

Webinar Panelists

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Chad Gallinat	U.S. Department of Energy
Debbie Karpay Weyl	SEAD Initiative
Hugh Falkner	

This Transcript

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Sean Esterly:

Welcome to today's webinar hosted by the Clean Energy Solutions Center and Super-Efficient Equipment and Appliance Deployment. We're very fortunate today to have Mia Forbes Pirie, Dr. Chad Gallinat, Dr. Hugh Falkner and Debbie Karpay Weyl joining. These very speakers will focus on the SEAD Electric Motor Awards Competition. And, one important note to mention before we begin our presentation is that the Clean Energy Solutions Center does not endorse or recommends specific products or services. Information provided in this webinar is featured in the Solution Center's resource library as one of many best practices resources reviewed and selected by technical experts.

Now, before we begin, I just want to go over some of the webinar features. For audio, you have two options. You may either listen to your computer or over your telephone. So if you choose to listen to your computer, please select the 'mic and speakers' option in the audio pane. By doing so, you eliminate the possibility of feedback and echo. And, if you select the telephone option, you will see a box on the right side displaying the telephone number and audio PIN that you should use to dial in.

Panelists, we just ask that you please mute your audio devices any time you are not presenting. And if anyone has any technical difficulties with the webinar, you may contact the GoToWebinars Help Desk at 888-259-3826.

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presentations will be posted to that page. I will send out that link once the webinar is underway as well.

Now, I have a great agenda prepared for you today that is focused on the 4th SEAD of Global Efficiency Medal Competition for Electric Motors. Before our speakers begin their presentations, I just want to provide a short informative overview of the Clean Energy Solutions Center's initiative and then follow on the presentation, we'll have a question and answer sessions and wrap up with some closing remarks, followed by a brief survey.

So let's probably just provide some bit of background in terms of how the Solution Center came to be. The Solution Center is an initiative of the Clean Energy Ministerial and is supportive to a partnership with UN Energy. It was launched in April of 2011 and it's primarily led by Australia, the United States and other CEM partners. Outcomes of this unique partnership include support of developing countries, doing enhancement of resources and policies relating to energy access, no-cost expert policy systems and peer-to-peer learning and training to all subject of the webinar you're attending today.

So there are four primary goals for the Solutions Center. First goal is to serve as a clearinghouse of clean energy policy resources. Next, it also serves to share policy best practices, data and analysis tools specific to clean energy policy and then programs. And, the Solution Center also delivers 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.

So our primary audience is energy policy makers 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.

One of the marked feature that the Solution Center provides is the expert policy assistance, so this is known as Ask an Expert, and it's a great service offered to the Solution Center at zero cost. We have established a broad chain of over 30 experts from around the globe who are available to provide remote policies, advice and analysis to all countries. So for example, in the area of low-emission vehicles, we are very pleased to have Ted Sears, the senior project leader at the US National Renewable Energy Laboratory serving as our expert. So if you have a need for policy assistance on low-emission vehicles or any other clean energy sector, we encourage you to use this service. Again, it is provided free of charge.

So to request assistance, you may submit your request through the Ask an Expert feature at cleanenergysolutions.org/expert. We also invite you to spreads the word about the service to those in your networks and organizations.

So, to summarize, we encourage you to explore and take advantage of the Solution Center resources and services including the expert policy assistance, process grantor and newsletter and participate in more webinars like this. And, with that, I'd like to turn over the webinar to Mia Forbes Pirie. Mia.

Mia Forbes Pirie

Hi. Thank you, Sean. Hi, everyone. I'm Mia Forbes Pirie from the Policy Partners. Welcome to the first of two webinars on the SEAD Global Efficiency Medal Competition for Electric Motors. As Sean said, this session is going to be recorded and available for download on the Clean Energy Solutions website. Also, it's come to my attention that the number of the US participants who'd hope to be able to make it are unable to because of parallel commitments on the US Department of Energy Rule Making Corp. So that's a bit of an unfortunate instance but one which hopefully means that the future of energy efficiency and motors is safe. So we're all working hard on it at the same time.

There'll be another live webinar taking place on this 22nd of January at times more convenient for Australia and Asia—so just making sure that this—local coverage not only of the competition but also in terms of the webinar. Let me take a moment briefly to introduce the presenters and the people who are going to answer the questions—so the people you'll hear speaking today. They were involved in different ways in SEAD and then the Motors Competition. Dr. Chad Gallinat and Debbie Karpay Weyl are co-members of the SEAD team. They both sort of drive forward the program and the competition, which spans across a number of different products.

Chad is currently a science and technology fellow at the US Department of Energy. He has a solid foundation in Science at the highest level and has worked in both the private sector and at the US National Laboratory. Chad's going to talk to you about SEAD and the Clean Energy Ministerial. So he's going to be giving you the big picture.

