BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA

Order Instituting 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.	Rulemaking 12-06-013 (Filed June 21, 2012)

SUPPLEMENTAL FILING OF SAN DIEGO GAS & ELECTRIC COMPANY (U902E) CONTAINING RESPONSES TO QUESTIONS AND RELATED TESTIMONY PURSUANT TO PHASE 1 ASSIGNED COMMISSIONER'S RULING

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Dated: March 21, 2014

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San Diego Gas & Electric Company ("SDG&E") hereby files and serves its Responses to Questions 26 – 38 as set forth in the Assigned Commissioner's Ruling Requiring Utilities to Submit Phase 1 Rate Change Proposals that was issued in Rulemaking ("R.") 12-06-013 on February 13, 2014 ("ACR"), together with supporting testimony. Pursuant to direction provided in the ACR, SDG&E is also concurrently serving the following supporting testimony:

- Chapter 1: Prepared Direct Testimony of Alex Kim;
- Chapter 2: Prepared Supplemental Testimony of Leslie Willoughby; and,
- Chapter 3: Prepared Supplemental Testimony of Cynthia Fang.

SDG&E's responses to Questions 26 – 38, which include parenthetical references to the sponsoring SDG&E witness, are attached hereto as Attachment A. Three chapters of testimony that are being concurrently served with this filing are briefly summarized below.

- Testimony of Alex Kim presents SDG&E's Customer Communication, Outreach and Education, and Technology plan as it pertains to the rate change proposals submitted on February 28, 2014.

- Testimony of Leslie Willoughby provides an overview of SDG&E's experimental Time-of-Use ("TOU") pilot, SDG&E costs to implement the pilot, and a timeline for the implementation and evaluation of the TOU rates to be conducted.
- Testimony of Cynthia Fang provides the rates for the experimental TOU pilot presented in the testimony of Ms. Willoughby.

DATED at San Diego, California, on this 21st day of March, 2014.

Respectfully submitted,

By: /s/ Thomas R. Brill

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ATTACHMENT A

INDEX OF COMMISSION QUESTIONS AND RESPONSES WITH REFERENCE TO SUPPORTING WITNESS
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Additional Details on TOU Rates, Time Periods and Seasons

26) (SPONSORED BY CHRIS YUNKER) Provide any analysis which demonstrates that the time periods and seasons that you propose for your TOU and critical peak pricing (CPP) rates are appropriate for at least 5 years.

Response:

SDG&E has provided evidence that the time of use periods proposed in its 2015 Rate Design Window will be appropriate for at least 5 years. In this regard, the Commission is requested to take official notice of the testimony of SDG&E witness Dave Barker in SDG&E's 2015 Rate Design Window proceeding which demonstrates that SDG&E's TOU proposed periods will be appropriate for 5 years. (A copy of this testimony is attached to these Responses as "Appendix "A" for ease of reference.) For SDG&E, the changes from the 33 percent RPS are expected by 2017 and do not differ significantly in 2020. Data is also presented on Statewide changes in likely hours of capacity need in 2020. For the reasons set forth therein and in SDG&E's response to Question 28 below, SDG&E believes that TOU periods present utility- specific issues and should be considered in a utility specific rate proceeding rather than jointly with the other utilities in a statewide proceeding such as the Residential Rate OIR.

The periods for CPP events can reasonably be expected to change more frequently than 5 years as they represent event-based pricing that is meant to capture a small number of peak hours in a year. As the penetration of both utility scale and customer sited renewable energy generation increases, the net peak hours will shift to later in the day. Being able to shift a shortened CPP window within the proposed TOU on-peak period will provide for a stronger price signal and less difficulty for customers in providing load reductions in the on-peak TOU period, while effectively capturing the net peak hours. In that way, a shorter CPP period which shifts more frequently than 5 years will make it easier for customers to respond and provide more incentive for customers to respond in comparison to a longer CPP period.

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27) (SPONSORED BY CHRIS YUNKER) When should the Commission next modify TOU and CPP time periods and seasons and why?

Response:

SDG&E has determined that the time to examine TOU periods for SDG&E's service territory is now and SDG&E has submitted a proposal in its 2014 Rate Design Window Application (RDW) to update its TOU and CPP time periods. In that Application, SDG&E covers the technical analysis, policy and rate design updates to support its proposal. In short, the TOU periods need to be addressed now in order to capture the shift in the high cost hours to later in the day, as is outlined in the testimony of SDG&E witness Dave Barker in the 2014 RDW.
Further support for addressing TOU periods now comes from:

1) Negative pricing from surplus renewables that is already showing up in spot power prices;
2) The need to prepare for the transition of residential customers to TOU pricing for optional and default rates in a manner that creates greater certainty and more beneficial demand response; and,
3) Consideration in the development of NEM 2.0 rules (see discussion at p. 6 below).

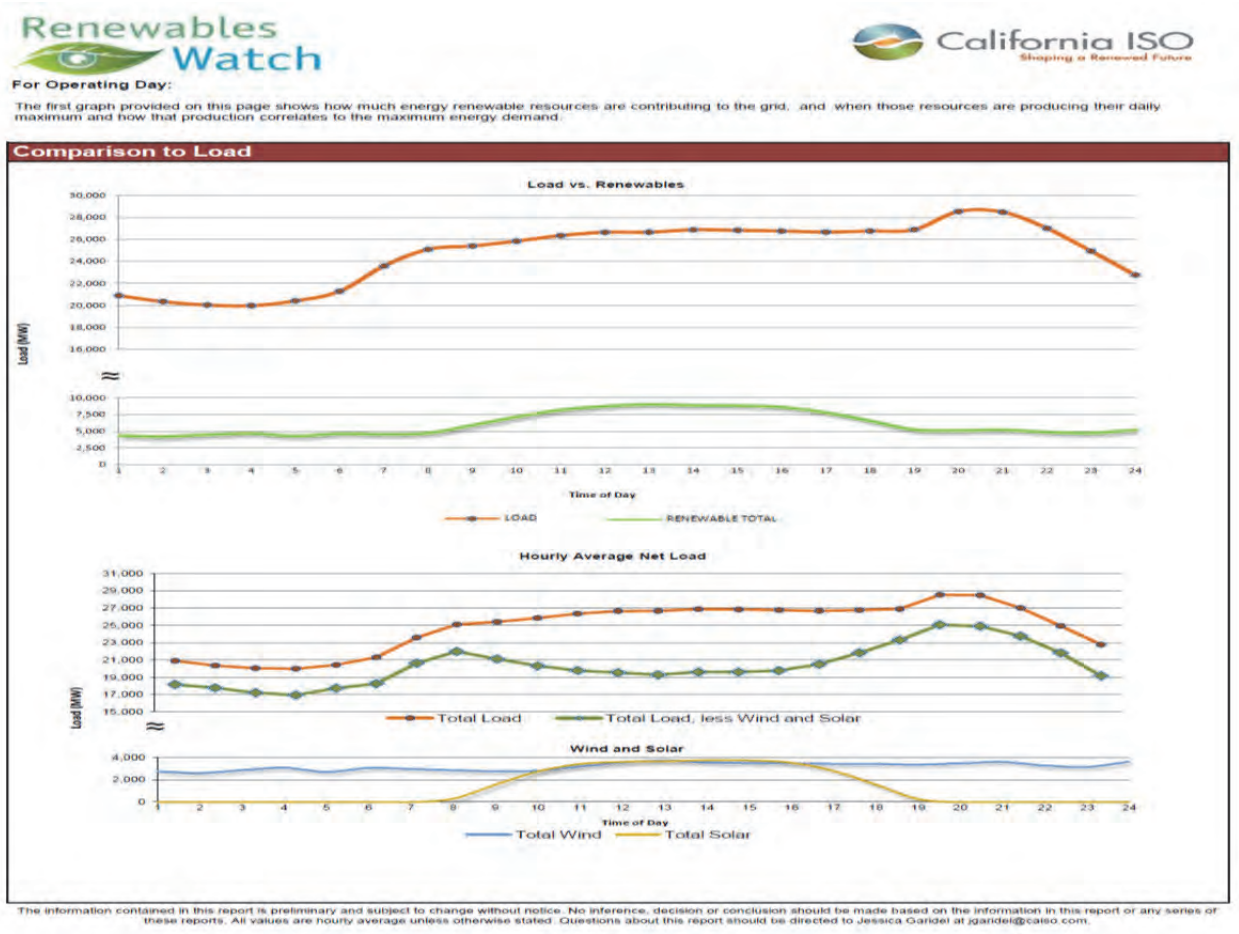
1) The net load, which is impacting the high cost hours on SDG&E's system, can be seen today in negative prices that are showing up in the spot market.[1] A driver of the negative pricing is

[1] Bloomberg New Energy Finance Newswatch, March 13, 2014 - Spot wholesale electricity turned negative in California as solar and wind generation topped forecasts, a signal to suppliers to reduce flow.
Wind turbines produced 1,830 megawatts during the hour ended at 11 a.m. local time, more than double the forecast, data show from the California Independent System Operator Inc., which manages the state grid. Solar output topped projections by 9 percent with 2,558 megawatts during the period. Spot power at Northern California's NP15 hub, which includes deliveries to San Francisco, averaged minus $27 during the hour ended at 11 a.m., down from $11.62 the same time yesterday, grid data compiled by Bloomberg showed.
Average on-peak prices at the hub are down 58 percent so far today at $16.26, heading for the lowest daily average since June 12, 2012. Southern California's SP15 hub, serving Los Angeles and San Diego, was minus $34.77, down from $11.50 from a day earlier. On-peak prices are down 64 percent at $14.42, the least since Dec. 24, 2012.

"Renewables have been wreaking havoc on prices for the past two weeks," said Chris DaCosta, a Boston-based analyst for Genscape Inc., which tracks real-time power data. "The combination of greater-than-expected generation from both wind and solar resources coupled with seasonably weak demand in March has consistently led to low real-time prices across the middle portion of the day when solar is strongest." Electricity consumption on the state grid was 26,275 megawatts at 11:50 a.m., slightly above the day-ahead outlook of 26,039 megawatts for

the penetration of renewable energy both in Investor-owned Utility (IOUs) portfolios and customer sited renewables such as roof top solar. Utility scale renewables are procured by IOUs and other Load Serving Entities to meet the Renewable Portfolio Standard (RPS) compliance obligations of 33% by 2020. With the passage of AB 327, the 33% RPS has been changed from a cap to a floor. AB 327 has also lifted the cap on customer owned renewables through Net Energy Metering (NEM).

With the "duck belly", shown below, that depicts the shifting net peak that is already emerging in California's energy market, and with no statutory restrictions on the level of renewable generation market penetration, the shift in peak periods needs to be reflected in TOU periods now so that customers have the opportunity to make economically efficient decisions as they increasing respond to TOU price signals in the future.



the hour, according to the California ISO's website. Spot prices can turn negative when there is excess supply on the grid, serving as sign to generators to cut back production.

2) SDG&E has proposed optional TOU rates starting in 2015 and default TOU rates in 2018 consistent with the Energy Division proposal.[2] Moving TOU periods now will allow customers to opt into optional TOU rates with the periods that will be in place in 2018 when customers will be defaulted to TOU rates, easing the customer transition to TOU rates and ensuring that customer response to TOU rates provides maximum system benefits when default TOU rates are implemented.

3) In order for customers to make economically efficient decisions when adopting new technologies such as distributed solar, Electric Vehicles, Demand Response automation, and electricity storage, customers need to be sent accurate price signals. Now is the time to introduce pricing that reflects the new high cost periods so that customers have the information necessary to assess the costs and benefits of new technologies such as LED lighting. To the extent customers make energy efficient investment decisions based on TOU periods that reflect utility costs, they could potentially result in the utility avoiding the need to build new infrastructure. This will also provide customers the information necessary to understand the potential future impact of the investment decisions they make today.

   In addition, the Commission will be developing rules for NEM 2.0 in 2015[3] which can be informed by SDG&E's new TOU period so that the rules are consistent with PUC Section 2827.1. The new rules for NEM 2.0 must "Ensure that the total benefits of the standard contract or tariff to all customers and the electrical system are approximately equal to the total costs."[4] Addressing SDG&E's TOU periods now will allow the costs and benefits to the electric system to be accurately assessed.

[2] Energy Division Whitepaper Section 4.4 Page 63 "Staff believes that cost-based opt-in TOU (un-tiered) is desirable during the 2015-2017 transition to default opt-out TOU rates"
[3] Per PUC Section 2827.1(b) "Notwithstanding any other law, the commission shall develop a standard contract or tariff, which may include net energy metering, for eligible customer-generators with a renewable electrical generation facility that is a customer of a large electrical corporation no later than December 31, 2015."
[4] PUC Section 2827.1(b)(4).

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28) (SPONSORED BY CHRIS YUNKER) What is the appropriate proceeding to address modifications to the TOU and CPP time periods and seasons in a coordinated fashion, and the optimal process and frequency of developing and approving subsequent changes? (including this proceeding.)

Response:

Given the utility specific issues associated with the determination of TOU periods, it is appropriate that TOU periods be determined in utility-specific rate design proceedings. SDG&E believes that TOU periods should be driven by utility-specific concerns including customer composition and behavior and the individual utility grid reliability requirements that drive infrastructure build requirements.

Customer composition includes not only the mix of traditional rate classes, but will increasingly be affected by consumer preferences and adoption of low carbon technologies. Adoption of distributed renewables, and the performance of the renewable technologies will be driven by the preferences of the customers in an IOUs territory as well as the weather in the utilities' territory. Electric vehicles are an emerging technology that can also create differences in future loads the IOUs serve, not only due to differing adoption rates for electric vehicles but also the geography of the IOUs territory, which can impact the charging behaviors of customers who have adopted electric vehicles. As customers adopt more low carbon technologies and new technologies are introduced, an IOU's customer composition and customer behavior will be a growing contributor to the distinct nature of an IOUs load.

The utility scale renewable resources developed in a utility's load planning area also impact the net load requirements. Net load is the load less must-take renewable resources. Net load resources will drive energy as well as local and flexible capacity costs.

While the timing and frequency are driven by utility specific concerns, SDG&E will strive to set TOU periods that will be effective for at least 5 years. CPP events can reasonably change more frequently than 5 years as they are event based pricing that is meant to capture a small number of peak hours in a year. As the penetration of both utility scale and customer sited renewable energy generation increase, the net peak hours will shift to later in the day. Being able to shift a shortened CPP window within the proposed TOU on-peak period will provide for a stronger price signal while effectively capturing the net peak hours in a shorter window. In that way, a shorter CPP period which shifts more frequently than five years will make it easier for customers to respond and provide more incentive for customers to respond in comparison to a longer seven hour period that covers both current and future peak hours.

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29) (SPONSORED BY CHRIS YUNKER) If TOU time periods and seasons should be addressed in this proceeding should they be part of Phase 1 and or a later subsequent phase of this proceeding? Please explain your answer.

Response:

TOU periods should be addressed in utility specific rate design proceedings given the utility specific concerns that drive TOU periods.

If the Commission were to move the TOU periods assessment to the Residential Rate OIR, contrary to SDG&E's recommendation, it would need to do so in a later phase so that a timely decision could be made on pressing residential rate issues such as tier reform and monthly service charges. This would unnecessarily delay the assessment of TOU periods, thereby diminishing the opportunity for customers to more effectively address the shifting load in SDG&E's service territory through the adoption of Distributed Energy Resources and emerging technologies that allow customers to manage their load.

The pressing need to adopt meaningful tier reform and implement monthly service fees to better align rates with a customer's cost of service is driven by rising pressure on upper tier customers who represent a cross section of SDG&E customers. As the cap on NEM has been lifted by AB 327 and if the trend of more affluent higher use customers adopting solar continues, lower income customers will represent an increasing percentage of remaining high tier customers. As such, resolution of tier reform and the adoption of monthly service fees are issues that need to be addressed this year so meaningful relief and a transition path to sustainable rates needs can be implemented beginning January 2015.

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30) (SPONSORED BY CHRIS YUNKER) Regardless of when and where TOU time periods and seasons are addressed please comment on the following potential list of issues and questions and add any additional issues or questions that should be addressed:

a) What factors, in addition to high marginal energy costs, should determine the selection of the peak hours for TOU rate design?

