DOCKETED

Docket Number:	17-AAER-05
Project Title:	Phase II Pre-Rulemaking
TN #:	220258
Document Title:	Presentation - Results of Invitation to Participate - Irrigation Controllers
Description:	Presentation for Irrigation Controllers by Ryan Nelson
Filer:	Ryan Nelson
Organization:	California Energy Commission
Submitter Role:	Commission Staff
Submission Date:	7/19/2017 9:45:13 AM
Docketed Date:	7/19/2017

Results of Invitation to Participate: Irrigation Controllers

Phase II: Appliance Efficiency Pre-Rulemaking

Appliances & Outreach & Education Office

Efficiency Division

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California Energy Commission: Rosenfeld Hearing Room

July 20, 2017

Agenda

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

Purpose

- On March 14, 2012, the Commission issued an Order Instituting Rulemaking to consider standards, test procedures, and labeling requirements for appliances.
- Staff held the Invitation to Participate (ITP) workshop May 11, 2017 to request information that will shape the Commission's phase 2 standards.
- Today we will discuss responses submitted during the comment period that closed June 16, 2017.

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

Respondents to Invitation to Participate

- California Investor Owned Utilities Codes and Standards Enhancement (CA IOU CASE)
- U.S. Environmental Protection Agency (U.S. EPA)
- Hunter Industries
- Irrigation Association - Smart Water Application Technologies (IA SWAT)

Information Requested

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

Product Definition & Scope

Information Requested

- How should products be defined and differentiated?
- What would be the scope for a water efficiency standard?
- What would be the scope for an energy efficiency standard?

Product Definition & Scope

Product Definitions:

- Weather-based irrigation controllers
- Soil-moisture-sensor-based irrigation controllers
- Traditional irrigation controllers (Time Clock)
- Add-on rain shut-off sensors
- Battery-operated controllers (Similar to traditional irrigation controllers)

Product Definition & Scope

DISCUSSION

- Are there any other references that define irrigation controllers other that those previously listed?
- What irrigation controllers should be included in the scope of a possible standard?
- How should a standard be structured and implemented?
- Additional Comments

Existing Test Procedures and Test Procedures Under Development

Information Requested

- Are there additional test procedures available?
- Are there new test procedures under development?

Existing Test Procedures and Test Procedures Under Development

Existing Test Procedures:

- IA SWAT: “Turf and Landscape Irrigation System Smart Controllers Climatologically Based Controllers: 8th Testing Protocol” (September 2008)
- IA SWAT: Turf and Landscape Irrigation Equipment Rainfall Shut-Off Devices Testing Protocol Version 3.0 (October 2008).

Existing Test Procedures and Test Procedures Under Development

Existing Test Procedures Cont'd:

- IA SWAT: Turfgrass and Landscape Irrigation System Smart Controllers SOIL MOISTURE SENSOR-BASED CONTROLLERS, Laboratory and Operational Tests, Version 3.0 (August 2011)
- U.S. EPA WaterSense: WaterSense Specification for Weather-Based Irrigation Controllers, Version 1.0, (November 3, 2011)

Existing Test Procedures and Test Procedures Under Development

Under Development:

- IA/ASABE S627: New test procedure under development. (weather-based and rain sensor shutoff)
- IA/ASABE is currently working on a new soil moisture sensor test procedure. It is currently in beta testing.

Existing Test Procedures and Test Procedures Under Development

- IA SWAT Website Product Test Results:
  - (2) Rain Sensors
  - (9) Soil Moisture Sensor Phase 1
  - (6) Weather Based

Existing Test Procedures and Test Procedures Under Development

DISCUSSION

- Are there test results available for the new IA/ASABE S627 test procedure?
- Are there test results available for the new soil moisture sensor test procedure?
- Are there any test procedures in development to measure standby active and stand passive power consumption for irrigation contollers?
- Additional Comments

Product Lifetime

- The CA IOU CASE team estimates that the effective useful life (EUL) of irrigation controllers is 11 years.

