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Low Power Mode Roadmap

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Webinar

Agenda

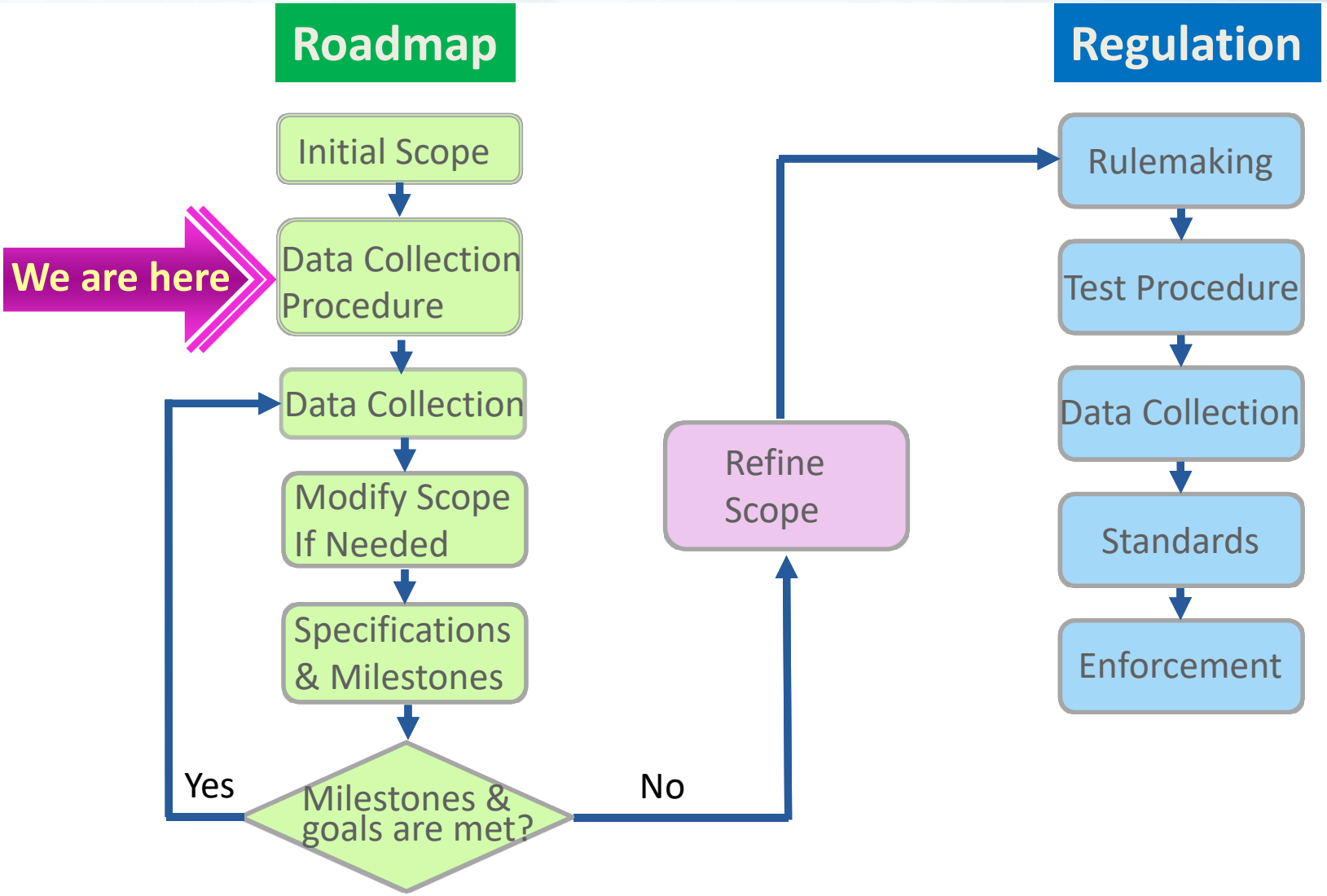
- Low Power Mode roadmap overview
- LPM roadmap versus LPM rulemaking
- Proposed scope
- Comments received for data collection procedure
- Summary and next steps
- Questions and Comments

Low Power Mode (LPM) roadmap

- LPM includes any mode or state other than “Active” mode.

