

Energy Star Program
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Ladies and Gentlemen:

I am writing on behalf of EcoFactor, Inc. in regard to Draft 2, Version 3.0 of the Energy Star Program Requirements for Room Air Conditioners ("RACs").

EcoFactor is not a manufacturer of RACs, and has no plans to become one. We are, however, active participants in the revolution in the Smart Grid, and we see great value, to individual consumers and to the grid, in making RAC's smart-grid-capable. We therefore support the communications provisions of the draft specification.

According to the Energy Information Administration's 2005 data, RACs are used in 26.9M homes. More than 15M of them are used either "quite a bit" or "all summer." RACs use 34 billion kWh at a cost of \$3.7B annually. These numbers convey the overall impact, but just as important, RACs disproportionately affect people with low and moderate incomes. The EIA data shows that the average household below the poverty line using RACs spent \$152/year to operate them.

EcoFactor offers an energy management service that has been proven to save homeowners up to 30% in energy use and cost without sacrificing comfort or giving up control. We currently accomplish this by optimizing the use of communicating programmable thermostats connected to central heating and cooling systems. EcoFactor has also delivered impressive demand response results. In 2010 pilots, EcoFactor delivered 36% more load shed per connected home than was achieved by conventional demand response techniques, and did so while substantially eliminating discomfort for the occupants of the participating homes.

We believe that similar opportunities to deliver value to consumers and for the grid exist with RACs, and that there is value in building communications capabilities into RACs. Specifically, we believe that energy management services will also be able to deliver enhanced demand response and energy efficiency with communicating RACs.

We understand that RACs are relatively low cost devices, and that competitive pressures make it impractical for the baseline specification to require expensive communications hardware that may be used only rarely, at least at first. But that low price relative to the cost of electricity that RACs use over their lives makes enabling energy efficiency more important, not less.

Energy Star's own calculations suggest that the annual operating cost of a RAC can easily exceed \$150, which may significantly exceed ½ of its purchase price. We believe that this makes energy efficiency especially valuable in this application. We have not yet been able to apply our management service to RACs, but if EcoFactor's energy management is able to achieve savings similar to what we are achieving with central air conditioning, savings of \$20 - 45/year should be possible. If every RAC were connected to an energy management system such as EcoFactor, we believe that such savings would easily justify a substantial increase in manufacturing cost. However, we understand that in the short run at least, only a small percentage of RACs will actually be connected, and thus the justifiable cost increment is smaller. Thus we believe the appropriate balance between savings potential and low cost is the approach taken by the proposed specification – to create an optional smart grid-capable tier that is at least field-upgradeable to be capable of communicating. To be clear: we are not just saying that adding communications to RACs can save enough energy to pay for the communications upgrades in, say, ten years. We are saying that we believe that adding communications can save enough more than enough energy to pay for the upgrade *and the air conditioner itself*.

We understand that some stakeholders may be seeking to minimize the extent to which authorized 3rd parties may remotely optimize RACs and/or access RAC operational parameters. While utilities may be satisfied with RACs that are capable only of very simple, hard-coded responses to a few remote commands, we believe that RACs are capable of delivering far more *consumer* benefit if communications are not so circumscribed. We also believe that limiting the benefits of communications to grid-level benefits will only serve to limit the appeal of communications, and thus limit the adoption of this technology, thereby frustrating both goals.

Communicating thermostats that can send and receive the specific parameters similar to those listed in section 4.A.e and 4.A.f already allow EcoFactor to deliver double-digit percentage reductions in air conditioner energy use with residential central air systems. They also allow us to deliver substantially increased demand response compared to traditional techniques at the same time as we substantially decrease occupant discomfort. This is possible because we are able to use the data from communicating thermostats to determine the parameters of the “thermal battery” each home represents, and optimize individual pre-cooling strategies to maximize load shed while minimizing discomfort.

We expect that many of these benefits will be possible with RACs as well, but only if third parties are able to fully interact with the control systems as currently set forth in the specification. And although we expect that our approach will result in substantial benefits for the consumer and for the grid, we also assume that other companies will develop additional innovative applications that can advance the art still further. But we believe that such innovation will be stifled if communication with RACs is restricted to pre-defined situations and canned mechanical responses.

Specifically, we think it is shortsighted to define the universe of applications and responses allowed from RACs in this specification. We feel that technology is generally best enabled by separating the major constituent layers. In this case, the three relevant layers are the hardware layer, the communications layer, and the application layer. As written, the portion of the specification that deals with communications does a reasonably good job of separating the communication and hardware layers from the application layer. Sections 4B and 4C do violate this concept, but so long as the language in Sections 4B and 4C speaks of “capabilities” rather than requirements, and remains overrideable by the consumer, the harm is probably minimal. But we believe that demand response is an application; it is not necessary to mix layers by limiting the hardware to a specific version of a specific application. Saying that RACs that will be used for a decade or more are limited to doing DR in the specific way utilities prefer today is the equivalent of requiring in 1985 that all personal computers must run Wordstar for DOS. Applications evolve; open hardware and communications standards enable that kind of progress.

EcoFactor strongly believes that, as with climate controls, the driving force behind the new Energy Star RAC specification should be consumer benefit. As we understand the goals of the Energy Star program, success should largely be measured by the energy consumers are helped to avoid using. This goal may well coincide with the goals of a given utility at a given time. But consumer benefit should dominate the discussion, and we are confident that the communications portion of the specification can and eventually will generate significant energy savings, and thus significant consumer value.

We again thank the EPA for the opportunity to comment on the proposed specification.

Sincerely,

John Steinberg
CEO
EcoFactor, Inc.