Response:

In addition to high marginal energy costs, capacity needs in local areas need to be considered. It is important to note that the local area capacity needs will be different for each IOU. When capacity will be needed during the day can differ based on the composition of load (C&I, residential, agriculture, etc.) and the composition of renewables and hydro in local areas and/or serving the local area.

The hourly profile of energy prices may also differ by local area (i.e. SDG&E DLAP prices may be different than PG&E's) due to transmission constraints and resources serving the area.[5] Similar to capacity considerations, the composition of renewables and hydro in local areas and/or the serving local area can influence energy prices just as they can influence capacity needs. TOU periods between IOUs have differed historically due to such differences. For example because of their hydro resources, PG&E has a Spring season that SDG&E and SCE do not have, the months included in the Summer season vary across the utilities, and the on-peak periods have varied.

b) What is the optimal length of peak pricing periods that will induce peak demand reduction and load shifting;

Response:

High cost hours are determined by grid conditions, which include the time of high marginal energy costs, and the time of local and flexible capacity needs based on service area and renewables in local area or serving the service areas. On-peak periods need to cover the high cost hours so that the prices customers see reflect cost causation (CPUC Rate Design Principle 3). Prices that reflect cost causation allow customers to make economically efficient decisions (CPUC Rate Design Principle 9).

[5] This aspect should be explored further; a brief examination of day-ahead and real time DLAP prices showed some consistency in the day ahead market, but large difference in the real time market.

Ratio of Real Time DLAP prices of SDG&E to PG&E over 3/3/14 to 3/14/14

1pm	2	3	4	5	6	7	8	9	10	11	12am
78%	82%	91%	103%	113%	156%	172%	186%	130%	99%	66%	57%

SDG&E has proposed optional and experimental rates to study customer response to alternative pricing periods to determine if one period or two shorter periods or both most effectively cover the high cost hours of providing electric service.

c) Would offering multiple TOU rate options (e.g., a choice of shorter or longer peak periods) increase the attractiveness of optional TOU rates?

Response:

SDG&E is proposing to study alternative TOU pricing options for residential customers. SDG&E has proposed an optional TOU rate that is available to all customers as well as an experimental TOU rate option that has customers on one of two shorter on-peak periods with higher on-peak to off-peak pricing differentials. Depending on the results of the experimental rate study and customer acceptance of the optional TOU rate SDG&E could potentially offer multiple TOU rate options.

d) Whether to have a single peak period reflecting the highest marginal energy costs in the day or two diurnal peaks (one peak reflecting the morning ramp and the other the late afternoon/evening ramp);

Response:

SDG&E is not contemplating two diurnal peaks at this time. The diurnal peaks will become pronounced in the winter first. In the future should the diurnal peaks capture a significant portion of the high cost hours SDG&E would review the need to incorporate a diurnal peak into the TOU structure.

e) Whether to include a super off-peak rate in general TOU rates to encourage off-peak EV charging or to encourage electric vehicle (EV) owners to switch to an EV-specific rate schedule;

Response:

SDG&E is including a super off-peak period in the optional and experimental TOU rates. SDG&E has seen a positive response from Electric vehicle customers in their ability to shift charging to the super off-peak period. SDG&E is extending this option to all customers so that customers who are capable of shifting load to the super off-peak period or can adopt storage technologies are sent a price signal which allows them to benefit from a behavior or technology which promotes a more efficient utilization of the existing infrastructure.

f) How steeply differentiated to make the peak to off-peak and semi-peak to off-peak ratios;

Response:

Ultimately on and off-peak ratios must reflect cost causation so that customers can make economically efficient decisions. Distorting peak to off-peak ratios from cost causation and marginal cost principles results in cost shifts between customers, which are increased when a technology is adopted based on that inaccurate price signal.

With the introduction of customer-side distributed energy resources, close attention needs to be focused on the ability of a technology to bypass a distorted price signal and the cost shift that ultimately results from the bypass of that distorted price. That is why prices, including on and off-peak TOU pricing differentials, need to reflect cost causation principles. If these on and off peak differentials are not sufficient to support the adoption of a low carbon technology that specifically supports a CA policy objective, a clear and transparent price signal can be provided. For example, an incentive which is sized based on the difference between accurate price signals that reflect cost causation principles and the market price of the technology could be adopted to support the state policy objectives of driving market growth in that technology. That way, customers who adopt these technologies can do so with greater certainty of the economic payback that will result from their investment and non-participating customers will pay the lowest cost necessary to achieve the state's policy objectives.

g) Whether TOU time periods and seasons should be consistent statewide for all IOUs for the purpose of coordinating outreach and education and customer awareness; and

Response:

As noted in SDG&E' response to a) above, TOU time periods are driven by utility specific issues such as local area capacity needs and renewables that are in and/or are serving a utility service territory. As such, adoption of arbitrarily uniform TOU periods across all IOUs would undermine California's ability to achieve the benefits that TOU rates can provide. On the other hand, TOU periods that are set on the basis of each utility's specific conditions and costs will allow customers to make economically efficient decisions that support sustainable adoption of low carbon technologies in a manner which protects non-participating customers from cost shifts and maximizes economic efficiency.

As noted in SDG&E's response f) above, the need for accurate prices that reflect cost causation principles are necessary to sustainably support the adoption of new technologies and protect non-participants from cost shifts.

Rates that create distorted price signals create economic incentives for customers to invest in technologies to bypass a distorted rate, minimizing economic efficiency and leading to a cost

shift that will ultimately need to be addressed. This creates uncertainty for adopters of low carbon technologies and non-participating customers alike.
California is seeing rapid adoption of low carbon technologies such as distributed solar, batteries and electric vehicles. Accurate price signals need to be put in place now to sustainably support these technologies as well as the low carbon technologies that are to follow.

h) How best to balance the need for technical precision around system needs with consumer comprehension and ability to take action.

Response:

Balancing technical precision and system needs with customer comprehension should be done by providing customers with options. For customers who prefer a simple rate that allows them to procure all services from the utility, as has historically been the case, pricing options can bundle services to a greater degree relative to customers who would prefer to self-provide a portion of their energy services. For customers who choose to adopt technologies to self-provide services, provide services to the grid and/or adopt technologies to more efficiently manage their energy use, more accurate pricing options should be available. In that way customers can choose the pricing structure that best suits their needs while balancing the technical precision that is required to support the sustainable adoption of low carbon technologies consistent with California state policies.

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Customer Communication, Outreach and Education, and Technology

31) (SPONSORED BY ALEX KIM) Provide a year-by-year roadmap for customer communication, outreach and education, and technology that addresses how you will prepare customers for the changes in the residential rate design over the 2015-2018 period and beyond.

Discuss how your roadmap addresses rate design principle #10 in this proceeding.

Specifically, describe how your plan addresses each of following groups:

- *Elderly and vulnerable customers including medical baseline and third party notification customers.*
- *CARE and other low-income customers.*
- *Customers from diverse cultural and linguistic communities.*
- *Other hard to reach customers*

Response:

The Communications, Outreach and Education, and Technology plan intends to build upon the foundation that the Smart Pricing Program established. This approach supports SDG&E's desire to view customers from a relationship perspective, rather than a transactional one; understand their needs and provide an integrated customer experience. The Smart Pricing Program Guiding Principles will support the development of this outreach and education plan. These Guiding Principles are outlined below:

Customer Centric

- Deliver Comprehensive service offerings that customers value

Simplify

- Make it easy to understand, easy to do

Listen

- Be collaborative, open and transparent

Engage

- Motivate in an innovative and effective way

Flexible

- Be willing to learn and adapt

By utilizing this approach for the rate reform roadmap, SDG&E will engage in and nurture an on-going dialogue with affected customers that will promote continuity throughout the customer's lifecycle. The attached year-by-year roadmap leads the customer through the progressive stages of customer engagement and seeks to specifically increase the level of understanding and acceptance of these rate proposals that will ultimately lead to default time-of-use rates in 2018. (The roadmap is attached at Appendix B.) Our vision is to seamlessly transition customers through this process by building on existing strategies as well as incorporating new approaches.

Aside from the target groups identified in the Smart Pricing Program plan, there are several additional sub-segments that SDG&E intends to engage with due to their specific needs. In order to provide the best customer experience possible for these sub-segments, SDG&E will leverage its knowledge and experience with these customers while utilizing the specialized knowledge of our community partners that work closely with these sub-segments. SDG&E has earned their trust as energy advisors through continuous engagement by way of outreach, which plays a pivotal role, and direct communication. This course of action will continue in order to ensure we're by their side throughout this process.

Segment Group	Plan of Action
Elderly/vulnerable customers	• Integrate with existing tactics • Leverage relationships with community based organizations including senior and special needs groups
Medical Baseline customers	• Integrate with existing tactics • Leverage appropriate community based organizations including hospitals and clinics
Third party notification customers	• Utilize direct contact to both the customer and the third party
CARE customers	• Integrate with existing tactics • Leverage relationships with Capitation Agencies, Door-to-Door contractors and community based organizations serving high-opportunity zip codes
Other low income/hard to reach	• Utilize existing segmentation data to reach out through direct contact • Leverage relationships with community based organizations including community centers and intake organizations
Customers in diverse cultural & linguistic	• Leverage relationships and outreach efforts

communities (including customers with Limited English Proficiency)	with community based organizations in high-opportunity multicultural zip codes

Elderly/vulnerable customers

Using our existing broad network of community based organizations (CBOs) that specifically service elderly and vulnerable customers; SDG&E will integrate messaging and leverage our current relationships with groups like Deaf Community Services (DCS), San Diego Center for the Blind and the County of San Diego's Aging and Independence Services (AIS). Working with DCS in the past, we have produced closed captioned videos and videos in American Sign Language. We will also leverage our work with the Cool Zones Program, specifically geared towards seniors and those most vulnerable. SDG&E will continue to partner with AIS and include education on rates as part of our comprehensive outreach plan. Special consideration needs to be focused on tailored treatments such as ensuring messaging and communications are in large print, Braille if necessary, and that videos are available in closed captioning or in American Sign Language. Research has also shown that traditional methods of communications are much more successful with this segment of customers. As such, direct mail, in person communications and community partner communications will be the dominant communication channels. As of March 2014, SDG&E has over 130 customers on the Temperature Sensitive program. We will send a direct mailing to these customers, ensuring they receive the information about rates and offer our dedicated staff to answer any questions. Additionally, outreach efforts will include hosting training and/or workshops with partner organizations, as well as staffing appropriate partner events.

Medical Baseline customers

Interactions with our Medical Baseline customers occur at specific points throughout the program. SDG&E will leverage opportunities to incorporate messaging at point of entry in the program, in the renewal phase, and any time when assistance is needed throughout their participation in the program. Informing new Medical Baseline customers about the new rate design will occur as part of our existing communications with this customer base. SDG&E currently has 28,000 customers enrolled in the program, of which 18,000 are Medical Baseline customers without the CARE discount. Communication with this customer segment about the new rate design can also happen through SDG&E's education partners, working with CBOs and networks like community clinics and hospitals as well as targeted efforts such as direct mailing. SDG&E's dedicated Medical Baseline staff will also be prepared to explain the changes throughout their interaction with customers by telephone.

Third Party notification customers

Customers who are sick, elderly or vulnerable to overlooking their utility bill can designate a third party to receive a copy of any late notice or service disconnection. SDG&E currently has approximately 130 customers enrolled in the Third Party notification program. Customers are enrolled in the program until their own voluntary withdrawal. Separate targeted mailings to both the customer and their designated third party will occur to ensure they are aware of the changes and how the changes may impact them.

CARE customers

The CARE population is SDG&E's largest sub-segment in this plan. SDG&E has the ability to guide this segment of customers during multiple stages of their journey throughout their participation in the CARE program. SDG&E's strategy will include a combination of integrating messaging with existing communication tactics and tapping into its broad network of partnerships with community based organizations.

- Targeted Communications – Research and customer feedback from 2013 indicates CARE customers prefer to get their information from us through direct mail. Also, SDG&E's Residential Segmentation Study indicates that this customer segment is especially receptive to offers such as spending alerts to help them manage their bills. Utilizing this targeted form of communication will help us reach these customers in the format they prefer with offers that will help them better understand their energy use. A direct mailing to approximately 300,000 CARE customers explaining the new rate design along with offers such as signing up for spending alerts, will help transition customers to the idea. CARE customers also indicate email is another channel preference to receive messages. Through our years of experience in communicating with this customer base, SDG&E now knows the best subject lines, messages and frequency that work best.
- Community Outreach – Working with partner organizations in high-opportunity zip codes, customized tactics including events, presentations, workshops, promotions and enrollment fairs will be utilized to engage customers on these new pricing plans. Organizations can include community clinics, food banks and social service agencies, multicultural centers and other nonprofit organizations.
- Social Media – Providing two way communications with CARE customers and engaging them in conversation about the rate structure.
- Gamification – Research indicates that this customer base relies on their cell phone as their main life line. Their cell phones act as their computer. This is the way they get their news, utilize social media, and retrieve email. Research also tells us that customers who rely on their cell phones are more likely to take part in activities such as playing the lottery or calling in to radio stations to win prizes. This research would then suggest that introducing a game-based platform may be effective to push information and messages out to these customers with the opportunity to win small prizes based on their performance in the game. Curriculum and calls to action would be focused on leading the customers towards enrolling in the time-of-use rates.

- Web – Enhancing the existing Customer Assistance landing pages with information specific to the new CARE rate structure will provide an additional information tool to educate customers. In addition, using the existing mailbox for CARE customers can be highlighted as a direct channel for customers to reach out with any questions or concerns, specific to the CARE customer.

Other low income/hard to reach

Currently, for program recruitment, SDG&E targets hard to reach and low income areas using estimated eligibility data. This data factors in criteria such as home ownership, median household income and other behavioral norms. SDG&E will use these channels to reach this segment with integrated offers including new rate information.

- Targeted communications- direct mail and email campaigns to these customers explaining the new structure.
- Community Outreach – using target zip codes and partnering with community-based organizations, outreach activities including presentations, workshops, promotions, enrollment fairs and community events will be utilized to engage customers in these new pricing plans. Organizations can include service clubs, community centers and schools.

Customers in diverse cultural & linguistic communities

SDG&E's existing network of CBO's plays a critical role in reaching out to the customer base that is not covered by other efforts. Over the years, SDG&E has nurtured and fostered relationships with key organizations in the community in order to strengthen ties in these communities. All of these relationships and communications channels will be leveraged to educate customers about the changes to rates.

- Community outreach – continuing our relationships with our partners in the community, including our current multi-lingual/multi-cultural partner, SDG&E will incorporate rate education in our comprehensive outreach plans with these community based organizations.

- Web – SDG&E's customer assistance landing pages are translated into 11 languages. Content can be developed and translated specific to rate changes and included in these pages. These pages will be referenced in various communications.

- Collateral – translating collateral and developing videos for the deaf or for customers with Limited English Proficiency with rate education information in multiple languages, including American Sign Language, for deployment in various community based organizations that service ethnically diverse customers.

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32) (SPONSORED BY ALEX KIM) What level of expenditure do you propose each year for customer communication, outreach and education, and technology? How are these expenditures broken out and what is the justification for the level of budget?

Response:

SDG&E is not requesting separate funding for its Customer Communication, Outreach and Education, and Technology activities at this time. Until the proceeding progresses much further and a more clear understanding of exactly which rate reform proposals might be adopted by the Commission, it is impossible to determine the exact details and extent of the customer communication/outreach plan. While SDG&E has already established the methods and channels it will use to communicate with customers, final details will be determined once the rate reform changes are better known, researched and tested in collaboration with partner input.
SDG&E suggests that the best way to capture the costs of the robust communication, outreach and education activities would be in a memorandum account. This type of account can also be used to identify existing sources of funding that will be used for communication activities, but will not necessarily require additional funding**.**

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33) (SPONSORED BY ALEX KIM) Explain how rate-related customer communication, outreach and education, and technology efforts will interface with similar efforts related to residential demand response and energy efficiency programs.

