

Leveraging Ratepayer Programs to Cut Industrial Energy Use

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Webinar Panelists

Bruce Hedman	Institute for Industrial Productivity
Kim Crossman	Energy Trust of Oregon
Wendy McPherson	NYSERDA
Sandy Glatt	U.S. Department of Energy, Advanced Manufacturing Office

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Sean Esterly Hello everyone and welcome to today's webinar. I'm Sean Esterly with the national renewal energy and today's webinar is being hosted by the Clean Energy Solutions Center and also the institute for industrial productivity. Today's webinar will be focus on leveraging rate pair program to cut industrial energy use. One important note of mention before we begin today's presentations at betting Clean Energy Solutions Center does not endorse or recommend specific products or services. Information provided in this webinar is featured in the Solutions Center's resource library, as one of many best practices, resources, reviewed and selected by technical experts. Then I'd like to go over some of the features of the webinar platform that we're using. You have two options for audio. You need to listen to your computer or over your telephone. If you do choose to listen to your computer, please select the mic and speaker's option, which is in the audio pane and doing that will just eliminate the possibility of feedback and echo and if you're dialing in by phone, please select the telephone option in the audio pane and the box will display the telephone number and audio pane that you should use to dial it, and panelists, we just ask that you could mute your audio device while you're not presenting and if anyone is having any technical difficulties with the webinar's platform, you can call the helpdesk number at the bottom of that side and that number is 8882593826 and we encourage anyone from the

audience that has a question to submit those questions at any point throughout the presentations and you can submit your questions by going to the question pain and typing in and submitting it there and then we'll present those question to the panelist during the question and answer session following the presentations and if anyone is having difficulty viewing the materials to the webinar portal, we will be posting PDF copies of the presentation very shortly to cleanenergysolution.org/training and you can follow along with those and also an audio recording of the presentations will be posted to the clean energy solutions training pain within about a week of this project.

Today's webinar agenda is centered around the presentations from our guest panelists, Sandy Glatt, Bruce Hedman, Kim Crossman, and Wendy McPherson, and these extra panelists have been kind enough to join us today to look at industrial program design across the United States looking out what has worked well and what more can be done to improve the outcomes for regulators, industry, and also rate payers. Now, before the speakers begin their presentation. I just want to provide a short informative overview of the clean energy solutions and initiative. Then following the presentations, we'll have a question and answer session where the panelists will ingest questions amended by you, the audience, and end with some closing remarks and a very brief survey.

I just like to bite a bit of background and chance of how the Solutions Center came to be formed. The Solutions Center is an initiative of the clean energy ministerial and is important to a partnership with UN energy. It would launch on April 2011 and is primarily led by Australia, the United States, and others GEM partners. The outcome for that unique partnership includes support of developing country to enhance many resources with policies relating to energy assets, no complex, or policy systems and get a pair of learning and training tools such as the webinar you are attending to at and there's four primary goals for the solution. First goal is to serve as a clearing house of clean energy policy resources second goal is to share our policy best practices, data, and analysis tools specific to clean energy policies and programs, and third, the Solutions Center tries to deliver dynamic services that enable expert assistance, learning, and peer-to-peer sharing of experiences and then lastly, the center fosters dialogue on emerging policy issues and innovation around the globe. Now, our primary audience for the Solutions Center is the energy policy makers and analysts from government and technical goal organizations in all countries, but then we do also strive to engage would be private sector and also in the civil society. That's why we give an overview of one of the marquee features that the Solutions Center provides. It's asking expert policy assistance and the Ask the Experts program has established a broad team of over thirty experts from around the globe who are available to provide remote policy of bites in analysis to all countries at zero cost. So for example, in the area of industrial efficiency, we are very pleased to have Emily Goldberg, the North

American programs manager as an industrial productivity, serving as our expert. So if you have a need for policy assistance in industrial efficiency or any other clean energy sector, we do encourage you to use this useful service. Again, this assistance is provided free of charge to those requesting it. In two of our quest assistance, you need to make your request by registering to our Ask an Expert feature at cleanenergysolutions.org/expert and we also invite you to spread the word about this service load to your networks and organizations.

So in summary, we do encourage you to explore and take advantage of the Solutions Center resources and services including the Ask an Expert policy assistance, the database of clean energy policy resources, subscribe to the Clean Energy Solutions Center newsletter, and participate in more webinars like this.

And now, I would like to provide a brief introduction for today's distinguished panelist and our first speaker today is Sandy Glatt, a project manager, at the US Department of Energy in the advanced energy office, and ten years responsible for the development and delivery of programs in the area of industrial energy efficiency focused primarily on developing partnerships with state local and regional energy efficiency organizations as well engaging utilities and the delivery of affective industrial energy efficiency programs and resources, and following Sandy, we will hear from Bruce Hedman, the technical director at the Institute for Industrial Productivity and Bruce has over 30 years of experience in industrial energy technology research, and development in commercialization. Now, our third presenter today is Kim Crossman, and Kim is in industry and agriculture sector lead at the Energy Trust of Oregon and as a developer and manager of efficiency and the renewable energy products and programs, Kim Crossman has been providing clean energy solutions for industrial institutional enlarged commercial businesses for 15 years, and our final panelist today is Wendy McPherson, a senior project manager in the process powered glass tech group at the New York state Energy Research and Development Authority, and so with those introductions, I like to welcome Sandy to the webinar.

Sandy Glatt

Thank you very much Sean and I do want to start out by offering a quick caveat that there is an additional organization that is involved in supporting this webinar and that is the state and local energy efficiency action at work at see action that work, which I'm going to provide a brief introduction to all of you with today. I'm very thrilled that we're having this webinar. It's an opportunity for the c-action that work to introduce our newest resource from our industrial energy efficiency and CHP working group, which is a document entitled industrial energy efficiency designing effective state programs for the industrial factor and the content of this webinar will include an overview of the document and then two other presenters, we will provide examples of their actual programs that are highlighted in the document and we think this is going to be informative. I provide some great insight into the work that we've done to create this

document and hopefully continue to excite folks in the realm of designing and delivering programs for the industrial sector.

So next slide please? And the next one?

So the C-action at work is an activity that is facilitated at by both the Department of Energy and the Environmental Protection Agency and it builds on the activities that many of you may be familiar with the National Action Plans for energy efficiency. It compels of a network of over 200 participants focused largely at the state and local level policy makers specifically and others who work in the space of energy efficiency with the goal of bringing all cost-effective energy efficiency to scale. It is focused on providing best practices and recommended approaches on key program and policy areas primarily based on the state and local experience so it is not [Indiscernible][00:08:53] co-sponsored by federal agencies that is not focused on federal activities. It is actually focused on state and local activities. The size of resources that are produced through this effort are guidance documents, training, dialogues, workshops, events, various forms of technical assistance, and the goal is to achieve all cost-effective energy efficiency by 2020. We are working within the EE space maximize the renewable energy space, the build environment versus transportation and as mentioned previously, state and local. Each composed of eight different working groups, which I am a staff lead for one of those, which is the industrial energy efficiency and CHP working group. Next slide?

