

Training Local Workforces to Promote Energy Management in Industry and Buildings

—Transcript of a webinar offered by the Clean Energy Solutions Center on 3 February 2014—
For more information, see the [clean energy policy trainings](#) offered by the Solutions Center.

Webinar Panelists

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This Transcript

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Sean

Hello and welcome to today's webinar brought to you by Clean Energy Solutions Center and Partnership's Energy Management Working Group and the International Partnership for Energy Efficiency Cooperation. Today, we are very fortunate to have Graziella Siciliano, Sylvia Boucher, Patrick Crittenden, Heman Grover and Paul Scheihing joining us. This great group of panelists I'll be discussing Training Local Workforces to Promote Energy Management in Industry and Buildings.

One important note of mention, before we begin our presentation, is that the 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.

Before we begin our webinar, I'll just go over some of the features. You have two options for audio. You may either listen through your computer or over your telephone. If you do choose to listen through your computer, please go to the audio pane and select "mic and speakers". This will just eliminate the possibility of any feedback and echo that you might receive. And, if you put the telephone option, a box from the right side will display the telephone number and audio pin that you should use to dial in.

And panelists, we just ask that you please mute your audio device while you're not presenting. And if anyone has any technical difficulties, you may contact the GoToWebinars helpdesk at the number at the bottom of that slide and that number is 888 259 3826.

Now, at any point throughout the webinar, we encourage our attendees to submit any questions that they might have and you may do that by going to the GoToWebinar window and finding the questions pane and type in your question there. And if anyone's having any difficulty viewing the material through the webinar portal, you will find PDF copies of the presentations at cleanenergysolutions.org/training. And I will send out that link once the webinar's—once the panelists begin and you can follow on with them. Also, an audio recording of the presentations will be posted to that site within a day or two of the presentations.

Now, we have a great agenda prepared for you today that will describe international workforce training program that facilitate greater energy management proficiency for personnel in the industry and commercial building sectors.

Now, before the speakers begin their presentations, I'll provide a short informative overview of the Clean Energy Solutions Center and then following the presentations, we'll have a question and answer session, some closing remarks, and a very brief survey for the attendees.

This slide provides a bit of background in terms of how the solutions center came to be. The solutions center is an initiative of the Clean Energy Ministerial and supported through a partnership with UN Energy. It was launched in April of 2011. It's primarily led by Australia, the United States, and other CEM partners. So, now comes to this unique partnership includes support of developing countries through enhancement of resources on policies relating to energy access, no cost expert policy assistance, and peer to peer learning and training tools such as the webinar everyone's attending today.

Now, there are four goals, four primary goals for the solutions center. It serves as a clearinghouse of clean energy policy resources. It also serves to share policy best practices, data, and analysis tools specific to Clean Energy Policies and Programs and the solutions center delivers dynamic services that enables expert assistance, learning, and peer to peer sharing of experiences. And then lastly, the center fosters dialogue on emerging policy issues—

Now, our primary audience is energy policymakers and analysts from governments and technical organizations in all countries. But then, we also strive to engage with the private sector, NGOs, and civil society.

A marquee feature that the solutions center provides is expert policy assistance. "Ask an Expert" is a valuable service that's offered to the solutions center at zero cost to those that submit their request. So, we have established a broad team of over 30 experts from around the globe who are available to provide remote policy advice and analysis to all countries at no cost.

So, for example, in the area of Sustainable Energy Action Planning, we are very pleased to have William Becker, the Senior Associate, Natural Capitalism Solution, serving as our expert.

Now, if you have any—for policy assistance on sustainable energy action planning or any other clean energy sector, we do encourage you to use this useful service. Again, it is provided free of charge. So to your request assistance, you simply submit your request by registering through our "Ask an Expert" feature at cleanenergysolutions.org/expert. And, we also invite you to spread the word about this service to those in your networks and organizations.

So, in summary, we encourage you to explore and take advantage of the solutions center resources and services including expert policy assistance, subscribe to our newsletter where you can learn about more webinars like this and then participate in the future webinars.

And now, I'd like to provide some brief introductions for today's panelists. First up, we'll be hearing from Graziella Siciliano, an Oak Ridge Institute of Science Education Fellow at the U.S Department of Energy where she has served as a Coordinator for the Global Superior Performance Partnership (GSEP) initiative of the Clean Energy Ministerial since August of 2012.

Now, following Graziella, we will hear from Sylvia Boucher, the Chief of Training and Outreach for the Industry and Transportation Division of the Office of Energy Efficiency at Natural Resources Canada.

And then, our third speaker today will be Patrick Crittenden. Patrick is the Director of Sustainable Business and International Visiting Scholar at the Steven L. Newman Real Estate Institute and a Researcher at the University of Technology in Sydney.

And then, our fourth panelist today is Herman Grover, a Project Manager for the Industrial Energy Efficiency Project with the National Cleaner Production Centre of South Africa.

And then, our final speaker today is Paul Scheihing, a Project Manager for the Advance Manufacturing Office (AMO) Technical Assistance Team with the U.S. Department of Energy.

And now, with those introductions, please join me in welcoming Graziella Siciliano to the webinar.

Hi! Graziella are you there? Is Graziella having an issue with audio?

Sean

All right. Let's move on to Sylvia. Graziella, I'll send you a chat and we'll try to get your audio worked out and we can do your presentation at a later point in the webinar.

Sylvia

Yes, hello! I'm Sylvia Boucher from Natural Resources Canada, Office of Energy and Efficiency. As Chief of Training in Outreach, I'm responsible for the Dollars to Cents Program which consists of Energy Management Training and Awareness for industrial, commercial and institution organizations.

Before getting into my presentation, I would like to acknowledge and thank the Clean Energy Solutions Center and the Global Superior Energy Performance Partnerships, Energy Management Working Group for allowing me to present on behalf of Canada.

In preparation, panelists were asked to review the work and multi country analysis report on the knowledge and skills needed to implement energy management systems in industry and commercial buildings. A document, per reviewed by my colleague engineer, Bob Fraser; together, he and I noticed similarities between the knowledge and skills required in each step of an energy management system from program initiation to management review.

What I will present today is how Canada promotes energy management in industry and buildings through its Dollars to Cents Program. A program that helps organizations becomes more energy efficient and environmentally responsible and that helps them reduce operational cost and bolster their competitiveness while contributing to a cleaner environment. The legislative basis for the program is the Energy Efficiency Act.

So, following an outline of my presentation today, I'll have one slide for the introduction; maximum eight slides on the Dollars to Cents Workshops, one of which will show the linkages to implementing an energy management system; one slide each to describe how program is delivered, measured, and the results since its inception; one slide on the challenges and opportunities; and the last one on looking ahead.