Response:

Beginning in 2014, there will be multiple campaigns in market that will be vying for our customers' attention. The potential for customer confusion is high as is the potential for all messages to be watered down and lost in the noise. Both of these result in creating customer distrust and customer inaction. To combat this situation, the communications, education and outreach efforts surrounding TOU transition should be integrated into the existing campaigns as much as possible. Leveraging the awareness and interest in energy topics created by the statewide Energy Upgrade California, SDG&E will build additional messaging in appropriate campaigns to provide an opportunity for customers to hear complementary messages, rather than confusing or conflicting messages. As mentioned in SDG&E's response to Question 31, the Smart Pricing Program plan will serve as a foundation for this additional effort. Bundling the new rate options with other services, programs and tools, helps communicate a holistic message and reinforces our relationship with our customers. In summary, all ongoing Integrated Demand Side Management (IDSM) efforts will continue and become even more critical as SDG&E communicates these changes.

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34) (SPONSORED BY ALEX KIM) How will your utility attract the maximum number of customers to opt-in to time variant rates prior to 2018? Describe your strategy and the methods you will use to target and segment outreach to customers that maximizes effectiveness of outreach efforts. During the transition period (2015-2017), would financial incentives either as rebates or rate discounts, be appropriate as a means to induce customers to experiment with TOU and CPP rates? Why or why not? During the transition period (2015-2017) should customer outreach and education about TOU and CPP rates, and possibly incentives to adopt them, be targeted based any or all of the following:

- *Geographic based on climate zones with greatest potential peak load to shed.*
- *Low-income and hard to reach customers.*
- *Geographic based on highest avoided Transmission and Distribution (T&D) cost areas.*
- *Other demographics that indicate greatest likelihood to reduce peak load.*

Response:

Geographic-based on climate zones:

- Community Outreach: Targeting the highest opportunity zip codes, SDG&E will educate and engage customers in new pricing plans through presentations, events, promotions, trainings and other tactics in collaboration with community partners. Incentives would be utilized in combination with pricing plans including bundling of current solutions offerings (programs, services and tools).

Low income and hard to reach:

- Targeted Marketing: SDG&E currently targets low income and hard to reach customers with estimated eligibility criteria, which is part of an annual compliance filing done on behalf of all the investor-owned utilities (IOUs). SDG&E will continue to use this accepted estimated eligibility criteria as it has already been adopted by all utilities in the state and approved by this Commission. In targeting low-income and hard to reach customers with program recruitment messaging, email channels proved to be successful in reaching this segment. Our email campaigns produced unique open rate as high as 32%, compared to national averages of 18.9%. SDG&E had an over 99% deliverability rate, meaning the email addresses used were valid and therefore reaching the customer. Our email campaigns are also designed to be mobile friendly as in 2013, 52% of our CARE program emails were first opened on a mobile device. The work SDG&E has done with this customer base, both in the past and now, has helped to shape our different approaches in reaching out to this segment. Using this targeting approach will also factor in our analysis on bill impacts. SDG&E will focus first on those that can benefit the most.
- Community Outreach: Targeting the highest opportunity zip codes, SDG&E will educate and engage customers in new pricing plans through presentations, events, promotions,

trainings and other tactics in collaboration with community partners. Incentives would be utilized in combination with pricing plans including bundling of current solutions offerings (programs, services and tools). Additionally, partnering with community-based organizations to conduct trainings and/or enrollment drives based on high-opportunity populations.

Geographic-based on highest avoided T&D:

- Community Outreach: Targeting the highest opportunity zip codes, SDG&E will educate and engage customers in new pricing plans through presentations, events, promotions, trainings and other tactics in collaboration with community partners. Incentives would be utilized in combination with pricing plans including bundling of current solutions offerings (programs, services and tools).

Other demographics

- Community Outreach: Targeting the highest opportunity zip codes, SDG&E will educate and engage customers in new pricing plans through presentations, events, promotions, trainings and other tactics in collaboration with community partners. Incentives would be utilized in combination with pricing plans including bundling of current solutions offerings (programs, services and tools).

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35) (SPONSORED BY ALEX KIM) Consistent with Sec. 745 (a)(5) describe how the utility shall provide each residential customer, not less than once per year, using a reasonable delivery method of the customer's choosing, a summary of available tariff options with a calculation of expected annual bill impacts under each available tariff. Describe whether this rate comparison is currently offered online, will continue to be offered online, and what if any, improvements you will make to enhance customers' understanding of their rate options in economic terms.

Response:

As a component of the SPP Marketing and Outreach, a personalized plan comparison report will be used to proactively communicate to customers that SDG&E has new pricing plan options. This report will forecast their estimated annual bill on each of the new pricing options based on their last 12 months of usage. With the launch of SPP rates, the personalized comparison will be available online, via My Account, customers can call into our Contact Center for information and those customers included in the SPP direct mail campaign will receive paper copies of their report. SDG&E is reviewing the potential to leverage the technology foundation built by the SPP project to include all residential customers and available tariff options. Additionally, SDG&E will utilize the customer feedback from the SPP offering to determine necessary improvements to both the report design and content that will allow for a better understanding of our rate offerings and the associated financial impacts.

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36) (SPONSORED BY LESLIE WILLOUGHBY) Given the evidence that enabling technologies such as communicating and programmable thermostats 9 increase customer load response when coupled with TOU and CPP rates, how would you propose to encourage adoption of such devices in conjunction with the roll-out of new TVP rates? Describe whether any of the following approaches are appropriate and reasonable as well as other methods you propose:

Response:

SDG&E is currently offering free programmable communicating thermostats (PCTs) to customers that have and use air conditioning as part of its Small Customer Technology Deployment program. The target population includes single family homes that are non-medical baseline, that are Reduce Your Use (RYU) eligible. Additionally, SDG&E publishes a list of tested and verified PCTs and In-Home-Displays (IHDs) on its Home Area Network (HAN) website:
http://www.sdge.com/residential/about-smart-meters/home-and-business-area-network.

Customers can select from several IHDs and two types of PCTs that will communicate with their smart meter. Some of the devices on the website have manufacturer rebates. SDG&E provides customers with the information needed to obtain the rebates if one is offered for that product. SDG&E plans to offer free PCTs when it rolls out its TOU and TOU plus rates to residential customers who have air conditioning and meet the eligibility requirements.

Describe whether any of the following approaches are appropriate and reasonable as well as other methods you propose:

- *Incentives for the adoption of enabling technology either as rebates or rate discounts.*

Response:

To the extent incentives are required to meet an explicit policy goal then a direct incentive is the appropriate means by which to achieve the policy goal. In that way the cost of the policy can be accounted for and allocated to customers on an equitable basis.

Current incentives for the adoption of enabling technologies are provided for RYU opt-in customers. Once a customer registers, they are able to receive a higher rebate amount for RYU events. RYU was introduced as a default transition rate/program. AB1X prevented SDG&E from defaulting its residential customers onto dynamic rates at the time it installed its smart meters. Now that the statutory limitations have been removed by AB 327 and SDG&E is permitted to propose default TOU in 2018 and offer CPP rates to its residential customers, SDG&E will not have to rely solely on the RYU rate option, and consequently asked for an incentive reduction in its RDW filing, filed on January 31, 2014.

- *Targeting of incentives for technology based any or all of the following:*
  - *Geographic based on climate zones with greatest potential peak load to shed.*
  - *Low-income and hard to reach customers.*
  - *Geographic based on highest avoided T&D cost areas.*
  - *Other demographics that indicate greatest likelihood to reduce peak load.*

Response:

Geographic based on climate zones with greatest potential peak load to shed. – Currently SDG&E is targeting customers who have and use their air-conditioners, and that effort is not limited to geographic areas or climate zones. SDG&E believes that customers with air-conditioning loads have the greatest potential to shed load during peak times, given that the devices that are being utilized are PCTs.

Low-income and hard to reach customers. – Similar to the response above, SDG&E is reaching out to customers who have and use their air-conditioners which includes low-income and hard to reach customer groups.

Geographic based on highest avoided T&D cost areas. – SDG&E is currently implementing its locational demand response pilot that targets high load circuits. In this effort SDG&E is marketing tailored messages to those customers and providing offers of PCTs for those customers qualify to receive them.

Other demographics that indicate greatest likelihood to reduce peak load. – SDG&E, together working with a consultant, has created a process that identifies customers that have a high likelihood of having air conditioners. Customers that are identified receive an offer for a free PCT, and SDG&E confirms the presence of air conditioning prior to the installation of the PCT. Technicians that install the PCTs inform customers about SDG&E's RYU program. The PCT installers are also provide literature that has information on how to sign up for RYU alerts and those customers will automatically be signed up for the higher credit amount, which will enable those customers to earn a higher rebate on RYU days. See: www.sdge.com/reduceuse

37) (SPONSORED BY LESLIE WILLOUGHBY) Do you propose any pilot programs to measure customer load reduction and the effectiveness of enabling technologies? If so what are some of the research questions and objectives of these pilot programs? What is your proposed timeline for implementing these pilot programs?

Response:

In 2014, SDG&E is providing PCTs to customers that have air conditioners. Those customers are and will be encouraged to sign up for RYU with the technology adder. As part of the load impact evaluation, SDG&E can identify those customers that have enabling technology and evaluate their load reduction along with customers registered for RYU alerts that do not have enabling technology.

The CPUC directed SDG&E to file budgets for its existing DR programs for 2015 and 2016. In that filing SDG&E asked to continue its residential PCT program. SDG&E will evaluate the effectiveness of its PCT program for 2014 and 2015. Those impact evaluations will be informative as to what the load impacts are and whether the PCT program is cost effective. That information will be utilized in 2016 when SDG&E plans to file its next DR application to become effective in 2017.

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38) (SPONSORED BY ALEX KIM) Should the Commission establish a parallel phase in this proceeding to address particular aspects of Customer Communication, Outreach and Education, and Technology that are best addressed outside of Phase 1? For example, should coordination of TOU rollout with demand response and energy efficiency outreach be considered in a separate phase? If yes, which topics would you propose get addressed in a parallel phase and what should be expected results of that phase?

Response:

SDG&E does not believe that a separate, parallel phase would be the most productive or effective way to address the Customer Communication, Outreach and Education, and Technology issues that are under consideration in this proceeding. Rather, SDG&E believes that addressing these issues at the same time and in the same phase as the consideration of the rate reform proposals themselves is the most effective way to proceed.

Customer communications are an important aspect of any changes to rates or rate structures. Any separation from the Commission's and parties' consideration of the rate reform proposals might cause an unnecessary disconnect between the outcome of the proposals and how the utilities should educate and communicate with customers.

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APPENDIX A: Prepared Direct Testimony of David T. Barker in Support of SDG&E's Rate Design Window Application (A.14-01-027)

BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA

Application of San Diego Gas & Electric Company (U 902 E) for Authority to Update Electric Rate Design Effective on January 1, 2015	Application 14-01-____ (Filed January 31, 2014)

Application 14-01-___
Exhibit No.: (SDG&E-___)

PREPARED DIRECT TESTIMONY OF

DAVID T. BARKER

CHAPTER 3

ON BEHALF OF SAN DIEGO GAS & ELECTRIC COMPANY

BEFORE THE PUBLIC UTILITIES COMMISSION

OF THE STATE OF CALIFORNIA

January 31, 2014

SDGE

#285030

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PREPARED DIRECT TESTIMONY OF

DAVID T. BARKER

(CHAPTER 3)

I. PURPOSE AND OVERVIEW

The purpose of my testimony is to support a proposed change in the time-of-use ("TOU") periods of San Diego Gas & Electric Company ("SDG&E"). This proposal reflects SDG&E's need to respond from an operational perspective to changes in peak demand caused by the large increase in solar generation expected to occur over the next few years in California as a whole and the expected increase in solar generation serving the SDG&E service territory in particular. In other words, the proposed changes to the TOU periods will help manage the shift to a low carbon future by recognizing that the period of high electricity prices will shift to later in the day.

The new TOU periods are designed to send more accurate price signals that will encourage less electricity use when electricity demand and prices are high, and encourage more electricity use when electricity demand and prices are low. For example, residential customers with TOU rates will be incented to shift discretionary activities such as laundry, dishwashing, and electric vehicle charging from early evening when electricity prices are expected to be the highest to other times of the day. It should be noted that SDG&E is not proposing a change in marginal costs from the level proposed in the 2012 General Rate Case ("GRC") Phase 2 proceeding. Rather, as explained in more detail below, SDG&E is proposing to only change the TOU periods, resulting in a new allocation of marginal energy costs ("MEC")[1] and marginal generation capacity costs ("MGCC").[2] In addition, SDG&E is proposing to align all current

[1] MEC are the added energy costs incurred to meet the projected growth in electricity consumption

[2] MGCC are the added generation costs incurred to meet the projected growth in peak electric demand. MGCC are also referred to as "capacity costs" throughout this testimony.

TOU rate schedules, so as to give all TOU customers a consistent price signal that reflects expected future electric grid needs in SDG&E's service area.

My testimony is organized as follows:

Section II. Current TOU Periods. SDG&E has a number of different TOU periods in different rate schedules that would be harmonized in this RDW. This section describes the affected rate schedules.

Section III. Expected Changes in the Near Future. The California Independent System Operator ("CAISO"), the California Energy Commission ("CEC"), and independent energy analysts suggest there will be large changes in the hourly profile of energy costs and capacity needs as a significant amount of distributed and central station solar photovoltaics are added to the electric system. These changes necessitate a redefinition of TOU periods (and load-modifying demand response availability periods) to provide appropriate demand side price signals that are necessary to move toward a low carbon future as efficiently as possible. The need for a change in TOU periods was discussed in SDG&E's last General Rate Case ("GRC") Phase 2, and has also been recognized by Southern California Edison Company ("SCE") and by the Energy Division ("ED") of the California Public Utilities Commission ("Commission").

Section IV. Allocation of Marginal Energy Costs to Hours. As significant distributed solar generation lowers demand for electricity in daylight hours and as central station solar produces increased low variable cost energy during daylight hours, the cost of electricity in various hours throughout the year are expected to change accordingly. This section describes the modeling to forecast the changed hourly profile of expected energy prices based on a production simulation model of the western United States and the resulting new hourly price profile.

Section V. Allocation of Marginal Generation Capacity Costs to Hours. As new distributed solar generation lowers the demand for local capacity in daylight hours and as new central station solar produces increased resource adequacy in daylight hours, the local San Diego needs for capacity in various hours throughout the day are expected to change. To a lesser extent, new solar will also impact the time at which there is likely a statewide need for capacity. This section describes the modeling to forecast the changed hourly expectations of the needs for capacity.

Section VI. Determination of New TOU Periods: Accurate price signals provide utility customers, or demand response providers who aggregate customer loads, with the proper incentives to make consumption/demand response decisions and result in improved economic efficiency. Hourly prices would provide the most accurate price signals, but are impractical to implement. TOU periods are a workable compromise between hourly-differentiated prices and flat rates. The objective in choosing TOU period definitions is to group together hours with similar marginal commodity costs, including both energy and capacity costs. Based on the data on hourly energy price profiles and periods of local and system capacity needs, a recommendation is made to shift the SDG&E on-peak TOU period for Summer to 2 p.m. - 9 p.m. on non-holiday weekdays and for Winter to 5 p.m. - 9 p.m. on non-holiday weekdays for all TOU rate schedules. In addition, a super off-peak TOU period is proposed for all rate schedules as 12 a.m. – 6 a.m. daily, with all other periods being semi-peak.

Section VII. Statement of Qualifications: This section presents my qualifications.

II. CURRENT TIME OF USE PERIODS

SDG&E has a number of rate schedules with different TOU periods as shown in Table DTB-1 below. These TOU periods vary because they were adopted at different times and for different customer groups, some which have not been changed for 30 years.