- Active Mode: Device performing its main or primary function/task.
- Roadmap is a new approach to achieve energy savings.

LPM Roadmap Plan



Roadmap versus Regulations: Similarities

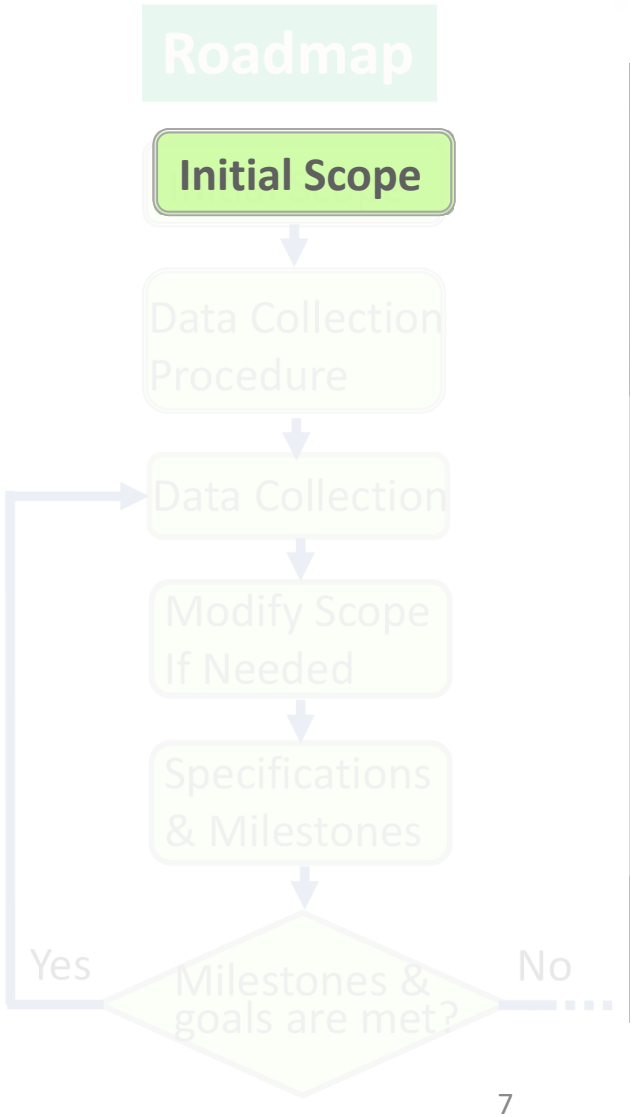
- LPM energy consumption limit with considerations for:
  - Energy Savings
  - Cost Effectiveness
  - Technical Feasibility
- There is a test procedure.
- Opportunities for public participation through process.
- Outcome is based on data and analysis that demonstrates energy savings.
- Approved by the Energy Commission at a public business meeting.

Roadmap versus Regulations: Differences

- Roadmap specification is voluntary. There is no administrative penalty.
- Roadmaps are not subject to federal preemption.
- Roadmaps can evolve more quickly.
- Roadmaps are more flexible.
- Roadmaps can identify and support non-regulatory activities (e.g., further research questions, funding opportunities, programs) that would support long-term efficiency improvements.

Initial Scope

- All electric and electronic products **except**:
  - Federally regulated appliances that already have low power mode standards.
  - California state regulated appliances that already have low power mode standards.
  - Appliances that are in other CEC roadmaps.
- Other exemptions may apply.