So our working group, like most of the working groups in the network has like generally two co-shares. In our instance, we have one Todd Currier who's been with us since day 1, very helpful co-chair from Washington State University, our second coach in the slide is currently taken when the process are working to fill that. There are two staff leads from both DOE, and two from DOE and two from ETA and at any given time, we have an arranged 20 or so numbers and you can see what the sort of organizations that compose our membership and we are always working for new members so if this is something that might be of interest to you, please go ahead and reach out to me. We have two very challenging goals. They are to achieve two and a half percent annual reduction in industrial energy intensity and to install 40 gigawatts of cost effective CHPs that we are working vigorously to help achieve those goals.

Just it might be as to what we have completed is in these working routes specifically. We do have a blueprint document, which is our guidance document. We have completed a number of webinars and she has been in existence as well as a series of what we call dialog meetings. These were meetings we did around the region focused on both CHP and industrial energy efficiency what we call foundational documents. Our first document was completed a little over a year ago, our Guide to Successful Implementation of State CHP Policies and the one we're going to talk about today on new slide are document the industrial energy efficiency designing state programs for the industrial sector. So without ado, I would

like to pass the baton over to Bruce Hedman. Just want to let you know that Bruce is representing the organization that helped throughout this document on behalf of the working group. So thank you Bruce.

Bruce Hedman

Alright, good afternoon and good morning everyone. I trust you can see the screen and as mentioned earlier, I'm with the institute for industrial technology. We're an international NGO that's part of the climate and that work. We have offices in China, India, and the US. We've got projects on the go with industrials and in China and India, and these three countries, China, India, and the US are really are represent the leading industrial energy consumers on the globe. I think combined is 60% of the industrial energy use in the world and our objective is to help implement best practices and technology and policies and management practices to increase energy efficiency and reduce some environmental impact from industrial activity. My job today is to interview the report that we just produced with Sandy and C-action and industrial and CHP working group. Our first cover why rate payer funded industrial energy efficiency programs are important than highlight a few of the lessons learned in designing and delivering effective state programs but my real objective early is to go through this summary pretty quickly. The real, the real interest in this webinar is going to be the detail program descriptions, and on the ground, lessons learned that the speakers after me are going to cover from program in Oregon and in New York.

So to get started, again, the purpose of the guide, the report was to provide guidance on a design and implementation of successful ratepayer funded industrial energy efficiency programs. The report is targeted for state regulators, utilities and energy efficiency program administrators and really for the broader energy efficiency of stakeholder community as well. The objective again was to identify the significant benefits that industrial energy efficiency programs can bring to the states and to industrials, and to highlight those program features that successfully respond to the needs of industrial customers and provide benefits to all into these involved. There has been much discussion over the past ten years, and really longer than that, about the health of US manufacturing and more recently, about the reassuring of certain manufacturing sectors back to the US because of a changing energy landscape given by Shell gas. The industrial sector actually has remained fairly steady in terms of percentage of energy use in the US over the past 20 years. Accounting for about 1/3 of all NU's, are primary energy consumption. It has remained the largest energy-consuming sector even with continuing increases in energy efficiency and in changes in industrial mix and output and as do we project, this role is expected to continue and energy consumption in 2020 is projected to reach 34.8 quads of primary energy again about 1/3 of total end use consumption. Additionally, there have been numerous studies that all concluded that the potential to further promote energy efficiency and reduce energy consumption in this sector is enormous even with the efficiency gains the industry has already made.

One study that is often quoted is from the Kinsley. They identified the potential to economically reduce industrial energy consumption by 20% by 2020, which again if you applied it to the recent DRE numbers with what needs about seven quads of potential primary energy savings in the year of 2020. Many states have just talking about energy efficiency in general. Many states of institute of energy efficiency programs funded by the public repairs to achieve a ride of benefits, but one of the core compelling reasons that thickens the energy efficiency represents a least cost for options for supplying energy services compared to other prevailing alternatives and thus providing both consumers and the state society with cost savings in both electricity and natural gas, actually even in our current bounded Shell gas environment.

For electricity, a recent study showed that energy efficiency program caused average about 2.8 cents per kilowatt-hour compared to 7 or to 15 cents for new supply resources for the electric sector. Natural gas energy efficiency programs also have been demonstrated to be a low cost resource with an average portfolio across of about 35 cents with some calculated across ten states of the recent study and comparing that to the lower, which is lower than the average steady gate price of natural gas of 49 cents per term nationally in 2013 so energy efficiency really is a localized and achievable resource and in a report that's about to be released soon by WRI and ACEEE, industrial energy efficiency programs were shown to have one of the lowest cost of saved energy among end-use sectors and in a population of 182 utility programs and these are utilities that have programs in residential, commercial, and industrial and reported the full complement of data for savings and expenditure in 2012. In industrial, on average was lowest. To be clear, cross structures, and levels do vary quite a bit by state and locality and sector, but in general, industrial energy efficiency was very crossed effective. So for a growing number of states including a robust industrial energy efficiency program in their portfolio is very important. Again, industrial energy efficiency IEE resources are very cost effective. Industrial energy efficiency creates value not only for the participating industrial company but for the state itself and is listed here for manufacturers. It's, you know, it's a hedge against energy price. It's cost saving. It's increased productivity and competitiveness, and for the state, it's early economic development jobs and environmental benefits.

In some states, industrial energy programs are really going to be needed to meet overall state level efficiency goals in the future. Much of the low hanging efficiency gains in the residential and commercial sectors have already been harvested in many areas and industrial energy efficiency is going to be critical. States have also that rate payer efficiency, industrial efficiency programs can help deliver a larger slice of energy savings from industry can likely be achieved if industrial energy users pursued them on their own individually. Industrial companies, you know, they are aware of profitable energy projects. Many companies have a solid record of developing energy saving projects to save money but management focuses

often on projects that can pay off and wonder two years or less and other projects that could be highly profitable over longer term are sometimes left on the table, and this is where efficiency programs can help. Ratepayer funded programs can make significant difference, not only by fostering higher implementation of quick payback projects but also by providing incentives and improve the economics what would have been longer term payback projects that are typically outside the interest of the industrial decision maker. There is a lag variation and the types of industrial energy efficiency programs perceived by states, utilities, and program administrators, the dynamics of local economies, regulatory frameworks, political interest and even the characteristics of the local industrial market really help define what different states feel are most appropriate approaches for these kinds of programs. The report goes into the spectrum of all frames that are out there. Different states have offered varying mixes of these elements and their programs and it ranges from technical assistance and knowledge sharing programs. These are typically low or almost no cost technical assistance that include workshops, networking, and success dissemination. There is proscriptive in-center programs, which are really the standard in centers or rebates that you see in commercial and residential energy efficiency. They are straightforward to administer what are usually for common efficiency technology like lighting, motors, drags, things like that. There are custom processing center programs. These are normally financial and technical support for potentially complex efficiency projects that are tailored to individual industrial customers or specific processes and technologies. There are also marked transformation programs that address the structural barriers to energy efficiency by trying to streamline the introduction of new efficiency products or practices to the market. Strategic energy management, energy manager support programs, another area of these programs, and a growing area I think, these programs promote operational organizational, and behavioral changes in a company rather than just focusing on changing out technology or proving the efficiency of the equipment that's there. And then, the report also just talks a little bit about the self-direct programs. Some states have chosen to include self-direct options for large customers. I will go into this a little bit later but self-direct programs allow qualifying customers to self-direct their fees that would normally be charged for a ratepayer-funded program directly into energy efficiency investments in their own facilities instead of into the broader pool of aggregated program funds. The report highlights a number of example programs. Each of the lessons learned, the successful designs were buttressed by an example or case study and this is a list of some of the programs profiled in the report and the two in grain, the Energy Trust of Oregon will be following today with the, will be highlighted by Kim Crossman and Wendy McPherson following my presentation. One thing also successful industrial programs have in common is that they recognize and are somewhat tailored to the specific characteristics and needs of their industrial customers. Energy industrial users, energy users complex for an industrial user, large industrial sophisticated energy consumers, the