Table DTB-1. Current SDG&E TOU Rate Schedules

Standard TOU Period	SCHEDULES EV-TOU, EPEV-X, EPEV-Y, EPEV-Z
Summer (May 1 - October 31) On-Peak: 11 a.m. to 6 p.m. Weekdays Semi-Peak: 6 a.m. to 11 a.m. and 6 p.m. to 10 p.m. Weekdays Off-Peak: All Other Hours including Weekends & Holidays **Winter (November 1 - April 30)** On-Peak: 5 p.m. to 8 p.m. Weekdays Semi-Peak: 6 a.m. to 5 p.m. and 8 p.m. to 10 p.m. Weekdays Off-Peak: All Other Hours including Weekends & Holidays	**Summer (May 1 - October 31)** On-Peak: 12 p.m. to 8 p.m. Every Day Super Off-Peak: 12 a.m. to 5 a.m. Every Day Off-Peak: All Other Hours **Winter (November 1 - April 30)** On-Peak: 12 p.m. to 8 p.m. Every Day Super Off-Peak: 12 a.m. to 5 a.m. Every Day Off-Peak: All Other Hours
SCHEDULE DR-TOU	**SCHEDULE AS-TOD**
Summer (May 1 - October 31) On-Peak: 12 p.m. to 6 p.m. Weekdays Off-Peak: All Other Hours including Weekends & Holidays **Winter (November 1 - April 30)** On-Peak: 12 p.m. to 6 p.m. Weekdays Off-Peak: All Other Hours including Weekends & Holidays	**Summer (May 1 - October 31)** On-Peak: 11 a.m. to 6 p.m. Weekdays Off-Peak: All Other Hours including Weekends & Holidays **Winter (November 1 - April 30)** On-Peak: 5 p.m. to 8 p.m. Weekdays Off-Peak: All Other Hours including Weekends & Holidays
SCHEDULE DR-SES	**SCHEDULE EV-TOU-2**
Summer (May 1 - October 31) On-Peak: 11 a.m. to 6 p.m. Weekdays Semi-Peak: 6 a.m. to 11 a.m. and 6 p.m. to 10 p.m. Weekdays Off-Peak: All Other Hours including Weekends & Holidays **Winter (November 1 - April 30)** Semi-Peak: 6 a.m. to 6 p.m. Weekdays Off-Peak: All Other Hours including Weekends & Holidays	**Summer (May 1 - October 31)** On-Peak: 12 p.m. to 6 p.m. Every Day Super Off-Peak: 12 a.m. to 5 a.m. Every Day Off-Peak: All Other Hours **Winter (November 1 - April 30)** On-Peak: 12 p.m. to 6 p.m. Every Day Super Off-Peak: 12 a.m. to 5 a.m. Every Day Off-Peak: All Other Hours

SDG&E proposes to harmonize these rate schedules in this RDW proceeding by providing consistent on-peak, semi-peak and super off-peak time periods for all rate schedules with TOU periods for both summer and winter seasons.[3] All customers should have the same price signals as to when electricity is expensive and when it is less expensive to guide consumption and demand response decisions.

III. EXPECTED CHANGES IN NEAR FUTURE

Because of California's drive to a low carbon economy and an in-state preference for renewables, as shown below, renewable technologies including solar and wind energy will have much higher penetration in the near future and will have significant impacts on the California and San Diego electricity markets. These technologies, once in place, produce electricity as nature provides. Solar technologies produce electricity when the sun shines (concentrated in the middle of the day), and wind technologies produce when the wind blows (mostly in the middle of the night). While these are expensive technologies to build, once in place their variable costs are very low. As a result of the 33 percent Renewable Portfolio Standard ("RPS"), when these renewables produce energy it is accepted by the grid regardless of need or price; hence, they are labeled "must-take" resources.

As variable renewable energy displaces fossil energy, the hours grouped today as the most expensive for which to provide electricity are no longer be the right set of hours for purposes of consumer decision-making about electricity use. I provided a preliminary

[3] These rate schedules reflect the seasons adopted in the SDG&E 2012 GRC Phase 2 Application, D. 14-01-002.

assessment of the coming required changes to TOU periods in my 2012 GRC Phase 2 testimony, originally filed in 2012.[4]

SDG&E is not alone in recognizing the significant changes on the horizon. In the 2013 Integrated Energy Policy Report ("IEPR") proceeding at the CEC, a workshop was held to begin to think about the long-term implications of expanded renewables on the electricity market in California. Table DTB-2, taken from a presentation at the CEC workshop, shows the large increase expected in renewables by the CAISO over the next 10 years, with over 70 percent being in-state variable renewable generation (wind and solar). [5]

Table DTB-2. Significant Increase in In-state Wind and Solar

Projected RPS Additions
2013 - 2022

Technology	Projected Annual Energy (GWh)			Nameplate Capacity (MW)
	In-State	Out-of-State	Total	
Solar	18,843	1,633	20,476	9,115
Wind	4,481	1,496	5,977	2,149
Geothermal	3,766	1,200	4,965	688
Biofuels	1,377	0	1,377	193
Small Hydro	0	0	0	0
Total	28,468	4,328	32,796	12,144

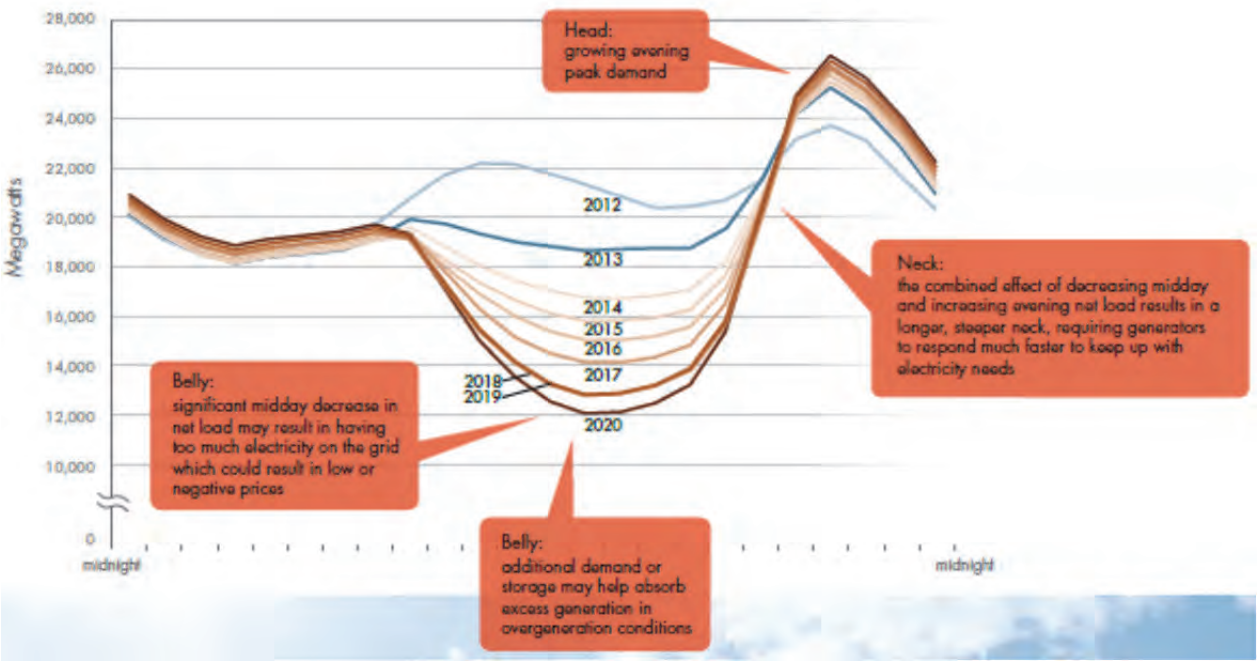
Source: California ISO

[4] See Attachment A of the Revised Prepared Direct Testimony of David T. Barker in the GRC Phase 2 Application, A.11-10-002, filed February 2012.

[5] Dave Vidaver, Electricity Analysis Office, Electricity Supply Assessment Division, "Evaluating Electricity System Needs in 2030," IEPR Lead Commissioner Workshop on Evaluation of Electricity System Needs in 2030, Sacramento, CA, August 19, 2013, based on data provided by the CAISO.

Charts DTB-1 and DTB-2 below show expected impact on typical electricity loads net of solar and wind energy in the winter and summer seasons. Chart DTB-1 below is the CAISO's "duck graph" from the CAISO document, "Building a Sustainable Future, 2014-2016 Strategic Plan."[6] As shown in the graph, net demand will become lower mid-day. Price signals to increase usage midday and reduce evening demand will reduce the required flexible generation resources to keep up with the ramp-up in electricity needs.

Chart DTB-1. Spring Loads Net of Wind and Solar

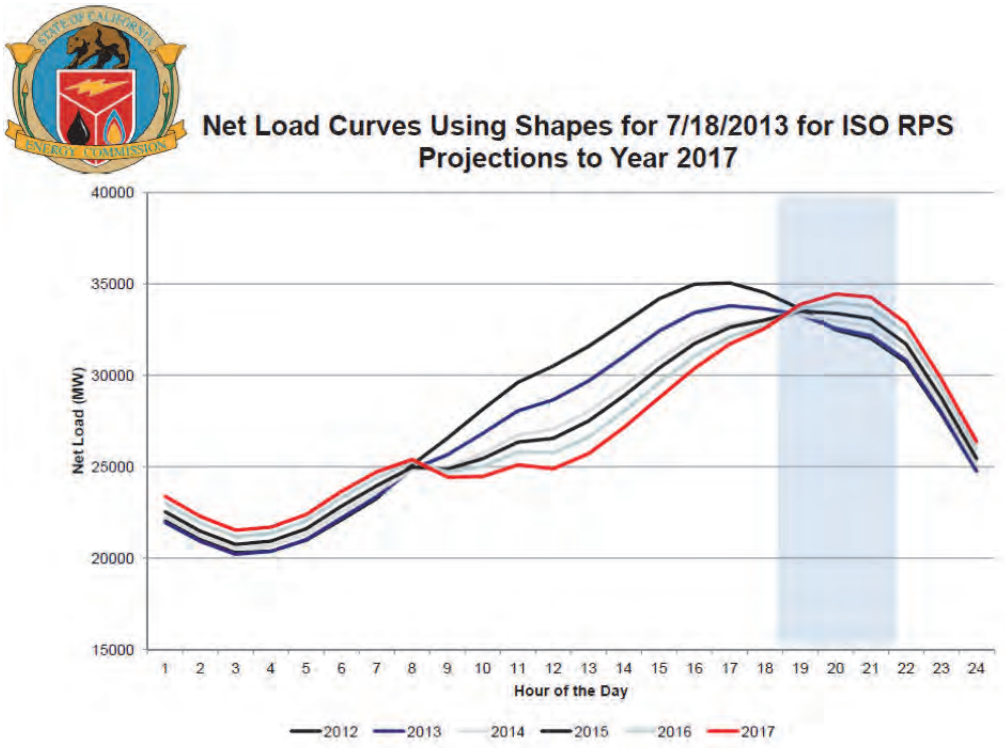


By 2017, the impact of solar on the net load shape will be substantial, requiring significant ramping resources in the afternoon to meet peak net demands in the early evening in winter and spring. TOU periods to encourage reduction in customer demand in the evening hours and increase customer energy use midday can reduce the severity of the need for ramping resources.

[6] CAISO, "Building a Sustainable Future, 2014-2016 Strategic Plan," page 9.

Chart DTB-2 below shows that by 2017, current TOU periods, with incentives to shift loads from summer afternoons (11 am- 6 pm) to early evening hours (6 pm – 9 pm), will no longer provide the right price signal statewide, but will exacerbate the peak load net of renewables. Adjustment of the TOU periods to encourage more customer electricity use in the midday hours (11 am – 2 pm) when solar is producing at its maximum and to encourage less customer use in evening hours (6 pm – 9 pm), highlighted in Chart DTB-2) will provide the right signal.[7]

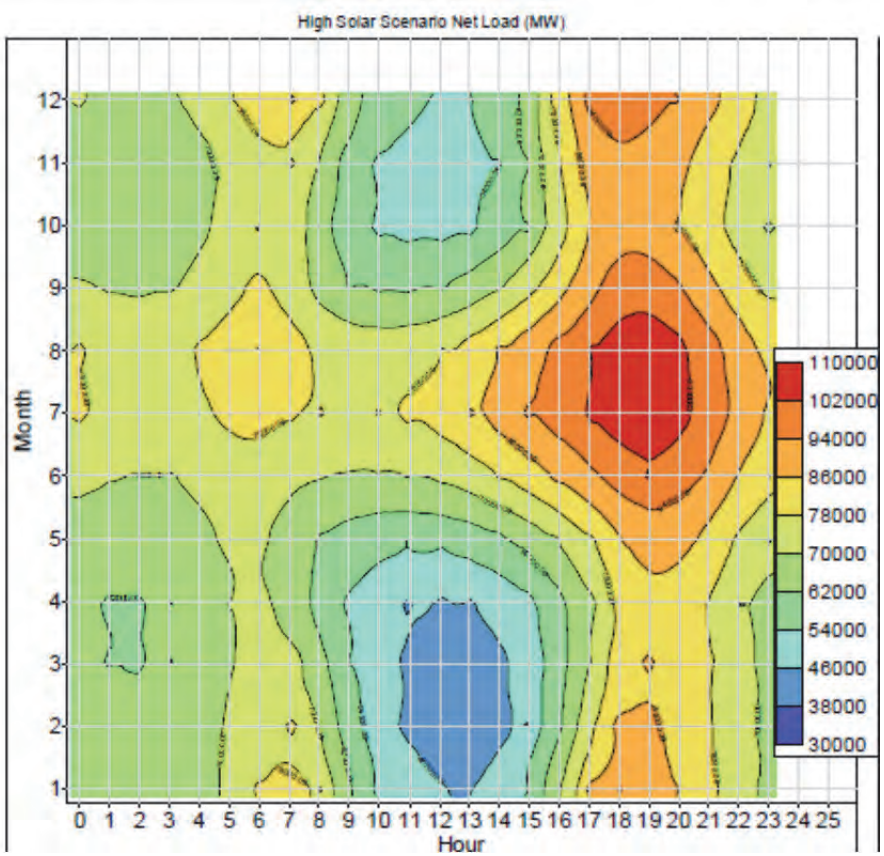
Chart DTB-2. Summer Loads Net of Wind and Solar



[7] Dave Vidaver, Electricity Analysis Office, Electricity Supply Assessment Division, "Evaluating Electricity System Needs in 2030," IEPR Lead Commissioner Workshop on Evaluation of Electricity System Needs in 2030, Sacramento, CA, August 19, 2013. This need to shift demand from early evening hours was also highlighted in the presentation by Craig Lewis, Executive Director of Clean Coalition, "Distributed Generation + Intelligent Grid Optimizing Value for Ratepayers," August 22, 2013 IEPR workshop, slide 16.

Data developed by the National Renewable Energy Lab ("NREL") similarly points to a changing shape of electricity load net of renewable resources.[8] The Western Wind and Solar Integration Study Phase 2 shows graphically that significant solar generation in the West can lead to significant changes in expected load net of renewable resources. In particular, the study provides a "contour map" that color codes net demand by month and hour that is reproduced in Chart DTB-3 below. The highest load net of renewable resources in the high solar penetration case is in the early evening hours between 5 pm and 9 pm in the Summer as represented by the red area. The contour map also shows ramping needs would be the largest in Winter and Spring– where contour lines are narrowest – and occur between midday and the early evening hours.

