BEFORE THE

PUBLIC SERVICE COMMISSION

OF MARYLAND

IN THE MATTER OF THE APPLICATION OF DELMARVA POWER AND LIGHT FOR ADJUSTMENTS TO ITS RETAIL RATES FOR THE DISTRIBUTION OF ELECTRIC ENERGY	)	**Case No. 9670**

Direct Testimony of

Melissa Whited

On Behalf of

The Maryland Office of People's Counsel

December 2, 2021
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Table of Contents

I. INTRODUCTION AND QUALIFICATIONS 1

II. SUMMARY OF CONCLUSIONS AND RECOMMENDATIONS 3

III. RATE DESIGN AND ENERGY POLICY OBJECTIVES 6

IV. DPL'S PROPOSED RESIDENTIAL TARIFFS 8

V. RESIDENTIAL EV TARIFFS (R-PIV AND PIV) 12

VI. RESIDENTIAL TOU TARIFFS (R-TOU-ND AND R-TOU-P) 14

VII. DEVELOPMENT OF ADDITIONAL ELECTRIFICATION TARIFFS 20

Exhibit MW-1: Resume of Melissa Whited

I. INTRODUCTION AND QUALIFICATIONS

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

A. My name is Melissa Whited. I am a Principal Associate at Synapse Energy Economics ("Synapse"), located at 485 Massachusetts Avenue, Cambridge, MA 02139.

Q. Please describe Synapse Energy Economics.

A. Synapse Energy Economics (Synapse) is a research and consulting firm specializing in electricity and gas industry regulation, planning, and analysis. Our work covers a range of issues, including economic and technical assessments of demand-side and supply-side energy resources; energy efficiency policies and programs; integrated resource planning; electricity market modeling and assessment; renewable resource technologies and policies; and climate change strategies. Synapse works for a wide range of clients, including attorneys general, offices of consumer advocates, public utility commissions, environmental advocates, the U.S. Environmental Protection Agency, U.S. Department of Energy, U.S. Department of Justice, the Federal Trade Commission, and the National Association of Regulatory Utility Commissioners. Synapse has over 30 professional staff with extensive experience in the electricity industry.

Q. Please summarize your professional and educational experience.

A. I have 13 years of experience in economic research and consulting. At Synapse, I have worked extensively on issues related to utility regulatory models and rate design. I have been an invited speaker in numerous industry conferences, including as a panelist for the

National Association of Regulatory Utility Commissioners (NARUC) Subcommittee on Rate Design at the 2021 Winter Policy Summit and the 2018 Annual Meeting.

I have sponsored testimony before the Nova Scotia Utility and Review Board, the Newfoundland and Labrador Board of Commissioners of Public Utilities, the Georgia Public Service Commission, the Rhode Island Public Utilities Commission, the Massachusetts Department of Public Utilities, the Maine Public Utilities Commission, the California Public Utilities Commission, the Hawaii Public Utilities Commission, the Public Service Commission of Utah, the Public Utility Commission of Texas, the Virginia State Corporation Commission, and the Federal Energy Regulatory Commission. I hold a Master of Arts in Agricultural and Applied Economics and a Master of Science in Environment and Resources, both from the University of Wisconsin-Madison. My resume is attached as Exhibit MW-1.

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

A. I am testifying on behalf of the Office of People's Counsel (OPC).

Q. What is the purpose of your testimony?

A. I was retained by OPC to evaluate the rate designs proposed by Delmarva Power & Light Company (DPL or the Company) to ensure consistency with Maryland's energy policy goals, particularly those specified in Maryland Public Utility Article (PUA) § 2-113(a)(2), which requires the Public Service Commission of Maryland (Commission) to consider the impacts of public service companies on the achievement of the State's climate commitments for reducing statewide greenhouse gas emissions. My testimony

summarizes my findings regarding the impacts of DPL's proposed rate designs on customer electricity usage and beneficial electrification technologies and provides recommendations for rate design modifications.

