DOCKETED

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Results of Invitation to Participate: Fans and Blowers

Phase II: Appliance Efficiency Pre-Rulemaking

Appliances & Outreach & Education Office

Efficiency Division

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California Energy Commission: Rosenfeld Hearing Room

July 19, 2017

Agenda

- Purpose
- Information Requested
- Responses and Discussion
- General Comments
- Next Steps

Purpose

- The Energy Commission is gathering information for Phase 2 products in its appliance efficiency rulemaking.
- The Invitation to Participate (ITP) is an opportunity for stakeholders to provide information and data that will help shape the Energy Commission's policy regarding Phase 2 appliances.

Purpose

- The ITP requested information and data on the following topics:
  - Commercial and Industrial Fans & Blowers
  - General Service Lamps
  - Spray Sprinkler Bodies
  - Tub Spout Diverters
  - Irrigation Controllers
  - Set-Top Boxes
  - Low Power Modes & Power Factor
  - Solar Inverters
- During this workshop, we will discuss the information and data submitted for Fans and Blowers.

Respondents to Invitation to Participate

- Air Movement Control Association International (AMCA)
- Air Conditioning, Heating, and Refrigeration Institute (AHRI)
- University of Illinois at Urbana-Champaign – Bio-Environmental and Structural Systems Lab
- Trane
- Cooling Technology Institute (CTI)
- Twin City Fan Companies, Ltd
- Appliance Standards Awareness Project (ASAP)
- Keith T. Lins
- Dale Price

Respondents to Invitation to Participate

- Morrison Products, Inc.
- The Greenheck Group
- Natural Resources Defense Council (NRDC)
- Sacramento Municipal Utility District (SMUD)
- Ebm-papst Inc.
- Acme Engineering and Manufacturing Corp.
- California Investor Owned Utilities (IOUs)
- Northwest Energy Efficiency Alliance (NEEA)

Information Requested

- Product Definition & Scope
- Existing Test Procedures and/or Test Procedures Under Development
- Sources of Test Data
- Existing Standards and/or Standards under Development
- Product Lifetime
- Product Development Trends
- Operations
- Energy-consuming Features
- Energy-saving Features & Technologies
- Control Features
- Market Characteristics
- Installed Base Characteristics
- Market Competition

Product Definition and Scope

- Definition
  - Some definitions were independently submitted to the docket.
  - Definitions to a draft ASRAC Term sheet were also referenced.
  - Reference to industry definitions.
  - Reference to definitions in AMCA 210
  - Reference to definitions provided in the U.S. Department of Energy (DOE) 3rd Notice of Data Availability (NODA)

Product Definition and Scope

- Scope
  - Test procedure and standard should include the following categories of fans:
    - Axial Cylindrical Housed fans;
    - Panel fans;
    - Centrifugal Housed fans;
    - Centrifugal Un-housed fans;
    - Inline and mix-flow fans;
    - Radial housed; and
    - Power roof ventilators
  - Fans greater than 1 Brake Horse Power but less than 150 Air Horse Power

Product Definition and Scope

- Scope
  - Reference to possible steps to follow in order to include fans embedded in non-regulated equipment.
- Scope Exemptions
  - California should exclude all fans agreed upon the ASRAC Term Sheet addressed on DOE's 3rd NODA.
- Consensus on scope to be those agreed upon in the ASRAC Term Sheet included in DOE's 3rd NODA.

Product Definition and Scope Discussion

- Most comments point to the 3rd NODA for the definitions and scope. Should California adopt the scope and definitions of the 3rd NODA and ASRAC Term Sheet? Why or why not?
- Could fans that operate under 1 brake horse power or greater than 150 air horse power be included in the scope? Why or why not?
- Should California implement a procedure to regulate fans embedded in non-regulated appliances?

Test Procedure

- EU ISO standard 12759-2010, which uses AMCA 205 is a standard used in EU and does not consider motor/drive influences and sizing.
- Consensus that AMCA 210 should be the test method for fans and blowers.

Metric

- The EU standard uses the Fan Efficiency Grade (FEG) and Fan Motor Efficiency Grade (FMEG). One does not consider for motor/drive influences, and the other does not consider sizing.
- AMCA 207 and 208 uses a Fan Electric input Power (FEP) to calculate a weighted Fan Energy Index (FEI).

