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Polaris Energy Services Comments on Load Management Rulemaking

Additional submitted attachment is included below.

POLARIS
ENERGY SERVICES

Comments on 19-OIR-01 Load Management Rulemaking

Polaris is an EPIC grantee (EPC-16-045) for 'Development of new technologies for agricultural loads to participate in renewables integration, RTP programs, and/or new Time of Use rates' and a participant for the last decade in Demand Response programs focused on the agricultural and water pumping sector.

Questions for Stakeholders

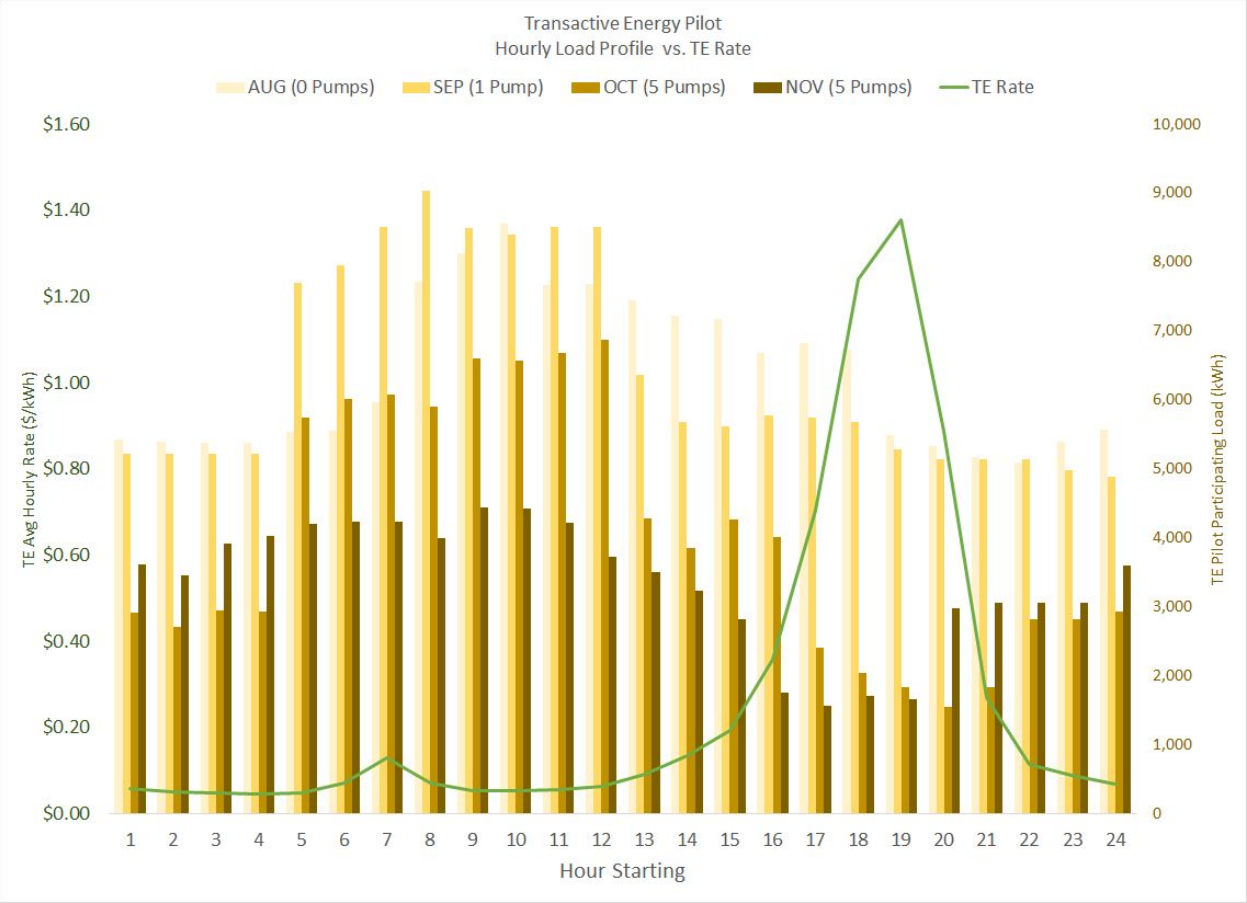
(1) What are your recommended additions or modifications to this draft scope?

