



# EPA ENERGY STAR Connected Thermostats

Stakeholder working meeting  
Connected Thermostat Field Savings Metric  
9/11/2015



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# Agenda

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- Introduction – anyone new joining the call?
- Software module alpha release
- Begin discussing how to handle products customized for particular customers/partners or regions
- Opportunity for small project to develop method for deriving per-zip code baselines



# Attendees

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- Abigail Daken, EPA
- Doug Frazee, ICF International on behalf of EPA
- Dan Cronin, ICF International on behalf of EPA
- Matt Golden, Open EE on behalf of ICF and EPA
- Alan Meier, Lawrence Berkeley National Laboratories
- Ethan Goldman, VEIC
- Michael Blasnik, Nest Labs
- Raj Shah, Carrier
- Kurt Mease, Lux Products
- Phil Ngo, Impact Labs
- Dave Cassano, Nest Labs

# Software Modules Alpha Release

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- Update from OEE or Doug on progress in last 2 weeks
  - Will be starting in upcoming weeks
  - Available to help with using software
  - Updating input format: simpler, fix daylight savings problem, provide usable example files
  - Provide better feedback when input format errors occur
- If you have an issue, load it to GitHub, and OEE will get in touch with you
- If you can't even get the modules running, email or call Phil Ngo:



# What is a unique product?

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- Have touched on different HW running same service, but what about different services on the same hardware?
- Some products have diff algorithm flavors for diff utility partners
- Many products may be deployed w/wo DR program
- Others have more than one flavor of DR program
- In this context, when is it a different product?
- Hinges on how these differences affect savings and metric results



# Distinguishing products discussion

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- Do different flavors of DR affect savings/metric scores?
  - Demand response events rare, but similar services that are optional add-ons: seasonal savings, etc.
  - Products that provide pre-cooling in areas with TOU rates may have a different profile for energy savings
  - If population you average over has all flavors, it comes out in the wash
  - Except what if you have one flavor that's really great, and one that is awful, and consumers can't really tell which one they are purchasing
  - For highly customized product, a particular flavor may not be available in a geographically or climate wise diverse areas.
- Related question: what types of software changes would constitute a “new product”



# Distinguishing products discussion

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- As much as possible, group flavors together to reduce testing burden. But maintain integrity of advice to consumers
- [very silent from providers]
- What about this idea that most and least energy savings need to meet criteria
  - Would need to know how to group flavors in order to define least and most energy savings
- For new product or significant update, would be very advantageous to be able to label at release
  - Can we grandfather? Anticipate? Or is this not possible at all?
  - Easier for new hardware; or software that retains features leading to energy savings



– In everyone's interest to make this possible

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# Distinguishing products discussion

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- Concrete question: Do any providers think they might need to have several products?
  - One provider: want to avoid different model differentiators, important company strategy point (simplicity part of DNA)
  - Believe it will be possible to avoid multiple products
- Can proposal for retail packaging labeling inform this?
  - For a consumer, purchasing hardware that has several services from different providers available would be similar to purchasing a product that has several options available from one service provider
  - Similar to the idea that some households will not save energy using a certified product
  - Perhaps distinguish only to the extent that differentiated messaging is possible





# Distinguishing products discussion

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- What is the market impact of a choice here?
  - If we average all, benefits providers to get customers enrolled in the most energy saving service options
  - This is a good thing

# Opportunity for small regional baseline study

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- EPA may have an opportunity to do a small study examining methods for setting regional baselines
- To get you started thinking about the proposal; not expecting reactions on the fly
- Will have 1:1 calls with vendors in coming weeks
- EPA itself would not run the study, such that it would be capable to have NDAs for data



# Thoughts on study design

- Choose area with ~20 zip codes, some expected to have lots of CTs, some not.
- Providers submit mean and uncertainty of mean for “comfort” temps in each zip code where they have > minimum # of customers (100? 500? 2000?)
- Average across vendors to derive baseline comfort temp in zip codes where all/most vendors have data
  - Average result for CT solutions, **not** average over households.
  - Avoids skewing by which providers has predominance of customers in area
  - Avoids submitting # of customers in sample
- Find simplest possible model (climate only?) to cover zip codes with little/no data
- Send results to providers for sniff test compared to those zip codes



# Regional baselines study discussion

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- What kind of public data would be taken into account in attempting to predict baselines for zip codes? This is the multivariate regression models.
  - Would require data from a diversity of zip codes
  - What would the public data sources be?
    - Fuel source would be a major factor
    - Forced air/ hydronic
    - Location within same climate
    - Housing type
    - Demographics may also be a factor
  - Key: these differences may be larger than differences between products
  - Small study should look for causal factors



# Regional baselines study discussion

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- Are there significant differences in zip codes within the same general climate (expected answer, yes)
- Good demographic data by zip code can be very hard to get – might need to use a larger area
- How many zip codes have good data anyway? Likely to skew urban.
- Are there other boundaries we can use that would stay within a climate zone, but align with divisions in demographic data?
  - Some utilities have good demographic data
- A few thousand zip codes with more than 100 Nest 'stats
  - 30 to 50 might even be enough



# Regional baselines study discussion

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- Can we come up with a plan to aggregate zip codes less populous areas?
  - Could be good to try to examine during an initial study
- Would we end up finding big differences between vendors in a single area? Clearest signals in extreme climates, not vacation homes.
- Proposal: Ask each vendor to identify the 500 zip codes where they have the most products in the field, and researcher looks for overlap between those, then asks for data for ~10 of them

# Contact Information

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Web site for these notes and all public discussion/comments:

[http://www.energystar.gov/products/spec/connected\\_thermostats\\_specification\\_v1\\_0\\_pd](http://www.energystar.gov/products/spec/connected_thermostats_specification_v1_0_pd)

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