So, the Dollar to Cents Program was introduced in 1997 and consisted of only one workshop called The Energy Master Plan. It explains how to develop and implement a comprehensive energy management plan including assembling an appropriate team using financing options and developing cost effective energy solutions.

In 1998, two workshops were added to the curriculum. They were the Energy Monitoring and Tracking Workshop and the Spot the Energy Savings Opportunities Workshop. The program first grew—further over the years and today, the Dollar to Cents Program Curriculum includes six standard workshops and various customize workshops including ISO 6001.

So, the six standard workshops are Energy Management Planning, Spot the Energy Savings Opportunities, Energy Monitoring, Energy Efficiency

Financing, Recommissioning, Energy Management Information System. And each of these six standard workshops can be adapted or customized to an organization's specific needs. They can be for a few hours to a couple of days. They're designed to address an organization's energy management needs from raising awareness to building technical competencies.

So, what's the target audience, you may ask?

Well, typically, our participants are managers or executives, financial operations managers or controllers, energy champions or building managers, operating engineers, plant or process engineers, maintenance or production supervisors, electrical or mechanical trades person and shop floor employees.

First, I will speak very briefly to four of the six workshops, numbers two to five; and then, with a bit more detail on the first and sixth. So, Spot the Energy Savings Opportunities provides a principles-based methodology that pinpoints energy savings opportunities in existing systems such as lighting, motors, pumps, boilers, heating, cooling and compressed air. Energy Monitoring shows how to measure and analyze an organization's energy consumption, both before and after efficiency improvement.

Energy Efficiency Financing shows how to build a finance-based business case for an energy project or how energy efficiency projects create financial value and what are the basics of third party financing mechanisms. Recommissioning teaches a fundamental principles and components or put differently, the benefits and the processes of recommissioning and building and this one is intended for building owners or managers.

Now, moving to the first and last workshops; in the Energy Management Planning Workshop, participants learn to build the framework for integrating an energy management program into their organization. It provides a systematic step-by-step approach to energy management in a manner that aligns with an organization's strategic object. In that sense, the strategic goal of most corporations is to gain a competitive advantage by seizing external and internal opportunities to improve the profitability of their operations, products, sales and marketplace position. Developing a successful corporate strategy requires taking into account all of the influences on the organization's operation and integrating these various management functions into an efficiently working whole. The workshop covers the critical elements of an energy management framework, commitment, understanding, planning, acting, and evaluating.

Here are the stages in the evolution of an Integrated Energy Management Plan. A successful plan will not only differ in technical aspects but also and more importantly for organizational aspect. The integration of energy into the overall management system should involve evaluation of energy implications in every management decision in the same way as economic,

operational, quality and other aspects are considered. Building an organizations energy management is required to ensure the maximum results of the technical energy actions are taken.

There are different templates available to help you put together Comprehensive Energy Management Plan. The best plan will be the one that fits into or as part of the overall operation plan of the organization. To show yourself that you have senior management support or a commitment for an energy policy, there's an energy champion and a team in place, goals and objectives are known and accepted by all; roles and responsibilities of all personnel are well defined. There's an effective reporting system on energy efficiency goals, targets, results that ensures all employees are up to speed on the topic. It is the responsibility of each and everyone in the organization. The action plan should include a base here, result achieved to date, targets, past actions, potential future actions to achieve target.

Now, I'll skip a couple here and go down to number six.

Training is required to build competency. For example, how do you operate a direct digital control system effectively? Communication is required to build awareness of the users. What's the procedure for shutting down my PC at night? Training and communication should be included in the budget for an Energy Management Plan.

Should provide financial benefits of capital upgrade; prepare a value proposition and arguments for capital competition; investigate internal and external funding mechanisms; and of course, last, evaluate results.

In the Energy Management Information Systems Workshop, participants learn how an information system dedicated to energy management saves money by laying the foundation for monitoring, documenting, and reporting on an organizations energy performance. They learn the stages of EMIS Development, how to build a business case for EMIS, and how it can help the organization comply with the energy management system standard.

So basically, EMIS is a performance management system. It makes energy performance visible so that people at different levels of the organization can make decisions and take effective actions to systematically improve energy performance and create financial and other value for the organization. It is a fundamental building block of an energy management system.

Implementing EMIS establishes a foundation for complying with the Energy Management System Standards. It fulfills the requirement of doing an energy review and establishing an energy baseline.

Early, I mentioned to having found similarities between the knowledge and skills required in each step of implementing an energy management system. So, let me now identify them in relation to the Dollars to Cents Workshop.

Initiating an energy management program links to the Dollars to Cents Energy Management Planning Workshop with respect to having energy policy, organizational leadership and commitment, a team and basic energy management concepts.

Conducting energy review links to the Dollar to Cents spot and Energy Monitoring Workshops with respect to collection of energy data, analyzing energy consumptions and costs, identifying major energy uses, conducting energy assessments, and identifying potential opportunities.

Energy Management Planning links to the Dollar to Cents Energy Management Planning and the Energy Monitoring Workshop with respect to setting a baseline, determining performance metrics, revaluing up opportunities, selecting projects, and developing action plans.

Implementing Energy Management links to all of the Dollars to Cents Workshops with respect to obtaining resource commitment, providing training and raising awareness, communicating to all stakeholders and then repeating action plans.

Measurement and verification links to the Dollars to Cents Energy Monitoring and EMIS Workshop with respect to monitoring, measuring, verifying, tracking and documenting energy used and savings.

And lastly, Management Review, well, that one links to the evolution and success of the Dollar to Cents Workshop since 1997 with respect to reviewing progress, modifying goals and action plans as needed. To deliver energy management training and awareness, there are two currently mechanisms in place; instructor led workshops and webinars on various energy efficiency topics.

For workshops, we run a competitive process and establishes standing offer with qualifying companies that have the mandatory technical requirements and experience in delivering energy management workshops. Currently, there are five service delivery providers in four regions across Canada. In this model, an [inaudible][0:18:38] maintains intellectual property rights or a documentation. An internal team of industry and buildings officers solicits interest in partnership arrangements with external clients.

The Canadian Program on Energy Conservation [inaudible][0:18:52] is a key network of 23 sectors. An administrative team liaisons with regional facilitators and the clients leading to the signing of an agreement. A call-up against a standing offer is issued and the workshop is planned and

delivered. Participants then evaluate the workshops and upon submission of their evaluation, receive a certificate of completion.

For webinars, the process involves determining energy efficiency topics of interest, planning and delivering monthly. It is our no cost option for promoting energy management awareness. Subject matter experts are called upon to make presentations on topics such as motors management, process integration, ISO 5001. Now, there are also other means to promote energy management training and awareness such as licensing and e-learning but I won't get into that here.