Q Have you testified previously before the Public Service Commission of Maryland or participated in any Commission-sponsored proceeding?

A Yes. I testified before the Commission in Case No. 9655 regarding Pepco's multi-year rate plan. I was also closely involved on behalf of OPC during both Phase I and Phase II of the working group effort established by the Commission in Case No. 9618 regarding multi-year rate plans and performance incentive mechanisms.

Q. What materials did you rely on to develop your testimony?

A. The sources for my testimony and exhibits are public documents, responses to discovery requests, and my personal knowledge and experience.

Q. Was your testimony prepared by you or under your direction?

A. Yes. My testimony was prepared by me or under my direct supervision and control.

II. SUMMARY OF CONCLUSIONS AND RECOMMENDATIONS

Q. Please summarize your main conclusions.

A. My conclusions are as follows:

- Rates that encourage customers to electrify their homes and vehicles will reduce carbon dioxide emissions and help Maryland meet its emission reduction targets. In addition, rates that encourage customers to shift load to off-peak hours will result in more efficient utilization of the system and reduce costs for all customers.

- Simply offering time-varying rates is not enough. Time-varying rates must be well-designed so that they:
    - Offer sufficient savings to motivate customers to shift load to off-peak hours;
    - Are reflective of the temporal nature of system costs;
    - Encourage customer enrollment by avoiding extremely high on-peak prices; and
    - Provide operational savings to customers who convert fossil-fueled technologies to electric technologies.
- DPL's residential rates do not meet these criteria. Specifically:
    - The Company's EV tariffs do not provide sufficient savings for customers who charge their vehicles off-peak, and, in the case of the PIV tariff, contain unnecessary costs for a second meter.
    - Rate schedule R-TOU-ND is poorly designed, in that it is nearly impossible for a customer to save money on this tariff and is only open to customers who take supply service from a retail supplier.
    - The on-peak prices in rate schedule R-TOU-P are excessively high, impeding customer enrollment. Further, this tariff's on-peak windows do not accurately reflect the proportion of costs incurred during on-peak windows and could result in load shifting behavior that exacerbates distribution system peaks.

Q. Please summarize your recommendations.

A. To encourage the adoption of beneficial electrification technologies among residential customers in Maryland and encourage more efficient use of the grid, I recommend that:

1. The EV tariffs' off-peak prices should be reduced in order to provide greater savings for customers who charge their EVs off-peak. This can be done by narrowing the off-peak period.

2. Customers taking service on schedule PIV for electric vehicles should be permitted to use lower-cost submetering technologies or vehicle telematics to separately measure and manage vehicle load, rather than requiring a second meter to be installed.

3. R-TOU-ND should be adjusted to be revenue neutral; the on-peak period should be reduced from 11 hours to approximately 4 - 6 hours; the on-peak and off-peak prices should be clearly linked to the timing of costs on the system; and the tariff should be made available to all customers, not just customers who take service from a retail supplier.

4. R-TOU-P should be modified to include weekends in the on-peak period, distribution system costs should be allocated in a manner that more closely adheres to cost causation, and the total on-peak to off-peak price ratio should not exceed 4:1.

5. DPL should develop a tariff similar to that offered by its Delaware counterpart for customers who convert fossil heating systems to efficient electric technologies.

III. RATE DESIGN AND ENERGY POLICY OBJECTIVES

Q. Why should the Commission consider the impacts of DPL's application on greenhouse gases?

A. The passage of House Bill 298 expanded the mandate of the Commission. Specifically, the bill modified PUA § 2-113(a)(2) to require the Commission to consider the impacts of public service companies on the achievement of the State's climate commitments for reducing statewide greenhouse gas emissions. Maryland's Greenhouse Gas Emissions Reduction Act (GGRA of 2016) requires the state to achieve a minimum of a 40% reduction in statewide greenhouse gas (GHG) emissions from 2006 levels by 2030.