- **The scope addresses technology and rate structure but does not include mechanisms for communicating the existence and benefits of these to energy users. In our experience and from our research, adoption of energy management technologies and programs succeeds only with significant efforts to educate, train and support customers. Too often these are afterthoughts and it is assumed that utility account reps will fill this function or that vendors of enabling technologies will play that role in order to sell their wares. While these are true to some extent, there is no guarantee that they are sufficient and it is probable that dynamic pricing will to some extent reduce the need for aggregators. Even if the structures enacted from these rules are mandatory, evidence shows that many customers will not respond to them and simply bear the cost, reducing their efficacy. We recommend explicit provision for customer education, training and support in the rulemaking.**
- **Even if this rulemaking results in broad changes to rates, a slate of Demand Response (DR) programs will presumably remain in place. Now, DR programs and incentives work against rather than in concert with TOU price signals; for example, AutoDR incentives reward the greatest possible usage during peak hours but penalize customers that shift some load off-peak while offering additional load reduction for occasional DR events. The rulemaking should examine how to stack the grid requirements and align them with incentives so that customers are presented with a cohesive and consistent regimen of pricing and DR. Specifically, the rulemaking should ensure that automation incentives are available for responding to price signals and not just to DR events. The rulemaking should also examine the obstacles to this alignment inherent in the rules and processes that hamper participation in DR programs now and aim to reduce--or at least not compound--these obstacles.**

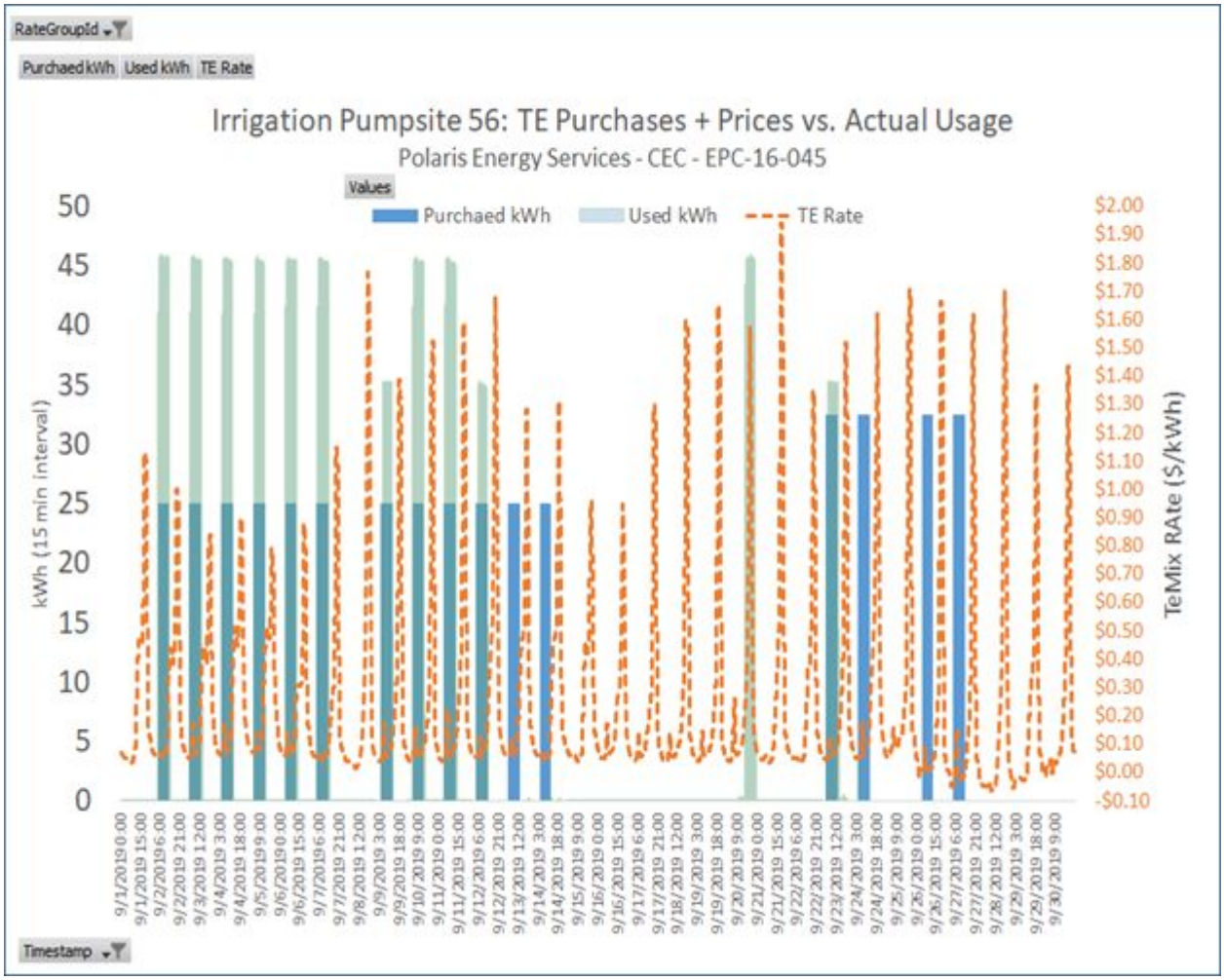
(2) Are there additional technologies, strategies, studies, or other materials that should