Metric

- In addition the following two metrics were suggested:
  - Cubic feet per minute per Watt for agricultural purpose fans.
  - The Best Efficiency Point Metric (BEP) based on the average of three points as per the first DOE's NODA.
- The majority of the comments received have consensus on the Test Procedure and FEP/FEI Metric discussed in the 3rd NODA.

Test Procedure and Metric Discussion

- Is there data that supports a CFM/Watt metric better than the FEI metric? Could FEI also make sense for agricultural purpose fans?
- Should California develop a different metric for agricultural purposed fans? Why or why not?
- Is there data supporting that a BEP metric will provide a better basis for a standard?

Sources of Test Data

- California has glanced and there is consensus from commenters on the Test Data provided as part of the 3rd NODA.
  - Engineering Analysis
  - Government Regulatory Impact Model (GRIM)
  - Life-Cycle Cost Analysis (LCC)
  - National Impact Analysis (NIA)

Sources of Test Data Discussion

- How should California analyze the Engineering Analysis, LCC, NIA, and GRIM to be representative of California?
- Should California use a simple percent value from the data analyzed? If so, what percentage would be representative?

Existing Standards & Standards Under Development

- DOE has developed significant analysis presented in the 3rd NODA. This analysis demonstrates consensus around FEI as the metric for a standard.
- There is currently no efficiency standard for commercial fans and blowers.

Existing Standards & Standards Under Development Discussion

- Is it feasible to set an efficiency level higher than EL 3 for all fans? Why or why not?
- Should California incorporate the work already done by DOE through the 3rd NODA and all of what was agreed?
- Would a tiered standard be more beneficial to California?

Product Lifetime

- Per comments received and according to the analysis done by DOE the average lifetimes are:

Table 2. DOE estimates of average fan lifetimes

Fan type	Average lifetime (years)		
	All fans	Standalone fans	Embedded fans
Axial cylindrical housed	28	29	18
Panel	25	28	21
Centrifugal housed	21	27	18
Centrifugal unhoused	19	27	17
Inline and mixed flow	27	27	n/a
Radial	30	30	n/a
Power roof ventilator	30	30	n/a

Product Lifetime Discussion

- Can California use the 3rd NODA's LCC for the fans sold in California? Why or why not?
- Is there other data that negates or further supports the conclusion of product lifetime? If so, please provide it.

Product Development Trends

- No information was received on product development trends.
- California would like to understand the trends for the proposed fans.
- What research and development is necessary, if any, to comply with the proposed standards?

Energy Consuming Features

- No information was provided in regards to Energy Consuming Features for Fans and Blowers.
- What is the major contributor or the different contributors to inefficient energy consumption in Fans and Blowers? Is there supporting data?

Energy Savings Features and Technologies

- No Energy Saving Features comments were provided.
- The National Impact Analysis provides a minimum National Savings of 2.17 quadrillion Btu and maximum of 19.13 quadrillion Btu at efficiency levels (EL) 1 to 6 respectively.
- At EL 3, the savings would be of 4 quadrillion Btu.

Energy Savings Features and Technologies Discussion

- Should California assume a 12% share of electricity savings from national energy savings discussed in the NIA?
- Should California adopt a higher Efficiency Level than EL3 achieve a higher energy savings?
- Should California implement a tiered standard to provide a stepped increase in energy savings for California consumers?

Test Procedure Under Development

- Agreement on AMCA 210 as the test procedure developed to certify fans and blowers.
- Should California continue from the agreed 3rd NODA and conclusions agreed upon under the ASRAC Term Sheet? Why or why not?

Control Features

- There were no comments in regards to Control Features for Fans and Blowers.
- Should fan controls be implemented into a standard? Why or why not?
- Are all control features energy saving ones? Is there data to support such?

Market Characteristics and Competition

- No information was received in regards to Market Characteristics and Competition
- Should California use the Shipments and Shipment projections under DOE's NIA?
- What calculation should California perform to DOE's NIA for the shipments and shipment projections to be representative of California?

Installed Base Characteristics

- No information was provided on Installed Base Characteristics.
- What calculation should California perform to the DOE's NIA in order to represent the Installed Base in California?