Q. What is the role of rate design in meeting Maryland's energy policy goals?

A. Rate design can impact customer electricity usage in multiple ways, which in turn has important policy implications. In particular:

1. Rate design can reduce greenhouse gases through promoting the adoption of beneficial electrification technologies, such as electric vehicles (EVs) and heat pumps, and

2. Rate design can support more efficient utilization of the grid, lowering both costs and emissions associated with electricity consumption.

Q. Please explain how rate design can promote beneficial electrification.

A. To reduce statewide GHG emissions by 40 percent, Maryland must not only reduce overall energy consumption through programs such as EmPOWER, but must also replace technologies that use fossil fuels with cleaner electric technologies. The 2030 GGRA

Plan notes that "the transportation sector is the largest source of GHG emissions in Maryland,"[1] and the combustion of fossil fuels in buildings for space and water heating "is a substantial source of emissions in Maryland."[2] However, electric technologies, such as heat pumps and electric vehicles, often cost more up-front. To overcome the adoption barrier of high initial costs for cleaner electric technologies, it is important to provide customers with operational savings relative to using fossil fuels. Rate design is a critical component in yielding such bill savings.

Q. Please explain how rate design can support the more efficient use of the grid.

A. By conveying price signals regarding when to use electricity, rate design can encourage electricity consumption during times that benefit all customers. For example, well-designed time-of-use (TOU) rates encourage customers to shift load away from hours with higher costs and emissions to hours with abundant, low-cost renewable energy. This will be increasingly important as we shift more of the state's energy uses to run on clean electricity. However, TOU rates are only effective if customers elect to take service on them. Having TOU rates on the books without meaningful customer enrollment is not only futile – it is a waste of ratepayer resources given the costs associated with marketing, education, billing, and overall administration of the rate schedule.

[1] The 2030 Greenhouse Gas Emissions Reduction Act Plan ("2010 GGRA Plan"), p. 45, available at https://mde.maryland.gov/programs/Air/ClimateChange/Documents/2030%20GGRA%20Plan/THE%202030%20GGRA%20PLAN.pdf.
[2] 2030 GGRA Plan, p. 47.

Q. Has the Commission recognized the potential benefits of advanced rate designs?

A. Yes. In its order on November 28, 2017 in PC44, the Commission noted that it was hopeful the TOU pilots would "result in significant, measurable, system-wide benefits and make smart home, electric vehicle, distributed energy resources and energy storage, and other new technologies even more attractive," while facilitating future tariffs that "enhanc[e] customer control and insight into the smart grid."[3] Although the Commission's objectives were stated in the context of the PC44 TOU pilots, they are also applicable to the time-varying rates proposed by DPL in this proceeding. I have therefore considered both the mandates contained in PUA §2-113 as well as the Commission's stated goals for TOU rates when evaluating DPL's rate proposals.

Q. Do DPL's residential tariffs further the objectives of the Commission and PUA §2-113?

A. DPL's application contains several time-varying rate designs that are intended to support the state's energy policy goals. However, the proposals suffer from several critical flaws that are hindering their success. The sections below identify these deficiencies and propose modifications that would improve the ability of the tariffs to meet the Commission's objectives and the state's environmental commitments.

IV. DPL'S PROPOSED RESIDENTIAL TARIFFS

Q. Please describe DPL's residential rate offerings, as proposed in its application.

A. DPL is proposing to continue five residential rate offerings, as summarized below:

[3] Maryland Public Service Commission, PC44 Rate Design Workgroup Order, November 28, 2017, pp. 2-3.

- Rate schedule "R," which is a flat rate and the default tariff for residential customers;
- Two TOU rates:
  - Schedule "R-TOU-ND," which is DPL's legacy TOU rate available only to customers taking service from a retail supplier, with a mild on-peak to off-peak ratio of 1.7:1;
  - Schedule "R-TOU-P," which is the continuation of the TOU rate tested in the PC44 pilot (updated to DPL's proposed revenue requirements) and has a steep on-peak to off-peak ratio of 6.2:1;[4]
- Two EV rates:
  - Schedule "R-PIV," which is a whole-home TOU rate with a mild on-peak to off-peak ratio of 1.6:1 during the summer and 1.9:1 during the winter;
  - Schedule "PIV," which is for separately-metered EVs and has a mild on-peak to off-peak ratio of 1.5:1.

