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BEFORE THE CALIFORNIA ENERGY COMMISSION

In the Matter of:	)	
	)	Docket No. 16-OII-01
Water Conservation and Water Loss	)	
Detection and Control Technologies	)	
	)	

CALIFORNIA ENERGY COMMISSION

FIRST FLOOR

ART ROSENFELD HEARING ROOM

1516 NINTH STREET

SACRAMENTO, CALIFORNIA

TUESDAY, OCTOBER 11, 2016

10:00 A.M.

Reported by:

Peter Petty

APPEARANCES

Staff

Sean Steffensen, Energy Efficiency Division

Colin Corby, Energy Research and Development Division

Kevin Mori, Energy Efficiency Research Office

Leah Mohney, Appliances Unit

Virginia Lew, Energy Efficiency Research Office

Also Present

Max Gromberg, State Water Board

Todd Thompson, Department of Water Resources

Public Comment

Carissa Boudwin, Electro Scan

Richard Svindland, California American Water

Steve Birndorf, Valor Water Analytics

Michael Klicpera, Rein Tech

Jenna Rodriguez, Ceres Imaging

Bob Hitchner (via WebEx), Nexus eWater

Tanner Kelly, Aclara Technologies

Sofia Marcus (via WebEx), Los Angeles Department of Water and Power

Sue Mosburg (via WebEx), Sweetwater Authority

AGENDA

P R O C E E D I N G S

10:01 A.M.

SACRAMENTO, CALIFORNIA, TUESDAY, OCTOBER 11, 2016

MR. STEFFENSEN: This is the start of the Water Conservation and Water Loss Detection and Controls Technology Workshop at the California Energy Commission. Welcome today. So we'll be starting at 10 o'clock, and going through prepared presentations, followed by public comment.

So my name is Sean Steffensen. I'm a Mechanical Engineer with the Efficiency Division at the Energy Commission, and I want to go over a few a procedural items before we begin the discussion today.

There are bathrooms through the double doors and out to the right.

In case of an emergency, please go through the double doors. You can exit the building through either the right or left and follow Staff to the park that is across the street where we'll all meet up.

I will go over the agenda. We have a number of items today. I will provide an introduction to today's topic regarding eliminating water waste. Colin Corby and Kevin Mori will present work related to water conservation and leak reduction that is ongoing at the Energy

Commission's Research and Development Division. Max Gomberg from the State Water Resources Control Board will present on detection and reduction of leaks in distribution systems. Todd Thompson from the Department of Water Resources will present on Senate Bill 555 and leak detection.

After the presentations we will have comments and discussions, followed by next steps and conclusion. We will start with comments in the room, and then move to comments online and on the phone. If you are online, please use the raised hand to indicate you have a question or comment, or you may type your message in the comment chat box. Times are approximate, and we will move to the next topic without pause. The meeting will adjourn when we have received all public comments.

I want to briefly provide the background to why we are meeting today. California has been in a remarkable drought, this being the fifth year. We are here to gather ideas on eliminating water waste.

On May 9th, 2016, Governor Brown issued Executive Order B-37-16 titled Making Water Conservation a California Way of Life. The executive order lays out a broad initiative. I will quote in part the California Water Action Plan that calls for concrete measures and actions to make conservation a way of life and manage and prepare for dry spells, and this is in order to improve the use of water

in our state. The plan is broken into four parts, and the four parts are use water more wisely, eliminate water waste, strengthen local drought resistance, and improve agricultural water use efficiency and drought planning.

The plan involves the State Water Resources Control Board, the Department of Water Resources, the California Department of Food and Agriculture, the California Public Utilities Commission, and the Energy Commission as an Interagency Team.

As part of the eliminate water waste, the Energy Commission shall certify innovative water conservation and water loss detection and control technologies that also increase energy efficiency.

In response to the executive order, the Energy Commission adopted, in July, an Order Instituting Informational Proceeding to gather ideas on implementing the initiative. Staff has reviewed prior studies on the topic and performed outreach to stakeholders. Staff has also worked collaboratively as part of the inner agency team.

Today we ask for public comments and discussion at this workshop. Staff will review all comments and submit a revised draft to the Interagency Team to be incorporated into the Drought Executive Order Report, which is currently underway. There will be two additional opportunities to comment on this effort, one on November 7th for the draft

Interagency Report, and another on January 10th, after the final Interagency Report is released.

One of the roles of the Energy Commission is to undertake a public rule-making process to develop standards that improve the efficiency of appliances. A vital process is gathering information to show technical feasibility and cost effectiveness of the proposed standards. These two requirements are mandatory for an appliance efficiency rule making. Technical feasibility can be shown through surveying the marketplace for available technologies or technological trends to show the efficiency goal can be met by the effective date.

As a recent example, Staff reviewed showerhead flow rates as provided to the Energy Commission for manufacturer data. Staff used this information to set a proposed maximum flow rate. Staff could show through the data that well over 1,000 showerhead models were ready and available to meet the proposed maximum flow rate standard.

Cost effectiveness is shown by calculating the value of the water and energy savings. The cost is compared to the increase cost to the consumer for products that comply with the standard. The value of the savings must exceed the cost to the consumers for the proposed standard to be cost effective.

The next two slides introduce the discussion

topics that we hope to look into further today. We hope to identify and gather information on water conservation ideas. An increase in appliance efficiency means a decrease in water and energy usage, and therefore conservation. Recent Commission rule makings on low-flow toilets, urinals, faucets and showerheads will yield 150 billion gallons per year of savings for California when all of the stock is turned over.

Some questions to consider today are: What appliances provide an opportunity for water conservation through increased efficiency? What technologies would lead to water conservation by using water more wisely? What information would support the technical feasibility and cost effectiveness of these opportunities?

We hope to gather information on water loss detection and control technologies. I have shown a rough categorization of products and technologies. Distribution losses occur within the distribution system. What tools are there to identify real and apparent losses? What tools can detect background and unreported leakage?

I have identified a trend where devices are in development that employ unique approaches to identifying the types of water use to inform the homeowner or business owner of when and how water is used.

Additionally, there are devices that are intended

to be placed close to appliances to provide an alert if a leak happens. Under a dishwasher, clothes washer, water heater or faucet are locations where these products could be placed. The speakers after me will discuss in more detail approaches to leak detection and control.

So again, some of the questions are: What techniques can be used to detect and control leakage from distribution systems? What products could be used to identify leaks within a home or business? And again, what information would support the technical feasibility and cost effectiveness of these opportunities?

We are in a comment period right now. Comments may be submitted electronically at the link above or emailed to the docket. Hard copies may also be sent to the Energy Commission at the address shown on the slide.

For those of you on the phone, this entire slide package, as well as the other slide packages on the agenda, have been docketed and are available in the docket, 16-OII-01. Comments are due to the Energy Commission by 5:00 p.m. October 28th, 2016.

Thank you for your participation today. My contact information is shown here.

We will next proceed into the formal presentations, followed by an opportunity to receive comments from the public. I can take clarifying questions

on this presentation, but substantial comments and statements should be saved for the public comments following the remaining formal presentations. Thank you.

So at this time are there any questions or comments as to this presentations? Okay. Thank you.

