Results of Invitation to Participate: Computers

2013 Appliance Efficiency Rulemaking

California Energy Commission

May 29, 2013

Ken Rider
Appliances & Process Energy Office
Efficiency & Renewable Energy Division
Ken.Rider@energy.ca.gov / 916-654-5006

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 computers.

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)
- Consumer Electronics Association (CEA)
- Green Technology Leadership Group (GTLG)
- Information Technology Industry Council and Technology Network (ITI and TechNet)
- Natural Resources Defense Council (NRDC)

Scope

Existing Definitions for computers and form-factors in ENERGY STAR versions 5 and draft version 6.

Generally comments stated that the largest energy saving opportunities were in high volume laptops and desktop form factors

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 Computers

The CEA 2010 residential energy consumption report estimates an residential national installed base of 132 million portable computers (laptops) and 101 million desktop computers.

IOUs and NRDC estimate 66.5 million US shipments of computers (desktops and laptops) in 2012 based on an IDC report. The comment suggests a continual decrease in both laptop and desktop shipments. IOUs scaled the shipment data by GDP to estimate CA shipments.

Discussion:

- Is GDP scaling superior to population scaling for computers due to its use in the commercial sector?
- Are desktop and laptop shipments decreasing? If so what is the cause?
- Are there any concerns with either the CEA or IOU/NRDC estimates?

Modes of Operation

IOUs, NRDC, ITI supported alignment with ENERGY STAR

- Active state (includes idle states)
- Idle States: Long Idle, Short Idle
- Sleep Mode
- Off Mode (soft-off, not mechanical off)

Discussion:

- Are there any missing important modes to properly characterize power scaling?
- The ITI/TechNet comment states that newer computers are implementing alternate states to traditional ACPI states, how is this effecting the market and energy consumption?

Duty Cycle of Computers

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

- ENERGY STAR version 5.2 (tables 5 & 6)
- The CEA 2010 residential energy consumption report (table 3-18, and 3-28)
- IOUs suggested a new duty cycle estimate is needed

Discussion:

- Which duty cycle best represents average real world use for computers in the market today? Is a new set of duty cycles needed? If so, for both residential and commercial computers?
- Are there expected features or trends that may significantly change the duty cycle of computers?

IOU Duty Cycle Table

Table 2. Assessment of Duty Cycle Literature

	Desktop			Notebook			Date	Segment	Sample size	Methodology
	Active-idle	Sleep	Off	Active-idle	Sleep	Off				
PG&E / Barr, Harty & Nero	94%	1%	5%	63%	15%	22%	2010	Enterprise (Thin-client, Cross-sector, U.S.)	110,000	Automated tracking and collection.
Ecma-383, 3rd Edition, Annex B	50%	5%	45%	40%	35%	25%	2010	Enterprise (International, technology companies)	500	?
Microsoft, Customer Experience Report	41%	5%	54%	27%	9%	6%	2008	?	75,000	Automated tracking and collection.
Pigg & Bensch	49%	51%		29%	71%		2010	Residential (Wisconsin)	81 computers in 50 homes	Automated tracking and collection.
Fraunhofer / CEA	39%	25%	36%	33%	25%	42%	2010	Residential (U.S.)	1,000 homes	Phone survey
Chetty et al.	75%	25%		36%	64%		2009	Residential (U.S)	59 computers in 20 homes	Logging, surveys, interviews

Power Management

- ENERGY STAR requires power management to be enabled as factory settings
- The CEA 2010 residential energy consumption report estimates approximately 30% of computers have power management disabled.
- Minnesota study of home computers, QDI study of enterprise computers, PIER study of office space plug loads suggests poor enabling rates of power management settings for computers.
- CEC is funding further power management study at UCI CalPlug

Discussion:

- Do a large percentage of computers transition from factory defaults to poorer power management settings?
- How should the CEC interpret these enabling rates relative to estimated duty cycles?

Energy Consumption of Computers

Many sources and estimates of computer energy and sub-component power consumption were received in response to the ITP:

- CEA 2010 residential energy consumption report estimates a large increase in national computer energy consumption from 2006-2010 due to increased usage and number
- IOUs, ITI/TechNet, and NRDC estimated a downward trend for unit energy consumption
- NRDC points to large variation in the energy consumption of computers in the market with similar features. One ENERGY STAR category ranged from ~150 kWh/year to ~750 kWh/year

Discussion:

- Will growth in sales and usage continue to increase energy consumption?
- Are such large variations in allowances necessary for programs such as ENERGY STAR?

Lifetime of Computers

Many sources and estimates of computer product life were received in response to the ITP:

- ITI/TechNet: Enterprise computers 3-5 years, consumer computers 1-3 or 3-5 years depending on warrantee and type of user
- IOUs: 4+ years for desktops, 2-3 years laptops

Discussion:

- Lifetime presented by stakeholders contain a large range, even 2-3 years is too broad. Should the average of these numbers be used? Some other weighting?