Key characteristics of these rates are summarized in the table below.

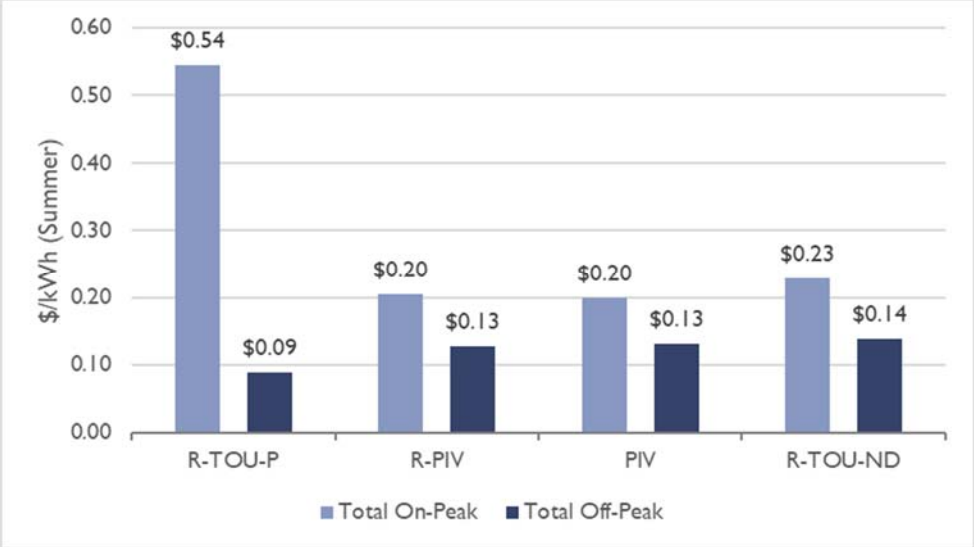
Table 1. Summary of DPL's proposed residential tariffs

	R	R-TOU-ND	R-TOU-P	R-PIV	PIV
Applicability	All residential	Retail Choice Customers	All residential	EV customers	EV customers
On-Peak Price (Summer)	0.15	0.23	0.54	0.20	0.20
Off-Peak Price (Summer)	0.15	0.14	0.09	0.13	0.13
On-Peak to Off-Peak Ratio	N/A	1.7	6.2	1.6	1.5
Separate Meter	No	No	No	No	Yes
Number of Customers	182,264	60	513	5	0

[4] Schedule (MTN-SD)-1, page 4.

The figure below depicts the Company's proposed summer on-peak and off-peak prices (including standard offer service) for each of the four time-varying residential tariffs.

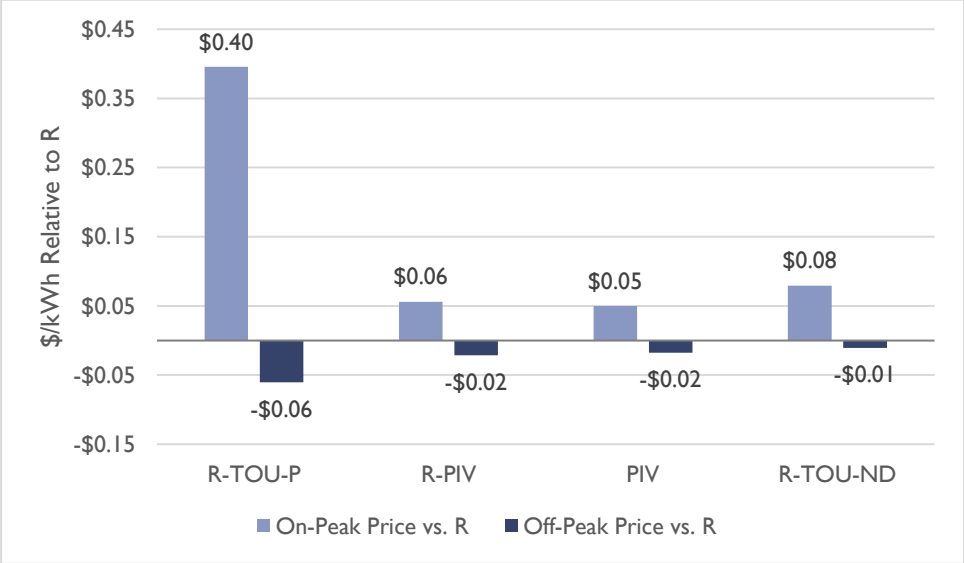
Figure 1. DPL's proposed summer on-peak and off-peak prices