I would like to next invite up Colin Corby from the Research and Development Division.

MR. CORBY: Good morning. Thank you, Sean.

Good morning, everybody. Welcome to the California Energy Commission. Thank you for joining us this morning. I'm Colin Corby. I'm a Supervisor in the Energy Efficiency Office, which is part of the Energy Research and Development Division. My contact information is on this first slide.

Here's a brief overview, quick overview of what I'd like to cover today. This is just a brief look at part of our research program and what relates to the water research. I'd like to look at the water and energy R&D background, our Electric Program Investment Charge, EPIC, and how it's water and energy related activities, examples of the water and energy R&D projects we've funded, and just a brief intro into our energy innovation showcase.

Okay, let's just make sure I get all the slides here.

Since 2000, we've been involved in water and

wastewater energy efficiency research. We currently have two funding programs. The first one is our EPIC program, Electric Program Investment Charge, which funds clean energy technology projects promoting greater electricity reliability, lower costs, and increased safety. We also have a Natural Gas Research and Development Program that funds natural gas related to energy research. As related to water, this is mostly having to do with hot water reductions.

We are also involved with a lot of water agency coordination, specifically through WET-CAT, which is the Water-Energy Team of the Climate Action Team, which is tasked with coordinating efforts to reduce greenhouse gas emissions associated with the energy intensity of water use, and of coordinating how such efforts to reduce the energy intensity of water use can help with efforts to address potential climate change impacts to water. WET-CAT focuses on information sharing to inform actions that help reduce energy intensity of water use.

Okay, Electric Program Investment Charge, or EPIC, and these are some of the water-related activities, and just a little history of a couple of our past solicitations.

Solicitation 15-327 (phonetic) was released in 2015 and was focused exclusively on water and energy efficiency, including consideration from better energy and

water projects. The purpose of this -- I'm sorry. The purpose of this solicitation was to fund advanced and innovative pre-commercial technologies to strategies that result in both water and energy savings and overcoming barriers to large-scale deployment.

Another purpose was to fund innovative and replicable approaches to accelerate the deployment of drought-resilient strategies, minimizing the need for new water-related energy infrastructure. Some of our targeted sectors for the solicitation include ag, industry, businesses, residences, local governments, water districts, and the disadvantaged communities.

The second one we released in 2016 was Solicitation 15-323 (phonetic). And the purpose of this solicitation was to fund advanced pre-commercial technologies and processes that would result in both air -- I'm sorry, both water and energy savings. And each application was to encompass at the demonstration site major reductions in onsite energy use through energy efficiency, and onsite water reuse, reduction and or production of water that would meet drinking water, water recycling, or onsite water use standards, which is Title 22. The targeted sectors for this solicitation include industrial, including food processing industry, water or wastewater facilities, commercial facilities, and disadvantaged communities.

Examples of our water-energy R&D projects funded, and these are types of projects, not specific, through our EPIC program we've funded the following types, energy and water management for industrial, commercial and agriculture sectors, wastewater treatment and reuse, treatment of degraded water supplies and reuse, and our latest one which I call it, Kevin will speak about it in a couple of minutes, is a leak reduction strategy. As these are all EPIC funded, all projects must show electric IOU ratepayer benefits.

We currently have one funding solicitation that does have some water elements with it. It's Funding Opportunity 16-305. For more information regarding this, you can please check our funding page on the Energy Commission website. We'll be glad -- you know, Kevin has a little bit of information about that, although we're not allowed to speak much about it, but it is out there. And proposals are due by October 21st, if you're interested.

And finally, this is our energy innovation page. This is new. For more information on our water research projects, or any other research we are working on, I ask you to please look at our energy innovation page. The website is listed. It has quite a bit of information on what we're doing, not only in water but in other areas, as well.

Do we have any questions at this time?

If not, I'm going to turn this presentation over

to my colleague, Kevin Mori, who will be discussing one of our newest projects, which is demonstrating leakage reduction strategies.

Kevin?

MR. MORI: Bear with me one second. Okay. All right. There we go. All right.

So good morning. I am Kevin Mori from the Energy and Efficiency Research Office. Today I will be going over our leak detection with American Water Works Company.

As you may know, nothing lasts forever. That includes our water piping infrastructure. This piping is aging and is reaching the point where the number of cracks in the system is increasing. Typically, leaks are only found when they reach the surface. American Water Works will be demonstrating three leak detection technologies that have the potential to find leaks that don't make it to the surface. These technologies will be compared to one another and evaluated for further improvement, cost effectiveness and reliability. The three technologies are correlating continuous acoustic monitoring, flow sensitive pressure reducing valves, and satellite imagery leak detection.

The correlating continuous acoustic monitoring system uses sensors attached to the fire hydrants to listen for vibrations normally caused by leaks. With these sensors installed throughout the water district, they will be able

to narrow down the location of the potential leak.

The flow sensitive pressure reducing valves will be combined with district metering to analyze the flow at night. A leak is detected when the flow system sees an abnormally high night flow. The system has a dual purpose and not only can it detect leaks, but can also reduce the pressure in the system to prevent leaks from getting larger.

Satellite imagery is the more vetted technology of the three and will be used to find leaks that reach the subsurface.

On this slide we have the four sites, and the technologies that will be demonstrated at each site. There's Coronado, Duarte, Ventura and Baldwin Hills.

If you would like more information, please don't hesitate to contact me after today's presentations. And thank you. If you have any questions, I'll be happy to answer any.

MR. STEFFENSEN: Hi, this is Sean Steffensen. I just had maybe one question where you could briefly discuss the schedule for the project?

MR. MORI: Currently, it hasn't started yet. But I think in maybe like a year or so they'll start installing the technologies at these sites.

MR. STEFFENSEN: Okay.

MS. BOUDWIN: Carissa Boudwin with Electro Scan.

I was wondering how you narrowed down to those three technologies for the project?

MR. MORI: It was not my decision, it was American Water Works. They found these technologies outside of the U.S. and thought they would be good for California.

MS. MOHNEY: This is Leah Mohney. I just wanted -- I'm the supervisor for the Appliances Unit. And I had formerly worked in the Research and Development Division.

These projects were chosen. It was part of an open solicitation where people had to submit their proposals. They had to meet a number of criteria. The ones that were scored above 70 percent were then considered, and they were awarded based on the quality of the technology, the quality of the research. And then awards were made based on the highest scoring proposals. So that's how that whole process works.

And as Kevin and Colin mentioned, if you look at the website, we do have a solicitation that is open right now, and there are a number of solicitations available. You can sign up for the listserv if you wish to be notified.

So that's how the projects were chosen. It was through a solicitation process.

MR. SVINDLAND: Hey, good morning. I'm Rich Svindland with California American Water, the local entity of American Water Works that's running this project.

My understanding is that we're in the process of signing agreements. It's, I think, in your court, soon to come to our court to sign. So we're trying to get this going pretty quick. And we're hoping for a kickoff in November-December.

MR. MORI: Yeah.

MR. SVINDLAND: So that's where I understood the project is. And I'm certainly -- if there's any questions, you know, feel free to ask me and I can answer them.

Yeah, we did partner with a national engineering firm to help put in the solicitation, and then we were successful in getting it.