General Comments

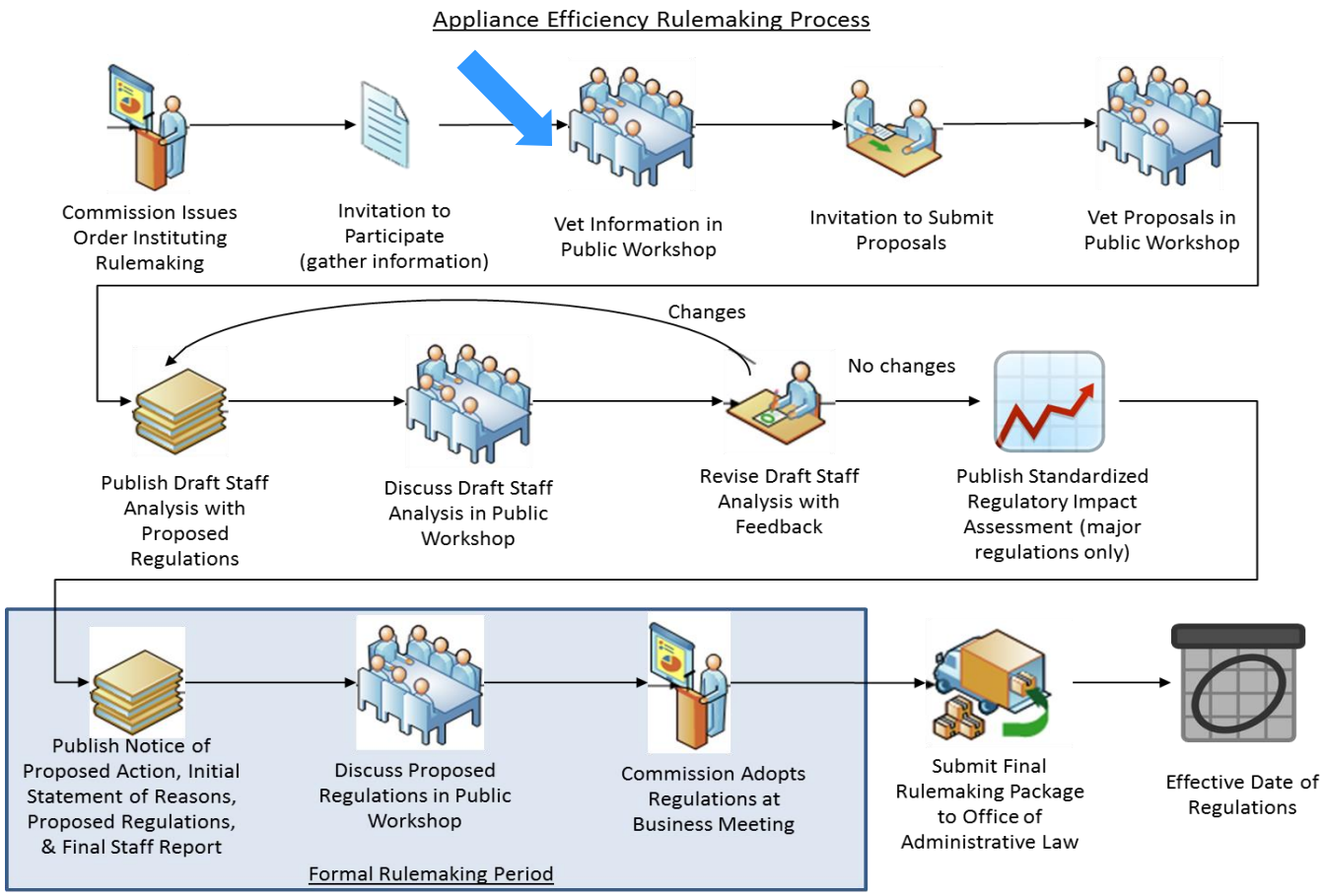
- Are there any other topics stakeholders wish to discuss?

Next Steps

- Following the ITP workshops, the Energy Commission will request proposals for efficiency standards or measures.
- Proposal Template and guidance is forthcoming.
- Commission staff are available to discuss questions and concerns at any time during the proceeding.

Public Participation

1/27/17



Discussion & Comments

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