Q. How do these time-varying rates compare to the standard residential rate?

A. The R-TOU-P tariff has a summer on-peak price that is $0.40/kWh higher than the standard residential rate, while the summer off-peak price is $0.06/kWh lower. (The winter rates are very similar.) The other tariffs differ much less dramatically from the standard residential tariff, as shown in the figure below (shown for the summer season). While the R-PIV, PIV, and R-TOU-ND tariffs all offer a discount during the off-peak hours, the magnitude of the discount is only in the range of $0.01 to $0.02 per kilowatt-hour.

Figure 2. Prices relative to standard residential tariff – summer season



Q. Why do you contend that DPL's rates are ineffective in supporting Maryland's energy policy goals?

A. There are very few customers enrolled on any of the tariffs other than the default R rate schedule, as shown in Table 1. In fact, only 0.3% of residential customers are enrolled in an alternative rate schedule, and only 5 customers are enrolled in either of the EV rates. With so few customers enrolled in alternative tariffs, the rates are clearly accomplishing little in terms of supporting adoption of beneficial electrification technologies or encouraging customers to utilize the grid more efficiently. Below I describe several proposed modifications to DPL's tariffs that would improve their effectiveness and customer uptake.

V. RESIDENTIAL EV TARIFFS (R-PIV AND PIV)

Q. Do DPL's proposed EV rates provide cost savings to EV customers that could help encourage customers to switch to cleaner vehicles?

A. Yes, but only to a limited extent. As noted above, the prices during off-peak hours are only about $0.02/kWh lower than the flat rate, which is not enough to generate substantial savings for EV customers, even if they charge their EVs entirely during off-peak hours. For example, if an EV customer used 350 kWh per month charging their EV completely off-peak, they would only save approximately $6.00 - $7.00 relative to the standard R rate. For many customers, enrolling in a special EV rate may not be worth the hassle of such small savings.

Further, the PIV tariff requires a second meter, the costs of which are billed to the customer.[5] The costs associated with the second meter and its installation could easily erase the expected cost savings from charging off-peak. Due to the minimal cost savings, these rates are unlikely to encourage additional adoption of EVs.

Q. Is a second meter necessary to measure and manage vehicle charging?

A. No. Multiple potentially lower-cost options are available, including submetering technologies and vehicle telematics. For example:

[5] DPL response to OPC Data Request 5-11.

- Submetering is possible using networked EV chargers, such as ChargePoint's Home L2 charger, used by Madison Gas & Electric in Wisconsin.[6]

- Vehicle telematics (on-board communication technologies) are already being leveraged by Delmarva and other utilities in Maryland using WeaveGrid's software,[7] and Baltimore Gas & Electric plans to use the software for managed charging.[8]

Q. What do you recommend regarding the Company's EV tariffs?

A. I recommend that:

1. The off-peak price should be reduced in order to provide greater savings for customers who charge their EVs off-peak. This can be accomplished by narrowing the off-peak window to fewer hours, and by implementing an on-peak to off-peak differential in the distribution rate. The existing rate only includes time-varying pricing for supply costs.

