

Results of Invitation to Participate: Network Equipment

2013 Appliance Efficiency Rulemaking
California Energy Commission

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Sub-Agenda

- ❑ Purpose
- ❑ Results
 - ❑ Responses received
 - ❑ Scope
 - ❑ Installed base and shipments
 - ❑ Modes of Operation
 - ❑ Duty Cycle
 - ❑ Power Management
 - ❑ Energy Consumption
 - ❑ Lifetime
 - ❑ Incremental cost of efficiency
- ❑ Next Steps



Purpose

- ❑ The Commission is gathering information to determine how to proceed with products listed in Phase 1 of the OIR.
- ❑ The Invitation to Participate (ITP) is an opportunity for stakeholders to inform the Commission's policy, direction, and process.
- ❑ ITP requests product, market, and other relevant information.
- ❑ During this session, we will discuss the results of the ITP for network equipment.



Information Requested

- ❑ Product Definition & Scope
- ❑ Existing Test Procedures
 - ❑ Across all modes
- ❑ Sources of Test Data
- ❑ Existing Standards & Standards in Development
- ❑ Product Lifetime
- ❑ Product Development Trends
 - ❑ Redesign Cycle
- ❑ Operations & Modes
- ❑ Energy-Saving Technologies & Features
- ❑ Costs
- ❑ Hardware
- ❑ Market Characteristics
- ❑ Market Competition



Responses

- California Investor-owned Utilities (IOUs)
- Cisco Systems
- Consumer Electronics Association (CEA)
- Information Technology Industry Council and Technology Network (ITI and TechNet)
- Natural Resources Defense Council (NRDC)
- Telecommunications Industry Association (TIA)
- Verizon



Scope

IOUs suggest harmonizing the scope with ENERGY STAR's draft small network equipment specification.

NRDC pointed to blurred lines between STB and Network Equipment where STBs are also wireless gateways/routers. Additional overlap exists with pay-tv infrastructure devices.

TIA, Cisco Systems, Verizon, ITI/TechNet suggested network efficiency should not be considered at all. TIA further elaborated that “enterprise and carrier grade” commercial equipment not be considered in this proceeding.

Discussion: None, stakeholders should use ITP feedback to determine what is and is not included in their proposals. A clear scope is one of the key characteristics of a good proposal.



U.S. Shipment Information

The majority of shipments and sales presented by stakeholders were for modems, routers, and gateways

- NRDC's comment estimates 135 million residential units installed in the US in 2013.
- The CEA comment estimates 136.8 residential units installed in the US in 2010.
- IOUs estimate 5.5 million units of residential network equipment to be purchased in California in 2013.

Discussion:

- What portion of these units are leased? Do all leased network equipment have pay-tv STB-like functionalities?



Modes of Operation

ENERGY STAR

- Various levels of On: idle, low data rate, high data rate

Discussion:

- Are there any missing important modes to properly characterize power scaling?
- Is true idle a valid state (0 kb/s rate)? Is this more representative of “disconnected” than idle?
- ENERGY STAR states are relative to data rate, are there other states that should be considered related to power over Ethernet (POE)?



Duty Cycle

Several estimates of network equipment duty cycles were provided to the CEC in response to the ITP:

- IOU comment: network equipment spends most its time in network-standby
- The CEA 2010 residential energy consumption report estimates that network equipment is almost always on, although points to a lack of an existing sleep/idle mode in equipment as the reason, not that they are actually idle or not.
- NRDC network equipment study assumes a 100% idle duty cycle

Discussion:

- Which duty cycle best represents average real world use for network equipment in the market today?
- Are the duty cycles for modems, routers, and gateways different?



Energy Consumption

- CEA 2010 residential energy consumption report estimates national energy consumption to be 6.4 TWh/yr
- NRDC's network equipment study estimates national energy consumption to be of the same equipment at 7.4 TWh/yr.
- The primary cause of difference is in estimated unit energy consumption

Discussion:

- There seems to be relatively little change in power and energy consumption in these devices over time. Is energy consumption in network equipment increasing, decreasing, or remaining relatively the same?



Lifetime of Network Equipment

- IOUs & NRDC: 5 years

Discussion:

- Is the lifetime of network equipment substantially different than a STB?
- Does 5 years seem like a reasonable lifetime for network equipment?



Incremental Costs of improved efficiency

Improved efficiency opportunities identified by ITP responses:

- Improved components
- Energy Efficient Ethernet
- Automatic power save delivery mode (APSD)

NRDC estimates \$0.00 incremental cost between an efficient 4.6W router and an inefficient 7.9W router with similar functionality based on analysis of retail costs.