On the basis that you can't manage what you don't measure; our performance management team has developed performance indicators and performance measurement tools for our energy management workshops and webinars. These indicators were integrated to a reporting system called to "The Better Energy Efficiency Reporting Systems". (BEERS). Truly Canadian. The tools such as workshop evaluations and follow-up survey, organizations. We collect both quantitative and qualitative information about our workshop. The information allows us to measure our achievements on energy efficiency and to report to management using dashboards and BEERS. The cumulative results to date are significant. Since the beginning of the Dollars Descents program, we know that one in 26,000 individuals have participated in our workshop. We also know that as a result, \$160,000,000 in energy is saved annually, and 1.1 megaton of emissions have been avoided. The finder's success maintaining management fine for these workshops can be a challenge. Our business case must be tweaked accordingly to reflect changing trends, policies and directives. In strange relate mostly to new directives on cost and expenditures, with a fiscal prudent policy objective, the federal government whose funding comes from taxes, reports spending cuts.

For our program, it means reexamining the way our services are delivered which of view to continuous improvement and reduce spending, without of course, compromising the quality of our program. But, when there are challenges, there are also opportunities, which are the deduction of and integration of new ways, mechanisms of doing business through new technologies, new approaches of blending of the old with the new, strategic thinking exercises. It also mean extending our reach to our market segment not considered before - the E-learners, including the international community. Looking forward, we must continue to recognize the benefits of energy efficiency. The idea of being that saving energy has a number of benefits. Many of which are not immediately obvious. What I mean by that is it's not just about dollars. Other benefits include reducing costs to gain a competitive advantage which support company growth and job security. The idea is to get participants to think holistically and not just about energy and isolation.

The Dollars Descent curriculum of Energy Management Workshop will continue to evolve to respond to the changing needs of the organization.

To continually improve the way we deliver workshops, to lower operational costs, to improve energy efficiency savings, and to contribute to a cleaner and safer working environment. Energy Management works and you may go to these websites to find out what some organizations have saved. We have ISO certified plant - Saint Mary's Cement in Bowmanville plant who saved \$750,000—between \$750,000 and \$1,000,000 in total annual operating cost over five years. That was an 8% reduction in energy operating cost. [0:22:50.2] Canada, [0:22:51.5] plant, [0:22:52.5] Canada, Inc., [0:22:55.8] plant. Once organizations generate enough savings to pay for cost of the retrofit, each and every year, they will save. These money goes right to the bottom line for increase profit, reduce taxes, or more services to the taxpayers. The Dollar Sustains Energy Management workshop are one way in which NRCAN is supporting the federal clean air agenda. By encouraging energy efficiency, not only do these workshops help reduce operating cost and improve competitiveness, but they also help combat greenhouse gasses and other pollutants that endanger our environment. Natural Resources Canada's Office of Energy Efficiency has tools and services that save energy and money and help protect the environment. The Office of Energy Efficiency website will give you the detailed information on all of the available support. Thank you. That's the end of my presentation and now I'm asked to introduce the next panelist, which is Patrick Tenant, Director of Sustainable Business, Private Company Unlimited.

Sean

And actually we're going to try Graziella's audio one more time, and if it's working then we'll go ahead with her presentation right before Patrick's.

Graziella

Goodness. So sorry about that folks. I manage to screw it up even despite practicing. But, thank you all. To all the panelists and participants for joining here, for this webinar. I am the coordinator for the Global Superior Energy Performance Partnership Initiative of the Clean Energy Ministerial. And, I just want to talk about some of the works that we're doing to promote workforce development in the field of energy management.

Next slide please.

Just some background on GSEP, an initiative launched in 2010 at the First Clean Energy Ministerial. Overall, GSEP is led by the U.S. and has 14 member countries.

The key objectives are to significantly cut global energy use by encouraging industrial facilities and commercial buildings to implement energy management systems. We also promote private partnerships for cooperation on specific technologies or in individual energy incentives sectors. Within GSEP, there are six working groups, each lead by a different member country.

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The energy management working group aims to significantly cut global energy use in industrial facilities and commercial buildings and through the achievement of continual improvement of energy performance and through wide spread implementation of energy management systems. We have broad participation in some countries. We have currently 11 members, and the working group brings together, not just countries, but other stakeholders to share approaches and resources to enhance national programs and where possible, create alignment to promote and accelerate energy management globally.

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So what is the value of energy management? Industrial facilities and commercial buildings account for over 40% of global energy use.

And, there is significant opportunities for companies to realize energy cost reduction by applying energy efficient technologies and practices. In addition, there are opportunities for important non-energy benefits such as increase in productivity, quality and consistency that can further drive shareholder value and cost reduction. The benefits of an energy efficient will also translate into the broader national economy, increasing competitive and contributing to energy security and emissions reduction. Despite these benefits, energy efficiency improvement with various favorable payback periods often do not get implemented, and even projects that are implemented may not be sustained due to lack of support of operational and maintenance practices. The key problem is that energy efficiency is not integrated into dealing management practices. The solution is to engage staff at all levels within an organization in the management of energy and shift from a project to project based approached to one of continual improvement. An energy management system can help accomplish that.

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Energy management systems allow companies to systematically track, analyze, and plan their energy use. Enabling for greater control of and continual improvement in energy performance.

For instance, ISO 50001, a global energy management system standard that was published in June 2011. Forty-four countries were involved in designing the standard and many have transitioned to this as their national standard. ISO 50001 has a plan do check act framework which describes the key phases of a continuing process of energy management and performance improvement. Traditionally, energy efficiency in industry has focused on the planning and doing phase, which is to identify an action that will be able to greater energy efficiency, and then implementing that action. The energy management system brings that process full circle by implementing controls to check that measures are producing the expected results and to recommend and implement remedial activities to assure that

energy saving potential is achieved and maintained. Implementing energy management systems, along with adoption of more efficient technologies can improve energy performance by anywhere from 10% to 30%.

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Through international collaboration, GSEP Synergy Management working group works to identify best practices, create disseminate resources, and also technical expertise support country efforts to promote energy management.

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One of the thematic areas that GSEP works on is increasing energy management system adoption through workforce development.

A key challenge to widespread adoption is that many companies need access to a workforce with specialized expertise in order to implement a quality energy management system. Access to skills of experienced professionals, whether internal to a company or an external consultant, will result in more effective implementation with higher energy savings. However, professionals with these skills are not yet widely available in the market. In addition, while implementation expertise is typically concentrated in technical and engineering positions within the organization, a variety of non-technical personnel also exerts significant influence on energy decision-making, including executive staff, accountants, and financial managers. While these non-technical staff members may not be knowledgeable in all aspects of energy management, they can be critical to the success of an energy management system within their organization. To begin to identify potential solution to workforce challenges, GSEP produced the report with recommendation on the specific knowledge and skill areas needed by personnel and positions likely to influence energy decision making within a company. These recommendations are based on an inventory of relevant knowledge and skill areas prescribed by existing programs and several GSEP member countries.