DISCUSSION

- Is 11 years reasonable for the EUL of the controller?
- What is the EUL for soil moisture sensors?
- What is the EUL for rain shutoff sensors?
- What is the EUL for onsite weather stations?
- Additional comments

Product Development Trends & Operations

- Are there new technologies coming to market?
  - Examples:
    - Wireless soil sensors
    - New types of controllers (combinations)

Product Development Trends & Operations

- The general comment is that irrigation controllers are advancing technologically by utilizing weather data, onsite soil moisture data, and rain shutoff sensors.
- Staff has found new wireless soil moisture sensors in the market.

Product Development Trends

DISCUSSION

- Are there product developments that would increase water savings?
- Are there product developments that would increase energy savings?
- Are there test results or research available for the new wireless soil moisture sensors?
- Additional Comments

Energy-consuming Features, Energy-saving Features & Technologies

- What features or options consume the most energy?
  - Low power mode & standby power consumption
  - Active mode power consumption
- Are there any other energy-saving features and technologies?

Energy-consuming Features, Energy-saving Features & Technologies

CA IOU CASE Team

- Reviewed studies that showed standby power ranged from 1W to 8W.

Staff Observation:

- There are many consumer products that have standby power draw of 1W or less.

Energy-consuming Features, Energy-saving Features & Technologies

DISCUSSION:

- What are the opportunities for reducing standby energy consumption for irrigation controllers?
- Additional Comments

Market Characteristics

- What are the yearly shipments to California?
- How many small businesses are involved in the manufacturing, sale, or installation of these products?

Market Characteristics

CA IOU CASE Team

- 18 weather-based controller manufacturers
- WaterSense Specification 2011
  - 67 labeled product in 2012
  - 153 labeled products in 2013
  - 400+ labeled products in 2017

Market Characteristics

U.S. EPA WaterSense

- Estimated 13.5 million residential lawn irrigation systems in the U.S. (2005)
- Industry estimates 10 percent use weather based controllers to schedule irrigation (2011)

Market Characteristics

Staff Stock Calculation:

Single Family Homes x % Homes with Automatic Irrigation= Homes with Automatic Irrigation

8,094,422 Homes *72% = 5,827,984 Homes with Automatic Irrigation

CALMAC: Andrew Funk and William DeOreo, Embedded Energy in Water Studies Study 3: End-use Water Demand Profiles, 2011

CAL DOF: California Department of Finance, E-5 Population and Housing Estimates for Cities, Counties, and the State, 2011-2016 with 2010 Census Benchmark, May 2016, http://www.dof.ca.gov/Forecasting/Demographics/Estimates/E-5/

Market Characteristics

Effects on Small Business In California

- CA IOU CASE Team
  - In addition to large manufacturers and distributors, small irrigation contractor businesses also play a role in the market, as these companies often provide the product to end-use consumers.

Market Characteristics

DISCUSSION

- Is 13.5 million systems a reasonable estimate of lawn irrigation systems installed nationwide?
- Is it reasonable to assume that California has 12% of those systems based on population?
- Is the staff calculation of 5.8 million irrigation systems installed in California a reasonable value?

Market Characteristics

DISCUSSION

- What is a reasonable estimate for current installations for each type of irrigation timers (or total installations)?
- How many of each type of controller are sold in California each year?

COSTS

- What are the retail costs per unit?
- How do costs vary and what are the incremental differences?
  - Number of zones controlled
  - Sensor inputs
  - Number of sensors included with the controller
  - Add-on sensors
  - Weather stations
  - Power supplies
  - Communication (WiFi, Ethernet, radio, cellular)

COSTS

Costs:

- U.S. EPA WaterSense:
  - Weather-Based Controller Cost: $240 per unit (2011)
- Staff Research:
  - Staff has found WaterSense labeled controllers for as low as: $36 (2017)

Discussion:

- Staff is interested in reliable cost data for irrigation controllers.