industrial market term, tends to be very heterogeneous. There are a lot of different subsectors that used energy very differently. Efficiency is often not integrated into the company's decision making process and is sometimes split across business units. Efficiency competes with core visit investments and the investments themselves can be heavily dependent on a plant's operational cycles. When is the process going to be down so that new equipment, a new way of doing something can be input. So all these things have to be taken in line in designing an industrial program. The report identified and described in detail again with examples, ten program features that seem to consistently add value to industrial customers and contribute to program success. I am not going to go through all these. I am going to talk about the first five in a little bit of detail on the next set of slides. These are very specific to providing value to industrial customers. The second slide, streamlining the process, conducting continual outreach, leveraging partnerships, these are also very important to industrial programs but there are also the highlight of any good energy efficiency program whatever sector is targeted at. So let me start with the first key program feature that I love to highlight and that is actively making the case for the value of proposition of energy efficiency to your industrial customers and this is really a constant outreach program. Implementing energy efficiency measures, it does lower the cost of production, efficiency as repeatedly demonstrated its effectiveness in improving facilities, industrial bottom lines, increasing competitiveness, you know, benefits can range from a lifecycle cost-saving, sometimes with minimal capital investment, they include a variety of non-energy co-benefits such as admissions, reductions, or water conservation and even reputational advantages.

A key point from a program perspective and making the value proposition case of energy efficiency and an industrial efficiency program to company managers is to really lay out in simple and concise terms the operating cost savings and the other benefits including increased profits and things like that. That would be left on the table by not addressing these efficiencies and opportunities and what we've seen is cost saving examples and success stories from similar companies and similar markets are always useful in making the case and in fact, this guide includes some brief case studies of companies that have experienced significant benefits from industrial efficiency programs adhere to listed here and I'm not going to go through this in detail in next two slides, but again, the information is in the guide and a number of examples where the company has identified what they do is talk about what specific projects are and how to improve their operation, what the sort of the funding was from a company and the program itself, and then what the benefits are. The benefits to the company in terms of cost-saving, the benefits to the state in terms of energy savings and sometimes, quantify as the environmental savings. This is just another example of a BB medical company located in Utah and again shows you, you know, obviously, there's much more description and detail provided in the guide, but it does give you some

initial examples of how industrial energy efficiency programs are to impact the bottom line of industrials.

I will lump the next two features together having industrial sector credibility and technical expertise on your program team to build confidence and provide real technical support is very important for program success and the value of developing long-term relationships with the customer is also a key. Maintaining relationships with key industrial customers is important. It takes time, a steady relationship for program personnel, time for them to understand the company circumstance, and needs, and also takes time for company personnel to understand what a program can offer to them. Satisfaction of industrial customers with program delivery and results actually often hinges on the level of trust established in the relationships between program staff or experts in the company and with this, it's, you need to understand developing long-term relationships can require substantial investments and staffing or contract with experts to maintain it over a number of years. Contracting for or planning for program delivery capacity based only on short term goals with frequent changes in staff or contractors, it is not likely to be successful so time and effort is really needed to set up effective systems, and effective programs also were very hard to develop credibility with industrial customers by employing staff or bringing in experts that understand the specific processes and marked and have detectable expertise to provide some quality technical input and support to the site. Effective programs about the language, the engagement strategies and the metrics that are meaningful to the corporate managers, you drive the positions within these companies and our different ways to approach this, if a larger company that often is on one to one, but for smaller companies as an example, was constant focus on energy program has used a closer approach to organize program delivery with subsector and industrial process expertise for specific roots such as food processors, plastics companies, or paper companies.

The fourth feature I want to highlight is to establish a program that can address the diverse set of customer needs that you will encounter in the industrial market. This goes back to the spectrum of offerings that show it earlier in the presentation. Many successful industrial energy efficiency programs provide a combination of both prescriptive offerings for common prospect technologies and customized project offerings for a more unique and complex projects, and a growing area of interest and impact really is the promotion of strategic energy management programs. SCM that really looks to get fuller engagement of management and fostering a process of continual energy improvement across the company. SCM provides a framework for saving energy by increasing the identification and implication of capital projects, but by also changes in behavioral and operational efficiency that provide continuous improvement at little or no cost over time.

The final, I think, important feature that all element highlight is having program flexibility to meet the project scheduling requirements of your industrial customers. Typically, scheduling of capital projects must consider both the operational schedules. I think they want production-wise, maybe taken out of operation and capital investment cycles that include the internal decision making process and then the programs need to somehow match this in order to make any programs. IEE programs with multiyear operational planning seem to be best able to accommodate these kind of industrial scheduling requirements and to take in account, the even flow of implementation progress, and I think Wendy McPherson from NYSERDA will focus with little bit on what NYSERDA does in this area in her presentation. Again, these are just the remaining five sort of important features to successful IEE program work detail that's provided in the report and what I want to do now is just end with a couple sort of emerging topics of the topic and one is just a few more words on self-direct programs.

Industrial customers often raise concerns about the extent to which ratepayer funded programs are able to meet their specific needs. At some states do allow industrials to opt out of paying fees collected for energy efficiency programs, but rather than allowing industrial customers to opt out, other states have designed affective self-direct programs, where the fees from these lots of customers could qualify to for opt make press for opt out. Can be directed into energy efficiency and investment center of own facilities. If designed and implemented well, the self-direct programs can really produce cost effect of any savings on the part would have been realized in a traditional, maybe administrator directed program, but to do that, you really need to have clear self-direct obligations and energy verification of the results in the savings. These are necessary to ensure that the electricity that the gas service savings are on a level around par relieved of contributions of other customers in the repair programs and there are different ways to do this.

Some states have established escrow like accounts to structure, use, or elicit fund base to encounter a greater participation and there seems to be a lot of interest in the industry right now at the efficiency industry on how to really make self-direct programs more effective and verifiable, and again, there are a number of approaches outlined in the report as noticed just identified one year with Puget Sound self-direct program where they got a pretty, I think comprehensive approach to measuring progress and for making sure that the self-direct programs are providing value to all the repairs. I won't dwell on this. This is just a map right now of sort of the status of self-direct programs as of January 2014 and this is an ever changing area and then finally the report identified for key areas where there is a lot of innovation and experimentation going on at the state and I'm just going to say a few introductory words about the first strategic energy manager and I have mentioned it a few times before and can cross and talk a little bit about this on the experience of the Energy Trust of

Oregon, but this is an area where my organization, IIP is. We're very interested in this and it's an area that we feel there is enormous problems in the industrial sector. Efforts to support implementation of SCM and industry or gained momentum and state programs and internationally as part of ISO 50001, the benefits of supporting internal company platforms for continuous identification and implementation of energy saving measures include, you know, more comprehensive deployment of energy savings investments fostering high impact, but will cost behavioral changes and continue operation and maintenance improvements across the facility as I mentioned before, and SCM implementation can be effectively supported by state IEE programs. The technical tool assistances important. Recognition programs is important and recognition of the savings from SCM programs and methods to do that and state energy efficiency goals is important and this is a developing area I think in this field. One key comment challenge is how to easily introduce strategic energy management into different corporate environments, and how to promote the value proposition of SCM to the companies and DUE as active in this with the SCM-accelerated program and again, you will see in the guide that many state programs are active with this. That was a very quick review of the report itself with that unfinished. Here's contact information for Sandy Glatt at DUE and for Amelie Goldberg and myself at IIP. Amelie was the lead author of this guide so any questions under direct to Amelie and at this point, I would like to turn it over to Kim Crossman from the Energy Trust of Oregon.

