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Key Questions for Setting Efficiency Standards and Labeling Requirements for Landscape Irrigation Equipment

Staff Technical Workshop

June 1, 2009

1. How do we define water "wastes", and how do these "wastes" occur in landscape irrigation practices? What are the different categories of wastes and strategies for mitigating them?

A. "Waste" is any water applied that can not be held in plant's root zone for transpiration. Any additional water applied and lost to runoff, deep leaching, and evaporation. This excess water is applied by system inefficiencies and improper irrigation schedules. An irrigation system is made up of many components and therefore there are many opportunities to improve efficiency. One method of improving overall irrigation system efficiency is to manage the controller with input from sensor data such as soil moisture status. This technology has the potential for savings by limiting watering based on plant demand.

2. How are landscape irrigation controllers, both weather based and moisture sensor based or add□on devices, expected to help reduce these wastes? How effective are they in actually reducing waste of water in landscape irrigation?

A. Soil Moisture or weather based controllers improve efficiency by limiting application of water by the controller portion of the irrigation system. Soil moisture managed system savings on the order of 20% to 65% are not uncommon with typical savings of approximately 25% to 35%.

3. Definitions of specific terms and equipment are required for any standards or labeling requirements. What are the applicable definitions for irrigation equipment, performance metrics and functions to be regulated? Are all the definitions used for the terms for this equipment agreed□to within the industry? If so, what is that terminology and what are the related definitions?

A. We would recommend that the CEC refer to the Irrigation Association's definitions along with the verbiage used in the state's Model Ordinance. This will establish some alignment in the state's efforts to have one voice and the manufacturer's need for clarity in meeting common goals.

4. How do we minimize water use increases and maximize water use savings with an efficiency standard for landscape irrigation devices? What performance

metrics must be included in such a standard (i.e., flow or application rate, pressure, net volume applied, duration, etc…)?
5. What measurements/protocols are used to verify these savings? Can these methods be applied to all types of controllers? If not, what adjustments must be made to more equitably compare different types of controllers? Sensors? Emitters? Valves?

A. In the case of smart controllers, or conventional controllers with add-on devices which allow them to perform like smart controllers, this is accomplished by adjusting the irrigation schedule based on sensor input. The scheduling of conventional controllers is highly subjective and therefore prone to over watering. There have been some efforts to establish testing protocols such as SWAT and EPA WaterSense. The performance metrics from SWAT seem reasonable and several manufacturers have completed the testing. Developing standards for additional irrigation component before January of 2010 would be very difficult and probably delay the standards for controllers and add-on devices.

6. Do we have definite measurements of efficiency or quantity of water and/or energy being saved by the use of either aforementioned controllers? How does this compare to add□on devices to traditional timers? Could standard or traditional timer□based controllers achieve similar savings? If so, how?

A. Many research reports and case studies are available from third party groups and manufacturers. Our experience is that soil moisture management devices that add-on to both conventional and weather based controllers improve efficiency by 25% or more. Of course the savings depends on how well the controller is programmed. A recent Smart controller study in California revealed that the group with the greatest improvement in water savings was the self installed and adjusted installations. This is consistent with our experience in that proactive landscape managers (homeowner or commercial) take the time to properly program and do fine-tuning adjustments. These individuals are the same people who can mange a conventional controller to surprisingly efficiency. The problem is that most users don't have a full understanding of how to schedule the controller appropriately. This is the reason why our add-on smart control devices improve efficiency.

7. Is there a common characteristic or operational element that can be defined between "smart" and "dumb" controllers that could be the basis of a performance standard for water savings? For energy savings?

A. A Smart controller differs from a "dumb" controller in that it is self adjusting to changes in plant demand. Energy savings would be based on the offset in extra energy consumed by the Smart controller.

8. What are the mandatory or required elements of an irrigation system to ensure increased efficiency?

A. The control system should be self adjusting to plant demand. The balance of the delivery portion of the irrigation system should meet minimum acceptable performance criteria.

9. Are new controllers or add□on devices compatible to existing irrigation systems? What difference in performance is there between new and modified systems?

A. Yes they are compatible with most systems. There would be no performance difference in the control part once modified, however some older distribution components may not be as efficient as newer ones.

10. Do we know whether the uses of the weather or moisture sensor based controllers (or add□on devices) would result in a statewide net saving of water use compared to current time setting or clock controllers? How much? What should be the minimum expected water savings and energy savings of an efficiency performance standard for controllers? Sensors? Emitters? Valves?

A. Yes, the amount of savings depends entirely upon how well the previous system was scheduled. A overall goal of 20% savings would be realistic.

11. What key elements or information are required for label content of landscape irrigation equipment (controllers, sensors, emitters, valves) to properly inform customers about potential of these devices to save water or energy? What content is required to ensure adequate understanding and installation to ensure desired performance? Where should labels be placed (on the device packaging, on the device itself, on informational documentation included with the device, etc…)?

A. The label should be a simple as possible and placed on the device itself. If the packaging prevents visibility to the label then an additional label could be placed on the package. It should state who the issuing party is and that the product meets issuing party requirements. The CEC could then provide the details of the various components requirements to the consumer via printed or online formats.

12. Is there adequate evidence to substantiate a specific standard of performance for all controllers? Sensors? Emitters? Valves? If not, what analyses or evidence is required?

A. Yes

13. The Energy Commission must do a cost benefit analysis as defined by statute. What costs should be used for a unit of water saved (i.e., current average statewide average cost per gallon; marginal cost of next increment of new water to statewide supplies such as ocean desalination, etc...)? What costs should be used for a unit of energy (i.e., current statewide electric or natural gas average cost per watt; marginal cost of next increment of new generation or natural gas supplies, etc...)?

A. The question is better answered by water and energy providers.

14. What is the expected average operational life of landscape irrigation equipment: controllers, sensors, emitters, valves? What is the design life of these devices (required information to evaluate costs to consumers)? What are the retail costs of these devices?
How are these costs expected to change over the next 10 years?

A. In reference to our sensor systems, studies have shown continuous operation for six years. We have seen some applications where the sensors are still in use after ten years. The devices range from $100 to $250 for residential systems. The selling price of our basic device has increased 8% in the past ten years. We would expect similar changes in the next ten years, inflation permitting.

15. AB 1881 requires the Energy Commission to prohibit the sale and installation of noncompliant equipment on or after January 1, 2012. How should the Energy Commission enforce the prohibition of the sale or installation of non□compliant devices? What partners should the Energy Commission collaborate with and what role should these partners play?

A. For permitted construction it can be enforced through the planning and construction inspection process. For other installations a public awareness campaign as well as a targeted awareness campaign for irrigation equipment suppliers could be developed. Partners could include building inspectors, water purveyors and business licensing officials.

16. Are there any special operational or regulatory considerations needed for systems that use recycled water?

A. No

17. What on□going data collection requirements are needed to ensure the compliance of regulated irrigation equipment with the standards?