Thanks.

MR. MORI: Thank you.

Any more comments or questions? Nope? Thank you.

MR. GOMBERG: Is it up? You guys are going to have find it. It's probably four. Thanks.

Good morning, everyone. I'm Max Gromberg with the State Water Board. And the State Water Board, as was mentioned, is one of the partners, along with five other agencies, including the Energy Commission, in implementing the Governor's Executive Order B-37-16 which includes the specific directive to the Energy Commission to certify innovative water loss control and detection technologies, which is why we're all here today.

So I just want to talk briefly about sort of where this fits within the context, not only of our work on sort of the water side of the house, but broadly in terms of California's energy and climate priorities.

So as was mentioned, you know, the Energy Commission does R&D through the EPIC program. And I think one of the things that we're going to find from -- or I'm hoping we're going to find from this collaboration with American Water is which of these technologies is really cost effective and can be scaled up. Because for those who aren't familiar with the water sector, we have over 400 large water agencies -- it's not like the energy sector where we just have a few utilities -- in the state, and they all have budgets for infrastructure, operations and maintenance. And we're sort of getting to the point where we are going to have a better understanding of what the loss rates are. But we know anecdotally from studies that have been done that there is probably a lot of water to be saved and gained through better application of water loss detection and control technologies.

So this is an issue that is not limited to California or even the U.S. It's one that gets a lot of international attention and has been a focus of efforts around the world in terms of fixing leaks and identifying them in distribution systems.

I just wanted to mention, you see three countries listed up there. We just met with a delegation from Denmark the other day that wants to do collaboration, particularly around water loss and technologies. And they actually have some people based in Palo Alto and Silicon Valley who want to work with us. So I'll be looping them into the CEC efforts here.

California, as part of our ongoing climate strategy, has MOUs with a number of countries, including Israel and Brazil. And those MOUs, in addition to the energy-focused aspects of the collaboration, include water. So we're really working, not only, again, at the state level, but even at the international level here in terms of some of our collaboration. And I strongly encourage the Energy Commission to make use of our international partnerships as it develops this certification approach.

You also see there a hyperlink to an article that was written a couple of years ago in the New York Times that sort of does a high-level review of what's going on internationally in the space. I think it's quite well done for sort of an overview of what the efforts on water loss are.

And then in addition to the state agencies represented here today, the Public Utilities Commission, through its supervision of the investor-owned energy

utilities, has directed in a couple of different decisions that those energy utilities, PG&E, Sempra, SDG&E as part of Sempra, and Edison, invest in water loss control in partnership with water agencies. And there have been some pilots showing that there are real and measurable savings to be had, both in the water and energy side of things, although the water side savings are the larger in terms of the benefits.

So Todd Thompson from the Department of Water Resources is going to speak after me and talk about implementation of SB 555 which is a bill that was passed last year and has a number of components. The component that the Water Board is responsible for is setting by 2020 enforceable statewide standards for water loss. So this is going to be something that actually ends up -- we're going to use the data that's being collected now, we're going to use the work that the Energy Commission does on the effectiveness of different technologies, as well as the economics involved, and come up with standards that, again, are going to apply to over 400 different public and private agencies that serve water to over 35 million Californians.

So in terms of what the CEC might be able to do here, I've listed some ideas. This is, I think, somewhat unique language in an executive order. It's not directing the CEC to specifically use Title 24 authority here. It's

directing the Commission to certify technologies. So there are a number of different ways that the Commission could go about that certification process or even define what that means. I've listed them sort of in order from highest level of work or intensity down to lower-level intensity in terms of what the Commission might do with the information that it receives.

But, you know, there's a certification approach that really gets in and sort of looks at and evaluates the effectiveness of every technology and ranks them

There's an approach that's more of a list of just what they are, how they work, what they do, how much they cost.

Then you've got, you know, parsing that down to like a cost effectiveness or a narrower approach that would look at just what the Energy Commission itself has funded and the effectiveness of those technologies. So these are just things for the staff and the assigned Commissioner's office to think about.

And then in terms of how will the rest of the state use the work that the CEC does. Here are some thoughts on that. We could tie these certified technologies to future financial assistance. We could rely on them and we will likely rely on the CEC work to inform the Water Board's ultimate standard-setting approach. And in

addition, the Utilities Commission and the Public Utilities Commission could base the CEC work in terms of future energy efficiency funding decisions for the investor-owned electric utilities. So again, just some ideas for the staff to think about.

With that, I'll take any questions.

Hearing none, I'll pass it off to Todd Thompson at the Department of Water Resources.

MR. THOMPSON: All right, thank you very much. My name is Todd Thompson. I am the lead for what was adopted as Senate Bill 555. It's related to the executive order, but not directly linked. So what I figure I'm going to talk about today is a little bit about water loss, what we're doing for SB 555, and some of the implications for some of the agencies that are involved, including urban retail water suppliers.

Yeah, okay, page up or page down? Let's see, I'll go down here. Oh, cool. Thank you.

So first of all, a little brief about water losses. Well, I mean, you know, water -- urban retail water supplier industry, water losses are inevitable. I mean, they've got miles of pressurized mains with laterals, thousands of connections, hundreds of valves and related pertinences, so water losses are going to happen. Basically what they want to see and what we want to see if that the

water losses are fixed where they make fiscal sense. And that's kind of the industry standard for us.

In terms of water losses, what are we talking about water losses? There's real water losses and apparent water losses. Apparent water losses are basically a lot of paper losses. It's where meters are inefficient, they're not registering properly, or where the water is being used, it's not being billed like theft, or water main flushing and things like that. Excuse me. (Clears throat.)

In the industry, generally water losses are addressed through audits, or in terms of where there are catastrophic emergencies, they're being addressed there, too. And urban retail water suppliers and wholesalers, for the first time we're required to submit audits as a part of their urban water management plans. So it's something that is coming forward. And Senate Bill 555 is -- oops, it went away -- is the next step for them.

It was chaptered in October 1st -- October 15th of 2015. It added a section to the Water Code that requires urban retail water suppliers to submit annual water audits that are validated annually. And it requires us to do the rule making for that, and we are doing that. And it also requires State Water Resources Control Board to provide some assistance, and DWR to provide assistance.

Actually, since I can do this, let's see, I will

start with that one, I guess.

So as I stated, the bill requires the urban retail water suppliers, and that is water suppliers that have more than 3,000 connections or treat and process more than 3,000 acre feet, so submit annual validated water loss audits. Those audits, they're specified to be the industry standard which is AWWA M36, which is entitled Water Audits and Loss Control Programs. And there's an associated software with it.

While a lot of urban retail water suppliers do have a good program, there are some that weren't doing it regularly. And so to some degree we're going to see urban retail water suppliers train some staff and do some certification.

For the State Water Resources Control Board, Max mentioned that there's performance standards that they're going to be working on. The bill requires performance standards no sooner than 1919 -- or 2019, excuse me. And so that's to get two full years of water audits so that they can base some data -- some -- the performance standards on data that has been submitted. They've also stepped up and they have what's called the Technical Assistance Program in cooperation with the California and Nevada section of AWWA. That program is where they are being, water agencies, and I think they've enrolled more than 300 water agencies, are

being trained on audits and validation of audits.

