

January 18, 2013

Ms. Katharine Kaplan
Environmental Protection Agency
Ariel Rios Building, SW, MS 6202J
1200 Pennsylvania Avenue, NW
Washington, DC 20460

Dear Ms. Kaplan:

The Consortium for Energy Efficiency (CEE) respectfully submits the following comments relative to proposed “connected” requirements for the refrigerator/freezer specification released by the Environmental Protection Agency’s (EPA) on December 21, 2012.

CEE is the binational organization of energy efficiency program administrators and a staunch supporter of the ENERGY STAR Program. CEE members are responsible for ratepayer-funded efficiency programs in 45 US states and eight Canadian provinces. In 2011, CEE members directed \$7.8 billion of energy efficiency program budgets in the two countries. These comments are offered in support of the activities CEE members carry out to actively leverage the ENERGY STAR brand, and are also informed by managers of Demand Response (DR) programs and technical experts on interoperability. CEE consensus comments are offered in the spirit of strengthening ENERGY STAR so it may continue to serve as our national marketing platform for energy efficiency while also supporting DR opportunities.

CEE highly values the role ENERGY STAR plays in differentiating energy efficient products and services that the CEE membership supports locally throughout the US and Canada. We appreciate the opportunity to provide these comments.

Cloud Connectivity Likely Beneficial, But Is Not A Sufficient Pathway to Connect

While cloud-based connectivity is encouraged, we believe that allowing cloud-based translation of proprietary protocols to open standards¹ as a sufficient pathway to be listed as “connected” by ENERGY STAR will compromise EPA’s strategic objectives. Our chief concern is that a broad segment of consumers will not have a positive experience if a cloud-based system is required for their ENERGY STAR appliance to connect. We continue to recommend that EPA require open standards at the appliance, so that consumers may allow any device or service provider to communicate with the appliance directly within the premises of the home, without relying on a cloud-based system provided by the appliance manufacturer. Several mature and widely-adopted technological solutions cited by EPA exist today that would enable this capability². Cloud-based solutions may be offered as an additional pathway to connect; our opposition is to adopting language that allows cloud-based translation as the only means to connect with an ENERGY STAR product through open standards.

¹ Single Radio, WiFi with protocol translation in the cloud – this solution uses proprietary protocols from the appliance, connecting to a cloud service that performs protocol translation. The cloud service will allow interconnection using open standards-based protocol(s) to a unique IP address that is representative of the connected appliance. Once the customer is enrolled in a signals-based DRLC program, the DRLC service provider will send signals to this IP address and the appliance must respond. Thus, from the service provider’s perspective, the physical location of the IP address is irrelevant. This solution, however, does require an internet connection.

²Single Radio supporting SEP2.0 / Zigbee – this product is capable of direct interconnection in the customer’s home, to a SEP 2.0 HAN enabled Smart Meter. However, a hub or energy management gateway will likely be required to allow one-to-many interconnection to enable additional connected features including energy management.

Single Radio supporting SEP2.0 (or OpenADR) / WiFi – this product is capable of both interconnection in the customer’s home, with no reliance on Internet connectivity, or interconnection in the cloud. If we consider the use case where a utility desires interconnection in the home to a SEP 2.0 HAN enabled Smart Meter, a protocol adapter will be required, likely in the form of a WiFi or wired LAN to Zigbee adapter. Interconnection in the cloud will not require an adapter or hub.

Dual Radios – Radio 1 supporting SEP2.0/Zigbee, radio2, WiFi. This product could meet the connected criteria based on Radio 1, only. Such a product will be capable of direct on-premises interconnection with a SEP 2.0 HAN enabled Smart Meter. Radio 2 (WiFi) could use proprietary communications.

Standardized Modular Communication Port – CEA 2045. This product would allow homeowners to select and install the appropriate module, and allows communication systems to evolve with making the original product obsolete.

