOU rates, vulnerable customers
10 (including low-income customers) should receive additional protections. In
11 particular, and as further discussed in detail in Mr. Bennett's Answer Testimony,
12 EOC recommends that the Commission require the Company to:

- 13 • Undertake targeted education and outreach to low-income customers,
14 • Ensure that low-income customers have the flexibility to opt in or opt out
15 of TOU rates at all times,
16 • Offer low-income customers extended bill protections and shadow billing
17 periods, and
18 • Create additional programs in the next demand side management plan to
19 extend no-cost smart technologies to these customers.

20 Mr. Bennett also discusses several recommendations for how the Commission
21 may ensure equity for low-income customers in the face of widespread rate design

⁵² Notably, the Company admits that of the low-income RE-TOU Trial customers that dropped out of the Trial, 77% of the customers moved. PSCo Response to EOC 4-10, attached as **Attachment TW-9**. Accordingly, accounting for the implications of moves is even more important for low-income customers.

1 change, including in extending access to bill assistance programs to a greater
2 number of qualified customers.

3 **VII. SUMMARY OF CONCLUSIONS AND RECOMMENDATIONS**

4 **Q Please summarize your conclusions.**

5 **A** My main conclusions can be summarized as follows:

- 6 • If implemented gradually, with significant customer education and
7 protections, TOU rates have the potential to enhance fairness and
8 efficiency, while simultaneously promoting the state's environmental
9 objectives. However, PSCo's proposed implementation of the Modified
10 RE-TOU rate structure is likely have the perverse result of turning
11 customers against TOU rates by causing significant customer confusion
12 and backlash. In doing so, the Modified RE-TOU rate would fail to
13 achieve its objectives.
- 14 • PSCo's proposal to implement mandatory residential TOU rates is nearly
15 without precedent and would violate the rate design principle of customer
16 acceptance. Based on historical experience and the results of the PSCo
17 customer focus groups, mandatory implementation is likely to stimulate
18 significant customer opposition and ultimately fail.
- 19 • PSCo's proposal would violate the rate design principle of simplicity,
20 understandability, public acceptability, and feasibility of application. The
21 roll-out of the rate structure would not be prefaced with the provision of
22 data to help customers understand their existing usage patterns because the
23 Company does not have such data.

- 1 • PSCo's proposal would violate the rate design principle of gradualism,
2 since the transition would be sudden without adequate education and
3 information, and most customers would experience bill increases.

- 4 • PSCo's proposal violates the principle of fairness, as the Company's
5 proposal removes the customer protections included in the pilot and would
6 cause the greatest bill increases for those least able to afford it.

- 7 • Low-income customers will suffer disproportionately from a mandatory
8 residential TOU rate, because of the relative difficulty such customers
9 have in shifting load. The Company projects that 82% of low-income
10 customers will experience bill increases.

- 11 • The Company can achieve its emissions reductions goals without
12 implementing mandatory TOU rates, since under an opt-out approach
13 approximately 96% of customers are likely to remain on the rate.

14 **Q Please summarize your overall recommendations.**

15 **A** I offer the following six primary recommendations:

- 16 1. The Commission should not approve mandatory TOU rates at this time. The
17 Commission may revisit this issue at a future date, once customers have more
18 data, education, and experience with TOU rates.

- 19 2. As customers receive an AMI meter, they should be allowed to opt-in to a TOU
20 rate. Customers opting in should receive bill protection for one year in which they
21 will pay the lower of the TOU rate or their regular rate each month. This will help
22 to encourage customers to sign up and become comfortable with the rate.

- 23 3. Customers who do not opt-in as they receive a meter should be provided with a
24 shadow bill that shows what they would have paid on the TOU rate.

- 1 4. The meter roll-out should be complete for an entire year before defaulting
- 2 customers onto the rate, so as not to disadvantage customers who move during the
- 3 year. However, customers should be provided with bill protection for at least one
- 4 year, and customers should always have the option to enroll in an alternative rate,
- 5 such as the existing inclining block rate. The Company should also be required to
- 6 provide customers with information regarding their rate options on an annual
- 7 basis.
- 8 5. Additional protections and measures should be provided to low-income
- 9 customers, as described further in the testimony of EOC Director of Advocacy
- 10 Andrew Bennett. These measures include targeted education and outreach,
- 11 additional flexibility to opt-in and opt-out of TOU rates, provision of extended
- 12 bill protections, additional programs in the next demand-side management plan to
- 13 extend no-cost smart technologies to these customers, and an opportunity for
- 14 more low-income customers to participate in bill assistance programs.
- 15 6. If additional emission reductions are needed, PSCo should investigate alternatives
- 16 such as expanding its demand response programs or implementing Peak Time
- 17 Rebates for customers who opt out of the TOU rate option.

18 **Q Does this conclude your direct testimony?**

19 Yes, it does.