For the State Water Resources Control Board, we are writing regulations right now. We are establishing the standards for the audits themselves, which was specified in the regs but we're putting in regulations. We're establishing validation procedures for minimum standards. And a lot of that is coming our Georgia because they did a similar statute in 2010. And so they've got a little bit of lead on us in that way, so we're learning from them, although California is not Georgia, is what I'm being told.

We're doing technical requirements for validators. And the California-Nevada section of AWWA is stepping up to that. They're going to set up a certification program. They're already working on it, and so that's coming forward.

And then what else we're doing is we're making sure that we're clear on what's required for the submission of the audits, the validated audits, and what our review process will be in terms of when we look at them to see what is a complete submission, what's not, pretty standard regulation stuff.

In terms of technical assistance, we are looking at continuing our program at the regions where we have some water loss audit detection systems that we can lend out. And we're hoping to get some Staff time to be able to

provide assistance, in addition to lending out the equipment. And the statute says that we have to keep the standard up. So if the AWWA changes the standard, we will have to go back and change it in our regulations. That's straightforward.

Where we are to date on the process, we've had three stakeholder meetings. They've provided us great input. It's been primarily people from the water agencies, both private and public, with water associations, and also with environmental groups have all been participating in the stakeholder groups.

We're preparing to take the draft public here shortly. I don't know if we'll get it out by October, but November, certainly. Our deadline is -- the statutory deadline is January 1. It's going to be really tight for us to get there.

In terms of ramifications for leak detection, I think there have been retail water suppliers. The ones that weren't doing it are going to be doing it. It's going to be a higher level of attention to leak detection, and that will probably drive some detection control technologies, some demand in control technologies.

And with that, I think I'll take any questions you have.

MS. MOHNEY: This is Leah Mohney from the Energy

Commission.

Can you give us a little more information on what you mean by fixing leaks when it makes fiscal sense?

MR. THOMPSON: Well, in terms of the standard and what the audit software does is it looks at what is the cost of the loss with the cost of the source water? And that needs to be balanced with the cost of fixing the leak. It costs a lot of money to dig up the road, divert traffic, and fix the leak with professionals, and then repave it. And so that's all got to be balanced with the cost of the water that's actually being lost. And so that's kind of what I meant by that.

Yes, sir? Sure.

MR. BIRNDORF: Hi there. Steve Birndorf with Valor Water Analytics.

With 555 and the Water Audits 5.0 that are required, it's a very mass balance or level 1 type of analysis. And often times from what we've determined there are nonsensical or some negative numbers that come up. And, you know, the TAP program is really helping with that.

My question is: Do you ever consider or think about requiring level 3 or a bottoms-up analysis?

MR. THOMPSON: We are not considering that. The minimum right now is a level 1 for validation in looking at the data in the audit. And we are not looking at going

beyond that in the initial phases here. And it hasn't been discussed in the future either, yet.

UNIDENTIFIED MALE: But we might?

MR. BIRNDORF: You might? Okay.

MR. THOMPSON: Thank you. Great. Thank you.

MR. STEFFENSEN: Hi, this is Sean Steffensen of the Energy Commission.

That concludes the formal presentations from the state agencies.

I would like to now open it up to public comments. So I guess perhaps a show of hands of those in the room so we can see how many may plan to make a comment today, or presentation? And this doesn't -- you know, and later on if you want to make a comment, that's fine too. I'm just trying to see how many. So I'll -- yeah, we'll start with -- yeah.

And would you come up and we'll --

MR. KLICPERA: Hello. My name is Michael Klicpera. I'm a Patent Attorney and a California Attorney.

When I grew up in Northern California, we were required to put bricks in our toilet to reduce the volume. I don't know if some of you remember that or not. But we've advanced way beyond that.

California has also advanced in population. In

1980 we had 20 million people living here. Now we have 40 million. We're tripled -- or doubled the population in 35 years. There's a lot of pressure on our water resources due to that.

About 2000, I started really thinking about this and started a company called Rein Tech. It's a water conservation company, and it's a legit company, it's got shares and everything. We currently have eight issued patents and numerous patent applications associated with water conservation and leak detection within houses and corporations. Our assets include also, not just the IP, but we have a number of prototypes we've been working on. We're on our second-generation shower device and our third-generation prototype for whole-house water monitoring and leak detection.

How do I move ahead?

UNIDENTIFIED MALE: Page down.

MR. KLICPERA: So I'm going to kind of go through real quickly, because this will probably bore everybody, but this is kind of a description of all my patents I have. These are all issued patents.

This page basically starts out with shower patents, where I came in, in 2002 and stuff, started working on ideas for showers.

This other deal, I don't need to get into a

discussion on that.

My other issued patent is now called Water Use Monitoring Apparatus. These are devices that are specifically for use to monitor water within a house or a corporation and to watch for leak detection.

These are patent applications that are pending that are along the same lines.

We have an intelligent water meter that we are testing right now. It's basically located at the primary water supply with connection to either the water meter or near the pressure reduction valve. It communicates with a cell phone or similar apparatus for home or commercial review of total water use and leak detection. The system communicates with remote servers known as the Cloud. It can contact the homeowner or municipality of a leak condition by call, text or email. It can be programmed to automatically shut off the water supply upon detecting a leaking condition.

We are developing and have cell phone apps that we will display hourly, daily, weekly, monthly water use on a real-time basis. We have cell phone apps, that will be homeowner or corporate owner, that will turn the water supply on or off using a cell phone.

We have pressure sensor technology in our device that detects small leaks.

We also have patented optional water quality sensors, halogen, TDS, (indiscernible) solvents, hardness of pH, metallic ions, we know that's a problem in some of our cities, and (indiscernible) sensors for (indiscernible) bacteria, as well. That's all patented.

This is a drawing from one of my patents for whole-house water monitoring and leak detection. You can see that we have a municipality worker getting wireless information from the system. You can see also, number 44 is a cellular tower. Just important, line 52 is providing the homeowner or corporate owner with real-time knowledge of its water use or leak problems.

This is kind of another picture or diagram from my patent. You can see on the top of the cell phone, you can change the data from day, week, month or year. You have different wireless technologies on the side, which is Bluetooth, Wi-Fi or cellular. You can see the middle as like of a pie chart. That pie chart, we have found that with one or two sensors that we have in our system, we can identify what I call a water signature. We can tell when a washing machine goes on and off with our software. We can see when a shower goes on and off. We can see when the irrigation goes on and off. And our software will be able to give you data on that, that's on the Cloud that can be received by the municipality or the homeowner on a real-time

basis.

This is a leak detection. It kind of came up on my patent, as well. You can see that there's two little dots on the top that have to do with lights, if the valve is on or off. We have two soft buttons, on and off, to turn the water on or off. And we have a schedule. Some of us work 8:00 to 5:00. There's no reason to have the water on in the house. You can have that scheduled so that you leave for work, it automatically turns off. I've been doing this for years now. It does not cause a problem in my house.

We also have the system so that when you have a water leak and you have not turned your water off, it will send you a text message or email asking you if you'd like to turn your water off and stop that leak. Now anybody who has had a leak in their house knows it's not the water loss, it's the damage to the house that's significant, and the mold growth, as well.