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The first section of the report classifies the knowledge and skill areas needed along the key steps in the energy management system implementation.

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In another section, the report contains job descriptions for multiple positions that can influence energy management within a company and specifies the most relevant knowledge and skills for each job type.

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And finally, the report identifies some common professional development models and examples of how GSEP member countries are using these models to build the energy management capacity of their workforces. That's what our panelist here to talk about some of these development models. I wanted to turn it back over to our panelist. I'm passing it over to Patrick Crittenden to talk about work in Australia. Mr. Speck. Thank you.

Patrick

Thank you very much, Graziella. It's Patrick Crittenden here and congratulations to the energy management working group for such a great report. And, it's clear that you've really been engaging across the world to pull that together and really build and share knowledge in capacity building in this important area. As Graziella introduced energy management systems, she mentioned that one of the critical areas is that staff at all levels need to be engaged on an ongoing basis in energy efficiency if we're going to achieve improvement in organizations. I'm going to talk about a project that specifically focuses on building skills and engagement amongst accounting and management personnel. They're clearly important in that they're involved in decision-making and yet historically, energy efficiency training has focused on building technical expertise and engineering expertise. Often, as companies are faced with the challenge of implementing an energy management system for technical personnel, they challenge to actually engage with other important stakeholders in their organization, like accountants and managers. The purpose of our project was really to help them with that engagement by providing specific training and other events that aim to build a winner's motivation and develop capability in accountants and managers.

So, the next slide is my outline, and today, I'll just cover some project background and rationale so you can understand where the project fits. I'm not talking about Australian capacity building and training, overall, just one specific project. I'll talk about the training needs analysis we did to start that project or describe the pile of training and materials developed and then some key lessons learned and future activities.

And, I'd like to really emphasize, that as well as delivering training and developing resources, the process of engaging stakeholders throughout the project was absolutely key to developing an enduring focus on energy efficiency awareness training and skills development for accountants and managers. The project material is available on the University of Technology Sydney website, and we very much welcome you to utilize that material and adapt it within your own agencies and organization.

The next slide highlights the project background and rationale, so just move on, and I'll explain that this project was funded by our regional government - the State Government of New South Wales through the Office of Environment and Heritage. I have a long history of working with organizations in supporting and through energy audits and other means.

To actually deliver, energy efficiency improvement. Over the past three years, I've been particularly focused on training, and I had developed a number of courses for engineers, which I have also done in conjunction with the national government. But this particular project was focused on accountants and managers.

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When we got the South Wales government put out a tender, they exclusively requested that organizations form partnerships with others. The aim here was to ensure that this was an enduring program that engage other stakeholders throughout the process.

So, led by UTS Business School and my role was project manager. I'm an independent consultant, but I've been doing PhD research in the UTS Business School. And, Professor Susan Ben and Dr. Paul Brown are the key contact people at UTS Business School. We then look for partners and we partnered with Ernst and Young in Sydney, and also the Chartered Institute of Management Accountants, The Westpac Group and TAFE New South Wales Sydney Institute who were involved in technical training.

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We started by saying who is our target audience? Who do we actually need to target in order to build awareness? We develop this hierarchy in that we wanted to go from the top - Directors, CEOs, CFOs and other C-Suite executives. We wanted to target middle managers as well, that work in different functions within the organizations around accounting and management. We also wanted to develop training that would have addressed future workforce needs by tapping into the academic and student pipeline.

And so, the next slide highlights how we then proposed a number of different mechanisms to provide this training to each of these target audiences. Directors, CEOs, CFOs are of course very busy and so we develop a leadership webinar to engage with them. For middle managers, we develop interactive to our seminars that we could use to build general awareness and follow that up with a modular two days short course that allowed participants to go into further detail. At the academic at the university level, we develop integrated university offerings. Looking at existing courses and identifying opportunities to integrate energy efficiency information within those courses. Throughout the program, we had a steering group that we turn to at each critical phase in the project. This was involve to the number of industry association representatives and other organizations that were valuable in terms of the input that they provided, but perhaps as importantly, would also pick up, and deliver, and support, and promote these materials after the project.

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This is the project overview. I've mentioned each of these—most of these components. We developed teaching cases and training leads analysis, the core offerings interactive seminars, C-Suite webinar, modular two-day course, integrated university offerings, and we completed an evaluation at the end.

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And, just to put this into context, in developing this program, we wanted to take a social network perspective in order to get enduring change, we wanted to bring in a range of stakeholders to achieve that. While this diagram doesn't address specifically the stakeholders we were engaging with, it does highlight where education fits in, in relation to driving energy efficiency and sustainable business improvement.

So, we'll just move on to the next slide. And, I'll talk about the training needs analysis, which was a critical path of actually understanding the needs and then, developing and engaging people along the way. Some of the key outcomes from that was that it highlighted, it confirmed that the organization response to energy efficiency needs to be cross disciplinary. And from the point of view of the accountants and managers involve in focus groups, they saw an opportunity to act as the business partner, supporting other divisions in the organization, other professions, to actually draft business improvement and they perceive energy efficiency to be a key component of that. It confirmed that there was interest and demand for energy efficiency training for accountants and business managers. Something we're a little surprise of that was that the feedback was that this could be an opportunity to develop soft skills, influencing skills, communication skills, within accountants and managers as well as analytical and technical skills that will be needed.

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It also highlighted that we needed to be very clear on the rationale for action and importance for energy efficiency as a fundamental starting point, because right at the start was this question, what is the role of accountants and managers? What do they need to know? How can they work with engineers and other technical staff and what is the overall, overarching business case to energy efficiency improvement in organizations. We identified also that the application approach would vary very much across public and private sector that touch of industry sectors, firm strategy, and firm culture. From the feedback we received there in the training needs analysis, we realize we had to take that into account.

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This sums up some of the skills that were identified from the training needs analysis. The soft skills which are mentioned cut right across energy efficiency fundamentals, developing the business case for project, extending accounting tools with energy efficiency context, modifying information system to support, energy efficiency and budgeting and financing. As we did this training needs analysis that then would inform the development of our material and the training pilots.

And, the next slide please. Just to run through very briefly some of the education training materials developed that you're welcome to have a look at this on the website. We started with a two-hour interactive seminar.

The aim was that this would be a short package of material and we wouldn't just present in these two hour seminars, but we do it in an interactive way. We did one seminar with location education training teachers. We developed an in-house seminar for the Westpac Banking group. We conducted a lunch seminar with CPA Australia, and also an evening presentation with the Chartered Institute of Management Accountants. As we did these seminars, we received really valuable feedback from the participants about what they saw their role to be in their organizations and the suggestions that they made to the top of training that would be appropriate to them.