2. To take service on schedule PIV, customers should be permitted to use lower-cost submetering technologies or vehicle telematics to separately measure and manage vehicle load, rather than requiring that a second meter be installed. This will help provide greater cost savings for these customers.

[6] Madison Gas & Electric, "Charge@Home" Program, Frequently Asked Questions, https://www.mge.com/our-environment/electric-vehicles/charge-at-home-program/charge@home-program-frequently-asked-questions.
[7] PHI Utilities. Case No. 9478. Mid-Course Program Evaluation and Semi-Annual Progress Report, September 14, 2021, at
[8] Peters, Adele. "The next step for electric cars is to make them part of the grid." *Fast Company*. October 4, 2021. https://www.fastcompany.com/90682274/the-next-step-for-electric-cars-is-to-make-them-part-of-the-grid

VI. RESIDENTIAL TOU TARIFFS (R-TOU-ND AND R-TOU-P)

Q. Do any of DPL's other residential tariffs encourage the adoption of EVs or the more efficient use of the grid?

A. Both R-TOU-ND and R-TOU-P could conceivably support customer adoption of EVs and the more efficient use of the grid by providing customers with savings for shifting usage to off-peak periods. However, there are several critical flaws in these tariffs that are likely impeding customer enrollment on these tariffs, thereby preventing load-shifting from occurring on a large scale and hindering adoption of beneficial electrification technologies.

Q. What flaws have you identified regarding rate schedule R-TOU-ND?

A. The Company states that the "purpose of this rate is to allow customers the opportunity to save on their energy bill during off-peak hours and to convey a price signal to customers to use during off-peak hours."[9] Yet the design of R-TOU-ND makes it nearly impossible for a customer to save money on this tariff. In fact, I estimate that a customer with an average residential load shape[10] would pay approximately 30% more on R-TOU-ND than on the standard residential tariff, and yet the Company has provided no justification for such a discrepancy in rates.

Q. What aspects of R-TOU-ND make it difficult for customers to save money?

A. The Company's proposed R-TOU-ND has an on-peak price that is $0.08/kWh higher than the flat rate, but an off-peak price that is only $0.01/kWh lower than the flat rate. It

[9] Response to OPC 5-6(d).
[10] Based on the average residential load as provided in the attachment in response to OPC 5-14 (Confidential).

also has a customer charge that is nearly $5 higher than the flat rate and a very wide on-peak period of 11 hours. Thus, to save money on R-TOU-ND, an average residential customer would have to consume more than 95% of their energy off-peak, which would be extremely difficult to do given the on-peak period of 11 hours per day. It is hardly surprising that only 60 customers are enrolled on R-TOU-ND given this design.

Further, R-TOU-ND is not open to all customers, as it is only available to customers who take service from a retail supplier.

Q. Do you recommend that R-TOU-ND be modified or discontinued?

A. I recommend that R-TOU-ND be modified but not discontinued. It is important to provide customers with rate choices, particularly for rates that offer more efficient price signals than a flat rate. However, R-TOU-ND in its current form does not accurately reflect costs on the system.[11] Thus, I recommend the following changes to R-TOU-ND:

1. R-TOU-ND should be adjusted to be revenue neutral. A customer who does not shift load on R-TOU-ND should pay the same bill as a customer on rate schedule R, at least until R-TOU-ND is broken out into a separate rate class upon showing of substantially different cost to serve.

[11] As indicated by the fact that R-TOU-ND collects approximately 30% more revenues than rate schedule R for a customer with an average residential load profile.

2. The on-peak period should be reduced from 11 hours to between 4 and 6 hours. A shorter on-peak window will facilitate customer load shifting by making it easier to shift usage to off-peak hours.