considered in this rulemaking? If so, please provide a brief description and a link to relevant information.

- **The EPIC project is applying advances in automation to a pilot of Transactional Energy (TE) rates for water pumping loads and we recommend that the results and recommendations of this study be considered in the rulemaking. The final report is in development and we can provide data and results in parallel with its completion. Monthly reports and the deliverables completed to date are available from the CEC Contract Manager, Dustin Davis, and Polaris can provide them to the rulemaking staff as well. The data from the project demonstrate that, with strong price signals, enabling technology and training, significant load shift is achievable from the water pumping sector, which represents ~20% of California's load.**

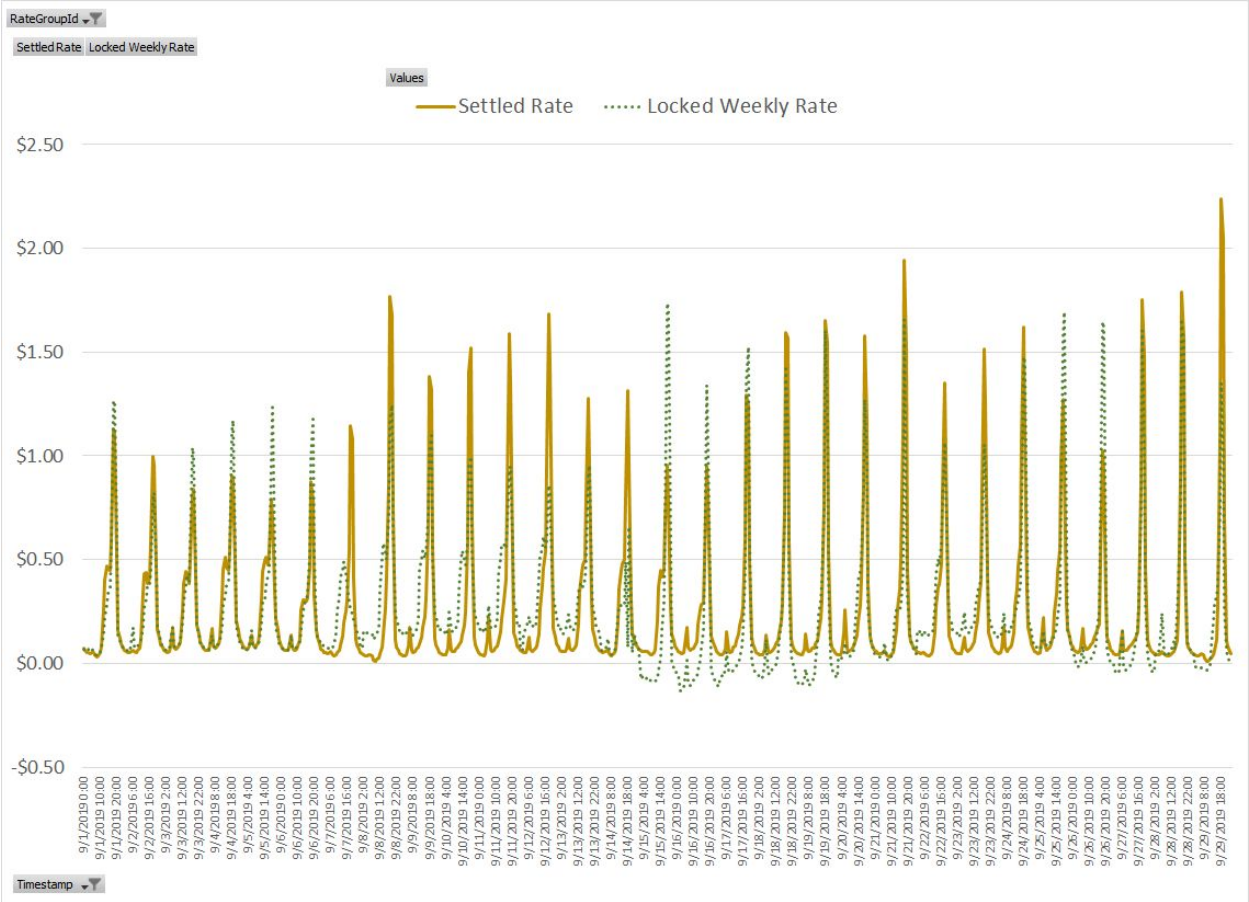


The graph shows total load by hour of day for five pumps during four months in 2019, during which the number of pumps responding to TE prices (green line) increased from 0 to 5. Total load decreases over the period because of seasonal variation (end of harvest) while the shape of the profile adjusts to the price signals from the RATES engine provided by TeMix.



The graph shows the response of one pump during one month vs. hourly prices.

- **The scope emphasises "real-time demand flexibility." Our research shows that there is much greater demand flexibility when price signaling is provided on the order of days to one week in advance; while not as 'perfect' as real-time price signals, these are much more dynamic than TOU rates fixed years in advance. We recommend that the rulemaking consider the tradeoffs of incorporating various time frames and what market mechanisms could bridge the gap between the real-time market prices and X days ahead. The Transactive Energy paradigm is one option in which some player (utility, aggregator, retailer) can manage that arbitrage. The data from our pilot show that a week-ahead price signal is very close to real-time prices in the timing of peaks and lows with variation mostly in their magnitude.**



The graph shows the actual settled rate from the TeMix platform for each interval during one month compared to a price for each interval locked at the beginning of the week (therefore between 1 and 7 days ahead). The locked weekly rate tracks closely to the actual settled rate.