This is a real app that we developed. It's not really significant, but it just shows you that we have real apps that we're working on. This is more for development of our system.

This is another picture, another drawing showing how we communicate from the remote control database -- remote control base station to the router, to the internet, and to the remote computer known as the Cloud.

Our software also picks up leaks in a very interesting way, sophisticated software. This is a pressure curve when you have no leak. This is a pressure curve that we get when we have a leaky toilet. It's 60 mils per minute. We know within five minutes that you've got a leaky toilet.

Our software can also detect pressure curves at 20 mils per minute, which is a dripping faucet, and we can pick that up, too, as well.

We are doing -- this is my contact information, but let me talk about a few things.

We are doing a home test site within a month where we're going to be doing a number of residences. And we'll be putting this intelligent water meter in those homes, and all the aspects I talked about will be implemented. So I will have data on that, probably in about, I'd say another three to six months, probably more than three months. And if somebody would like to see that data or talk to me about it, they can. Here's my contact information.

I have a website, by the way. It's on their too. And you can look at my website, as well.

Thank you very much. Any questions? Thank you.

MR. STEFFENSEN: Thank you, Michael.

I guess we do have blue cards at the front. If you could provide those cards to me, then we can take the

next person who would like to make a comment.

Is there anyone in the room that would like to make a public comment or ask a question?

(Colloquy)

MS. RODRIGUEZ: Hi. My name is Jenna Rodriguez. I'm Product Manager at Ceres Imaging. So I'll be focusing a little bit on agricultural water use efficiency. And just to give you a little bit of background about myself, I'm a recent PhD from Davis in hydrologic sciences where I was using remote sensing to make remote sensing actionable and applicable in ag water use. And I also worked at a GIS analyst at Gallo Winery on the side. So I also saw the industrial use or use of remote sensing in ag businesses.

So let me talk a little bit about Ceres and how we use aerial, so airplane-based spectral imaging to optimize water and nitrogen use, so using imagery specifically focused on water use, water deficits in crops, and nutrient deficits in crops. There we go. Okay.

So Ceres provides imagery as a service. And so how we do that, we contract pilots throughout California and Australia, the Midwest, and we're also branching out into Hawaii as of next week where we outsource our pilots. We build our sensors in-house and we use two-band and five-band camera systems, and bands meaning specific areas along the electromagnetic spectrum, so specific regions along the

light spectrum. And typically there's only been two bands used in the industry, the red and near infrared, to detect just basically photosynthetic activity. And we've gone a step beyond that to be specific to water and nutrient content.

And so what we do is we contract with pilots local to the area, build our sensors in-house, mount them on the airplane, as you can see in that picture there. And after we designate certain flight lines that our pilots fly over, they return back to us, we get the data, and within 24 to 48 hours we turn it back over to our growers as its gone through a rigorous analytics process. We have six PhDs in house from Stanford, Berkeley Astrophysics, David Hydrology, et cetera, that are processing this imagery. So it's an academically sound process that has also been validated with the UC Cooperative Extension.

So we're about a three-year-old company where we started out working with the cooperative extension to validate and use ground truthing to validate that imagery, ground truthing being pressure bombs for stem water potential and tissue samples for nutrient content.

And we have seen quite a bit of market success. We're actually over 250,000 acres now of flying. And we see anywhere from 30 to 3,000 percent return on investment with our growers. I left some of those slides out at the end,

but I'm happy to talk with you afterward if you want to go through that breakdown. That ROI completely depends on the year, the commodity, and the price for that commodity. So, of course, we were seeing a very high return on investments last year when almond prices were quite high, for example. So you might see a higher ROI on almonds or walnuts or grapes versus alfalfa or corn.

So we began as a drone-based company, and drones are very flashy right now and a very hot topic. Many growers have either experimented with it or know someone using drones. And with drones, one, it wasn't providing the price that we wanted to provide for our growers. We wanted to be in that $2.00 to $5.00 an acre price. And drones were $10.00. Some were sometimes upward of $20.00 an acre per flight, so very not cost effective for growers. Secondly, they were -- the platform is too small and didn't have enough payload to carry the larger sensors that we were building for more bands and thermal imagery.

On the flip side was micro satellites. Those are also popular. However, the further you get from the earth's surface the more opportunities you had for atmospheric contaminations, so aerosols, dust particles, things like that.

You also run into problems with your overpass repeat. For example, a landsat is a common platform that's

used, but you're stuck with a 8 to 16 day repeat. So if you miss that day, then you jump to 16 to 32 days overpass, and so on, whereas airplanes give us more flexibility on the timing, which is important for growers because we can time our flights with irrigation schedules or at specific times when they were intentionally stressing the plant that they wanted imagery for.

And lastly, it is very hard to get very tiny pixels when you're very far away from earth's surface. And so with airplanes, we do about 20 to 30 centimeter pixel resolution. And again, landsat is about 30 meters, and 100 meters in the thermal, so again, very large pixels.

Oops, what did I do? Okay.

So we serve all crop clientele. Right now we started in almonds and walnuts and pistachios, and that's how we validated our imagery. But now we do all perennial and row crops, and even some livestock patterns, working with growers anywhere from some being 30 acres, and some of our partners and customers being over 30,000 to 40,000 acres. So this imagery, there's no minimum acreage. We work with all growers.

I keep doing that.

So this is an important slide that I really want you to focus on. If there's anything that you walk away from today, it's from this slide.

So I mentioned those two bands as the industrial standard being the normalized difference vegetation index, the NDVI. And that's that center picture that we're looking at. So these three images are from the same flight over an almond orchard that we worked with, Blake Sanden at the UC Cooperative Extension, to validate our imagery. And this middle one is NDVI that shows canopy vigor. Sometimes it's called vigor. Sometimes it's called biomass. There's a lot of different names that you can call it. But NDVI is basically the photosynthetic activity and the vigor of the crop. And so what NDVI shows us is the status of the plant after recurring water stress, essentially.

And so on the left, it's going to be really hard for me to stay tied down to this microphone, but on the left we see the water stress where we have three irrigation sets going on. And you can see the blue-green areas being low unstressed, so no water deficits. You don't need to irrigate any more there. And so an irrigation cycle was occurring on that far left third on that water stress image.

And then there was a fertigation, so fertilizer and irrigation applications going on at all of these test blocks, these subblocks that you can see through the image. And so the water stress imagery pulls all of those out, if you can see that. If you can see all the tiny green dots through those areas, that's a very irregular pattern in a

normal crop. But the Cooperative Extension was doing this experiment, and we were able to pull out all those tiny blocks that you just could not pull out with NDVI.

So this shows proof of concept and the utility of this imagery for ag water use. This imagery is specific to water on the far left.

And then you move over to the far right. The chlorophyll content shows a different story. It's the nutrient content, validated by tissue samples in the crop. So sometimes they're correlated. So if you look at that maybe top left or top right-ish area you can see that you have some water stress and some nutrient deficiencies both occurring simultaneously. But you also see some of those low nutrient content areas also occurring at some different areas throughout the image.

So this imagery is the only imagery specific to water and nutrient stress on the market. Everything else, as I mentioned, has been NDVI or a variation of that index, using the near infrared and red bands.

