



E Source comments on the draft ENERGY STAR SHEMS specification

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Dear Ms. Jantz-Sell and Ms. Daken,

Thank you for the opportunity to provide comments on the ENERGY STAR Smart Home Energy Management Systems (SHEMS) Draft 2 Specification Version 1.0 and Draft Method to Determine Field Performance. This proposed specification not only has enormous potential to help customers better manage their energy consumption, but also to help utilities meet myriad goals as well, such as energy efficiency, demand response, supporting adoption of new rates, and decarbonization. By helping to standardize the concept of a SHEMS and monitoring actual performance in the field, ENERGY STAR is in an ideal position to ensure that customers realize tangible benefits from these systems while also clearly demonstrating the energy and demand benefits that smart devices and systems are able to offer.

We've provided comments on both the ENERGY STAR Product Specification for SHEMS, Draft 2 Version 1.0 and the ENERGY STAR SHEMS Draft 2 Method to Determine Field Performance separately below.

ENERGY STAR Product Specification for SHEMS, Draft 2 Version 1.0

- Some additional clarity may be helpful in the definition of Home Energy Sub Meter System beginning on line 80, particularly around the requirement that they must “monitor energy usage for individual circuits to account for their actual energy usages.” There are a variety of systems currently available that measure whole-home power draw and use disaggregation algorithms, data from connected smart devices, or other strategies to provide potentially relevant data and insights to customers around their energy use, but many of these don't necessarily track the power draw of each individual household circuit. Additionally, because each circuit may include a number of different end uses, it's unclear if data on the power draw of individual home circuits alone would necessarily provide meaningful insights to customers without additional disaggregation, analysis, or

synthesis with other data streams. For these reasons, we suggest deleting the reference to individual circuits in this definition.

- With regards to the definition of time-of-use (TOU) beginning on line 130, the U.S. DOE Smart Grid program's definition is acceptable as-is, but words like "usage" and "broad blocks of hours" may potentially be somewhat unclear. With that in mind, one potential alternative is the definition provided by the Rocky Mountain Institute in its 2016 [Review of Alternative Rate Designs](#) report, which we find to be a bit clearer: "A time-of-use (TOU) structure reflects historical temporal variation in system costs by differentiating prices by time of day. Both prices and their applicable time period are predetermined."
- In the Future Criteria Revisions section beginning on line 505, we suggest consideration of an additional bullet point indicating an openness to potentially moving beyond a requirement that a SHEMS support device optimization based on TOU pricing towards optimization based on other, more flexible, rate structures as well (such as real-time pricing, variable peak pricing, or critical peak pricing). While many utilities have already adopted—or are currently adopting—TOU rates, others are actively experimenting with different rate structures that may better reflect the marginal cost of supplying and delivering electricity, support renewables integration, and help drive behavioral changes on the customer side that can support improved demand management. For customers, having a flexible SHEMS that can respond to whatever rate structures their utility offers (and optimize devices accordingly) could help them better minimize their bills and lead to improved customer satisfaction with these systems.
- Also in the Future Criteria Revisions section, it may be worth including a mention of load building. As demand curves change due to trends such as growing renewables adoption and increased electric vehicle (EV) market penetration, it seems likely that utilities may shift from focusing solely on traditional demand response (focused on reducing demand during peak periods) to new strategies that could offer incentives for increasing loads during times of low demand to help flatten daily demand curves and improve demand predictability. If such a trend emerges, it would be helpful for an ENERGY STAR SHEMS to be able to let customers participate in such events and thereby receive any associated utility incentives.
- Beginning on line 281, the EPA suggests that it does not currently plan to mandate connectivity with EV charging equipment due to the immaturity of the market. With that in mind, it may be helpful to add a bullet point to the Future Criteria Revisions section stating that, as the market matures, the EPA will consider mandating SHEMS compatibility with connected EV charging equipment (potentially using a similar strategy to how it currently approaches connectivity with smart water heater controllers).
- One general requirement that may be worth inclusion in the specification is that a SHEMS must continue to function appropriately if network connectivity drops, and that functionality and settings will remain unaffected by such drops in connection (for example, to ensure that a system doesn't automatically reset settings following a power outage). Such a requirement could help better ensure that users have positive experiences with SHEMS, and that energy savings are likely to persist over time.

ENERGY STAR SHEMS Draft 2 Method to Determine Field Performance

- It seems that, for an ENERGY STAR SHEMS to be successful, any device that comprises part of a qualified SHEMS should be able to demonstrate energy benefits to justify inclusion. For this reason, we suggest adding conditional requirements to the Program Performance section starting on line 99 that any devices sold as part of a SHEMS (with the exception of submetering equipment, occupancy sensors, or hub devices) should report such data as average on-time, average away hours, average on-mode power draw, and average vacation/sleep-mode power draw. This kind of data would be especially helpful in quantifying potential energy savings realized by both smart plug load and water heater controllers sold as part of a qualified SHEMS.
- In the SHEMS Market Evolution section starting on line 192, it may be worthwhile to include an additional bullet point for asking for the percentage of installations with other energy-related smart devices not explicitly referenced elsewhere in the section, and asking for such devices to be called out. This kind of information could potentially help identify promising new devices that may warrant inclusion in a future ENERGY STAR SHEMS specification, and/or devices that customers find particularly appealing.

We greatly appreciate the EPA's extensive work developing these proposed SHEMS requirements and value the opportunity to provide feedback. Please feel free to contact me with any questions.

Sincerely,



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