- **Clearly, the price variability under any rate, tariff or market needs to be of a magnitude to cause customers to change their behavior. Our research shows that applying this variability to energy charges alone while leaving the current demand charges in place does not provide enough of a 'lever' to drive behavior in the agricultural sector and this conclusion applies to the industrial sector as well. Therefore, we recommend models such as the Transactive Energy model that bundle fixed costs (T&D) in the interval prices.**

(3) Beyond those mentioned here, what end-uses and customers are likely to be able to benefit from demand flexibility on voluntary hourly and sub-hourly tariffs?

- **The scope includes "large water pumps." We recommend ensuring that this specifically includes agricultural irrigation pumps and the dynamics of their operation (and not just the CWP pumps described at the workshop).**
- **Our research shows that significant demand flexibility is available from this large sector without major infrastructure upgrades.**

- **End-use Storage Systems should include reservoir storage for agricultural customers which provide flexibility in the timing of pumping water from aquifers to the surface as well as canals and ground storage.**

(4) What economic impacts should be considered? (e.g. positive or negative effects on load serving entities, customers, workforce, vendors, generators, etc.)

- **The ideal outcome of this rulemaking is a simplified, streamlined approach to communicating grid requirements to customers and incentivising their response. The existing regime often targets the wrong outcomes and does so inefficiently, requiring an ecosystem of vendors to design, implement and measure programs. While a simplified, price-based approach can greatly reduce the need for these activities, it is also true that the vendors performing these functions are often the most knowledgeable, experienced, motivated and effective in achieving load management goals. It would be a mistake to conclude that with simplification, the vendor ecosystem is obsolete. While we believe that it can be streamlined, we know the effort required to gain customer adoption of technologies and effect changes to their operations and maintain participation over time. The new regime should account for this fact and include roles for vendors to help customers transition to a new paradigm.**

Contact Info:
David Meyers, President
Polaris Energy Services
dmeyers@polarisenergyservices.com
415-722-2261