Kim Crossman

Hi. Good afternoon or morning depending on where you are. It's still morning here in Oregon. [Crossover] So I think what I'm going to do is maybe start talking while the presentation is being found pretty easily to do [Crossover]. No problem. Please advance the slide. Okay. So just briefly, Energy Trust of Oregon is an independent nonprofit organization. We are dedicated to serving customers of the investor on utilities in Oregon. We serve about 1.5 million customers. I'm sorry I just lost something here on my screen. Okay. We serve about 1.5 million customers of Portland General Electric specific power, Northwest Natural, and Cascade Natural Gas. Okay. This is fixed. Sorry folks. We basically are the resource acquisition organizations in Oregon and please advance the slide. So this is Oregon and those colored areas are the territories that energy Trust serves across all types of customers with residential, commercial, industrial, and agricultural, and we serve both electric and gas. These territory, although it doesn't look like much in this state, actually represent about 75% of the energy uses in the state. The rest of the state has got a lot of public power and real electric cooperatives and many of these work with the Bonneville Power Administration and they're very excellent industrial programs so between Bonneville and Energy Trust, we work great closely together to serve Oregon. Please advance it.

So the production and efficiency program serves basically all industries and agriculture and this would include water waste, water treatments. I

think the only key things here to know is that most people are not aware that Oregon is actually the most industrial state as a portion of our economy of our GDP of any state in the US, I think most people picture us as woods and mountains and oceans and we have all of that, but we also have quite a lot of very diverse industry. By large, we don't have a lot of giant industries here. I think I'm always blown away by the NYSERDA program because I just did have amazing industrial base to work with, so we work with a lot of what in other territories would be considered sort of medium to large industrial effects. Please go ahead and advance. So I think from our perspective, this is actually a fairly human focused presentation as industrial efficiency goes and that's because we have found that the key to any type of industrial efficiencies as described in the set is that this long term relationships with trusted advisors, we are that, and so as we and our contractors go to market, the key things we are bringing out is that we are easy to work with or we make it easy. This is something we showed back from our customers as well in the very regular evaluation for market research, we do group them. We are a one-stop shop. Everything that could be done at an industrial site can be handled through this, what it's called production efficiency. It's a single program, although within that single program, there are actually elements of every type of industrial program that Bruce laid out and so I talked about that a little but to the customers, it's just a relationship with energy trusts and our representative, so speaking about representative, we do base the entire program on having an assigned, almost an account engineer who serves a geographically assigned territory and that person tends to be a great engineer who is more of a generalist than a specialist usually although each of them has their own areas of specialization, but really there are program experts and they're going to make it very low impact as much as possible for these customers to participate in the program. We take a long-term perspective, in other words, we are not really looking for one off. We are actually trying to develop consulting relationships with all of the customers in our territory to work with them to achieve significant cost effective savings on an ongoing basis and achieve their energy goals long term. Next slide please. So please hit it again.

So who are we? I mean who does this work? This actually takes quite a few people. The program is essentially last couple of years about a 35 million dollar-year program, about 60-65% of that is in the form of incentive and the rest is a tiny bit for program administration delivery and technical services. So it begins, we manage this program in house at energy trust and that would include both the program staff who are paying attention to design and strategy of the programs as well as managing all of the developments of pilots and other innovations and long-term change that we might want to be engaged in. Please hit the slide again, thank you.

Really are key people out on the street of our program delivery contractors. These protect goals, energy savings goals on their portfolio of goals make up the production efficiency portfolio that we are bringing in

box number one and there are two different types of program delivery contractors. There are four program delivery contractors who are essentially customer relationship managers account engineers and they are assigned to work with end-use customers. They do not build anything for a living. There are representatives and so they can provide a good third-party unbiased technology neutral, vendor neutral view of what's possible at industrial sites. They also have the abilities since they work across many types of sites and sizes to take what we're learning in other sites and bring it to there in their neighbor sites, which is terrific. The other type of program delivery contractor and by the way, these folks are tend to be affiliated with our custom track, which I will talk about in a minute. The other type of program delivery contractor are streamlined track, PVCs and basically, these folks were to trade allies and vendors out in the market on what Bruce referred to as prescriptive but are also in industrial, many of them are calculated savings measures, not just purely prescriptive rebates, but maybe a little more complicated, but simple enough that we can train trade allies to deliver it and develop calculation tools that can analyze the savings and get us reliable answers there and the customers so please press again. We have specialized technical contractors and these are pools we have both engineering firms that do detail technical studies, most specific custom track and we also have technical services providers, many of whom are sort of uniquely good at bringing strategic energy management practices and principles into industrial organizations, but there is actually kind of a broad range of what those SCM services look like in our program, which I'll talk about in a minute, but these are deployed in one off basis at sites as needed to bring deeper system level expertise or solution expertise to there and end up teaming with the program delivery contractors to deliver those things. Next slide?

So and then finally we have presenters and trade allies and one common I wanted to make about this is that the topic of prescriptive shows up in this report and I think the key thing from my perspective as to why these channel is important, why is prescriptive important, because they are able to leverage these market-based trade allies and vendors. We don't actually have to pay them by enlarge. They will be a free sail force if we can equip them and in many cases are become a very great source of ongoing savings so I think that's actually, even though they prescribed and calculated savings are not your biggest source of savings, they are great place to get a lot of volume of projects and to get into rural areas and to just leverage the market but thoroughly in place to deliver our program. Please go ahead.

So this is a meaty slide and I'm actually going to spend a little bit of time here because it's a good spot to see where everything that we're doing actually turns into savings on the ground and this also kind of lays out our history in the form of whatever the outcomes of that history so I'm going to tell you a little bit about what was underneath for what contributed to these savings outcome that you see in the graph. When the program started

in 2004 and all the way through about 2006, it was essentially a custom program and people who are involved in custom industrial efficiency programs probably are aware that it can be a boom and bus cycle. A few very large projects can swing your results radically, which is incredibly clear here when you look at the megaprojects that are sitting on top of those custom blocks. Those are individual projects, I mean there are essentially custom projects, but we have called them out because they skew our data so badly if we _____ in the custom bucket, but by enlarge, this was a custom program and I would make the keys that during those years, it was largely focused of long strategic market sectors, pulp and paper, forced products, water and waste, water and food processing and specialized program delivery contractor to really knew those sectors were higher to deliver them by enlarge. Around 2006, a couple of changes occurred that actually had a dramatic effect on the development of the program going forward, one with that, we had a many crisis in 2006 and 2007 where the period that we had ran out of incentive and we have to go into a complex reservation system to basically limit the amount of funding going out and I would just make the case that this kind of gets to that point about multiple year frames for programs, you know in the end and looking back at the situation, it was a lack of understanding about exactly how these reservations work between the contractor running the program and ourselves, it turns out there wasn't actually any incentive crisis at all but we went into market saying there was, and this actually had a pretty big effect on us further about three years and had a very big suppressing effect on our savings, which haven't really showing here that much and looks like we were flat, but we should have been growing during that period of 2007-2009 and we weren't really. That so we ended a up bringing the program in house as a result of market feedback, evaluation feedback, and really a need to more closely manage a program that involved large chunks of incentives coming and going or not. This had any given time. We really needed to be on top of it and the customers themselves were demanding less layers between us and them and so we responded to that, for our program management in house in 2007 and began a multiyear trend of developed of diversifying our source of the savings and building out other parts of the program, we will begin to see lighting showing up in 2005 and 2006, but that was purely reactive. The lighting projects came in and we paid them, but we made a real push in 2007 to clearly incorporate the lighting and human comfort HVAC and every type of energy use and industry into the production efficiency program.