CEE Stands Ready to Support Successful Recognition of “Connected” ENERGY STAR Products

As detailed in previous comments, CEE is committed to supporting EPA’s efforts to recognize “connected” ENERGY STAR products while protecting the Brand’s equity. To this end, CEE and its members will monitor the market for the emergence of the concerns articulated in this comment letter, and work cooperatively with EPA to mitigate any negative consequences before they are fully realized. We encourage EPA and its partners to monitor the market for the following potential consequences:

Cloud-based translation is unlikely to maximize flexibility to consumers , or their freedom of choice. If a manufacturer selects a cloud-based pathway to connectivity, consumers will be required to depend on the appliance manufacturer’s cloud to obtain any benefit from “connected” products. Consumers have come to expect that when they purchase a connected product, they will ultimately have the choice and opportunity to connect that device to other products within their home, and/or directly with various service providers. Cloud-based translation to open standards is outside the norm of what today’s consumers expect regarding a connected product.

Cloud-based translation may permanently couple a consumer to a particular manufacturer’s service offering. All customer energy consumption data would likely need to be funneled through the appliance manufacturer’s cloud, raising privacy concerns for both the consumer and the program administrator. Any program element that jeopardizes consumer privacy will be difficult to adopt for program administrators. Even if EPA requires appliance manufacturers to share that data with 3rd-parties in a secure manner, consumers will always be required to work through the appliance manufacturer. Consumers should have the option to select how they will connect, and not be dependent on a particular service provider. If EPA allows cloud-based translation as a sole means of achieving connectivity, some homeowners may be obligated to maintain a relationship with that appliance manufacturer in perpetuity. This requirement likely violates the common expectation of today’s consumer regarding a “connected” product. Additionally, this could create a paradigm where the consumer is pushed towards a single manufacturer for all future appliance purchases because of perceived compatibility issues, and to limit the burden of managing multiple service accounts.

Cloud based translation creates a potential weak link in achieving connectivity. Consumers who purchase a “connected” appliance listed by ENERGY STAR that only connects via the cloud will be dependent on the appliance manufacturer maintaining a high-quality service 24/7/365. While it’s reasonable to assume major appliance manufacturers are capable of maintaining such a service, it’s possible that the business case for “connected” appliances will evolve or economic reality will compel some manufactures to abandon a cloud-based strategy for achieving

connected, particularly with the emergence of a standardized modular communication port. This situation would “strand” products that have no other means to connect. How will ENERGY STAR manage consumer dissatisfaction that would stem from such a situation? Further, there is no guarantee that the appliance manufacturer will serve as a neutral party as the point of translation in the long-run.

During outages, local connectivity within the premises of the home enables use of on-site photovoltaic, battery storage, or other resources to maintain power. Ideally a home energy management system would be capable of connecting during such conditions in order to enable the limited resources to power the most necessary home equipment, such as lighting, medical equipment, or even appliances. If the only way to communicate with the appliance during an outage is to connect via the internet, the connected appliance is unlikely to provide value at a critical time, or be linked with alternative power sources. Further, when the power comes back on, the appliance should be able to re-connect, and not need to be re-configured.

As a Mass Market Program, We Support Efforts to Serve the Majority of Consumers

Ideally, ENERGY STAR would identify “connected” products that are capable of benefitting the majority of consumers.

Cloud-based translation excludes customers without broadband. Estimates of broadband penetration in American homes range from 30-64%. If a majority of appliance manufacturers selected a cloud-based system to achieve “connected,” ENERGY STAR would at best serve only 2/3rds of the market. We believe ENERGY STAR, and the mass market it serves, would benefit from requiring manufacturers to provide numerous pathways to connect that do not require broadband internet. Ideally products listed as ENERGY STAR “connected” would support all open standards, be flexible to work with future upgrades to those standards, and adopt a protocol that might not even exist today.

Multiple Pathways to Connect Would Meet Consumer Expectations. Consumers have come to expect their existing “connected” household products, such as electronics, computers, and peripherals, to be capable of connecting to one another and to a home area network in several different ways (e.g. Wi-Fi, Ethernet, HDMI, a cellular network, etc.). If expectations aren’t managed, consumers may be disappointed to learn some ENERGY STAR products will only connect to other products via an Internet connection to the manufacturer’s cloud. It will be necessary to manage consumer expectations about the requirements to connect, and the uncertainty surrounding their eligibility for participation in utility programs. CEE is committed to work with EPA and other stakeholders to develop a communications strategy that manages expectations and mitigates risk to the ENERGY STAR brand.