3. The on-peak and off-peak prices should be clearly linked to the timing of costs on the system.

4. The tariff should be made available to all customers, not just customers who take service from a retail supplier.

Q. What concerns do you have regarding R-TOU-P?

A. Although Delmarva Power undertook heavy marketing of the pilot tariff in PC44, the Company has failed to attract customers to this rate. According to the TOU evaluation, the Company mailed more than 95,000 recruitment kits and nearly 50,000 reminder postcards,[12] and yet only 674 customers enrolled in the TOU tariff. Nonetheless, Delmarva Power is proposing to continue the R-TOU-P tariff in substantially the same design as the pilot tariff.

Q. Why have so few customers have enrolled in the R-TOU-P rate?

A. The Company has not analyzed why customers have been reluctant to enroll in its pilot TOU rate.[13] However, a likely reason that so few customers have enrolled is the extremely steep on-peak to off-peak price ratio of more than 6:1. Such a high on-peak to

[12] PC44 Time-of-Use Pilot Final Pilot Evaluation, Process Evaluation for Delmarva Power, Attachment 2B, October 4, 2021, at 2.
[13] Response to OPC 5-2(a).

off-peak price ratio is very unusual and is likely intimidating to most customers, as a small increase in on-peak usage could result in significantly higher bills.

Q. What evidence supports your assertion that a high on-peak to off-peak price ratio would impede customer enrollment in R-TOU-P?

A. The concept of loss aversion in behavioral economics holds that the pain of losing is much more powerful than the pleasure of gaining.[14] Applying this to TOU rates means that customers are more likely to be intimidated by the potential for higher bills due to high on-peak rates, than they are to be excited by the potential bill savings they could attain due to lower off-peak rates. A milder price ratio reduces the risk of bill increases and may be more palatable to customers, despite offering lower potential savings. For this and other reasons, many jurisdictions have opted for a price ratio of 2:1 or 3:1 for TOU rates, in contrast to the 6:1 price ratio associated with R-TOU-P.

In addition to the economic theory supporting loss aversion, I note that the Company acknowledged in discovery that a "lower on-peak to off-peak ratio may achieve greater enrollment,"[15] and the Company's TOU Process Evaluation recognized that the "high summer peak rate created another enrollment barrier."[16]

[14] Kahneman, D., & Tversky, A. (1979). Prospect theory: An analysis of decision under risk. Econometrica, 47, 263-291.
[15] Response to OPC 5-2.
[16] PC44 Time-of-Use Pilot Final Pilot Evaluation, Process Evaluation for Delmarva Power, Attachment 2B, October 4, 2021, at 1.

Q. Are the on-peak and off-peak prices in the R-TOU-P tariff cost-reflective?

A. No. The on-peak period is from 2 PM to 7 PM during summer non-holiday weekdays and from 6 AM to 9 AM during winter[17] non-holiday weekdays.[18] Weekends and other hours are off-peak. However, these on-peak windows do not align well with peak load on the distribution system, particularly during the winter. By analyzing the substation data provided by the Company,[19] I found that only 18% of substation peaks during the past five years fell within the winter on-peak period as defined in R-TOU-P. In 2020, this percentage totaled only 2% of total substation peaks.[20] In terms of the winter season, the percentage of peaks falling within the on-peak window is much higher at 46%, but still less than half.

The percentage of summer substation peaks from 2017-2021 falling within the on-peak window was somewhat better, yet only equaled 39% of total substation peaks, or 65% of summer peaks. These values are shown in the table below.

Table 2. Percentage of substation peaks captured by on-peak periods

	Seasonal Peaks Captured	Total Peaks Captured
Winter On-Peak Period	46%	18%
Summer On-Peak Period	65%	39%
Total		57%

[17] "Winter" is defined as October to May for the purposes of the TOU rate.
[18] PC44 Time-of-Use Pilot Final Pilot Evaluation, The Brattle Group Analysis, Attachment 1, October 4, 2021, at 3.
[19] Response to OPC 5-4.
[20] Of winter-peaking substations, only 20% fell within the weekday 6 AM – 9 AM timeframe in 2020.