On the next slide, I just talk about the C-Suite webinar. This was lead particularly by Ernst and Young and our team. They developed a one-hour webinar, which aim to enhance accessibility for chief financial officers and other senior managers around this important topic of energy efficiency. We have about 400 participants in this one-hour seminar. The content was focused on strategic business drivers excellently essential.

We found it excellently essential to articulate the business case, but in the same language that CFIs and other C-Suite Executives use and think about in terms of adding value to their organizations. We also explored ways in which the business case are actually could happen at different levels of the organization and we drew on successful business cases.

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The modular two-day course provide much more comprehensive training for mid-level managers and accountants. You can see there some of the key content, covering everything from accounting reporting considerations through funding mechanisms and also the soft skills communication and effective presentation, because at the end of a the day as we found in the feedback to a training needs analysis, presenting the business case in a compelling and engaging manner was essentially in order to get support for energy efficiency projects.

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The integrated university offerings - what we aimed to do there was to integrate energy efficiency teaching into existing programs rather than to create something separate. What we found was that there were great synergies between energy efficiency and the skills that accountants in particular were learning within these courses. And so, it really open the opportunities - case studies that help develop this accounting and management skills including accounting for business decisions, cost management systems and managing for sustainability.

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Following the development and the piloting of each of these training courses, we conducted a detailed evaluation, including obtaining data from assignments, and post training and education evaluation. We also conducted focus groups with participants, and we look at the actions taken by partners and the project's theorem committee to promote the role of energy efficiency within accounting and management.

Next slide please. And, when we reflect on our project, we found that collaboration was really important. Working with us, different stakeholders including industry associations, professional accounting organizations, universities, because each of those stakeholders brought different aspects, different specialties to the process and really helped us learn from each other. We consulted right through the process. We ensured that there was sufficient resources and support for participants, and also allowed us to acknowledge the effort and achievement that everybody put in. The future challenge that was identified was that many participants and the stakeholder involvement program suggest that we actually should bring engineers and accountants together in these training courses, so that they can learn from each other and share their perspectives on effective change for energy efficiency and how they can work together in organizations.

Just go to the next slide please. We very much encourage you to get in contact with us to use our materials, and if you have any questions, please contact me or Prof. Susan Ben and Dr. Paul Brown. Thank you very much for the opportunity to present today. I look forward, if you do have any questions, please send them through on the webinar and I can respond at the end, and in the meantime, I'll pass on to Herman Grover.

Sean

Hi, Herman. And, you are—I believe you are still self-muted, so just make sure you take your mic off mute.

Herman

My apologies. I have already started speaking. [Laughter] Good evening everybody. My name is—thanks, Sean. Hi, my name is Herman Grover. I will be presenting on the training of ISO 50001 certification auditors in South Africa. This certification training was offered by the NCPC and the

Industrial Energy Efficiency Project. A bit of background, this project is a joint collaboration between the South African government represented by the Department of Trade and Industry and the Department of Energy, the Swiss government represented by SECO, and the UK Department for International Development, and specifically, UNIDO. The project is implemented by the National [0:47:42.4] Production Center. And, the project objectives are specifically to reduce greenhouse gas emissions, enhance competitiveness of industry through improve energy efficiency.

But, from the inside of the project, as a project manager, I can tell you, we are trying to bring about a thinking paradigm shift of industry in South Africa to move away from Project Based Energy Management to Systems Based Energy Management. For that, there's a number of project components. The first thing, we—national energy management standard, the driving and the adoption of the national energy management standard in South Africa, compatible with 50001 and obviously, the capacitation of management system auditors of 50001. And, that's exactly what I'll be quickly speaking about. Energy Management System training offered by the NCPC and the South African government adopted the standard and obviously identified the need for energy management system training to be conducted in South Africa. And, to that affect, the mandate of the NCPC to offer the training. The training is offered at a number of levels. There's a one-day introduction to energy management systems, a two day advanced energy management system training which leads on to the expert level training that lasts twelve months which terminates in an exam which everyone needs to pass. There's also the five-day ISO 50001 Auditor Course, which I'll be speaking about. So, in total, 35 courses have been offered to date nationally. With nearly 900 candidates registered and completing each of those courses.

So, specifically homing in on the lead Auditor Course or the ISO 50001 Auditor Course. The training was developed with supports from the Southern African Auditor and Training Certification Authority, also known as SAATCA, and with their support to the training material was developed to align to criteria 6.2 of SAATCA, which is related to the energy management system auditor. So, based on that, we selected the candidates that could attend the course, depending on the academic qualification and their work experience. They also needed to have at least two years management system experience related to any of the management system such as 14000, 9000 in Southern Africa, and also have completed the SAATCA Certified Courses or courses that are offered by SAATCA Certified Training Providers on 1907 and 17021. That is the general criteria for the team management systems. With that criteria, we were confident that the candidates would be sufficiently equipped to take on the training on 50001. So, what was this specific need that our training addressed? 50001 is fairly a new standard in South Africa. It was released in middle of 2011, and South Africa was one of the first countries to adapt the standard as a national standard. And, based on that, a number of

organizations that implementing energy management systems aiming to get certification.

Currently, 10 organizations linked to the NCPC, have implemented energy management systems. There's obviously a need for certification auditors to be capacitated to conduct the certification audit to provide certification to these organizations. So, that was our target. That was our need that we addressed. The energy management knowledge and skills that were addressed, obviously we are aiming to equip the management auditors to conduct this certification audit for ISO 50001 and based on that, the knowledge that we transferred to the training was firstly, a technical graph on energy performance improvement so candidates were given a good understanding of significant energy users, EMPs, base lining, operational control, etc. All of that align to ISO 50001 from an auditing perspective. Then there was obviously the management systems skill where the candidates would train and auditing the management system side of ISO 50001. For example, documentation and record control, those and responsibilities, etc. It was a two-tiered approach to the training and technical and management system based. So, UNIDO funded the deployment and development of all of the training material. The developers and facilitators for this training were basically free.

We had Deann Desai from the U.S.A. She's an expert for the US technical advisory group for TC 242, the technical committee 242. She has a long list of other credentials, which I have omitted here, but she brings a lot of experience and knowledge on 50001 and audit management systems. So with her, Wendy, and myself, developed this course. Wendy has more than 25 years' experience in management system auditing in South Africa. She has also served as the SAATCA committee chair for Energy Management Systems and the Environment Management Systems, as well. She was bringing a lot of information and lot of quality control from SAATCA's perspective. And, myself with a bit of technical background, I was bringing the technical experience. We all collectively developed the audited training material for this specific training. The logistics and training administration was done by the Skills Development Department of the NCPC. The training was mostly classroom based training, where we have lecturing case studies, grouped discussions, and group exercises.