Prior to that, those human comforts and lighting measures have moved to our commercial program so this was a shift away from being organized around measures to really being organized around the customer relationship and so I think that was important for us and actually begin what provided the basis for a lot of gross that occurred later on of that one stop shop that I was talking about, so lighting grew and in 2008, you begin to see a small orange bar, which is our streamlined industrial and that would be other prescriptive and calculated savings projects from trade

allies like small compressed air and irrigation measures quite a few of those and we've been building that out slowly but surely adding measures as possible. I will say there is a real limit to how many prescriptive measures or calculated measures you can find in industrial because there is so much that it's not the same from site to site, but we continue to look for those actively and to build that outgrow it.

In 2009, we began our next phase of change in the program and started to actively tackle all of the ONM or what you call energy waste occurring in many factories, really it was a refocusing, and I think, in some cases, a number of us have been exposed to commercial [Indiscernible][00:50:43] prior to heading into this work and then our region in general was beginning to explore SCM and so energy trust jumped in early and started running strategic energy management pilots, which I will talk about that more in detail in just a few minutes and as you see with that light blue bar, this strategic energy management initiative or pilot, which we didn't expect to save us a lot of energy immediately, immediately paid off in a lot of cost effective energy savings and this has grown as a source of energy savings for us each year since then to point where in 2013, it represented 30% of what we saved, which is a huge thing.

The one other thing I'll point on this chart and then we'll move on is that in 2009, the energy trust decided to take a great leap forward and set out a five-year goal to double energy savings in the next five years and so what you see in 2010 to 2013 is our sector's contribution to that doubling of savings and I would make the case that while we see, you know, things fluxing here and there, a lot of these savings have come from our group and strategic energy management and industry line savings track. The custom track, which is still our bread and butter and probably always will be really states pretty steady over this entire period, which I think, you know, relatively steady. We're getting on average of 40 or 50 million kilowatt hours out of it and I think the only thing I would say that's exciting about that is that as a mature program at this point, you would think that we begin to see this if efficiency supply begin to bend down, you know, maybe would have realized a lot of it, but really, in fact, the custom track is driven by often manufacturing needs and changes what's beyond energy efficiency that in a lot of cases, what we're doing is adding energy efficiency into standard business changes that occur with great frequency in manufacturing and that that seems to happen kind of subtly if you take it across the pool of all of our industry. Next slide please?

I think that this is a kind of an important thing that we're able to bring in in 2009, little background here, when energy trust started delivering the gas programs in about 2005, gas customers were excluded, industrial gas customers were excluded from those programs. I think what was not understood at that time is that there were quite a few industrial gas customers who are actually fairly small and on commercial rates and so they actually were paying the public group discharge for gas and they started to show up in our program seeking services and what opportunities

for saving. In 2009, a policy decision was made and a special rate adjustment, a new funding mechanism was created for industrial gas users who are not buying their gas off of the market and so in 2009, we suddenly became were able to stir gas to a far greater number of our customers and so what you see is they kind of zero to 50 take off for us from 2009 to 2013. What's different here is of course we're getting custom projects. Unfortunately, the very largest gas users are by enlarge transports, not in the system so we cannot serve them or this number. We probably be five times bigger than what you're looking at here, but for everyone else we are able to serve with that custom project and actually, the industrial gas project, which find quite a few of them that are a little more standardized and we have been able to do more of it through these trade allied tracks. Officially, greenhouses we actually have, I think one of the largest greenhouse sectors in the country in Oregon and there is all sorts of things we've been able to do for this tiny little energy that have gotten up a good amount of savings so I would say this is being limited by who is eligible and besides that, the sky is the limit. We have barely scratched the surface on industrial gas and being able to start doing this was very easy because we already had all of these listing relationships with these customers. You know, to them, gas or electric, it's all energy and they would like to address it and so there was a great demand already built up. Next slide?

So this one's to say one thing about this, which is that we are as interested in bringing in the most cost effective savings we can as we are in servings equitably across our entire territory and all sizes of industries and so, this chart shows you that in terms of the count, the actual volume of projects coming through our program, when we started out as purely a custom program and that occurring all the way through 2008, we were basically at three to four hundred or less projects per year and actually in most cases, much less. As soon as we really ramped up the streamline tracks, the lighting, we suddenly had the volume and that volume means we're actually reaching rural areas of the state, smaller industries, we're reaching far beyond what we were able to do through our direct 1x1 work and that's been exciting. These results have actually pushed us this year to better integrate all of these different tracks in terms of cross marketing and cross promoting. When the custom PDC scopes a project, they go ahead and they include every lighting opportunity and all the calculated savings opportunities in that documents and help people how to move forward in getting those projects done that we're cross promoting in both directions and that's probably going to have a big effect that we'll see over the next two to three years. The strategic and review management is at the very bottom line and these are numbers of sights served each year. It seems small and I will remind you as to what the energy savings look like so through SCM, we're getting a large amount of savings from a small number of sites as of actually 2014, we've crossed the line of bringing 100 sites strategic energy management program training services and we have

a big, hairy goal to try to hit 500 sites in the next five years or so. Please move ahead?

I actually, I'll make one point about the last slide we want to go back. I think one of the keys for us has been that the diversification source of the saving having the custom, having the SBN, having the prescriptive, having the technical information resources, and even market transformation as a frame for everything we're doing, which is change over time really gives us a lot of flexibility when strange things happen in the market to any particular area. So we have a lot of lumpiness in this program and an any given track, any year, it will be up or down, but with the diverse portfolio, we've been able to hit a more consistent level of savings for the last few years when something's down, something else is up so that has been great for us. This is an example is a quickie and it's only here because, I think most of the examples we usually see in industrial or big giant complex custom projects, which are great but this is a very simple streamlined project. It's a new measure. We are actually doing a lot of views all of a sudden. It just came out last year and I think to me, what was important about this slide is that even though we've done just this one dinky project that's being shown here for the highest what the customer said was the information and training we get from energy trust provides us with ideas and options that help us improve efficiency and save money so this customer didn't just get this store done. They have done, you know, twenty measures with us, work with us on an ongoing basis year over year over year so it's not either or we want them to do whatever works for them in the moment and are actually doing planning with them around which project to take off that and this will be for any customer. Please go back? This is just the standard lighting pressure. The only thing I would like to throw out there is that we are seeing LED show up, of course this project involved about half of the space, the refrigerated space, and I continued what was important here with just simply the capture of the business proposition here, which yes, it is energy savings and it is energy cost-savings around. They are not going anywhere but after they install the project, that's when the customers start to talk about the non-energy benefits, you know workers are happier, accuracy has improved, they can see better. Many of these are not quantifiable, but we really work hard to get those quotes and those stories from the customers after the fact and promote the heck out of them in this way. Next? I think I'm probably closed to running out of time here and so can I check in with the organizers? Are we okay?