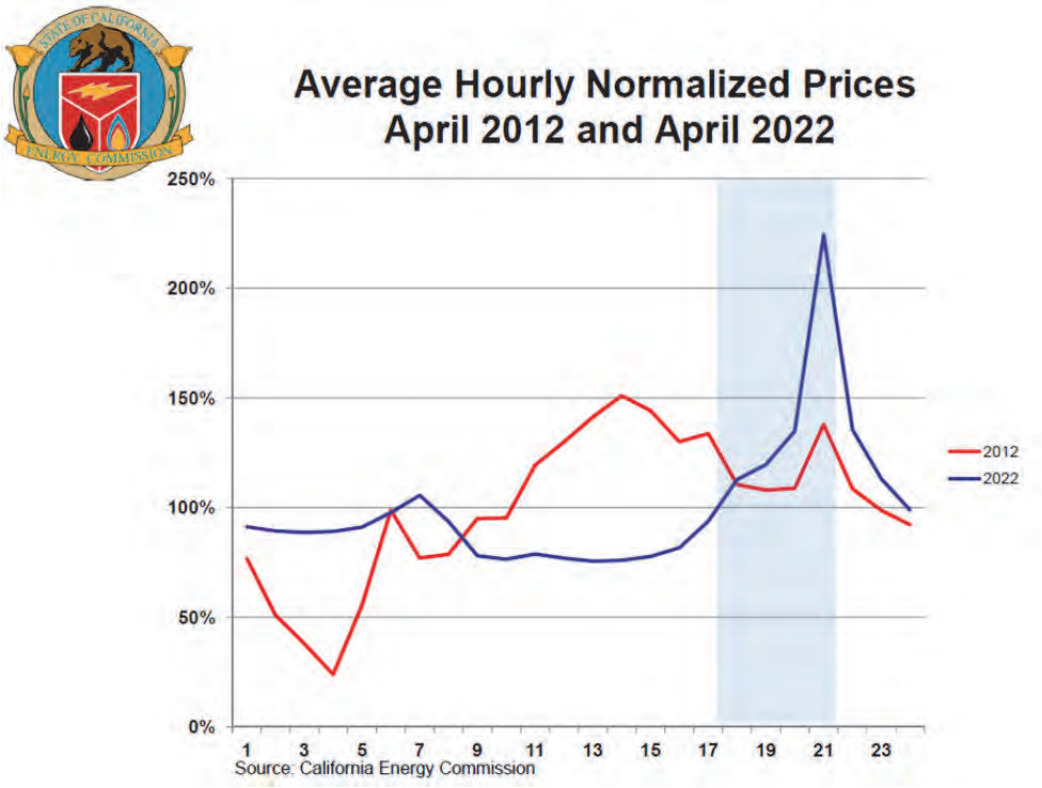
Chart DTB-3. Hourly Net Load by Month with High Solar Penetration



[8] D. Lew, G. Brinkman, E. Ibanez, A. Florita, M. Heaney, B.-M. Hodge, M. Hummon, and G. Stark, *The Western Wind and Solar Integration Study Phase 2*, Technical Report NREL/TP-5500-55588, September 2013.

The addition of must-take solar energy is also expected to impact electricity prices as shown in Chart DTB-4 below. Marginal electricity costs will become lower midday and will become consistently higher in the early evening hours as shown in the snapshot of Chart DTB-4.[9]

Chart DTB-4. Change in Electricity Price Shape



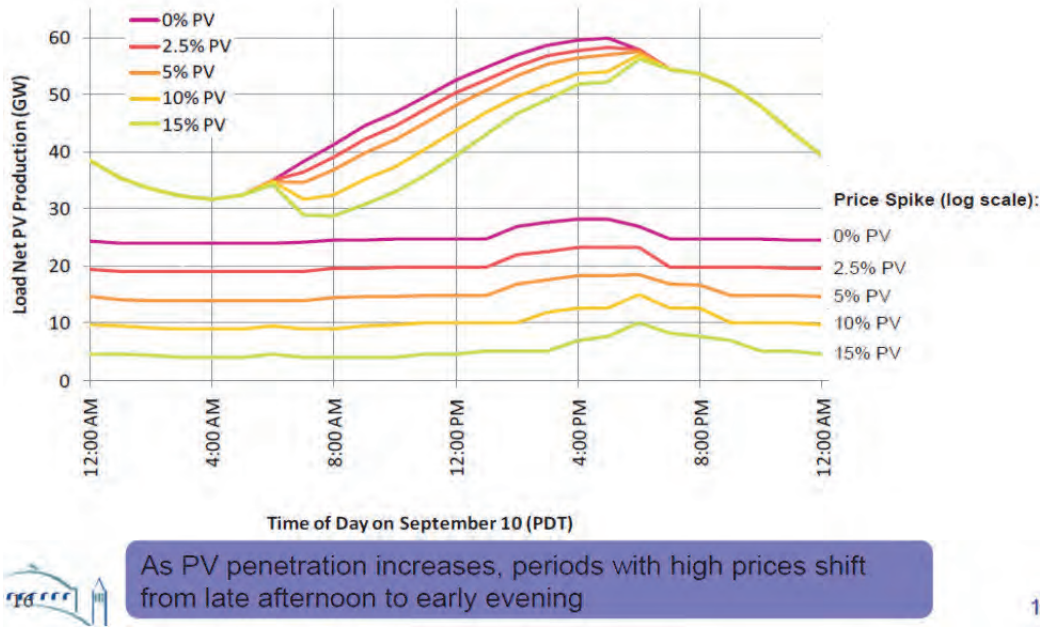
Numerous studies have documented the impact of solar on the changing the needs for capacity, though most do not indicate how the peak net of variable renewable generation changes.[10] But as Andrew Mills and Ryan Wiser explain in their recent study, "At high

[9] Dave Vidaver, Electricity Analysis Office, Electricity Supply Assessment Division, "Evaluating Electricity System Needs in 2030," IEPR Lead Commissioner Workshop on Evaluation of Electricity System Needs in 2030, Sacramento, CA, August 19, 2013.

[10] Most document the declining capacity value of solar as solar penetration increases without explicitly saying this occurs because the peak net of solar shifts to evening hours. See Andrew Mills and Ryan Wiser, "An Evaluation of Solar Valuation Methods Used in Utility Planning and Procurement Processes," Ernest Orlando Lawrence Berkeley National Laboratory, Berkeley CA, December 2012, page 24, figure 8.

penetration, the capacity credit of PV [photovoltaics] and CSP0 [concentrating solar power without storage] drop by a considerable amount …. because with high PV and CSP0 penetration **the net load peaks during early evening hours, and no increase in PV or CSP0 capacity can help meet demand during that time**."[11][Emphasis added] Mills shows this graphically in Chart DTB-5 below, a graph similar to Chart DTB-2, except here the adjusting factor is explicitly the amount of solar production.[12] As the net load peak shifts to after 6 p.m., added amounts of solar have a relatively small impact on net load peak reduction. Thus, the hours with expected highest electricity prices and the largest need for new capacity are expected to occur later in the day and new TOU periods (and associated load-modifying demand response periods) are needed to address this new high net load period that cannot be met with added solar generation.

Chart DTB-5. Peak Load Net of Solar in Summer

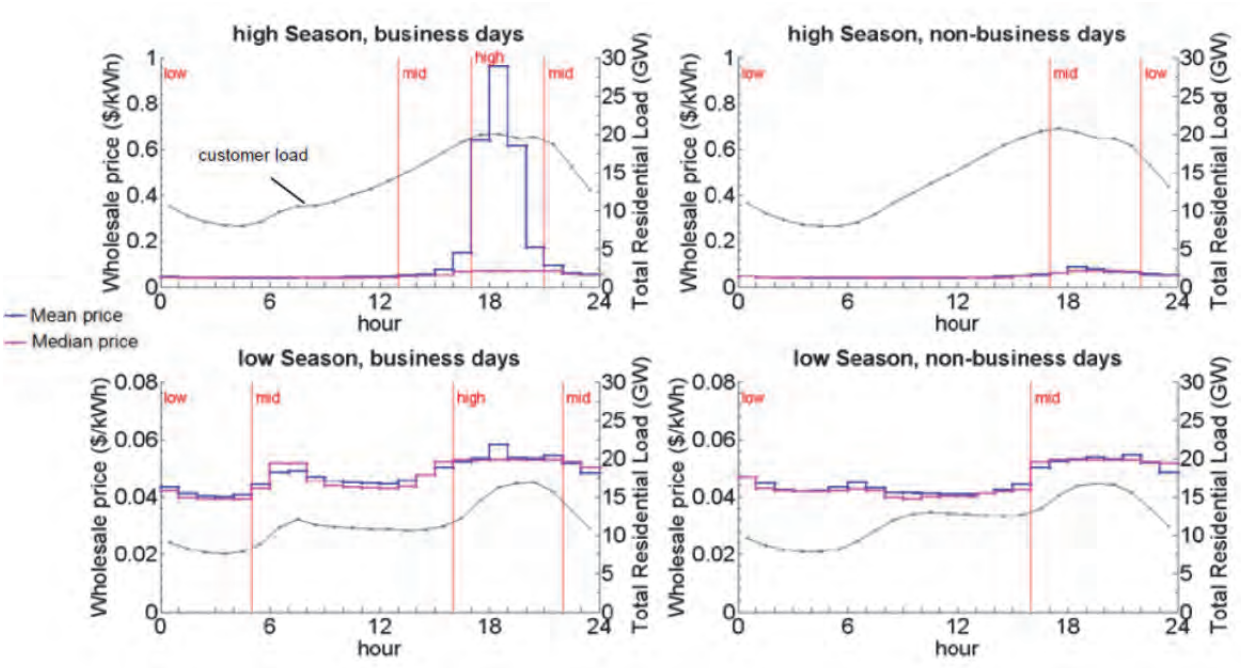


[11] Andrew Mills and Ryan Wiser, "Changes in the Economic Value of Variable Generation at High Penetration Levels: A Pilot Case Study of California," Ernest Orlando Lawrence Berkeley National Laboratory, Berkeley CA, May 2012, page 43.

[12] Andrew Mills, "Assessment of the Economic Value of Photovoltaic Power at High Penetration Levels," Lawrence Berkeley National Laboratory, UWIG Solar Integration Workshop, October 11, 2011, slide 16.

In another study by the Ernest Orlando Lawrence Berkeley National Laboratory, researchers developed a forecast of electricity prices in California with 33 percent renewables. High electricity prices no longer occur in the afternoon hours, but, instead, occur in the early evening hours during the Summer.[13] The data summarized in Chart DTB-6 shows the increased coincidence of residential customer load and the new hours of high energy prices during summer days. Thus it is important to provide price signals and load-modifying demand response to engage this customer class, in particular, in providing load reductions to impact the new period of high electricity prices.

DTB-6. Electricity Prices with 33% Renewables



The purpose of presenting these studies is to show that California is expecting a change in circumstances in the not too distant future as a high penetration of variable renewable generation, both distributed and central station, occurs. Both the energy price profiles and

[13] Naïm Darghouth, Galen Barbose, and Ryan Wiser, "Electricity Bill Savings from Residential Photovoltaic Systems: Sensitivities to Changes in Future Electricity Market Conditions," Ernest Orlando Lawrence Berkeley National Laboratory, Berkeley CA, January 2013, figure 12, page 42.

periods of need for capacity change and shift to later in the day as the penetration of solar energy increases.

Recently, the Energy Division of the CPUC released a report, "Staff Proposal for Residential Rate Reform in Compliance with R.12-06-013 and Assembly Bill 327," that acknowledges TOU periods need to change.[14] The report states,

> Most parties recognize that TOU time periods and seasons will likely need to change in the future to reflect changes in customer load shapes, shifts in system peak and utility marginal costs, the value of generation on the grid at different hours of the day as well as '…the changing nature of how customers will demand power from, and increasingly will supply power to the grid."[15]

The Energy Division Staff then makes the following recommendation for TOU time periods:

> …staff believes that TOU time periods and rate design need to be carefully developed in the context of GRCs, or comparable rate setting proceedings. Between now and the time of default to TOU rates in 2018, the Commission should assess the appropriate TOU time periods and seasons that best reflect marginal costs and advance the OIR rate design principles. AB 327 directs the Commission to strive to adopt time periods for TOU rates that are appropriate for five years.[16]

SCE, in recognizing the directives of the legislature and the Commission, recently filed a new set of TOU hours for proposed residential rate schedule TOU-D. SCE establishes an on-peak period to 2 pm - 8 pm weekdays throughout the year. SCE's on-peak period includes hours later in the day "because the latter part of the newly proposed on-peak window better aligns with SCE's future system-wide generation peak (because of the 33 percent RPS requirement), and also aligns with SCE's current residential peak usage."[17] SCE states "it is prudent to begin now

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[14] Energy Division, "Staff Proposal for Residential Rate Reform in Compliance with R.12-06-013 and Assembly Bill 327," January 3, 2014.
[15] Id., at 60-61.
[16] Id. At 62-63.
[17] SCE, "Prepared Testimony in Support of SCE's 2013 Rate Design Window Application," filed December 24, 2013, at 20.

(with several years of lead time) on TOU rates that designate the appropriate on-peak window to which customers can begin becoming accustomed."

The SDG&E proposed TOU period hours move toward a TOU period structure consistent with the ED's proposed criteria that it consider marginal costs, encourage conservation and energy efficiency, consider coincident and non-coincident peak, and be stable and understandable.

IV. ALLOCATION OF MARGINAL ENERGY COSTS TO HOURS

The objective in choosing TOU period definitions is to group together hours with similar marginal commodity costs, including both energy and capacity. In competitive electricity markets, prices are determined by supply and demand conditions. Demand is based on customer electricity usage and offset in part by customer generation, primarily from rooftop solar. Supply is also partly outside the control of the CAISO. Variable renewable generation such as solar and wind are must-take since they produce as nature supplies. Hydro facilities can be dispatchable, but may have requirements to run for the environmental health of the natural water (lake or river) system. Some fossil resources are contractually must-take, such as combined heat-and-power facilities that operate primarily to provide heat for the facilities' thermal needs. Other fossil resources are "must-run," operating in order to provide grid stability, providing regulation down, inertia, and spinning reserves to accommodate load variations and the intermittency of renewable generation. Finally, there are dispatchable fossil resources that bid into the CAISO's markets to meet the variable consumer demands for electricity in excess of the must-run and must-take supply resources.

With added wind energy production at night, supply increases relative to demand and the electricity price is forecast to fall relative to the average price. With added distributed solar,

customer demands for electricity are reduced in the middle of the day when solar production is at a maximum. With added central station solar generation, supply increases at midday relative to demand. This combination moderates electricity market prices in those hours, all other things being equal.[18] The allocation of marginal energy costs to hours will thus be affected by these expected changes in the level of intermittent renewable generation.

To assess the impact on the allocation of marginal energy costs to hours, SDG&E used a production cost model of the entire Western Electric Coordinating Council ("WECC") area. The energy market is for the most part determined by loads and generation throughout the WECC, though there can be locational differences based on local loads and transmission constraints. The analysis of the electricity price is based on the operation of power plants using Ventyx's Market Analytics production cost model. The model evaluates in detail the least cost dispatch of the electricity supply to meet system demand on an hourly basis taking into account must-take generation. It considers a complex set of operating constraints on power plants and on the transmission system to mimic "real world" power system hourly operation. The model minimizes system production cost, enforcing constraints on generation and transmission operations. A transmission area may import inexpensive power from neighboring transmission areas or export power to replace a neighboring transmission area's expensive power, subject to the limits imposed by available transmission capacity.