A lot of the group exercises were also very technical so they had to do calculations on energy savings, on energy unit conversion, and on the last day an exam is written. Each facilitator mocked the exam. We also contributed towards the development of the exams, as well. So, here's some photos. There's me going through a technical group exercise. This is from the earlier training of October 2012. And, this is from April 2013, where Deana is doing a string exercise, where each of the candidate are to identify what the links are between the various sections of the standard. This is quite a nice exercise. Unfortunately, we don't have a photograph of Wendy.

But, the outcome from the training, the training was offered in two sections, there was—or twice. First, in October 2012 where 12 candidates registered and nine passed the exam. Then the second round of training was done in April 2013 where 25 candidates registered and 20 passed the exam. So, in total 29 auditors has passed the exam on certification audit of ISO 50001. Most of these are certification auditors from companies that provide certification audits for various certification management systems. We've also received a number of requests for such courses to be held for internal auditors. For example, Mercedes Benz has requested us to do a three-day course, which we will be doing in February and a couple of other mining houses from South Africa had asked us to help with the training of their internal auditors to prepare them for the certification for 50001. Some of the lessons learned from this training. Most candidates that attended had strong management system auditing skill, but they are rather weak on the technical side.

When we were speaking about energy performance indicators and looking at the various energy systems - compressor, a boiler - that was a bit foreign to them. We were thinking of maybe deepening an understanding of the technical aspects through a pre-two day advanced energy use, energy management system cost to boost the technical learning, and also maybe have a practical exposure on a technical system as part of the training. So, to take everyone to a specific plant like a boiler plant or a compressor plant that is currently going through ENMS implementation for 50001 certification, so that all the candidates can have an understanding of how these technical systems, fits in. The resources available for this training program. NCPC aims to capacitate other training providers. For example, the South African Bureau of Standards to create sustainability of the order to training for 50001. So the auditors - the 29 auditors - that went through our course are now capable to deliver courses if they are registered with SAATCA and the training provider. And, the knowledge and experience of this developers and facilitators can be shared with those training providers most locally and even internationally, if required. Regarding the training materials, the copyrights for the training material are held by UNIDO. And, request for training material may be routed directly to UNIDO.

So, I'll end up with a case study - Johnson Matthey. Johnson Matthey is an automotive manufacturer in Germiston in South Africa, Johannesburg. Johnson Matthey commenced energy management system implementation in 2012. Their aim was to go for 50001 certification, and they have completed successfully stage two of the certification audit. So, they are on well on their way to receive their final certificate for complying with 50001. But, the [0:57:46.2] involved is quite interesting. The implementing consultant, which was Wendy, is a qualified energy management system expert, she's gone through our expert level training, and she's also the facilitator for the lead auditor training. I was the project

manager on that. I've also qualified as an ENMS expert on the expert level training and I was also the lead Auditor facilitator.

Peter Hasbrook from SAVS was the certification auditor from the management system side. He qualified as a lead auditor from our AIP training, the October 2012 training. Moses Maoul is also an energy management system expert provided technical expertise. This was a nice close group, where the IEE project took an organization such as Johnson Matthey. From the expectation of certification to going through implementation, and actually receiving that certification at the end. So, that's about it for me. I invite everyone to please logon to our website. Visit our links and group, as well. There's a lot of information that we share on that. Thank you very much. With that I offer—I hand over to Paul for the next presentation.

Paul

Thank you. Paul Scheihing here. I guess I'm the last talk before the discussion. I will try to move this along so we have time for Q&A. The Department of Energy has developed the superior into performance program. We felt from the beginning that having a qualified workforce would be essential to the success of this program, so that is going to be the focus of my talk to describe that to you.

Next slide please.

Just a little bit on superior performance or SCP certification. The requirements are two things. One, that you implement the ISO 50001 standard and secondly, that you have improve the issue performance of your facility beyond the requirements of 50001, and both of the things are verified by an auditor.

Next slide please.

Real quick, there are two pathways for getting qualified. Most facilities have used the energy performance pathway where you improve either 5%, 10% or 15% for silver, gold or platinum in your energy performance or you use the maturing pathway where you can reach back up to 10 years to improve 15% plus you have to achieve points on our best practice scorecard.

Next please.

So, this slide shows you the skills we have developed and the left hand side, which is the certified practitioners in energy management systems is a type of person that would implement the SEP program in ISO 50001. So, on the right hand side are the two types of people that are needed on the audit team to perform the SEP certification audits. So, they are all related and you'll see in another guy, you actually have to achieve a certified practitioner requirement first before you get to the SEP lead auditor or SEP performance per file.

Next please.

Okay, so this shows some of the skill set under the CPEMS credential. Much of it is ISO 50001 skills and you can see the different requirements which many of the previous speakers have actually described similar training that's available in other countries, and then we also will train the person and qualify them in knowing the SEP standards and protocols.

Next please.

The lead auditor is pretty much just that. This is the person who really has command of all the requirements of SEP, including ISO 60001 and leads the audit team, so therefore they need to be expert on not only the requirements of SEP but the audit requirements as defined by financee standard and will lead both the stage 1 and stage 2 audit, as well as the surveillance and recertification audits.

So, it requires a person who knows both ISO 50001 as well as energy type skills to look at both management system and energy engineering type issues as your performance issue.

Next please.

The performance provides more of a technical credential and it's the person that's going to look at whether the facility has met the requirements of the SEP measurement verification protocol and has improved that required amount to 5% or 10% or 15%, they will look at the client's energy performance model and the calculations that were performed for the various energy saving actions or total facility energy performance improvement, like if the model is valid or any adjustments that are made if they were satisfactory, and we also do a bottom-up sanity check where the client has to show the individual energy projects that were implemented and they need to add up to at least the minimum threshold to get qualified. And then of course we're looking at data quality and things like that.

Next please.

So, in starting this whole certification credential, maybe about four years ago, we went through a process to see what kind of credential we wanted and you can see the three types, registry of people, a certificate which really denotes that a person has gone through training or a full-fledged certification where we're testing for both their knowledge and skills. We decided on person health certification and we decided to go through an NC accreditation process, which requires that the exam prepared would be scientifically developed with the assistance of psychometricians.

We also felt that this would guarantee that the people that were certified would have the skill sets that are needed and they are competent to either implement SEP in ISO 50001 or to participate on our team. We feel that

this was important because it helps with these credentials to get international recognition.

Next please.