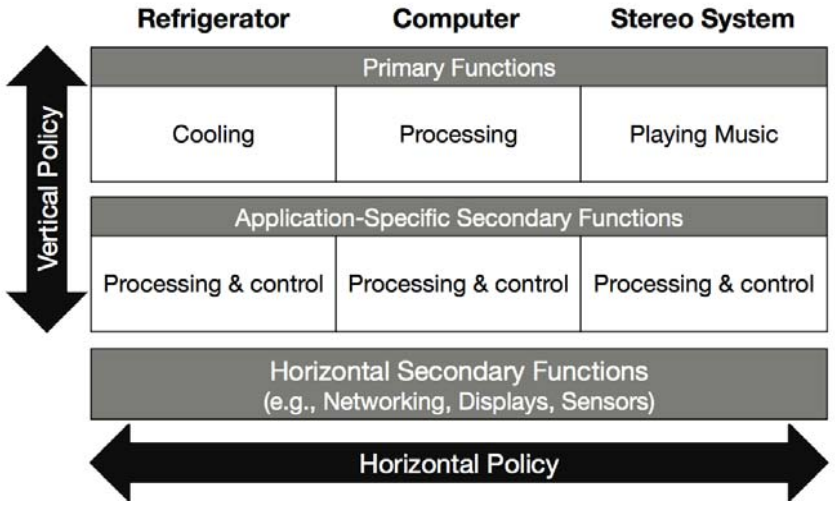
Energy Proportionality: Horizontal and Vertical Policy

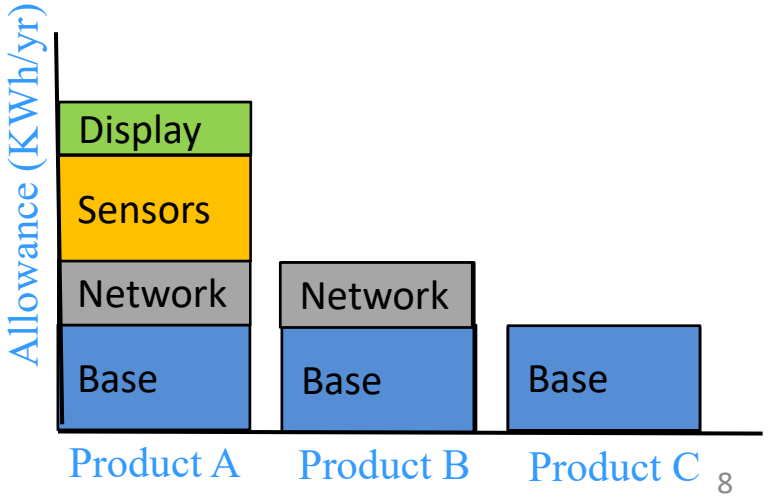
Horizontal:

- Group Products with similar base functions (secondary functions of the products).
- Establish a baseline energy for the group.

Vertical:

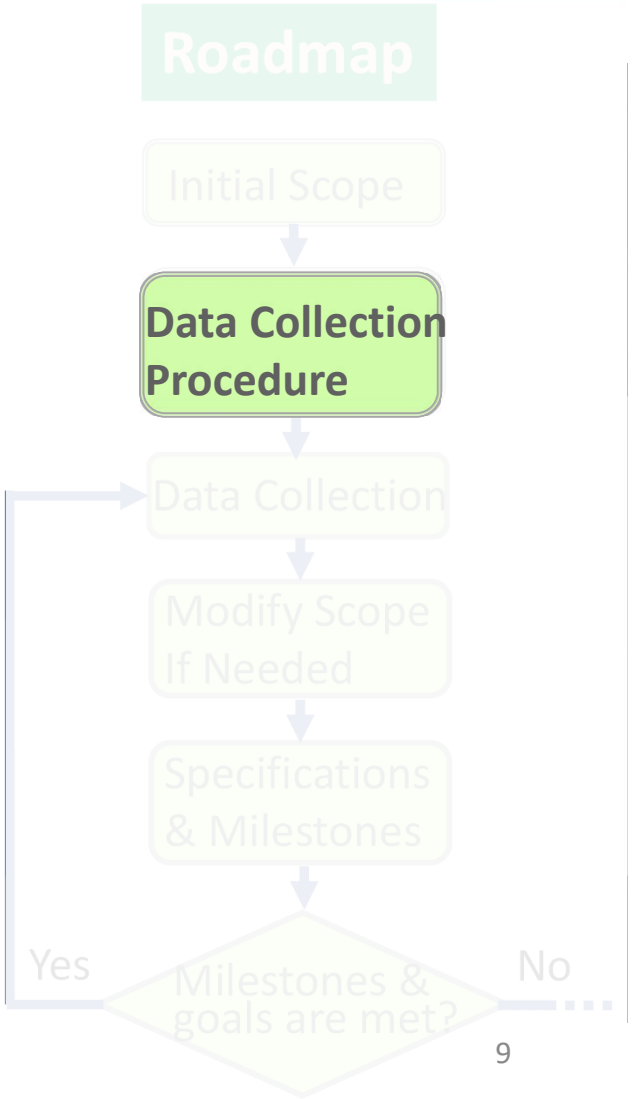
- Apply adders for specific functions other than the base function.