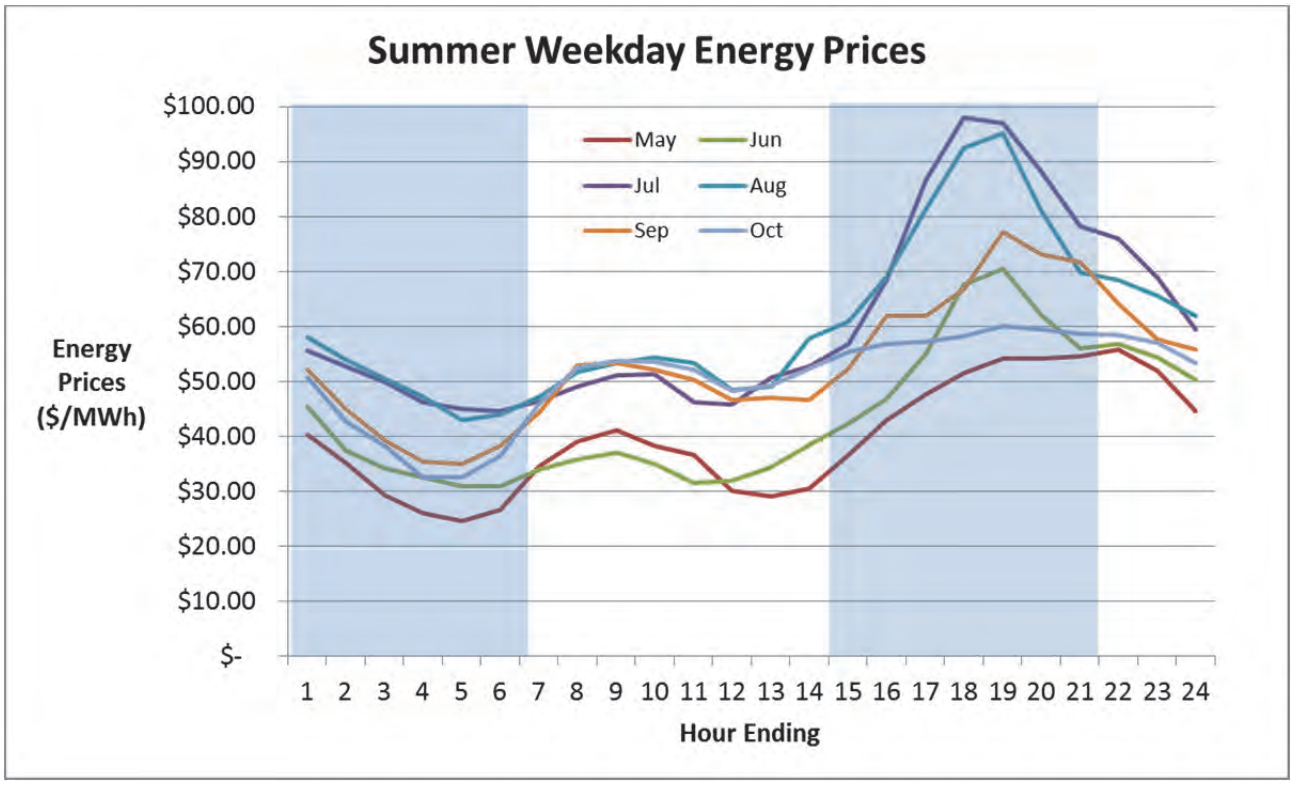
The primary data inputs to the production cost model for outside California are from Ventyx data on electric demand forecasts and generation resources. Ventyx develops these forecasts by collecting data from various sources, including demand forecasts filed by utilities before the FERC. For California, the modeling is based on the Mid-Case scenario from CEC's

[18] The effect is called the "merit-order effect" and has been documented in Germany. See for example Tveten, Asa Grytli, et al. "Solar feed-in tariffs and the merit order effect: A study of the German electricity market," *Energy Policy*, Volume 61, October 2013, 761–770.

Revised California Energy Demand Forecast 2012-2022, dated February 2012. Since the CEC forecast did not include any uncommitted energy efficiency starting in the year 2013, the forecast was reduced for the projected incremental uncommitted electric savings from the Mid Savings Scenario included in the CEC Preliminary Demand Forecast.

The production cost model results for 2017 were used to assess the grouping of hours to provide a price signal appropriate to California's long-term low carbon future. The production cost model output prices were adjusted to match the average annual price and the spread of prices as used in the 2012 GRC Phase 2 so as to not change marginal energy costs, but reallocate those costs to new hours. The resulting SDG&E DLAP hourly prices for on-peak days in Summer are shown in Chart DTB-7 and for Winter in Chart DTB-8.[19]

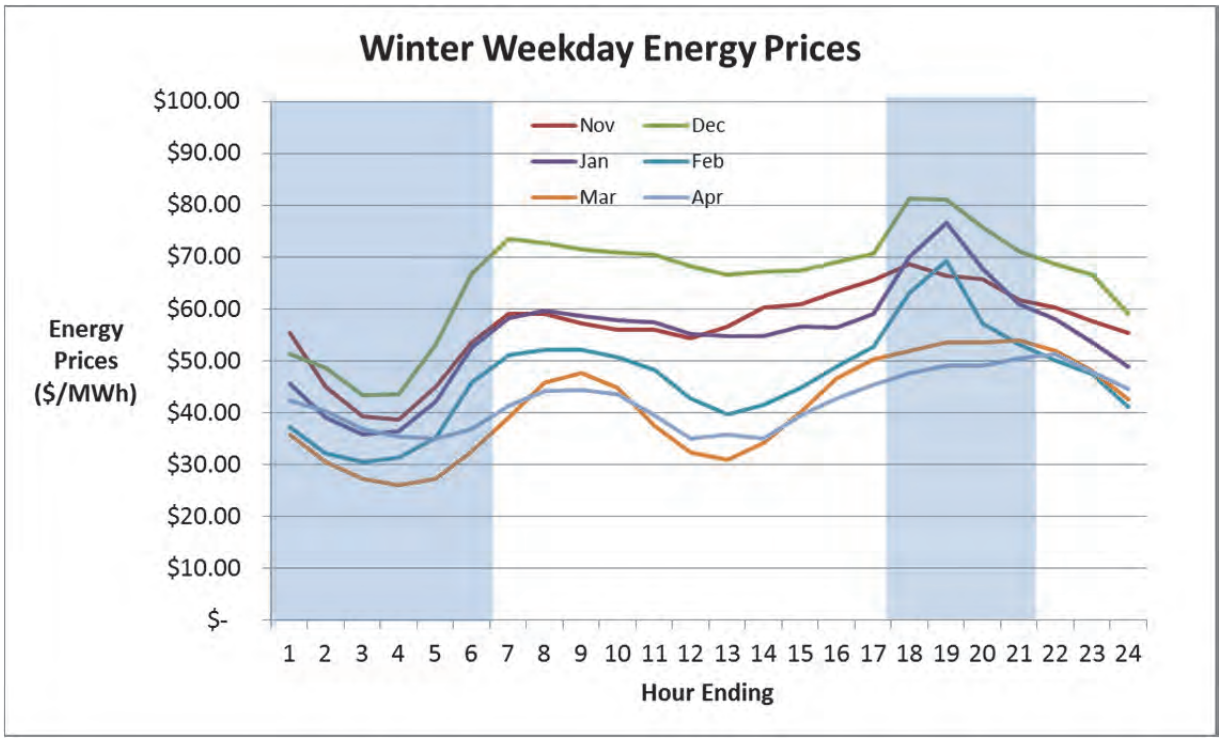
Chart DTB-7. Summer Electricity Prices with 2017 Hourly Allocators



[19] All hours shown are for "clock time." Pacific Standard time is used for months where applicable and Pacific Daylight time is used where applicable (3/12/2017- 11/5/2017).

The shaded areas represent the proposed new TOU periods. As can be clearly seen in the graph, elimination of the hours 11 am – 2 pm (hours ending 12-14) from on-peak and adding 6 pm – 9 pm (hours ending 19-21) in the Summer are both consistent with marginal electricity prices. It is further noted that including May and to a lesser extent June in the Summer period dampens the TOU energy price signal for the Summer period.

Chart DTB-8. Winter Electricity Prices with 2017 Hourly Allocators



There is significant diversity across months, but the proposed TOU periods capture the difference in prices throughout the day with the exception of midday in February, March and April, where the "duck belly" effect of the load net of solar declining, significantly impacting expected electricity prices.

The proposed TOU periods would capture the hours with the highest electricity prices even before the significant shift due to added solar energy in 2014-2017. The charts below show the SDG&E average DLAP prices by month for 2013 summer and winter. Even before the added renewables, the proposed periods capture the highest electricity prices.

Chart DTB-9. 2013 Summer SDG&E DLAP Electricity Prices

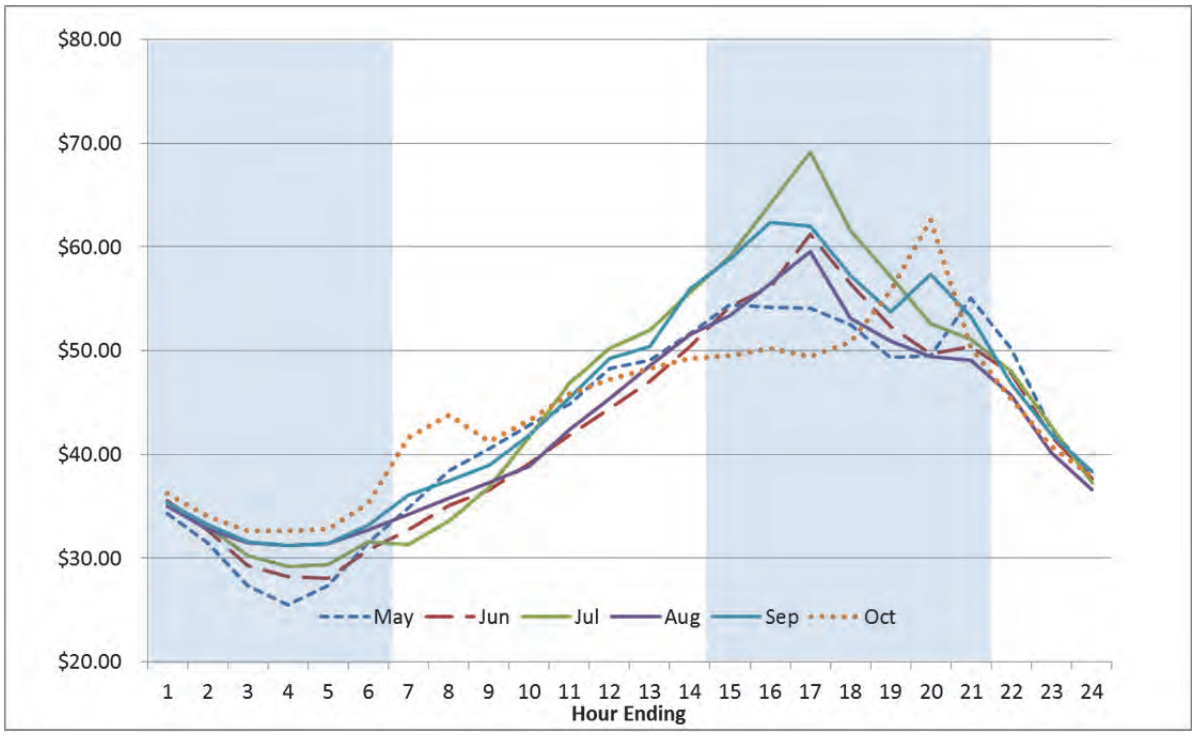
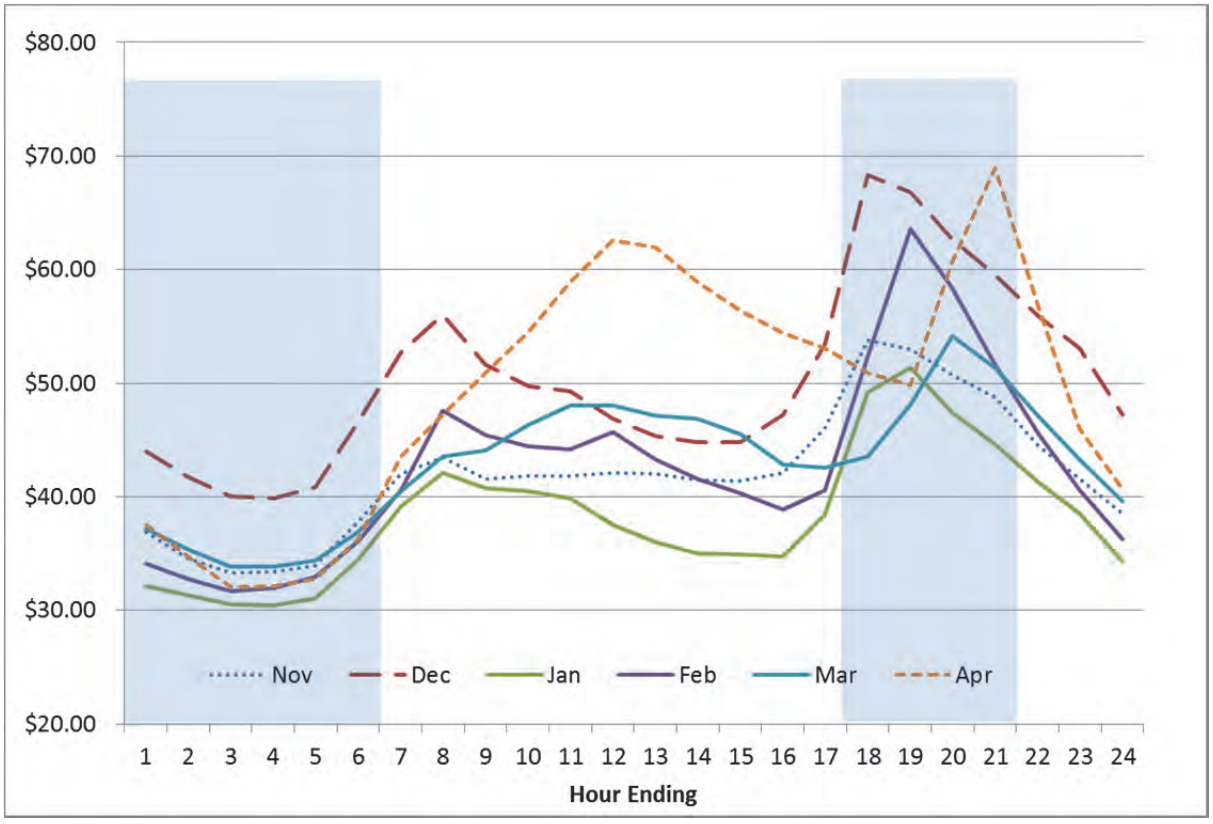


Chart DTB-10. 2013 Winter SDG&E DLAP Electricity Prices



V. ALLOCATION OF MARGINAL GENERATION CAPACITY COSTS TO HOURS

As stated previously, the objective in choosing TOU period definitions is to group together hours with similar marginal commodity costs, including both energy and capacity. The capacity component reflects the incremental cost of acquiring sufficient generating resource capacity to have on hand to meet customer demands during high net load conditions (customer load net of distributed and central station variable renewables), taking into consideration the uncertainty associated with customer demands and variable renewable generation. The TOU periods (and load modifying demand response periods) should be established to provide the right price signals; to reduce demand in periods of high net load (whether by price response, demand response programs or energy efficiency), and increase demand in periods of low net load.

To identify the periods of high net load and the likelihood of needing additional resources, SDG&E undertook two distinct methods. The first method is the same as presented in the 2012 GRC Phase 2, an investigation of net loads to see which hours are expected to experience the highest net loads. A second approach is Loss of Load Expectation ("LOLE") analysis; this type of analysis provides the expectation of the hours with the highest need for new resources given the variable nature of customer demands due to weather and the variable nature of solar and wind energy production. The net load analysis is deterministic and simple, while the LOLE analysis is stochastic and complicated.

A. NET LOAD ANALYSIS

The use of customer load net of distributed generation and central station renewables provides an indirect measure of when local capacity is likely to be needed. The basis of the analysis is SDG&E forecasted 2017 load data net of distributed solar. SDG&E forecasted system usage takes into account economic growth, energy efficiency, and expected expansion of

distributed solar generation. The average usage on Summer weekdays is shown in Chart DTB-11, while Winter is shown in Chart DTB-12.