So we follow the ISO 17024 standard for accreditation. This means that the organization, personal certification body would go through this accreditation and towards that end. We work towards creating a certification scheme. The scope and job task analysis are we call it the blueprint, which are the skills that we require. We created both the training and exams out of the scope and blueprint but as 17024 requires, the training needs to have a firewall with the exam, and that prevents the training to train for the exam where it would lead to a lesser quality credential.

We want to make sure the people know the subject and so we followed this 17024. So we have two types of organizations, we have a personal certification body which actually conducts the exams, checks on the professional qualifications and then issues the certification to the person and then there are personnel training organizations that conduct the training to prepare for the certification.

Next please.

So, this is a little bit of a repeat of what I showed you, but both the professional training organization and the certification body build off the scheme as well as the job task analysis. And we developed the CPNE in a mass—SEP lead auditor, SEP performance [inaudible] [01:07:55] all in this process.

Next please.

So, this shows the organization and the flow. So, the first thing you would do is you would get your certified practitioner and energy management system. That's kind of the foundational credential. From there, you can become an auditor. To become a performance verifier you have to move up to take the performance verifier exam. There's a training that goes along with that. If you want to be an SEP lead auditor, you first have to get the ISO auditor credential and then take some additional requirements for SEP lead auditor.

Those two people, the performance verifier and the lead auditor would be part of the verification body audit team and that verification body would be accredited to the ANC 50028, which builds off actually 17024.

All right, I think that's it, one more slide. So, this is our status, we have two training organizations, Georgia Tech as well as ULTQS for training. We have the Institute of Energy Management Professionals. That is the professional certification body and to date we have 77 people that are

these certified practitioners, 20 performance verifiers and 10 lead auditors and we also have 17 facilities that have gone to the SEP program and has been certified. I think that's it.

Next please. Thank you very much. That concludes my presentation.

Sean And thank you to each of the panelists for those presentations. I really appreciate it. And now we will move on to the question and answer session of the webinar. So, I just want to remind any attendees, if you do have any questions for the panelists, you may submit those to the go-to webinar panel and I will present those to the panelists. We did receive a few questions. I will start. This question is directed toward Hamad but anyone else after that may feel free to address it, and it asks, what's differentiates the training of ISO 50001 to any other standard, for example if you have exposure to general management system auditing principles, would there be a need for someone to attend the auditor training for ISO 50001.

Herman Thanks Sean, I think that's a relevant question that's been asked to us a number of times as well. The obvious difference with 50001 and other management systems, if you look at the back of 50001 in appendix B, it shows the clear similarity between 50001 and the other standards. However, the difference between 50001 and 140001 as an example is energy management systems requires continual energy performance improvement. And therefore, the organization has to show constant and consistent improvement in the energy performance, and to audit that, the auditor needs to know a little bit about energy and how energy performance is measured, what is the baseline, what is MNV, what are the significant energy uses that are being questioned. So, it's not just good enough to have management system auditing skills on just general management systems. You'd need to go specifically into 50001.

So, we've been asked that question by a number of auditors who are specialized in 140001 with a lot of confidence that, "Ah, 50001, we can do that," but this specific detail that this standard looks at related to energy performance improvement which need to be trained. I hope I have answered that question, Sean.

Sean Yeah thank you Herman. Did someone else want to jump in? I thought I heard someone. The next question is, the response might be too detailed for a complete response right now during the question and answer but I'll present it and maybe provide any feedback that you might have to the attendee that asked this, and the question is pretend houses that you are connecting to renewable energy such as solar, is it more efficient to use the system as a connected group or to make each separate house its own off-grid system?

Herman If I can fire that question?

Sean Yeah, definitely.

Herman I think there would be a lot of consideration that we'd have to look at, firstly cost, what kind of system are you connecting and the connectivity of those 10 houses in terms of the grid connection. Is it easy to connect them to that one central renewable energy source or are they separate in terms of grid connection, which necessitates individual renewable energy sources? Also the costs, it depends on what would be the cost implication of doing it as a standalone unit feeding those 10 houses, or is there any incentive tax benefit that each of those individual homeowners would reap from doing it individually on their own houses?

So I think there's a bit of information that would be required to specifically give one answer to that question. I don't know if any other panelists want to add to that?

Sean All right, we'll move on to the next question since I didn't hear anyone, and I believe this question is directed towards Pamela and it asks, how many Dollars to Cents workshops are delivered in a given year?

Sylvia I think that question might be directed to me?

Sean Oh sorry, that's what I meant.

Sylvia That's a good question. Actually, we've been delivering Dollars to Cents workshops like I said in my presentation since 1997 but at the time we only had one workshop. We've increased our curriculum to six workshops and several customized workshops since then and this year, we will deliver 145 workshops on energy management. Last year it was about 149, the year prior about 144, so within that range, our targets, we were developing performance measurement target with 120 initially. So, the numbers speak for themselves. Demand is high and we continue to exceed our targets we have for the past three consecutive years. Does that answer the —

Sean Yeah definitely, thank you. And the next question is are there manuals available for the energy management planning workshop?

Sylvia Is that also directed to me?

Sean I believe so.

Sylvia Okay. Yes, we have manuals. Our participants who registered for the workshops each received manuals. We have a series of manuals and practice guides and so on. So, one would have to register for the workshops to obtain this information.

Sean Great. So, once they register then those manuals will be made available to them?

Sylvia That's right.

Sean Okay, great. And the next question that we have received, I believe this one is for Herman again and the question is how would the challenge of auditors being strong in management system understanding and we technically be addressed when they actually conduct the management system audit?

Herman That's a good one. What we have found a lot of our management system auditors, the qualified management system auditors, what they are doing is bringing in an energy management system expert or someone who has gone through the expert level training but was very strong technically. So, they would look at the compliance to this standard from a management system perspective and the technical input or the technical evaluation will be done by the second expert on the technical side of things.

 We might not be very strong on the management system but very good on the technical side, as we saw in Johnson Matthew, Moses Maoul was keeping the technical input. So, that is one of the options that can be looked at, although it would be ideal if we have a single auditor who knows both management system and the technical aspects clearly.

Sean Great, thanks again Herman. And next question, again for Sylvia is could you talk about any fees for the Dollars to Cents workshops and webinars?

Sylvia Yeah sure. The answer to that one is that the webinars are offered free of charge but the Dollars to Cents workshops are not. So, there is a basic fee for a participant for a standard workshop and that's more than \$20.00 per workshop. Sometimes an organization wants to deliver a workshop to their employees and so they would pay delivery fee for a full-day workshop with two trainers, that would be \$5700 or if it's a half-day workshop, \$4700 and then of course there are different fees if the workshop is delivered with only one trainer, so in that case the full day delivery fee would be \$3600 and the half day would be \$2600. And customization of a workshop, there's a fee for that as well. So, when you take our standard workshops and try to customize it to a particular industry, then that fee is \$155 hours per hour plus the delivery fee that I mentioned earlier.