So this is just a quick graph to show you the results of the ground samples on the Y axis, the measured stem water potential from pressure bombs with our model conductance. And those samples were being taken from April to August in 2014. So just showing the validation of our imagery.

And so this is what I really want to hone in on, is the applications of our customers in California, of the agri businesses in California, using this imagery specific to improved distribution uniformity. You want uniform irrigation going on through your field to minimize over-irrigation, and also maximize your yields.

And so this is one such example where you see some different patterns going on in this image. These very linear patterns that you see, the very cut and dry lines, that's attributed to breakdowns in irrigation infrastructure. So for drip irrigation, for example, here you have some -- you're not getting pressure delivered to a system. And you can see those very linear patterns attributed to that irrigation breakdown. So that's one example.

A second one is down in the southern block at the far left you see the same kind of linearity, except it's isolated more towards the outer area. And that's due to a lack of flushing the lines. You get a buildup of salts and sediments in your drip lines. And so often times growers might need to flush that to improve their distribution uniformity. And this is an aggravated example of that. Usually it starts out just one or two rows, and this has encroached into about five to ten rows on that almond orchard.

Lastly, you have a couple of amorphous patterns. For example, the very bottom block to the far right you kind of have this, again, amorphous. It's not really -- it's not linear at all, and that's attributed to soil heterogeneity. And I'll show you how we identify those soil issues, as well, in this data. But again, there's a lot of different factors that can cause this lack of distribution uniformity, and using this imagery to optimize water use, water applications for our growers.

So with that soils issue, as I mentioned earlier, we pull in the NRCS soil layers. And there is a little bit of a margin of error; right? You're not just stepping over the line and you see a change in your soil type. But those layers help us to identify problems in soil heterogeneity that can cause issues in irrigation.

And so we offer our imagery as a service, again, where when you log in this imagery is delivered via an app on your Android or iPhone, or you can log in online and look at this. And you'll get little pop-up bubbles where our agronymous in-house have identified these problems, and usually, typically, provide some sort of irrigation suggestion or soil amendment or something like that to improve your distribution uniformity and optimize your irrigation scheduling.

Lastly, another important use of this imagery

associated with ag water use and improving water use efficiency is strategizing where to put your ground measurement tools. So many growers that we're working with are using some sort of ground validations to help guide them with their irrigation scheduling and providing the right amount of water to their crops. But often times, soil moisture probes being the classic example, these probes might not be placed in an area that's representative of their soil type and crop water demands.

So, for example, that red dot, that soil moisture probe right there, if it were to be placed in an area that might be just be bright red that's maybe, what, two percent of the orchard, you would be overwatering the rest of your field or the rest of your orchard.

So we also use the imagery and growers use our imagery to help better strategize where they're putting their probes to optimize and get the right amount of water that they need to putting on, based on the crop that they're growing.

And also, with targeted sampling. So many growers also have a PCA or they're taking their own ground samples, like tissue samples or pressure bombs. And that helps them with strategizing where -- what locations they want to be grabbing these samples from, as well.

And so as we're completing our Series A funding

this month, we have a couple of next-generation products that we'll be launching, specifically geared towards water and nutrient use, one of them being our evapotranspiration mapping. So that will help tremendously with irrigation recommendations, especially using that high spatial resolution, 20 to 30 centimeters.

We've also been working with variable rate applications and smart tractors to help with linking our nutrient mapping, our canopy nutrient mapping, with applications, with fertilizer applications via tractor.

And, of course, mapping macro and micro nutrients is one of those Holy Grail items in remote sensing in general. And so we are, of course, working on that, as well. It hasn't been done yet in remote sensing confidently, but that's something on our roadmap.

And lastly, we're working with Patrick Brown and the University of California Cooperative Extension in yield modeling. And so that will be coming up in 2017, as well.

So if anyone has any questions, I might have gone a little bit over, on remote sensing and agriculture in general?

MR. STEFFENSEN: I had one question. Cost effectiveness is something that we look to, and need to speak something to the return on investment.

MS. RODRIGUEZ: Uh-huh.

MR. STEFFENSEN: Is the return on investment based upon a greater crop yield, water savings, or how does that --

MS. RODRIGUEZ: That's a great question.

MR. STEFFENSEN: -- how does that break down?

MS. RODRIGUEZ: That's a great question. So we incorporate all of those factors. So, of course, your price per acre foot of water is going to vary throughout wherever you're located. And so that will be one of those factors attributing to that large range on ROI, 30 to 3,000 percent. So it depends on your commodity price, almonds being much. So someone with almonds in the Southern San Joaquin Valley would have a much higher return on investment than someone maybe with alfalfa with the San Joaquin County, just depending on the price per acre foot of water and the commodity.

So, yeah, great question. And we do incorporate that.

MR. STEFFENSEN: Okay. Thank you.

Then we look around the room to see if there are additional public comments and questions on this topic? Okay.

So why don't we go to the comment on WebEx. Okay.

Bob Hitchner, we're going to unmute you. Would you --

MR. HITCHNER: Yes. Hi.

MR. STEFFENSEN: Hi.

MR. HITCHNER: Thank you. Yeah, I see that you unmuted me. This is Bob Hitchner with Nexus eWater. And we're an onsite water reuse company. And I wanted to ask a question, and I may have missed it, I think it was in Colin Corby's presentation.

I think there's a real need in all of this work that we do that we have better data on the energy intensity of water throughout the whole chain of events from, you know, pumping it out of the ground, transporting it long distances over mountains, treating it, and then sending it down to wastewater treatment, retreating it, and possibly then pumping it back upstream to be reused.

And I believe, and I may have missed this and that's why I'd like some confirmation from Colin, if he's able to give it, the only detailed work I've seen on this whole subject is about 12 years old when the Energy Commission did a really interesting and, I think, path-breaking study on the energy embedded in water. And it did look at the whole chain of events. But are we getting beyond that? Are we getting to the point where we can map the energy intensity in different parts of the state, based on where we are in the chain and how that water is being used? And would that capability be available for

understanding better how energy is embedded in water in different applications in California?

MR. CORBY: Okay. What we're looking at, the information regarding embedded energy and the water-energy nexus, a lot of that is coming out in our -- the second EPIC Investment Plan, which is running from 2015 to 2017. We state,

"The amount of energy used to collect, convey, treat and distribute water to end-users, and the amount of energy that is used to collect and transport wastewater for treatment prior to safe discharge," this captures the entire energy picture, both upstream and downstream at an end-use customer, and a lot of times this is not associated with a particular facility but with the water itself.

MS. MOHNEY: Previously, research and development was not -- I don't want to say not allowed, but it was not in our strategic plan to be able to allow the embedded energy in water to be counted for anything.

The second investment plan, which is what we're starting to roll out now, allows for research in using the calculations for embedded energy and water to be counted for something. So this is something new for us. There has been a lot of disagreement about how to measure the embedded energy in water because it depends on where the water comes from, whether you have to pump it up and over a hill, down

to the place it's going to be used. There are a lot of different issues with using the embedded energy in water. But it is something that we are beginning to look at in our research.