General Comments

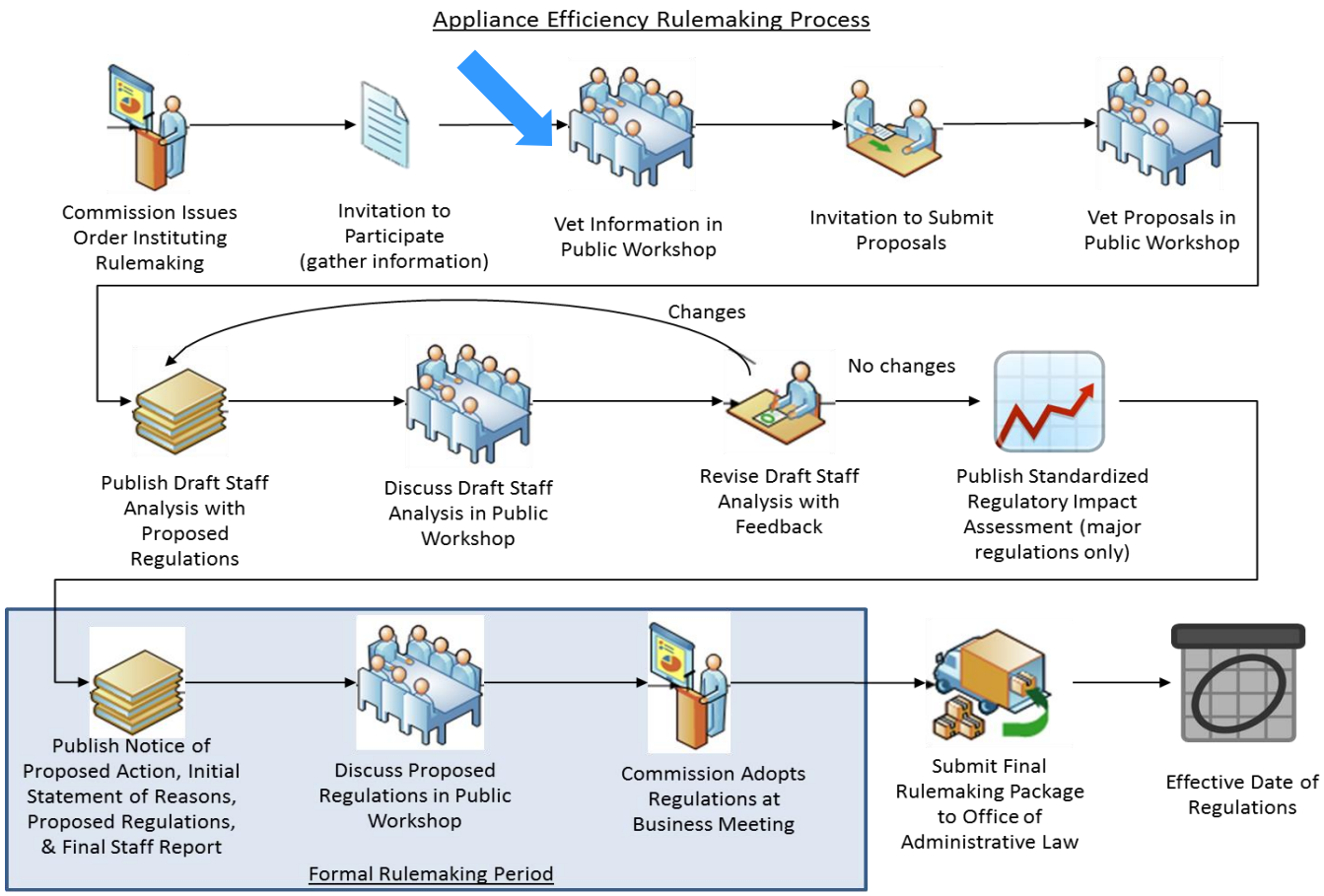
- Are there any other topics stakeholders wish to discuss?

Next Steps

- Following the ITP workshops, the Energy Commission will request proposals for efficiency standards or measures.
- Proposals are due by 5:00 pm on September 1, 2017.
- The proposal template can be found here: http://www.energy.ca.gov/appliances/2012rulemaking/documents/Appliance_Proposal_Information_Template.docx
- 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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Docket #17-AAER-10

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