Enabling Demand Response Programs Requires a Modified Approach

To the extent EPA intends ENERGY STAR “connected” products to help scale up demand response programs, we offer the following suggestions for serving this objective:

Some consumers will not allow use of their Internet connection. It is unknown what percentage of consumers would prohibit utility demand response or energy efficiency programs from accessing their consumer-paid broadband internet, but we expect some will. This reaction will further limit the number of households who would benefit from an ENERGY STAR “connected” product that only connects via the cloud.

Utilities may not choose to depend on an appliance manufacturer's cloud to implement DR or EE programs. Local electric companies use a variety of communication paths including AMI and expect to interact with their own customers as they see fit. This variety of communication paths implies that internet based connections are not the only solution for how they can, or intend to, interact with their customers. Additionally, these utilities depend on data that flows from an end-use device using an open standard to participate in different Energy Efficiency and Demand Response programs. It's unclear if, or how, appliances that connect via the cloud will enable this data flow.

Utility “visibility” to individual appliances is likely necessary to assess and act on DR opportunities. In order to maximize the effectiveness of DR programs, a product must be connected during the entire event, which requires high levels of precision and reliability. The proposed specification language defining the response to an event limits the surgical precision necessary for short duration DR events. Relying on an Internet connection has the potential to compromise both the precision and reliability of the connection during the event. Recent laboratory testing of DR-capable appliances by at least one utility has confirmed this is the case. More so, due to reliability concerns, it is unlikely that short duration events will ever be called by the utilities due to a lack of “visibility.” To extract additional value from the connected assets, the utility most likely will need to coordinate short DR events among many devices. In order for this to be successful, the utility must have a “clear line of sight” to individual DR-capable products, including their geographic location as it pertains to the electric grid. A cloud-based connected solution will hinder or prohibit extracting this value from these DR-capable appliances.

We are unaware of any interface standard for cloud-based systems. If cloud-based translation is required, the utility must have the ability to communicate with the cloud-based systems of multiple manufacturers. No universal interface standard currently exists to address this need. Utilities are unlikely to support multiple proprietary Application Programming Interfaces (APIs) developed by different manufacturers. Ultimately, the utility may be compelled to pick “winners”

for utility programs, further limiting consumer options for “connected” products that will achieve Demand Response.

Due to security concerns, many utilities will not leverage an appliance manufacturer's cloud to implement EE or DR programs. As mentioned early, any program strategy that jeopardizes the security of consumer data is unlikely to gain market traction. Program administrators fear there will be security and privacy issues with sending DR or other signals through a 3rd party service provider's system, such as a manufacturer's web site. Further, utilities that are dispatching for economic reasons may risk exposing their market based decisions through the cloud.

Cloud-based connectivity may not allow utilities to meet regulatory requirements for percentage participation in certain customer segments. Regulated utilities often need to serve all customer segments. Some customer classifications may have a low percentage of broadband internet subscribers, such as rural customers. This goes against the assertion that the location of the IP address - whether on the customer's premises or in the cloud - is not relevant. The ability to communicate within the premises would ideally be required in order to know the appropriate details (including physical location) of the customer being served.

Cloud-based interfaces for DR programs are generally used for business to business aggregator applications. By adopting a cloud-based model, manufacturers are inherently acting as DR aggregators, and may not completely understand the regulatory and systematic requirements needed to perform such a role. Manufacturers may not adopt the business oversight requirements associated with regulatory mandates for energy aggregation, further limiting the DR potential of ENERGY STAR “connected” products. CEE and its members stand willing to help manufacturers understand the role of aggregator, and recommend EPA investigate further the ability and commitment of manufacturers to play this role.

CEE would once again like to thank EPA for the opportunity to comment on its plans to revise the “connected” requirements within the ENERGY STAR Refrigerators and Freezers specification.

Please contact CEE Liaison to ENERGY STAR, John Taylor, at 617-532-0944 with any questions about these comments.

Sincerely,



Ed Wisniewski
Executive Director