Organizer

Yes, you're doing alright.

Kim Crossman

Okay thank you. So Roseburg Urban Sanitary Authority, this is interesting and I threw it in there because of some strategic energy management example. It is also an example of one point in the paper, there is discussion of leveraging other programs or other entities. I mean we are definitely not a solo act. In the northwest, there are lots of entities out there, all sorts of market actors whom we can work it. In this case for both of the firm, this

site, which who we've worked with a little bit and presently, they're one of the more advanced, I would say waste water plants in our territory and one of the bigger ones, they joined into an initiative called the sustainable energy management systems training and this is one where the association of clean water agencies in Oregon, the Oregon aqua, their association wanted to develop and put on a strategic energy management training for their members and DPA and energy trust teamed with them to help them get that program and actually, the US DPA provided some key materials as well for that initiative, but it was actually very low-cost to us. We were providing, you know, support. We were providing input on their design and strategy and we participated and we help to recruit some customers, but they themselves have these strong relationship, so this is like an SCM lite. Very very light implementation mostly focused on training, not a lot of technical support, you know, but to give them the basic tools and ideas, and actually, this site saves the money. They save some energy but more importantly, they change their culture and that is actually the purpose of strategic energy management. So the first task is to establish an energy goal, which they said is reducing energy use by 10% by the end of 2012. They learned how to work with us as part of their engagement, how to get studies from us, you know, how to actually work with us to identify energy savings projects and get our incentives. They formed an energy team. They made energy an agenda item at managers and staff meetings and they identified and implemented these projects. They actually even explored renewable as part of this process, which is great for us. We also do renewables out of our organization so we were thrilled with that and they have great opportunities of the waste water treatment plants so the engineer and operations manager at the plant said our involvement in this process help bring energy from the backburner to the top of our workload. Today, our staff members are much more aware of the plant's energy use. We also became more aware of the available services such as those from energy trust. At the end of the day, it means lower set costs, which is better for our ratepayers. It's our responsibility to minimize those problems. So that is an enlightened and informed energy champions [Indiscernible][01:03:54] from the Roseberg Urban Sanitary Authority. Please move forward?

I'd like to launch into just a few things that I'm going to say about strategic energy management and so what is a strategic energy management program. What are we trying to accomplish? We are actually trying to increase awareness of their energy use and of energy efficiency opportunities they have including understanding their energy waste. We are very focused on increasing the commitment of the organization to do energy efficiency and improving their capacity, you know, hoping to get the dedicated resource as needed at the sites to continue this work, improving their knowledge base and what they know about so that they can do a better job at this. I think one of the myths that SCM takes the run out and I heard this for years and years, is that industries already know how to do this. They already know how to manage energies and there is an

assumption that this is true but our experience is this is not the case and it's, I don't know that. You know, there may be exceptional industries out there. There definitely are who are posterior children but by enlarge, energy in our territory is a very tiny cost relative to their cost of doing this and it does not make the cut for strategic management. The way that anything else is important the industry does. This maybe because our folks are only paying four to six months of kilowatt-hour. You know, that may have something to do with it but I think that this is pretty pervasive. Industry has downsized dramatically year over year, they have leaned their staff and they are very reactive in many cases, much more than strategic. We're trying to affect that and change that culture. We actually want them to achieve energy savings as a result of doing this work. One of our very strong beliefs is that this will not stick in any way unless they see the bottom line intact and it's our job to help make sure that they see bottom line impacts in year one, year two, and reinforcing that on an ongoing basis. One of the great things we get out of this is that they actually have an increased ability to successfully do their capital projects in the future. Once they have done this, they have a gold, they have better ways to talk to the management and finally, you know, we are actor persistent of your practices. How do you get there? How do you embed this stuff and make permanent culture change around this? Next slide please?

So this is the emerging source of saving for industrial efficiency. I'm going to agree with Bruce. I think it's the most exciting thing I've seen in this field and the time I've been working in as a crosscutting opportunity to save five to twenty to 40% of energy use over a multiyear. That's what we're saying. It's remarkable. In terms of the amount of ways about there and the northwest, I am proud to say it's been a leader in deploying these programs for years now and we've been running them for at energy trust for five years, Bonneville for almost that long and we have had evaluations and they have been worked for report of evaluation and we have claimed lots and lots of energy savings so this is working. BP hydro has been doing a version of this for many years and of course, MIA actually helped us all by piloting a number of approaches to SCM starting in the early and we all were involved in watching that and advising it and trying to learn together as quickly as possible so that's going well. Nationally and internationally, strategic energy management appears to be taking off, you know, superior energy performance from the UST of lead is out there, I saw 50000 at one. It's something that we have actually worked with directly for other couple of our customer sites and then the conclusion for energy efficiency has launched an SCM working group that is publishing really interesting tools around how we define these programs and what's involved with them and really characterizing what works from what others and a whole lot of their members who are other resource acquisition program administrators or in the planning stages right now to launch these programs. Next slide.

So I'm going to make the case of this as a game changer and I am not going to say much more that once this site has learned SCM and it is embedded across their organization. They can actually address your energy use thoroughly right now and then on an ongoing basis. By having this knowledge and all the tools they need to be able to manage energy use. They actually will be much better suited to take on the next wave of emerging technologies, demand response, and attribute the generation, you know, whatever comes their way, whatever it is, they are well positioned to be able to participate in these things that can be a little complex in other areas of expertise normally and finally, we believe that strategic energy management might actually change the core design of our program once we bring it to scale over the next four to five years and the question we're asking ourselves is what would a resource acquisition program look like if all of our customers were practicing strategic energy management. What do we need to do for them and to help these things stick long term and it's an insightful question so thank you. I would like to check it over to Wendy McPherson from NYSERDA.

Wendy McPherson I came. Thank you very much. And Heather, I'm going to have to ask you if you could please run my slide, we've, oh, we're having a little technical difficulty on my side. I think I've got it now. So we're okay.

Female Voice Yes. We can see your slides. We can see your slides. Thank you.
[Crossover]

Wendy McPherson If it cuts out again, I may have to ask you but so far so good so we'll go as planned. Good afternoon everybody. As I've said thank you Kim and I'd also like to thank Sandy Blatt from DOE, Amelie Goldberg from the Institute of Industrial Productivity and the SCE action that worked industrial and CHP working group were providing this opportunity to speak about a successful New York state industrial program. So NYSERDA, what is NYSERDA? NYSERDA was established in 1975 as a public benefit corporation to help New York State made its goal. Those goals include reducing energy consumption and increase energy efficiency creating a clean energy economy growing diverse, renewable, energy supplies, protecting the environment and to provide experienced leadership and planning and policy. NYSERDA's industrial programs are authorized through our public service commission so I would like to take a moment to thank our New York State public service commission for authorizing this program. We New Yorkers are fortunate to live and work in a state with a PSP that has a long history of goals innovative leadership and utility restructuring. Energy efficiency, demand response and distributed generation and sense within program. Although NYSERDA supports industry through several programs, today, I'll discuss two energy efficiency programs. They are flex picked and industrial process sufficiency, IPE for short. NYSERDA's flex test program provides eligible commercial and industrial customers with objective and customized information to assist with begging informed energy decision. This information comes in the form of a details energy study conducted by