The third investment plan will be coming out probably later this year. And I'm not sure what's going to be in there, but water is something that we're beginning to be allowed to do research on. So we are looking at it but it's very complicated.

That was Leah Mohney, by the way.

MS. LEW: I'd like to make some comments. My name is Virginia Lew, and I'm with the Energy Efficiency Research Office.

And the first solicitation that Colin Corby mentioned where we did look at the embedded energy in water, we relied on the CPUC water-energy nexus calculator. And so they have a proceeding continuing on that. And so probably in the future, if we do want to quantify the embedded energy in water and take that into account we would probably look to the CPUC and their calculator.

Thank you.

MR. BIRNDORF: Hi there.

COURT REPORTER: Can you stand next to the microphone?

MR. BIRNDORF: Oh, sure. I'm Steve Birndorf with

Valor Water Analytics. And I had just a few short comments prepared. But as long as I have a few minutes, I thought I'd give a slightly more in-depth presentation.

But we do meter-level analytics for water utilities. We've been around since 2007. Our founder, Dr. Christine Boyle is a water economist, so our work is very rooted in economic analysis. Our primary goal is to quantify apparent water losses, and we do this from a bottoms-up perspective. We've won numerous awards, most notably recently the Imagine H20 Infrastructure Challenge, that was last year. And we are a certified woman-owned business.

We have a number of customers, primarily in California and the Southeast where water regulation is the most stringent. And we're looking at improving ways to satisfy the requirements of this regulation, and we believe we can help. We also are working with a number of large IOUs on both water loss, but we also do water-energy nexus work, so I just wanted to point that out.

I'm just going to speak very quickly about -- we have four products. I'm going to speak very quickly about Hidden Revenue Locator which is our apparent loss locator.

So as you may or may not know, apparent losses are a very significant problem for water utilities. It's very difficult to quantify and it makes up a significant portion

of retail water behind the meter. We found that (indiscernible) AWWA M36, it's typically a half percent to five percent of top line revenue, so it is significant. And again, it's retail water. So from a revenue perspective and a water conservation perspective it's critical, it's very important.

And what we do effectively is provide real-time analytics looking only at the data, so no physical measurements, other than what we get from the data from both CIS, the billing systems, and the meter data.

And I should also point out that we work very closely with AMI providers, advanced metering infrastructure, because the granular data down to a 15-minute interval becomes very important in making our algorithms better, more precise, and able to quantify both volumetric water loss, but also the revenue impact to a utility.

And I just want to quickly point this out, that this is one of our sample algorithms. For confidentiality purposes, I won't mention too much about it. But effectively what we do is we look at historical data and provide predictive analytics to determine what type of apparent loss is happening and what the magnitude volumetric and revenue impact is occurring.

We've seen some great results. This is one of our

customers from the Southeast. It's about 76,000 meters. And the punch line here is that we've identified about $1 million in apparent loss revenue, and that's on an annual basis. So this is revenue that was otherwise going uncollected. And again, these are apparent losses, water that is consumed but not billed for, paper losses in many respects. And you can see on a per-meter basis the value per meter per year is quite high, anywhere from about $10.00 on the residential side to almost $60.00 in commercial and industrial.

I should point out very clearly that these numbers will vary based on utilities which have very different cost structures, retail rates for water, et cetera. But these preliminary results give us a lot of confidence that there is value in the systems in apparent water losses.

And just quickly, to show you some of our dashboards, this is the output of our tool. So we look at all nine indicators. If we have AMI data, we can look at all nine indicators as identified by AWWA M36, this is a historical perspective of the different issues and indicators.

We also provide an executive dashboard. So we can actually, in this instance, this is a January 2016, and we can quantify at the indicator level volume discrepancy and revenue discrepancy. And this here, you can see that the

utility has undercharged about $83,000. There's some potential overcharges. But really what this is doing, it's not saying that these numbers are definitive, per se. It's saying that these are areas that you can look for and there are likely potential areas for revenue and water recovery.

And again, then we go down to the individual indicator level. And so this is leaks. We might look at meter under-registration, et cetera. And we can see that the information is prioritized in terms of volume and revenue impacts. The utilities can then streamline their operations to recover these revenues, and also satisfy the requirements of 555 or help with those requirements, per my previous question about a level 3 bottoms-up, and also help with to satisfy the requirements of Governor Brown's Executive Order.

What do we do? Revenue recover stability, regulatory status, satisfy regulatory requirements, and much more. But I will also point out the value of AMI and advanced metering infrastructure to helping these types of analytics. And we work very closely, as I said, as a package with AMI and data analytics.

So with that, I will say thank you very much for your time. We're very supportive of the work going on here. And we appreciate the opportunity to spend a few minutes to present.

Thank you.

MR. STEFFENSEN: Okay. I would like again to invite anyone in the room to make a public comment.

The gentleman in the back, please.

MR. KELLY: Hello. Good morning. Thank you for having me. My name is Tanner Kelly and I'm here today representing Aclara Technologies.

I wanted to take a moment to thank the Commission for considering some innovative water conservation and water loss detection technologies, and to express our appreciation for your leadership in employing some cutting-edge technologies to promote water conservation in the state, and the opportunity to speak here today.

Aclara Technology is an industry-leading company that works with more than 700 utilities worldwide, partnering with California communities to help them conserve water. We believe it's important to weigh in on the Commission's proceedings today because water leaks represent one of the most intractable challenges California faces during this historic drought.

Water leaks costs many cities as much as 10 to 30 percent of their water, while also wasting large amounts of energy. The EPA estimates that drinking and wastewater systems account for approximately three to four percent of energy use in the United States, adding over 45 million tons

of greenhouse gases annually, and account for 30 to 40 percent of total energy consumed by municipalities. Various studies show that approximately 56 billion kilowatts or $4 billion is used in providing drinking water and wastewater services each year, with the majority of the power used in potable water production being used for pumping.

Aclara AMI provides benefits beyond those available from older, automatic, drive-by meter-reading technologies that read meters, typically only monthly, just to support customer billing. The much more detailed consumption data provided by AMI can help reduce water use in many ways. A continuous flow of information from advanced meters, when combined with advanced data analytics, enables urban water suppliers to rapidly and precisely identify water losses and conservation opportunities.

Aclara ZoneScan technology allows water suppliers to rapidly pinpoint distribution system losses to within three feet of a water main leak, so that they can be fixed more quickly and at lower cost. This not only allows utilities to repair and maintain their systems, but can also be used to track trends and determine the size of leaks.

Aclara's STAR network has been deployed in California cities, including San Francisco and Huntington Beach. For example, in Leesburg, Virginia they used Aclara to reduce water loss there from 15 percent to 7 percent,

quickly identifying everything from service line breaks that were hemorrhaging water, to usage spikes that indicated problems like leaking toilets. The system paid for itself in less than five years.

Aclara AMI also encourages and enables customer conservation. Utilities using AMI can present regular usage information to users online. San Francisco consumers used to only see their water usage in a bill every two months. San Francisco's Public Utilities Commission now allows consumers to log onto their account and see their detailed usage for the prior day, and sends them individual communications if data indicates possible leaks.

AMI enables improved water pressure management of utility systems which consist of automatically modulating flow and pressure according to water demand, keeping pressure constant at service points.