Despite capturing only 57% of substation peaks on its distribution system for the past five years, the Company has allocated 100% of its primary distribution system costs to the on-peak periods, resulting in a very high on-peak to off-peak price ratio.[21]

Q. Why is it problematic that only 57% of substation peaks are captured by the on-peak period of R-TOU-P?

A. The distribution costs on rate schedule R-TOU-P are designed in a manner that allocates all primary costs of the distribution system to the narrow on-peak period.[22] This allocation results in an on-peak distribution rate of $0.31/kWh and an off-peak distribution rate of only $0.03/kWh. This differential is clearly not supported by the data, particularly for the winter period in which most of the winter substation peaks occur outside of the on-peak window.

Furthermore, a key objective of TOU rates is to encourage customers to shift load from peak hours in order to utilize the system more efficiently and reduce system costs. If price signals do not accurately convey the hours in which the system is stressed, customers will not shift load in ways that benefit the system. In fact, inaccurate price signals could cause customers to shift load onto peak hours, further exacerbating system peaks and increasing the need for system investments.

[21] Response to OPC 5-1.
[22] *Ibid.*

Q. How should R-TOU-P be modified?

A. Based on the foregoing analysis, I recommend that the Company include weekends in the on-peak period. This would result in more than half of summer substation peaks being captured in the summer on-peak period, based on historical data. More importantly, however, the costs included in the on-peak period should be modified. Primary system costs should be allocated to those windows based on a more sophisticated analysis of cost causation, such as the proportion of substations that peak during those hours. This would result in seasonally-differentiated prices, as well as lower on-peak prices, which would more accurately convey the temporal aspects of system costs.

In addition, I recommend adopting a ratio of on-peak to off-peak total prices (including supply costs) of no more than 4:1 to encourage greater customer enrollment by reducing the risk of higher bills.

VII. DEVELOPMENT OF ADDITIONAL ELECTRIFICATION TARIFFS

Q. Do any of DPL's alternative residential tariffs support the adoption of other beneficial electrification technologies such as heat pumps by providing savings beyond the default rate?

A. No. DPL offers no other residential tariffs beyond the options discussed above.

Q. What other types of rate designs could be used to promote beneficial electrification?

A. Tariffs with lower volumetric charges can encourage beneficial electrification because customers who adopt technologies such as EVs and heat pumps will typically increase their electricity consumption substantially. Volumetric rates can be reduced by increasing the fixed charge. However, such tariffs should only be implemented carefully, as higher

fixed charges reduce customer incentives to adopt energy efficiency measures. Further, low-income customers tend to have lower-than average usage and could be harmed by such a tariff. Thus, tariffs with higher fixed charges should generally be limited to customers who have invested in beneficial electrification technologies.

Q. Is there precedent for offering such tariffs?

A. Yes. Historically many utilities offered rate discounts to customers with electric space heat. Such tariffs could be expanded to customers who install heat pump space heating, heat pump water heaters, or induction ranges. DPL's Delaware counterpart offers a residential space heating tariff that features a lower volumetric rate for customers with electric heat, including heat pumps.[23] This rate features the same fixed charge but a 15% lower volumetric charge.

Q. What do you recommend regarding the development of a beneficial electrification rate?

A. I recommend that a tariff similar to that offered by DPL's Delaware counterpart be made available to any customer who installs a technology that (1) allows them to reduce greenhouse gases by switching from other fuel sources, and (2) is more efficient than electric resistance. This tariff would provide customers with greater cost savings for

[23] The distribution charge is $0.035/kWh for space heating customers, while non-space heating customers have a distribution charge of $0.040/kWh. The supply charges are also slightly lower for space heating customers. *See:* Delmarva Power & Light, Delaware, Residential – Space Heating "R" tariff, available at https://www.delmarva.com/SiteCollectionDocuments/Master%20tariff%20eff%2009-17-2021%20filed%2009-16-21%20Electric%20Final%20BRC%20Dkt.%2020-0149.pdf

switching from fossil fuels to electric technologies and would help overcome the high initial cost hurdle.

Q. Does this conclude your testimony?

A. Yes, it does.