Data Collection Procedure: Objectives

- Common test procedure for a wide variety of products; break products into groups when absolutely needed.
- Test setups that are repeatable and representative of the real world.
- Measures power draw in an “idle state”—when products are not performing their primary function.
- Capture the power consumption of whatever secondary functions are present.
- Allow stakeholders to collect and submit comparable data.



Data Collection Procedure: Concept

- Energy Commission staff proposes common test procedure to collect data to characterize LPM power draw for a wide variety of products.
- Products don't necessarily need to have the same function in order to use a common test procedure.
- General approach:
  - Reference to national and international standard procedures and protocols, such as IEC63103, IEC62301, EN50643, Energy Star, etc. and;
  - Modify or add as needed to achieve the objectives (e.g., test setup conditions).

Data Collection Procedure: Request for Comments

- Energy Commission staff published a discussion document on LPM test procedure on June 20, 2018.
- The discussion document contained a proposed procedure for data collection along with a list of questions.
- Commission staff requested comments from stakeholders and public to fill any gaps in the proposed procedure in order to develop a consensus data collection procedure.
- Stakeholder comments due September 14, 2018.

Comments: Existing Test Procedures

Comments:

Product	Test Procedure
Networked edge equipment	EN50643:2018
Networked interconnecting equipment & Small Network Equipment	ETSI EN 303 423
	ANSI/CTA-2049
	EU Broadband Code of Conduct EU's Complex Set Top Boxes voluntary agreement
	Energy Star product specification for Small Network Equipment, V1.0
	IEC 62301:2011
Lighting equipment	IEC 63103 (Expected 2020)
Audio-visual (AV) Equipment	IEC 62087
Imaging Equipment	Energy Star product specification for Imaging Equipment, V2.0
Smart Thermostats	Energy Star product specification for Connected Thermostat Products , V1.0
Telephones	Energy Star product specification for Telephony, V3.0

- Commission staff will review these test procedures and refer to them where applicable.
- **Request:** Commission staff appreciates updates from stakeholders on progress and release of IEC 63103 and any other relevant test procedures.

Comments: Product Provisioning

"1.1 How should the product be set up for provisioning?"

Comments:

- Varies by product: perform initial system configuration as applicable.
- Test twice: Once without any updates, once with full update. Collect update time duration as part of the data collection phase.

- Commission staff clarifies that product provisioning takes place after the product has been set up per data collection procedure and a network connection is established (if required).
- **Request:** Commission staff requests feedback on specific product types that require more than 24 hours for system provisioning and specific product types that require less than 24 hours for system provisioning.

Comments: Testing State

"2.1 Defining the testing state"

Comments:

- "Disconnecting primary function" should be clarified.
- Rename LPM to be more reflective of its state and be inclusive of products without LPM. Examples: Standby, Long-inactive, Long-no input.
- Define Small Network Equipment (SNE), Edge Devices, Standby, Non-active, No-load, Off-mode, Off-State.

- Commission staff will look into these clarifications.
- **Request:** Commission staff requests feedback on the definition of the above terms.

Comments: Testing State

"2.2 Process for entering LPM?"
"2.3 Inactivity duration before automatically entering LPM?"

Comments:

- Proposed process for entering LPM may work.
- LPM state stability needs to be confirmed.
- Time to enter LPM varies by product; Examples: 15 min for printers, 30 min for lighting products, 20 min for most others.

- **Request:** Commission staff seeks data on time to enter LPM state by product type.
- **Request:** Commission staff seeks information on how halting the primary function in different ways can impact LPM power. (For example manually entering sleep vs. allowing the product to auto power down.)