Chart DTB-11. 2017 Summer Load Net of Distributed Solar

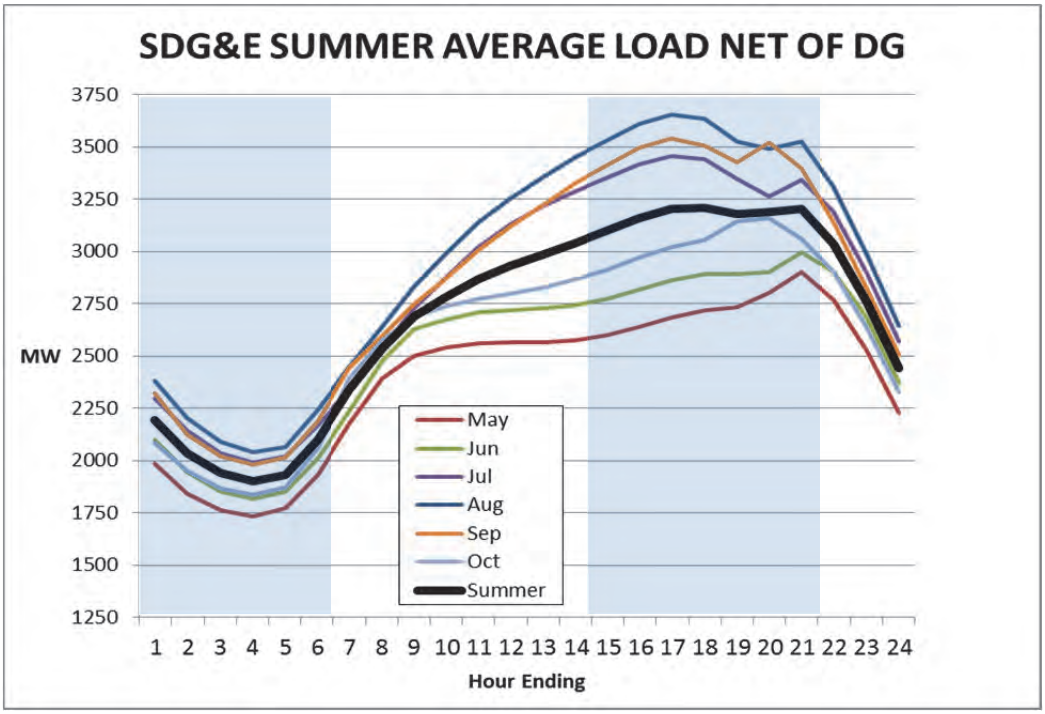
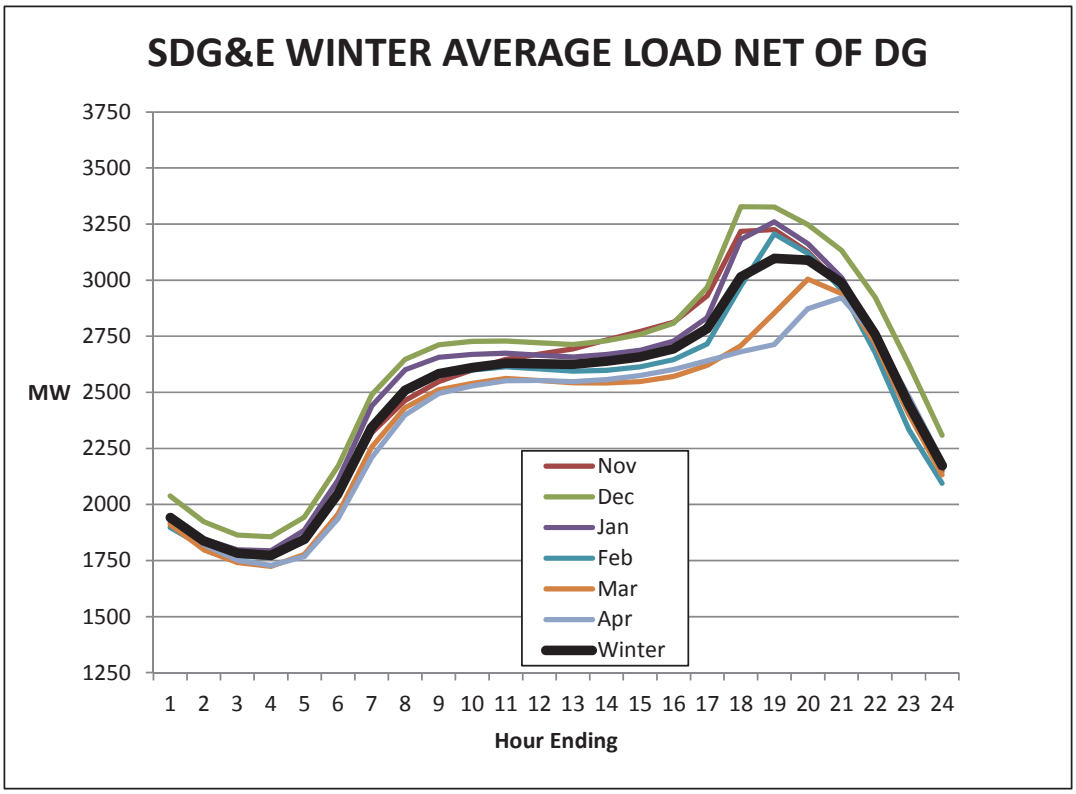
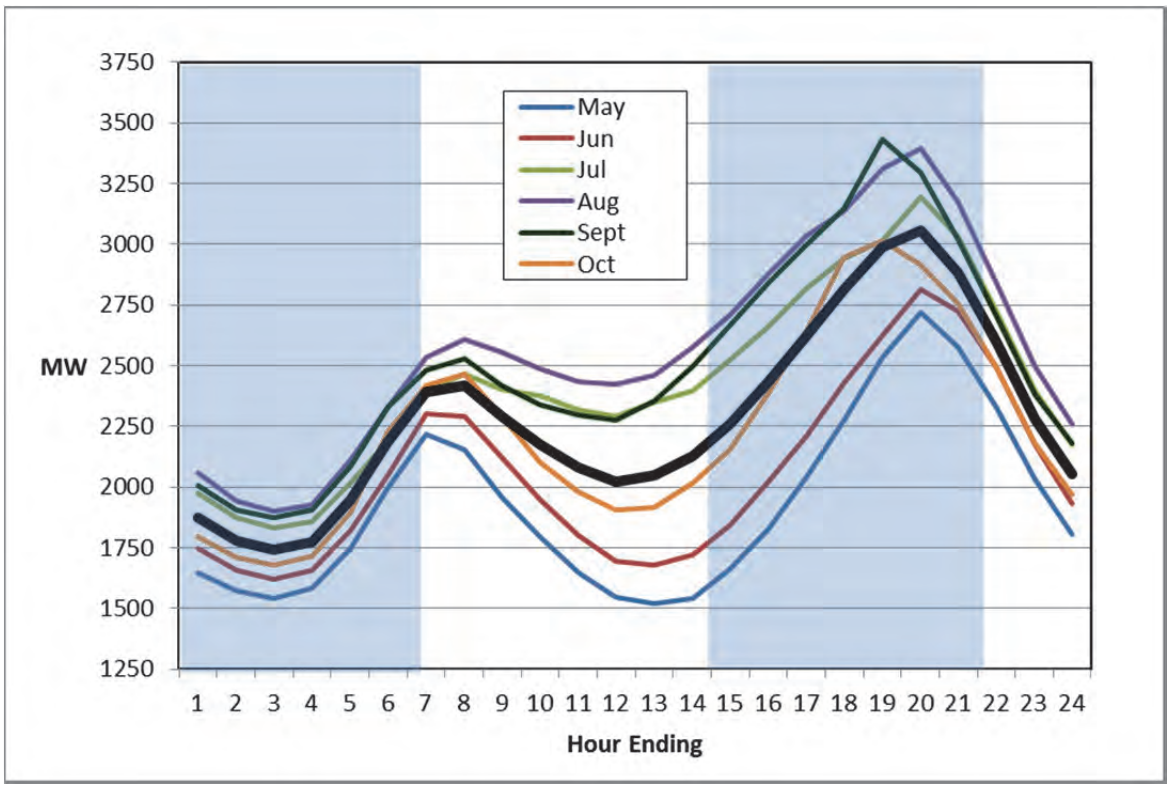


Chart DTB-12. 2017 Winter Load Net of Distributed Solar



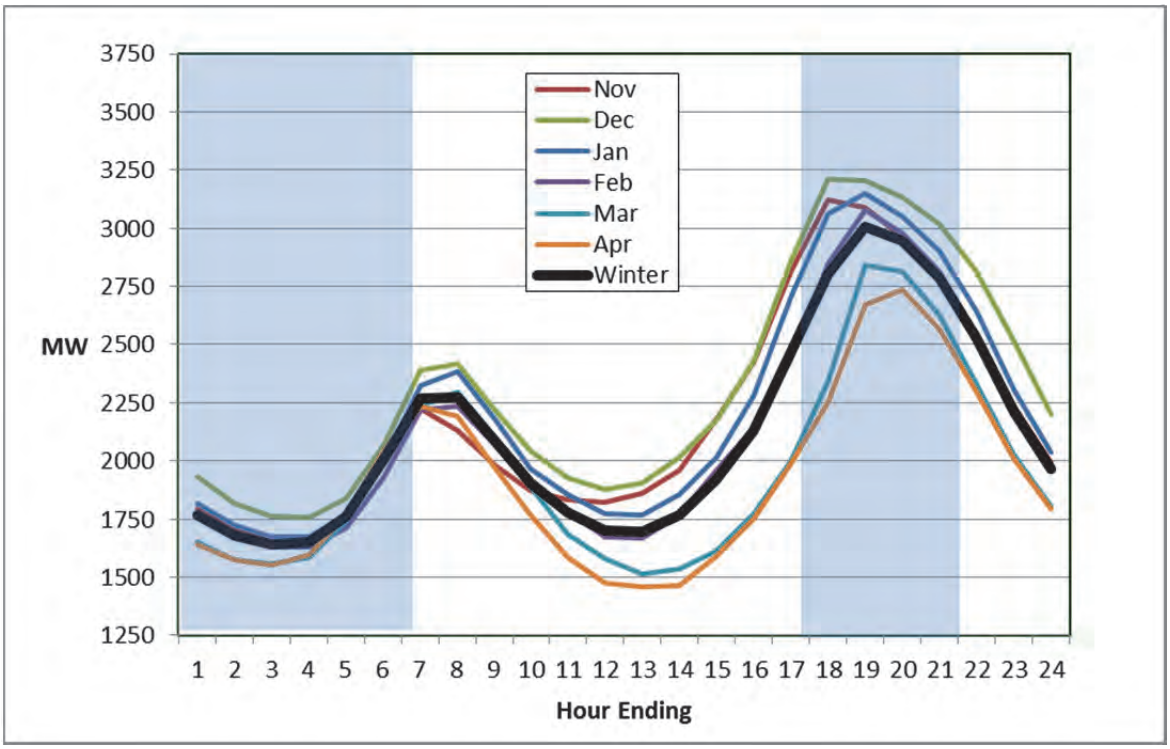
The next level of detail is to model the impact of central station solar and wind serving SDG&E load from within San Diego and Imperial Valley. The CAISO treats San Diego and Imperial Valley as a local capacity area.[20] The solar and wind generation are estimated based on averaged actual past production if the resource already exists, or a generic profile if the resource has been contracted for by SDG&E, but is not yet operational. This average production is deducted from load net of distributed solar to develop the likely hours of need for local capacity. The SDG&E system-wide hourly load forecast net of distributed solar as modified for expected average hourly production profiles of central station wind and solar is then averaged for each hour of weekdays for each month by season and presented in Charts DTB-13 and DTB-14 below.

Chart DTB-13. 2017 Summer Load Net of All Wind and Solar



[20] CAISO's "2014 Local Capacity Technical Analysis, Final Report and Study Results," April 30, 2013, pages 94-104. See also D.13-06-024, pages 6-7 and Ordering Paragraph 1.

Chart DTB-14. 2017 Winter Load Net of All Wind and Solar



Both charts show the proposed on-peak TOU periods would capture periods with the highest loads net of variable renewable generation, though the summer on-peak period includes a significant number of relatively low net load hours in the afternoon.

While average patterns are important for choice of TOU periods to provide the right price signals to encourage load modifying behavior, assignment of marginal generation capacity costs ("MGCC") has historically used a top 100 hours approach or the LOLE approach. The top 100 hours allocated capacity value to the top hours based on historical experience. In the GRC Phase 2, historical load data over the three year period 2006-2008 was used. A top 100 hours approach on an historical basis will not work where the future is much different than the past, but a top 100 hours on a forecast basis is also not as meaningful since the historical data provided a stochastic element. But for informational purposes, Chart DTB-15 provides a look at the variability across

high net load days. Chart DTB-16 provides an allocation of the top 100 hours to weekday summer periods on a forecast basis.

Chart DTB-15. 2017 Top 100 Hour Days

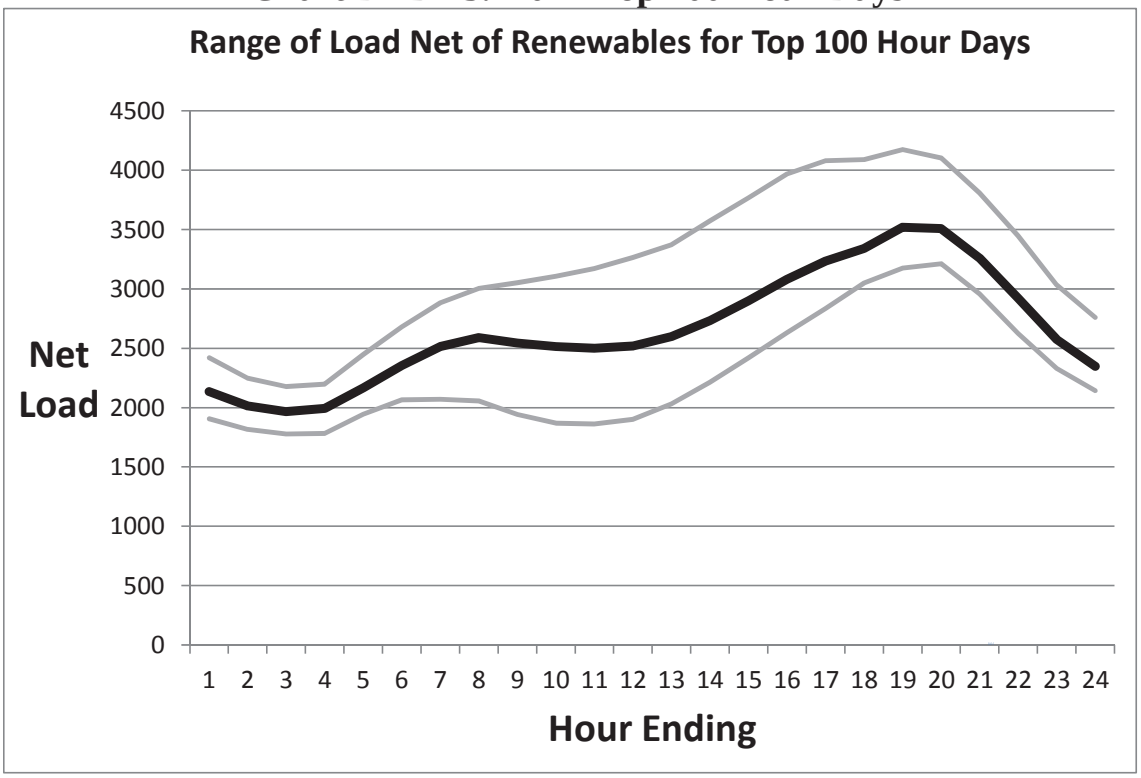
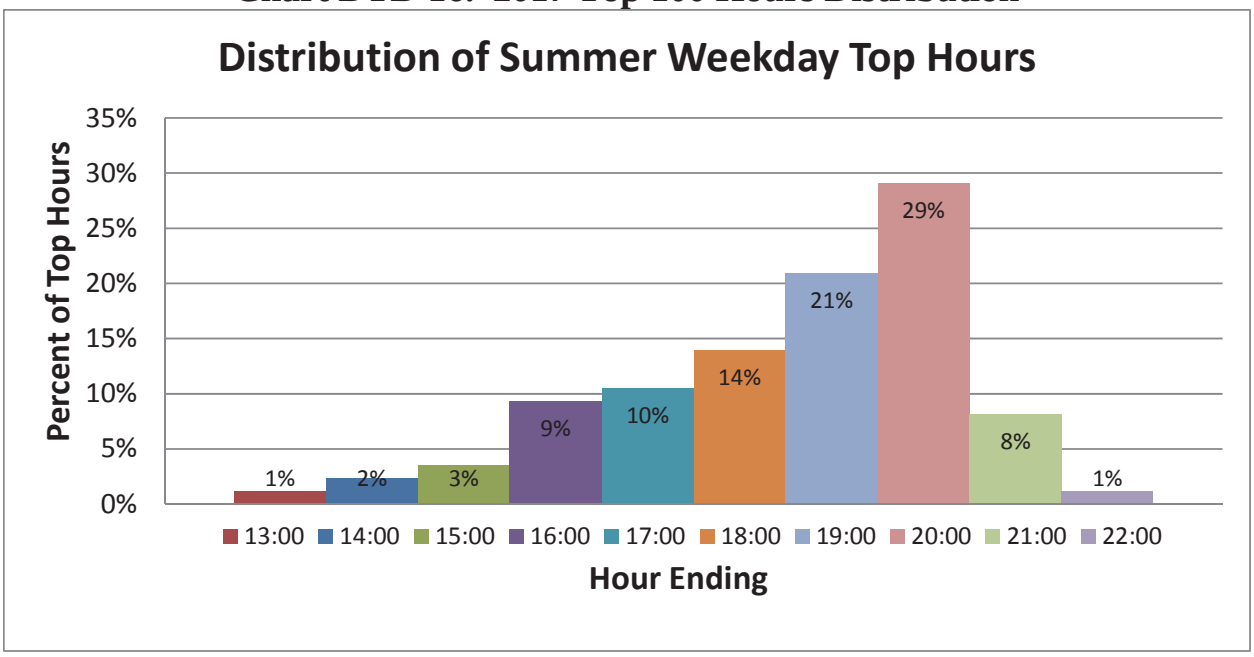


Chart DTB-16. 2017 Top 100 Hours Distribution



Approximately 82 percent of the top 100 hours are in the proposed on-peak TOU period.