Discussion:

- Do retail prices of network equipment correlate with the energy consumption for same-featured products?
- Does this incremental cost seem reasonable? If not, what should the costs be?



General Comment

Any other topics that stakeholders wish to discuss (if time allows)?



Next Steps

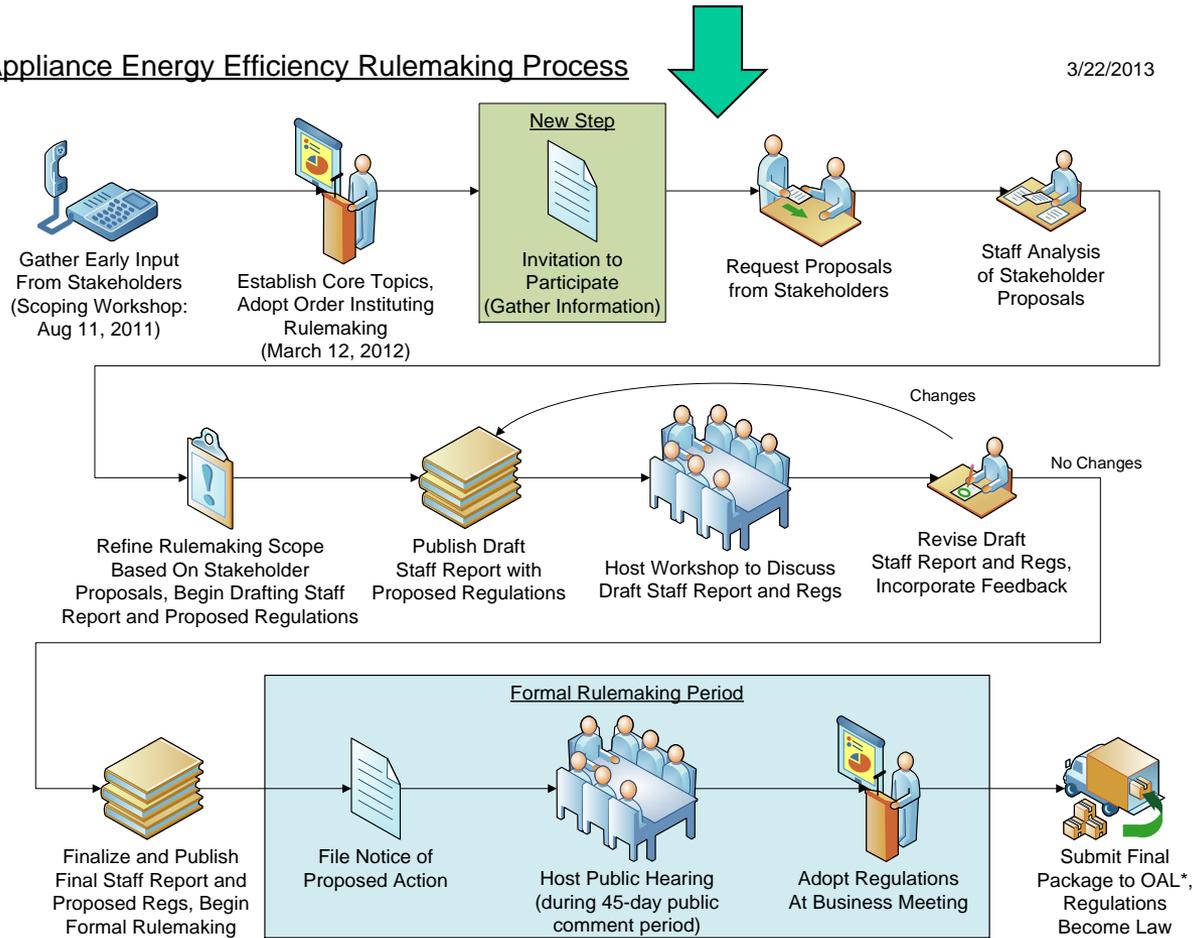
- ❑ Following the ITP workshops, the Commission will request proposals for new/updated efficiency standards or measures.
- ❑ Interested parties may submit proposals from **June 10 to July 25, 2013.**
- ❑ Proposal template and guidance is forthcoming.
- ❑ Commission staff are available to discuss questions and concerns at anytime during the proceeding.



Public Participation

Appliance Energy Efficiency Rulemaking Process

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Discussion & Comments

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