a third party firm. These studies identify site-specific energy savings measures that the customer could implement to improve energy efficiency of the buildings operations and to reduce their energy consumption and costs. Flex test studies are vendor and manufacture neutral, solution neutral, and tailored to address the needs of participating customers for most study, NYSERDA contributes up to 50% of the cost up to the lesser of either a million dollars or 10% of the annual energy clause of the facility. Flex test cost sharing can include general feasibility studies, which may encompass the entire plant or facility or be targeted a specific equipment or upgrade evaluation. Energy advisory or master plan services provide customers with long-term support on energy and carbon management issue. The study can focus on industrial and data center process sufficiency, which takes into account the unique characteristics and functions of production lines, data storage, and processing. Retro conditioning studies systemically verify the building systems, perform according to the design intent and operational need and PHP studies, which investigate the site-specific technical and economic feasibility of installing a CHP system. As you can see, by the examples, I just looked if this is indeed a flexible technology program. Industrial process sufficiency or IPE for short, has the primary goal of providing incentives that help New York manufacturers and data centers make energy efficient improvements that measurably reduce energy costs. The program offers both electric and natural gas incentives to offset the capital cost of these projects, which is very convenient for customers as our customers have many projects with both electric and natural gas components and savings to them. IPE has some substantial goal. We were tasked by the public service commission to save 800 thousand megawatt hours and over 2.9 million decatherms by 2015. In our orders to accomplish, in order to accomplish these goals, our industrial team has a number of outreach contractors. Their goal is to educate customers about our programs, assist them, and identifying project opportunities and help them with the application process. From this current funding cycle, which runs from 2012 to 2015, IPE was allocated 121 million dollars to achieve its targets. In order for customers to be eligible to perceive incentives, they must stay into the system benefit chart on their utility bills. IPE is a performance-based program so the energy savings are verified prior to issuing the incentive money. It's an open involvement program first come first served until the funds are exhausted or December 21, 2015, whichever comes first. I would like to point out the large cap associated with this program, up to 5 million dollars for electric and 1 million dollars for natural gas projects. These caps are deliberately set high to attract the attention of the largest New York State energy users. These customers want to know that embarking enlarged complex, which have the large energy savings associated with them will be worth their whiles. We have listened to our customers and our stakeholders and the rise of these caps that meet their needs. The majority of energy use for industrial manufacturers reside in the process. Energy use is embedded in every kind of paper, gallon of chemical or with it that's produced. With this in mind, IPE recognizes that

there are different ways to measure energy efficiency. It can be measured as a gross reduction of energy usage as measured on an electric or gas meter or it can be measured as a reduction of energy per unit of production. If a site is increasing yield or decreasing scrap by optimizing its process without a proportional increase in energy use, the energy per unit of production goes down, so if you were to increase output by 50% well your energy use only goes up 10%. Your energy per unit of production goes down. It's more flexible and more sophisticated way of looking at energy efficiency and IPE incentivises projects both ways. This allows us to support low growth, which in turn supports economic growth with the New York State. As you look at the example list of project types, you will recognize that these are typical projects in all manufacturing plants. It's actually rare to find a manufacturing plant that is not doing some type of capital project every year and though they may sink in terms of productivity or cost reduction, margin improvement or ROI, we work directly with the customers to educate them on the energy savings embedded in these projects. We make that connection for them. These are the types of projects that are perfectly suited per unit energy savings analysis. In addition to manufacturers, data centers are also eligible for incentives through IPE. Efficient data center low growth is a key to maintaining sustainability of the New York State economy and the IP delivery infrastructure. Data centers are by nature mission critical and are constantly growing, but instead of processing tons of paper or volumes of chemicals like manufacturers, they process crates for financial institution, medical records for hospitals, do scientific computing for research laboratories and more. All of these is requiring more and more computing power and computing capability over time. NYSERDA will intensify companies to do all of these more efficiently. Data center efficiency can involve both supports and improvements such as airflow management and UPS upgrade as well as IT computing optimization such as server upgrades, server utilization, server virtualization, dorch consolidation, and desktop virtualization. All of these strategies have the goal of utilizing pure processors but with greater productivity.

This slide shows the results of the IPE program from the beginning of this funding cycle January 2012 through December 2013, halfway through the program. The program has been very successful today. As you can see, the actual savings are 60% of goal for electric and 75% of goal for natural gas so IPE is certainly on track with mutual goals as ordered by the public service commission, you can also see that IPE has been operating in a cost-effective manner. So this may beg the question to what do we owe to success and what methods are we using to get these results. One very important component of IPE success is a strong outreach effort. We have a two-pronged approach utilizing outreach contractors and NYSERDA key account managers. As mentioned earlier in the presentation, we have outreach contractors focused on the industrial and data center verticals. These firms have industry expertise and a solid understanding of the outreach process. Their goal is to increase penetration in these verticals to

use various strategies and services to overcome specific to participation in NYSERDA programs and specifically to recruit customers to the IPE and flex tech programs. Their approach include market research and intelligence to identify the large energy users or key accounts to identify the key decision makers within those organizations and meet with them one on one. These approach fills long-term relationships with these potential customers so that NYSERDA becomes their goal to for all energy questions. To aid in the communication between a month at which contractors and NYSERDA project management staff, we used salesforce, which is a cloud-based customer relations management database. We are able to catch our customer information as well as outreach activities within the CRM database, which allows us to coordinate our communications with customers and to better understand the pipeline of projects. The other component of our strong outreach approach is the key account management effort. The objective of this is to ensure that entire key account organization from the CEO to the operators is fluent in the IPE program offerings that they fully understand the short and long-term benefits of these programs and feel entirely confident in our support and expertise to facilitate the implementation of energy efficiency projects. Our goal is for NYSERDA programs to become an inherent part of the customer's project and capital planning decision-making. Key account managers or NYSERDA project managers, they are responsible for maintaining existing and developing new relationships with the largest key industrial and process customers. Each of these key accounts has a key account manager assigned as they go to person within NYSERDA. The responsibility road map for the key account manager includes developing and understanding of who the key account decision makers are and the process by which projects are selective and capital expenditures approved. Visiting the facilities to educate the key account personnel on NYSERDA program and to tour the facility to gain another standing of the account needs with respect to process and energy efficiency opportunities and also to maintain an ongoing contact with the key account from mutual updates on NYSERDA program offerings and potential project opportunities. The key account effort is initiated and to rectify the NYSERDA staff are also supportive and reinforced by the outreach contractors and again salesforce is an essential tool to link key account management and outreach activities. As a team the outreach contractors and NYSERDA key account managers are directly engaged with the customers. Both staff and contractors have manufacturing and process experience. We speak the customers' language and are already familiar with the nature of these types of projects. Most industrial projects are initially driven by cost productivity, ROI or compliance and not necessarily energy efficiency. It's our job to point out that the energy savings component and all of these projects. Most of the projects are custom complex projects. We have the experience to discuss, organize, and prioritize these projects with the customers. Our outreach contractors are selective through an RFP process every several years. They are rated and selected based on their understanding of the industrial and data center verticals. Their existing

relationships and potential for relationship development, their vertical specific technical knowledge and their experience with the outreach process. We have been very pleased with the contractors who are currently performing outreach for and with us. We tracked our efforts and results so it is evident to us that they are a crucial part of driving energy savings and delivering on a program goal. Let me share with you a couple of case studies. In order to be competitive, Irving tissue worked with an OBM to design a paper machine with the objective of improving productivity with energy savings as one of the design criteria. Part of this development included a more efficient vacuum pump design but the cost for this new design was higher. After doing the energy analysis, which included the NYSERDA incentives, Irving shows the energy efficient is on. In addition, other design choices were documented and analyzed including a more efficient pump agitation system and be at this on the large pumping system. The resulting energy saving for 14.8 million kilowatt hours per year and Irving received an incentive of 1.8 million dollars. Incidentally, the MD that was done on this project measurement and verification caught a performance issue with the vacuum pumps since the problem was identified early and start up. Irving went to the OEM who fixed the issue thereby achieving the expected savings.