Comments: Network Connections

"3.A Traffic content and levels"

Comments:

- Network traffic should be limited to what is needed to resume the primary function from its non-active mode.
- ENERGY STAR SNE's 0.5 kbps data rate upstream and downstream is an appropriate approach; ENERGY STAR SNE's 0.5 kbps data rate upstream and downstream cannot be extrapolated to all SNE and edge products.
- Inbound and outbound traffic requirements will depend on the device type and communication technique.

- **Request:** Commission staff seeks data on the amount of inbound and outbound traffic needed to resume the primary function for different product types and communication technologies.

Comments: Network Connections

"3.A Traffic content and levels"

Comments:

- Security or other similar services will vary based on physical interface/network and the nature of the data service.
- Look to IEC 63103 and EN 50643:2018 for guidance.
- Approach from EN 300 328 v2.1.1 (2016-11) is recommended.

- Commission staff will review IEC 63103, EN 50643:2018, and EN 300 328 v2.1.1 (2016-11).
- **Request:** Commission staff seeks data on the impact of security conditions on power consumption, such as password protection on a local area network (LAN).

Comments: Network Connections

"3.B Configuration Requirements: Wires and Wireless connections"

Comments:

- Ethernet cable's length has an impact on power use: recommendations from as short as practical to 10 meters.
- No need to test wired connections individually because the difference between the different connections is insignificant.
- WAN or other external network connections should be set up according to EN50643:2018.
- The procedure in 3Bi is from Energy Star and is outdated, instead refer to CTA2049.

- **Request:** Commission staff seeks data on the LPM power sensitivity to cable lengths of 10 m, 2 m, and <2m.
- **Request:** Commission staff seeks data demonstrating the power consumption of devices with wireless versus wired network connections.

Comments: Network Connections

"3.B Configuration Requirements: Wires and Wireless connections"

Comments:

- Data collection procedure needs to address all radio technologies.
- Edge devices do not require different instructions from network devices.
- Additional test conditions should include shield enclosures for wireless devices and external network connections.

- Commission staff agrees testing should be for all radio technologies.
- **Request:** Commission staff seeks feedback to determine whether edge devices can use the same setup instructions as network equipment.
- **Request:** Commission staff seeks data on showing the impact of shield enclosures on power draw and examples of test procedures that have this requirement.

Comments: Network Connections

"3.B Configuration Requirements: Wires and Wireless connections"

Comments:

- Several recommendations for distance between product and wireless router:
  - should not be determined;
  - should be specified by manufacturer;
  - should be specified in the test procedure;
  - depends on router technology and architecture.

- **Request:** Commission staff seeks data on the impact of the distance between product and wireless router on LPM power.

Comments: Network Connections

"3.B SNE-Specific Instructions"

Comments:

- ENERGY STAR SNE TM setup conditions are adequate.
- Use ETSI EN 303 423 for SNE setup conditions.
- Need to include provisions for products with functionality similar to SNE but that are not SNE (e.g. multi-function lighting).
- 3-phase input power requirements should not be added to the setup instructions.

- Commission staff will review IEC 63103 and ETSI EN 303 423 and modify set up instructions as needed.
- Commission staff agrees that 3-phase input power is not necessary.
- **Request:** Commission staff seeks information on what provisions are needed for products with functionality similar to SNE that are not SNE.

Comments: Sensors

"4. Additional sensors and environmental conditions to consider"

Comments:

- The test procedure should allow for new sensor technologies.
- Specify a "clean" wireless network environment (IEC 63103).
- Additional sensors:
  - Hinge/Gyro, presence detection, fluid level, rotational velocity, air velocity, aggregated or instantaneous power levels, air density, static air pressure, dynamic air pressure, contaminants, smoke, carbon monoxide, vibration, door or lid open/close detection
- For Wake on Voice, ambient sound of 50-55dBA as measured at the center of an array microphone.

- **Request:** Commission staff seeks information on new sensor technologies and data on the impact of available sensor technologies on LPM power.
- **Request:** Commission staff also seeks information on the impact of different ambient sound conditions on LPM power.