Besides reducing leakage and bursts, smart pressure management lowers operating costs by reducing site visits and energy costs from maintaining unnecessary high pressure. Smart pressure management requires wireless communications, including sensors that measure pressure at critical points, software that analyzes the pressure at such points and calculates responses to achieve a desired pressure, and a controller device to prompt smart pumps or valves whose use can also save energy.

Aclara's technologies can also leverage existing gas metering infrastructure, eliminating some infrastructure and deployment costs. California's major gas utilities have already deployed Aclara, providing the umbrella infrastructure for a hybrid communication system that water utilities can use.

Harnessing existing networks can significantly reduce deployment time and allow rapid realization of conservation benefits. In these shared networks, Aclara technology is used to split meter reads for different utilities, lowering the cost of data collection. Aclara offers the technology needed to separate the collected data for each utility and provide the security to prevent comingling of each utility's data.

With these points in mind, Aclara Technologies looks forward to continue working with the California Energy Commission and municipalities to weather the state's water crisis and promote conservation today and into the future. We strongly believe that through powerful new tools made available through technology, together we can successfully make conservation a California way of life.

Thank you for your time.

MR. STEFFENSEN: Hi. I would like to invite anyone else in the room to make a public comment at this time.

If not, we can turn over to the WebEx.

If there is someone on the WebEx that would like to make a comment, would you raise your hand? Okay.

I would like to invite Sofia Marcus to make a comment.

MS. MARCUS: Hi. My name is Sofia Marcus from the Los Angeles Department of Water and Power. I just had a couple of clarifying questions. I notice on the executive order, it says for the California Energy Commission to certify innovative technologies, and I'm wondering what exactly that certification process will be. Is that something that you are planning to do prior to the January 2017 deadline or are you developing a framework right now that would go into the total framework in that January 2017 deadline? So maybe a little bit more clarification on that.

And then, also, I just wanted to put it out there that our utility has convened a Water Loss Task Force of around 100 of our own staff who work in several different sections, either with the Water Operations Division or Water Distribution Division, Customer Services. So they have come together and developed a list of actions based on what is cost effective for our utility to pursue. Some of these things will be smaller items that could be done within a couple of months to improve our data quality and improve our water audit. Some of the things will be pilot projects that

might be a multi-year process, for example, with pressure management starting to place pressure loggers, do pressure monitoring, do some modeling, and then determine what types of measures we could use from there.

So I wanted to put that out there as something that we're doing and that might be useful for this process. But also, I just wanted a little clarification on what exactly the certification process will be.

MR. STEFFENSEN: Hi. This is Sean Steffensen.

As part of the process that we're undertaking, we are part of an order instituting informational proceedings. The information that we gather today and through public comment through October 28th will be reviewed by Commission Staff, by myself, and will be useful in developing the approach to certifying those technologies for water loss and water conservation. So I think we need to review all the information. And then from there we can begin to develop what approach we will take.

I would like to invite Bernard from the WebEx to talk now, provide comment.

Hi, Bernard. We're unmuting you, if you would like to make a comment at this time.

I guess could we unmute everyone, in case there's someone who wants to make a comment, and just see if there's anyone else that wants to make a -- I think we're

approaching the end of the public comments here. So I want to, again, extend an invitation for anyone to make a comment at this time. So --

MS. MOSBURG: Hi. I have a question.

MR. STEFFENSEN: Okay. Would you identify yourself?

MS. MOSBURG: Sure. This is Sue Mosburg with Sweetwater Authority.

And first, thank you for putting the workshop agenda together. I guess I wasn't specifically clear on what the expected outcome of today was, so I do appreciate the information that's been presented.

I had a very quick question, which is there are several technologies out there. And is the result of the work that CEC is doing going to afford all of those different technologies an opportunity to have their value or information tested? And then what might be the timeline for the activities and the work associated with water loss control that are being undertaken?

MR. STEFFENSEN: Yeah, I think what I heard the question was, is what actions would the Energy Commission do to test various technologies?

We are at the very preliminary stages of this proceeding to gather information. I think we do need to weigh what comments we receive and what research we can

cover on this topic before we can begin to then describe to the public what our approach will be. I think that was the first question.

And then, I'm sorry, the second part of the question was?

MS. MOSBURG: The timeline for activity?

MR. STEFFENSEN: The timeline for activity, I'll just briefly show the implementation timeline on my package on the WebEx.

(Background WebEx conversations.)

MR. STEFFENSEN: I'm sorry, we're -- yeah, we'll take your comment in just a second.

I'm showing the slide four on the WebEx. It shows an implementation timeline where we are working with the Interagency Team to draft a portion of the Executive Order Report. That will be made public, and there will be a workshop on November 7th, followed by a final workshop on January 10th where the final report will be shown. So that's the timeline upcoming in the near term.

MS. MOSBURG: Thank you.

MR. STEFFENSEN: Okay. Thank you.

Is there another comment online? I believe there was a gentleman trying to comment earlier. Okay.

I guess we're reaching the end of the public comment here. Again, anyone in the room or online? If not,

I would like to thank everyone for coming today. This has been a very informational workshop. I'd like to thank the participation from the other state agencies, and from the Research Division. We will be gathering this information and reviewing it. It will become part of our report, as part of the Interagency Drought Report.

I would like to remind the participants today that comments are due by October 28th at 5:00 p.m. And that are three ways to comment, either at the link shown on slide eight to the Energy Commission docket, they can also be mailed or emailed. Only one item is -- or one way is needed. There's no need to do all three.

And I'll just end by showing my contact information. So I am Sean Steffensen with the Appliances Outreach and Education Office. And I can be reached at Sean.Steffensen@energy.ca.gov, or my phone number, (916) 651-2908.

Again, we look forward to any and all comments. Thank you. Okay. And this meeting is now ended.

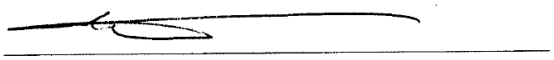
(Whereupon at 11:32 a.m., the meeting was adjourned.)

REPORTER'S CERTIFICATE

I do hereby certify that the testimony in the foregoing hearing was taken at the time and place therein stated; that the testimony of said witnesses were reported by me, a certified electronic court reporter and a disinterested person, and was under my supervision thereafter transcribed into typewriting.

And I further certify that I am not of counsel or attorney for either or any of the parties to said hearing nor in any way interested in the outcome of the cause named in said caption.

IN WITNESS WHEREOF, I have hereunto set my hand this 26th day of October, 2016.



PETER PETTY
CER**D-493
Notary Public

CERTIFICATE OF TRANSCRIBER

I do hereby certify that the testimony in the foregoing hearing was taken at the time and place therein stated; that the testimony of said witnesses were transcribed by me, a certified transcriber and a disinterested person, and was under my supervision thereafter transcribed into typewriting.

And I further certify that I am not of counsel or attorney for either or any of the parties to said hearing nor in any way interested in the outcome of the cause named in said caption.

I certify that the foregoing is a correct transcript, to the best of my ability, from the electronic sound recording of the proceedings in the above-entitled matter.

MARTHA L. NELSON, CERT**367

October 26, 2016