 But of course we have discounts that apply to returning participants or organizations and to those who attend multi-day workshops. So for example, rather than charging \$5700 for a full day workshop with two trainers, we would charge a returning organization \$4400. So, these organizations they can have 20, 25 participants so the per participant cost then, I guess the lower with the higher number of participants they have.

Sean Great. Thank you, Sylvia. And another question just came in and this is for any panelist to answer, do you know of any efforts to implement these programs in other countries? Have other organizations contacted you to learn more or replicate these results elsewhere?

Herman From the South African perspective, if I could speak Sean, the UNIDO program is being implemented in 12 countries. Currently, the energy management system implementation, the expert level training that we have conducted in South Africa is being conducted in a number of countries including Indonesia and now Ukraine is now going to start off with the program, but in Africa itself, I know Mozambique was contacting us to see if we could offer energy management system expert level training to some of their engineers on the national team of production side.

So, there's quite a bit of demand for this in Africa but to my knowledge I think South Africa is leading the way in Africa but there's other initiatives that have been done across the world through [inaudible] [01:21:05].

Sylvia And if I may say for Canada, I think in the past although I think it was before I joined the Dollars to Cents program, there were some Dollars to Cents workshops that were delivered in Mexico and this year, in Canada we have the Canadian Institute for Energy Training and their head company is called [inaudible] [01:21:38] and they deliver internationally energy management workshops. So, they have approached us more recently, sometime in December I believe it was and asked us if there were any opportunities for collaboration. So, I guess we're considering that at this time.

Paul This is Paul Scheihing. For the certified practitioner training, we have a pilot training plan in Canada with Natural Resources Canada through Bob Frasier and the Korean government, their GSEP has talked with us about possibly doing a certified practitioner standard but no specific plans.

Graziella And this is just a—generally speaking, the member countries that we have on the GSEP working group are all very interested in looking at energy management systems as a key strategy for promoting energy efficiency in industrial commercial building sectors. So, they're looking at policies, voluntary programs, mandatory programs, incentives, to get some widespread adoption in industry of these systems and as those programs strengthen, you'll see demand for skills such as ISO auditors and practitioners, internal and accountants with the financial analysis skills to understand the potential for energy efficiency. All the demand for these types of skill sets will increase significantly, and so some of the examples of the programs that we hear today, we're going to see a lot of demand for those types of programs and one of the roles we play within GSEP is to try to gather all of these innovative programs and be able to share them with member countries who are looking to build their capacity to make energy management system just a full strategy for their efficiency policy in a national level.

Sean Great, thank you everyone. And one more question that I did receive is there any research on how to break down the executive level barriers to implementing this approach? And that does not say who it's directed towards.

Patrick I'm sorry, it's Patrick here, my apologies.

Sean Yup, go ahead.

Patrick Short answer is yes, I'm aware of a number of reports and other projects. So, I'd be willing to put that on the website if you like so the people could reference some of those.

Paul This is Paul. Here in the U.S., we're taking superior performance and ISO 50001 to an enterprise wide level, and we're hoping to demonstrate that the cost of implementing the management system will go down substantially by going across many facilities, and we have six companies that are piloting this with us. So, we're expecting that once we make the business case that the cost are substantially down and the benefits are maintained or even greater than—corporations will start to adopt [inaudible] [01:25:24] in a more wide scale way.

Sean Great, thank you and Patrick, I can also email you the address of the attendee that had that question so maybe you could contact them directly. And then we have time for one more question and this is also directed towards any panelist, what has been the biggest factors to attract participation and support for your programs?

Paul Money saving I guess. Just make the business case. We spend a lot of time on quantifying the cost benefits and we published a report this summer through Lawrence Berkeley National Lab, the savings that nine facilities received and the cost they had spent. We found that the larger facilities got a payback within a half and one year on the total cost of implementing the SEP program, which is mostly staff time to implement the ISO 50001 management system.

Patrick This is Patrick here. Go ahead.

Sean Why don't we go Herman first and then we'll move on to Patrick?

Patrick Okay, great.

Herman From our experience here in South Africa, we've had a country where we've in the past 20 years leading up until 2001, 2002 we had very cheap energy and the day after there was a lot of growth in the electricity demand, which led to the supply-demand imbalance and we saw the first load sharing in the history of this country in 2008 and a lot of factors that led to the rising of electricity prices. And all of these factors have significantly impacted on the way industry looks at energy management, the way business looks at energy management and the way government looks at energy management and we've seen tremendous policy movement in the policy nationally on energy management and all of these factors have pushed the market forward to now really committing towards a

systems approach to saving energy and that's why we see a lot of demand and energy management systems in South Africa. Patrick?

Patrick

Yeah, in our experience because we've been engaging with senior management in organizations, often we found that for many costs and important driver, but for other organizations, it's seen as more of an operational issue that should be addressed further down the organization. So, in those cases we found in particular that it's been important to focus on value and multiple benefits.

An important question we found to ask is to look at each organization and ask the question, what are their current challenges and risks that they face and to see whether through energy management, the actual process of implementing an energy management system or conducting an energy audit might actually address some of those problems, those issues [inaudible] [01:28:58]. And by addressing a current issue, that can be much more appealing to senior management and lead to greater support. Some of those are multiple benefits and again as I said, it varies for one organization to the next, the commercial offices, they relate to attracting, retaining tenants particularly if they have old set of assets, manufacturing and mine processing might relate to product quality and through put in other organization's compliance risk and uncertainty associated with regulation may be an important driver and for others, still reputation.

So, just to sum that up, we found that asking the question, what are the challenges and issues that the organization currently faces and framing the value of energy management in terms that are most relevant to them has certainly got a more effective approach in obtaining senior management buy-in.

Sean

Great, thank you. And we are actually at the end of our time for the webinar, so I want to go ahead and ask the attendees to please just complete a quick, three-question poll that we have that just helps evaluate the webinar, and we do appreciate your feedback. So Heather, if you could display that first question which is, the webinar content provided me with useful information and insight. And you can answer in the go-to webinar window.

Great and the next question please, Heather. The webinar's presenters were effective. And then the last question is, overall, the webinar met my expectations.

Great, thank you everyone for participating in the survey and on behalf of the Clean Energy Solutions Center, I just want to again thank our expert panelists for participating today and for our attendees for joining us. We did have a great audience. I very much appreciate your time. I invite everyone to check the Solutions Center website over the next day or two if you'd like to view the slides and listen to the recording of today's presentation, as well as any previously held webinars. And so with that, I

just like to wish everyone a great rest of your day and we hope to see you again at future Clean Energy Solutions Center events. And this concludes our webinar.

DRAFT