B. RELATIVE LOLE ANALYSIS

LOLE, loss of load expectation, is the probability of not meeting load in an hour when key system variables are analyzed stochastically. SDG&E determined the LOLE for the SDG&E system using the Ventyx Planning and Risk model,[21] a system dispatch model tailored to the SDG&E system. It is the same production cost model as used by SDG&E to forecast procurement costs in the ERRA and GHG proceedings. It is primarily focused on the SDG&E area, unlike the Ventyx Market Analytics model which models the entire West. The focus in this analysis is on local capacity and the needs for local capacity that can be reduced through the use of appropriate consumer price signals in TOU periods (and demand response availability periods) to provide incentives for load modification.

The Planning and Risk model accommodates detailed hour-by-hour simulation of the operations of electric systems. It considers a complex set of generation operating constraints to simulate the least-cost operation of the system. The model's unit commitment and dispatch logic is designed to mimic "real world" power system hourly operation, minimizing system production cost, enforcing the constraints specified for the system, generation stations, associated transmission, fuel, and so on. The Planning and Risk model determines power flow to equalize the incremental costs of all transmission areas in the system and enforce the power flow constraints. In order to model real world uncertainties, different load and variable renewable production levels are generated by a stochastic process based on historical data. The Planning and Risk model then performs an hourly economic dispatch of generation resources against loads

[21] More detail on the model can be found at http://www1.ventyx.com/analytics/planning-and-risk.asp.

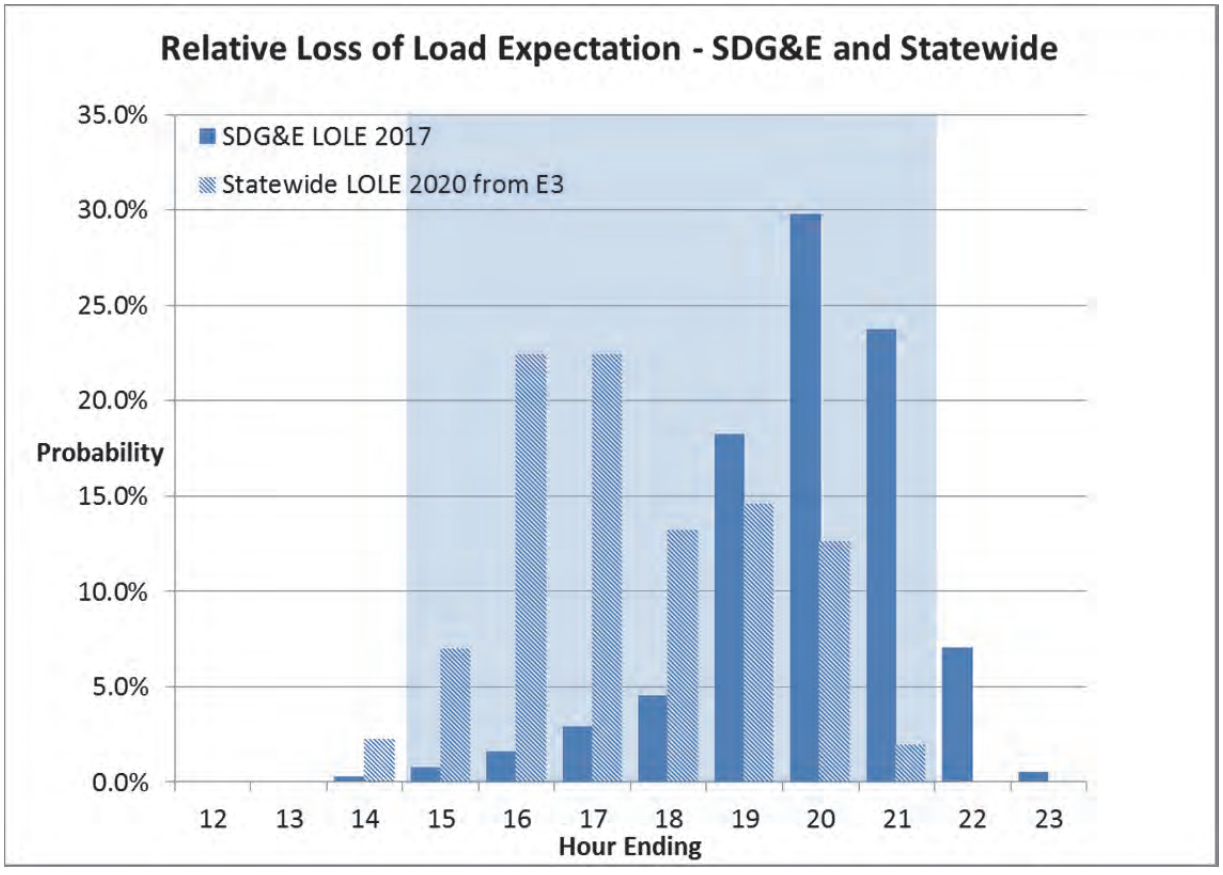
for each hour of the year. By running the model multiple times, a probability distribution of hours with relative expected loss of load can be developed.

Available generation in the analysis includes the units that exist in SDG&E's service area and Imperial Valley or are expected to be constructed by 2017 including both new renewable and conventional generation additions, but not SONGs. SDG&E made several additional model adjustments to develop its LOLE analysis. First, it has assumed that during times SDG&E is experiencing peak load conditions, the entire CAISO system is also stressed and therefore available market supplies are limited. Second, demand response is not included since its availability can be tailored to the hours with the highest relative LOLE. And third, no scheduled generation maintenance was included since this also can be tailored to be in hours without LOLE. The resulting analysis is not a measure of need for new capacity, but if there were a need, what hours of the year would likely experience the highest likelihood of a loss of load.

Each of the 250 model runs uses a Monte Carlo random draw to reflect 1) load for each hour due to weather volatility, 2) solar and wind production, and 3) fossil generation-forced outages. The random draw is from a distribution of outcomes based on historical data. In a majority of hours there will be sufficient generation to meet the load, and thus there will not be any unserved energy. But in some hours there will be energy not served ("ENS") if sufficient generation is not available to meet load. Each iteration results in a different number of hours with ENS given the random nature of Monte Carlo draws. Undertaking several hundred model runs provides a forecast of ENS for each hour of the day per iteration which can be used to assign a greater probability of loss of load to hours with higher levels of ENS. The LOLE analysis produced probabilities of outage for each hour in each month by dividing the hourly ENS by the total ENS over the year. The probabilities were aggregated by season and weekday/weekend.

The allocation of MGCC to TOU periods has traditionally focused on local capacity value, but it should be recognized that TOU periods (and load-modifying demand response periods) also provide benefits on a statewide basis. The statewide capacity value is called "system capacity." From a system capacity standpoint, it is the State as a whole rather than the local area which is important. And the need for system capacity, while not currently an issue given the amount of new renewable capacity, should also be considered in developing TOU periods. In Chart DTB-17 below I compare relative LOLE statewide based on the capacity planning model of Commission consultant, E3, to the SDG&E local capacity results.[22]

Chart DTB-17. Relative LOLE Results



[22] The E3 capacity planning model is available on the E3 website, www.ethree.com. In the past year, it has been used on projects for the CPUC including the RPS Calculator Update, Net Energy Metering, the CSI Impact Evaluation, and the 2012 LTPP. The data in Chart DTB-15 was taken from page C-36 of the Draft California Net Energy Metering Evaluation. Similar results were derived from directly running the model.

The statewide system capacity allocation is less shifted to the early evening hours compared to the San Diego-specific analysis. This result is not unexpected given the much larger industrial base through the rest of the state compared to San Diego and the lower relative amount of solar throughout the rest of the State compared to the San Diego local capacity area. But even though the shift is not as dramatic, there is significant probability of loss of load statewide in the early evening hours by 2020.[23] Based on the E3 capacity planning model results, the SDG&E-proposed summer on-peak period would contain 94 percent of expected statewide loss of load in 2020.

The third element of capacity is "flexible capacity," capacity that can be ramped up or down to meet the net load changes that occur in the morning and evening related to net loads. Increasing loads by lowering market prices before the ramp period will reduce ramping needs. The super off-peak period provides that benefit as does the move of 11 am – 2 pm from on-peak to semi-peak. And lowering loads at the end of a ramp period by increasing prices in the 5 pm - 9 pm period reduces ramping needs. The winter on-peak period provides that. The summer ramps are less dramatic in general so that the summer on-peak period is less critical for purposes of providing flexible capacity.

VI. TIME OF USE PERIODS

As stated previously, one general objective in choosing TOU period definitions is to group together hours with similar marginal commodity costs, including both energy and capacity, in such a way that customers know when electricity is expensive on average and when

[23] The E3 capacity planning model is available on the E3 website, www.ethree.com. In the past year, it has been used on projects for the CPUC including the RPS Calculator Update, Net Energy Metering, the CSI Impact Evaluation, and the 2012 LTPP. The data in Chart DTB-15 was taken from page C-36 of the Draft California Net Energy Metering Evaluation. Similar results were derived from directly running the model.

it is relatively inexpensive. The number of TOU periods is limited in order to make them understandable and actionable by customers, directly through pricing or indirectly through energy efficiency and demand response programs.

SDG&E has restricted the number of TOU periods to three periods - on-peak, semi-peak, and super off-peak - and two seasons – summer and winter – to maximize simplicity. The on-peak TOU period price informs customers that electricity is expensive and a super off-peak TOU period price informs customers that the cost of producing the electricity in this time period is much lower than average.

The results of the analysis presented above support shifting SDG&E's on-peak period to later in the day in the future as solar energy moves the net load peak, the hours most likely to experience a loss of load, and changes the profile of energy prices. SDG&E proposes the TOU periods in Table DTB-3.[24]

Table DTB – 3.

Summer on-peak	2 p.m. – 9 p.m. non-holiday weekdays
Winter on-peak	5 p.m. - 9 p.m. non-holiday weekdays
Super off-peak	12 a.m. – 6 a.m. daily
Semi-peak	All other times

The proposed Summer on-peak period is seven hours in length, the same as the current standard on-peak period, just shifted by three hours – from 11 am – 6 pm to 2 pm to 9 pm. While it is relatively long and as a result lowers the on-peak to super -peak rate ratios, it assures that both state and local capacity need periods are included. Demand response can be tailored to

[24] Similar Time of Delivery periods were adopted for use in future Renewable RFOs in D.13-11-024 as part of the 2013 SDG&E RPS Plan.

shorter periods within the TOU period targeted toward specific types of critical events that may be in the afternoon or the evening depending on state or local conditions. The Winter on-peak period expands the current standard TOU period by one hour from 5 pm – 8 pm to 5 pm – 9 pm to provide a consistent ending time for the on-peak period throughout the year. The super off-peak period of 12 am – 6 am is consistent with low net loads during this time period and lower rates during this period will encourage additional consumption during this period for customer energy storage including electric vehicle charging, other battery charging, and thermal energy storage applications.

Based on the 2012 GRC Phase 2 price variation, but with a 2017 allocation of prices to hours, the marginal energy cost factors for the proposed TOU periods is presented in Table DTB-4 below. These factors would be multiplied by the GRC Phase 2 adopted electricity price to calculate MEC for each TOU period. Energy prices do vary by TOU period, but there is less variation than prior TOU factors due to the flattening of electricity prices during daylight hours.

Table DTB-4. MEC Factors by Proposed TOU Period

	Summer	Winter
On-peak	1.327	1.272
Semi-peak	0.955	1.043
Super Off-peak	0.810	0.800

An analysis of the MGCC allocation to TOU periods is based on grouping high probability hours together in a TOU period. The resulting distribution of the likely hours of loss of load is then aggregated for each season. Table DTB-5 summarizes the results of the LOLE analysis based on the San Diego area.

Table DTB-5 Allocation of MGCC to Proposed TOU Periods

	Summer	Winter
On-peak	81.7%	2.1%
Semi-peak	16.2%	0.0%
Super Off-peak	0.0%	0.0%

The proposed allocation of MGCC reflects a small amount of capacity value in the winter on-peak period when compared to the GRC Phase 2 top 100 hours analysis of historical data.

This concludes my prepared direct testimony.

VII. WITNESS QUALIFICATIONS

My name is David T. Barker. My business address is 8330 Century Park Court, CP32F, San Diego, California 92123. I have been employed as an economist in the Resource Planning group of San Diego Gas & Electric Company since 2007. Prior to that, I was employed as an economist in the Regulatory Affairs Department of Sempra Energy Utilities from 2002 to 2007. Before 2002, I was employed at Southern California Gas Company in various staff positions including Economist (1991-1995 and 1998-2002), Market Consultant (1988-1989 and 1995-1998), Electric Energy Analyst (1990-1991), and Demand Forecasting Supervisor (1989-1990).

I received a B.S. in Mathematics from New York State University, a Masters of Economics degree from North Carolina State University, and a joint Ph.D. in Economics and Statistics from North Carolina State University. I taught undergraduate economics and statistics courses for four years on a full-time basis in Oregon, and then worked in the private sector for five years as an economist at Merrill Lynch prior to joining Southern California Gas Company.

I have previously testified before the Commission on economic analysis issues.

INDEX OF COMMISSION QUESTIONS AND RESPONSES WITH REFERENCE TO SUPPORTING WITNESS
SAN DIEGO GAS AND ELECTRIC COMPANY
IN SUPPORT OF MARCH 21, 2014 SUPPLEMENTAL FILING
RULEMAKING 12-06-013 PHASE 1

APPENDIX B: Roadmap for Customer Communication, Outreach and Education, and Technology

Outreach & Education Efforts

Residential Customer Engagement Continuum

2011	2012	2013	2014	2015

My Account

- Emails
- Online Banner Advertisements
- Paid online search
- Contact Center and Branch Office Promotion

Energy Management Tool

- Emails
- Energy Innovation Display
- Web Carousels
- Pandora
- Bill Inserts
- Collateral

Energy Use Alerts

- Bill Package
- Web Carousel
- Social Media
- Emails
- Energy Innovation Center
- Payment Centers
- SDGE App
- Stakeholder Outreach

Whenergy Plans

- Personalized Plan Comparison
- Microsite
- Direct Mail/Email
- Bill Package
- Online /Social Media
- General Market Comm.
- Stakeholder Outreach
- PCT Solution Offered

OIR Plans

Most effective tactics from previous campaigns will be utilized in support of the Test & Learn Strategy for residential customers.

- Separate strategy for subset of customers.
- Leverage existing community partners
- integrate messaging into accepted channels such as direct mail, emails, and website.

Enrollment Numbers

My Account
664,915 Customers

Energy Mngt. Tool
334,017 Customers

Energy Use Alerts
30,121 Customers

Estimated enrollment numbers are as of 12/31/2013
Low Income Enrolled includes California Alternate Rates for Energy and Energy Savings Assistance
Other Assistance includes Medical Baseline, Third Party Notification, Senior, Disabled and Temperature Sensitive