Incremental Costs of improved efficiency

Several stakeholders responded to the ITP with estimated manufacturing costs of efficient power supplies as defined by the 80 plus program:

- Moving from non-80+ to 80+: $7 (IOUs), $0.80 per 1% improvement
- Moving to 80+ bronze: $0.25 (GTLG), $2.35-2.70 (ITI/TechNet)
- Moving to 80+ Silver: $5.00-5.75 (ITI/TechNet)
- Moving to 80+ Gold: $1.00-$1.50 (GTLG), $9.15-10.50 (ITI/TechNet)
- Moving to 80+ Platinum: $1.00-2.00 (GTLG)

Discussion:

- There is a large discrepancy between cost estimates, what are the root differences in these estimations?
- GTLG suggests market momentum for 80+ gold, what is driving this transition?

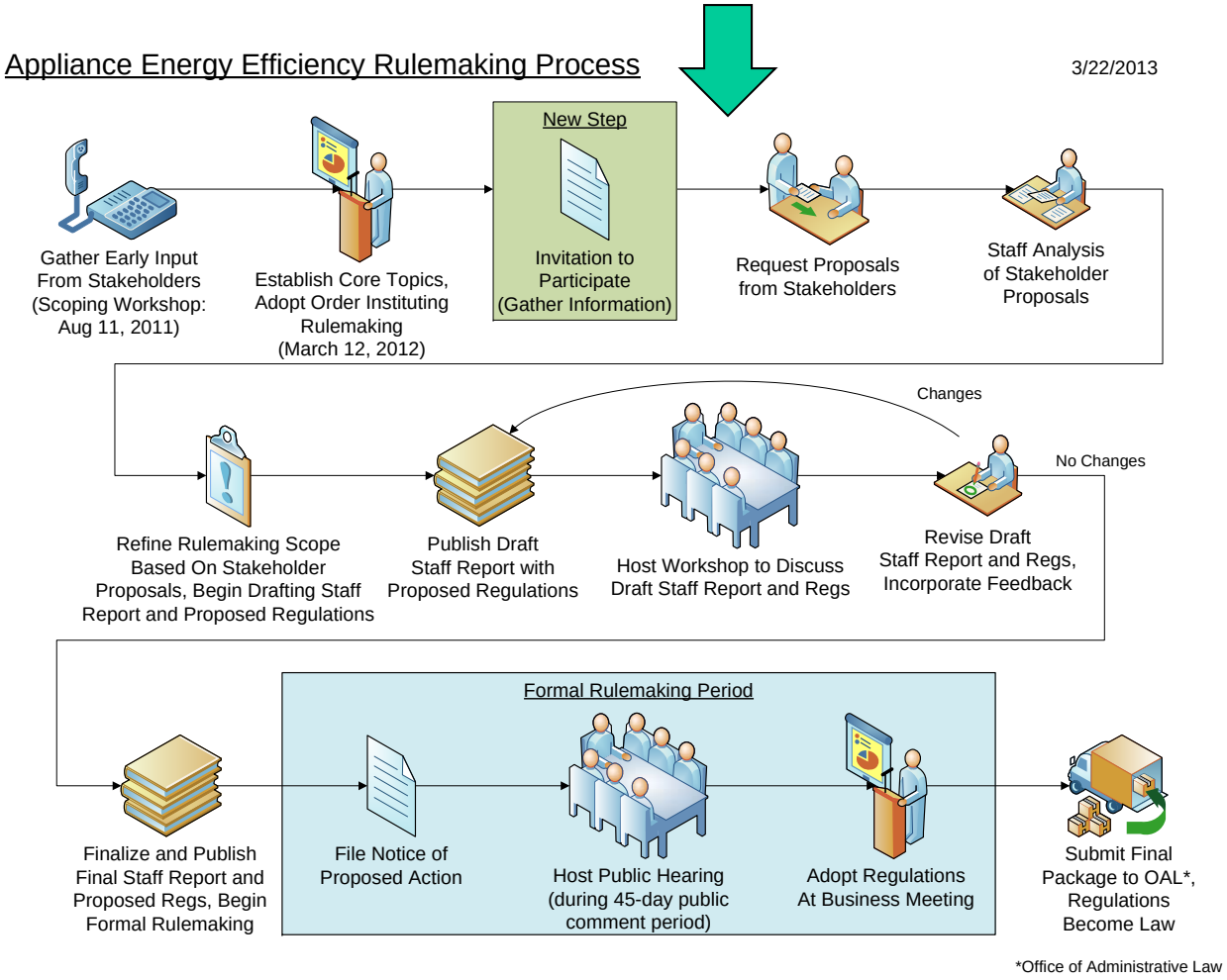
General Comment

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



Discussion & Comments

Ken Rider

Ken.Rider@energy.ca.gov

916-654-5006

Docket #12-AAER-2A

at docket@energy.ca.gov