Comments: Charging

"5. & 6. Wired & Wireless Charging"

Comments:

- The proposed test method could work for some products, but for other products (such as lighting products) following IEC 63103 is recommended.
- Supporting the proposed approach.
- LPM should be measured without a charged product attached. A second test with the fully charged product connected may be conducted, but should not be considered LPM.

- Commission staff will review existing test procedures and modify the proposed setup instructions as necessary.
- **Request:** Commission staff seeks information on the impact of attaching a fully charged product on the power draw.

Comments: DC Powering

"7. What are appropriate DC input voltages? Other test conditions?"

Comments:

- Lack of measurement method for products that are generally installed by contractors and not shipped with cabling.
- Are Power over Ethernet (PoE) products in scope?

- **Request:** Commission staff seeks input for a measurement method for hardwired products where load and controls or other associated loads are on the same circuit.
- **Request:** Commission staff also seeks LPM data on PoE and other DC-powered products (including data on power draw and market share).

Comments: DC Powering

"7. What are appropriate DC input voltages? Other test conditions?"

Comments:

- Provide separate instructions for low- and high-voltage DC.
- Use manufacturer's specified input voltage for testing.
- Measurement instructions need to specify port if multiple USB-PD-Type C ports are present.

- **Request:** Commission staff seeks data on whether powering a product through its different USB-PD-Type C ports will impact its power draw.

Comments: Systems

"8. Testing instructions for systems that are powered separately from their system hub?"

Comments:

- Systems are never in standby; there are always some components within a system that are in non-standby mode to control those that are in standby.
- Conflicting recommendations on how to test systems:
  - For products that receive power and data from a hub, recommend subtracting power of hub from power of hub + product to obtain product power.
    - Should be constrained to 1 product per hub, and the hub/power source must be kept in some sort of identical load in the connected and disconnected state.
  - Products that receive power and data from a hub should not be obtained by subtracting power of hub from power of hub + product.
    - The internal state of the hub product may depend on whether the edge device is connected.

- **Request:** Commission staff seeks data on systems tested using a variety of methods.

Comments: Off Mode

"9. Review Proposed Definition and Clarify Instructions for Power Measurement."

Comments:

- Describe off mode as a state where everything/all features are off. In certain devices, off mode may only be accomplished by disconnecting from the mains power.
- ENERGY STAR for Imaging Equipment v2.0 definition for off:
  - "The power state that the product enters when it has been manually or automatically switched off but is still plugged in and connected to the mains."
- Off mode does not include a restorable mode by command, such as network signal.

- Commission staff will review suggestions and make recommendations for off mode definition.
- **Request:** Commission staff seeks data on the impact of the length of time for off mode power measurement.

Summary

- Roadmaps are non-regulatory based specifications.
- May convert to mandatory data reporting or standards if milestones not met or to prevent backsliding.
- Collaborating with stakeholders to establish a data collection procedure.
- Refer to existing test procedures and only add/modify sections as needed.
- Energy Commission is requesting information for additional questions in this presentation.

Next Steps

- Establish a data collection procedure.
  - Written comments in response to the additional requested information or any other relevant data or information can be submitted to the docket.
- Collect Preliminary data per data collection procedure.
  - Energy Commission also welcomes additional relevant data collected through more customized test procedures.
- Publish Staff Analysis of Scope and Potential Opportunities.
- Public workshop and comment.
- Revise staff analysis (if needed).
- Public workshop and comment (if needed).
- Energy Commission adoption of LPM roadmap.

Written Comments

Written comments should be submitted to the Dockets Unit:

Docket # 17-AAER-12

http://www.energy.ca.gov/appliances/2017-AAER-06-13/17-AAER-12.html

For instructions on how to submit written comments, refer to:

https://efiling.energy.ca.gov/GetDocument.aspx?tn=226317&DocumentContentId=57082

Written comments due date will be announced soon.

Thank You

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Questions & Comments?

- Type your comment in the chat box which will be read out loud.
- Use the raise hand feature to let us know that you have a question. We will unmute your line to speak.