The second case study is World Kitchen. This manufacturer has a multistep energy intensive manufacturing line. They embarked on a capital project to improve productivity and efficiency, which focused on the final steps in the process. The existing rotary fire polisher was a complex piece of machinery intended to produce a lot of [Indiscernible][01:24:19] product. This was an issue because any product that makes it to the final step has a great deal of cost and energy already embedded in it. By installing a new rotary fire polisher, the facility generated less scrap and produced more sellable units using the same amount of energy. We calculated the incentive for this project on an energy per unit of production basis. This project not only improves productivity and efficiency. It also resulted in a reduction in Will's Kitchen's operating costs. Today, I presented NYSERDA's flex second IBE programs but I do want to let you know that NYSERDA has additional programs that support the industrial sector as show here. We can speak about this in other day for interest in hearing more about these programs. That concludes my presentation. I thank you for your attention. You welcome to use the contact information shown should you have any additional questions regarding any of the NYSERDA programs. Thank you.

Sean Esterly

Thank you to each of the panelist. We are little tight on time so we're going to move on to Sandy who will present some of the questions from the audience.

Sandy Glatt

Okay. So I think the good news is since we ran out or very close to the end of our time as I only really see two questions at this point in time and Sean you can correct me if I'm not seeing all of them but I have I think one, fairly quick one for Bruce, which will ask about the levelized cross chart

comparing energy efficiency to other resources and the question asked was dose that include CHP or just demand side energy efficiency?

Bruce Hedman Sandy, which, that's the one that's energy efficiency total should compare to the other resources. It's not the one that shows industrial energy efficiency in the other sources right?

Sandy Glatt Correct. [Crossover]

Bruce Hedman You know I don't know specifically if it does or not but I suspect it's just really focused on sort of the traditional energy efficiency programs as opposed to CHP. CHP right now is not incorporated to, not bringing any state programs so I suspect their numbers are focused on a more traditional energy efficiency.

Sandy Glatt And for the individual that asked a question, we do have a re, you know, we can refer to someone at ACEEE if you want the exact answer to that question but that's what we generally think of the case and that the only other question that I see here again Sean unless I'm not reading everything is probably not as quick to answer, but Kim, what is the approaches to measure and verify the SCM safety?

Kim Crossman Okay. SCM is actually, what's different about SCM programs, it's one of the key things that's different is that typically, at least in the northwest, we have been using top down meter level regression based models of energy intensity as the bases for both the customer being able to see how they are using energy and managing it moment to moment and as the basis for our MMD and so this is what has been third party evaluated so there are suddenly a lot more statisticians in our world than there were a couple of years ago on the implementation side because we are building unique regression models based on, you know, solving for the energy drivers at each site, that can accommodate all of the changes in manufacturing that occur and still give us a pretty reliable, you know, energy per whatever the KCI is though, and there is a lot of information available about that the northwest SCM collaborative, numerous ACEEE papers that have been published over the last couple of years for their industrial commerce study and CEE, the conversion for energy efficiency, and even I think USTLE has been planning together in full about this so. But I guess, my short answer is people come be concerned about this but by enlarge are evaluated when they look at it, I mean yes, we have to work with the evaluators quite a bit to help them understand the program design. I did a shift from how things have been done but by enlarge, people are finding it to be more robust than, you know, standard engineering calcs on a custom project so they're being fairly favorably evaluated. We have more than 100% technical realizations so far.

Sandy Glatt And a follow Kim, and I think the answer to this is there are several, but what regression models off were you specifically using?

Kim Crossman Oh, everybody uses whatever they use. I mean we just started using Excel and different contractors that we use have broad and different statistical analysis software depending on what their inclination is [Crossover]. There's a variety yeah.

Sandy Glatt Another question, I'm not sure who this specifically is after but I think maybe the larger paper is how does the example shown in the slides compare to best practices and I can quick step in that and that is very difficult to identify and define what is the best practice in terms of an IEE program offering or result and so we, we in the paper, really use the term success as it's measured by leading various criteria of savings that the program specifically itself that's up. Bruce do you want to add to that?

Bruce Hedman No. I think that's it. I mean it's really looking at elements that have been successful within that program and try to define what the best practice was I think pretty difficulty.

Sandy Glatt Yeah. And either Kim or Wendy, does that work for you guys as well.

Wendy McPherson Well, I have a one little comment on the best practice concept and it relates to what was said about self-direction. You know the question really is how much savings potential do we think is in industry and are we anywhere near achieving it so I would say that most of the things discussed in the program from microsectors, I mean in the paper, are the best practices currently and the things that are being focused on for the upcoming issues as well, currently, they are the best practices in industrial efficiency programs, but a well-designed program using these tools can help a site save 20-50% of their energy use in some cases, you know, depending on the industry type over a multiyear period. There's no self-direct program that I'm aware of that actually gets participants to the level and so you know so that I guess that's one thing people should be considering is how much of hits are we trying to get. We would say we want to get as much of it as possible so [Crossover]

Male Speaker Can I add something to what Kim said? Is there [Crossover] Okay. Well I guess just two things. Another point in the self-direction, yeah, what Kim said is most repair programs take the money and effectively, they leverage even more investment usually the minimum is 50%, frequently it's though even more or so. I think some will be good if got some information on self-direct programs and seeing if they're actually even leveraging with the same time investment and the other point in terms of reaping the benefit that's potentially out there in industrial sites, that you know, what we really want to do is promote renew processes, new developments, new ideas in our states, or in our regions or territories, and investment in the things that don't even exist right now and help categorize those and I think that's the big part of what we need to accomplish to. It's very hard for me to by the way to say what the total potential is and that. Thanks.

Sean Esterly

Thank you and we are out of time so we need to move on to the quick attendee survey and then wrap up the webinar. Heather, if you could display that first question for the audience? And that question does the webinar context provide new useful information and insight? And next question please Heather? The webinar's presenters were effective? And then the final question is overall, the webinar met my expectations? Great and thank you to the audience for answering our poll and I'm sorry that we certainly ran short on time down there but glad that we were able to get everyone's presentations then and addressed the questions from the audience. I just want to thank all the panelists again for the great presentations today and the attendees for joining us today to listen in. Again, a reminder that you can get the PDF copies of the slide at cleanenergysolutions.org/training. We will also be posting the audio recording of the webinar today. Additionally, you can find the information on the other out coming webinars or training events and we also invite you to inform your colleagues and those in your networks about the Solutions Center resources and services including the no-cost policy support. Hope everyone has great rest today and we hope to see you against future Clean Energy Solutions Center events and this concludes our webinar.