If we were going to the next slide, we have Debbie Karpay Weyl. She's an associate at CLASP who's the operating of the SEAD. And one of her key roles is to provide programmatic support to SEAD Global Medal Award across all products. Beforehand, Debbie consulted the US Department of Energy on Energy Efficiency programs. She has the Master's Degree in Environmental Policy and International Development. Debbie's very familiar with the rules of the competition and she's seen how they worked across the various products. So she's going to be a great asset in answering any questions about how the competition was and the practice.

If we go to the next slide, Dr. Hugh Falkner, a part of the Atkins, the policy partners team, and we're providing outreach and support on the competition. Hugh is a recognized world-leading expert on energy efficiency in rotating machinery. He has over 20 years of experience in the sector, having worked both in industry and then as an expert consultant.

Hugh's just come back from Brussels yesterday I believe where he was negotiating the panels that called a meeting for EU—for parts that he owned—and he's going to be involved in the next one on motors on February 10th. He was also involved in the development of the SEAD Global Efficiency Medal Competition for Electric Motors—so the competition that we're talking about today—which I understand was quite a complex and intense process. So he's best place to answer detailed questions about why things were decided the way they were and to give an explanation of all the rules and more details—and that's what he's going to be doing.

I'm a mediator and facilitator as well as a consultant on energy efficiency policy and strategy with the policy partners. I've had the privilege of working on both sides of the ocean on the UK Market Transformation Programme and as a program manager for Lawrence Berkeley National Lab on US Department of Energy World Makings. Today, I'm chairing this talk but I may also chip in on answering some questions on the competition with my outreach—format. So, over to you Chad for an overview of SEAD and the competition.

Dr. Chad Gallinat

Great, thanks so much, Mia. Yeah, thanks for everyone that's attending today. I'm pretty excited to talk about the competition for electric motors. So the idea of this webinar was to talk about the motor competitions from the perspective of the Clean Energy Ministerial as a whole, just to kind of provide a top-down understanding of exactly what this competition means from the Clean Energy Ministerial perspective.

So with that I will start at the highest level: What is the Clean Energy Ministerial? From here on up, I'll be calling it the CEM. It's a high-level global forum involving 23 member countries gathering all of the energy ministers, energy secretaries once a year and the member governments represent 90% of the global clean energy investment and 80% of the global clean house gas emissions.

How is the Clean Energy Ministerial—how does it work? Well, again, it unites these 23 participating governments to really push clean energy, energy efficiency, renewable energy problems, so the ministerial really centers around the annual meeting—the next one will happen at the end of May in Seoul, South Korea. And, everything kind of falls out of the ministerial meetings and we hope to really engage the private sector by building these industrial government collaborations to scale up clean energy around the globe. And this is all done through the 13 clean energy initiatives. Some initiatives are kind of—these four different categories of energy efficiency, clean energy, energy integration and human capacity. And we'll be talking about the SEAD initiative, which is energy efficient appliances.

SEAD is the Super-Efficient Equipment and Appliance Deployment Initiative. It engages the participating governments and the private sector

to really transform global markets for appliance and equipment to drive demand for super-efficient products to cooperation and the awards and procurement, facilitating information exchange through product specific collaborations, and establish common foundations for technical dialogue through this cost-cutting technical analysis. Sixteen member government, seven highlighted participate in the SEAD awards working group, so those seven elements really determine the scope of the awards and really put together the competitions. And China is an observer in the SEAD initiative.

A little bit more about SEAD, again, it's a Clean Energy Ministerial initiative but it's also an initiative with international partnership for energy efficiency cooperation IPEEC. We have a strong collaboration with the Efficient Electrical End-Use Equipment, 4E, the International Energy Agency Implementing Agreement and specifically the motors competition work very closely with the Electric Motor System EMSA. And of course, CLASP serves as the SEAD operating agent and administrator for the Global Efficiency and Medal Competitions.

Again, SEAD works to accelerate the phase of market transformation for these energy efficient products through a series of five different activities—the awards activity that we're talking about now, the incentives, procurement activities, standards and labeling, and this cost-cutting technical analysis. So that sort of the way that SEAD structured.

Specifically, the SEAD Global Efficiency Medal Competition encourages the production sale of the super-efficient appliance and electronics by identifying the most efficient of products in each category in four regions as well as a global and overall global winner. So the medal competition seeks to advance efficiency improvements by recognizing products with the best energy efficiency by guiding early—consumers who might want to purchase the most energy-efficient models and by demonstrating levels of efficiency that are achievable with commercially available and also emerging technologies.

And really, the competition's goals align really well ultimately—with the ultimate goals of SEAD, which are to realize the greatest energy savings potentials by increasing market share of highly efficient products. We hope to spur innovation among manufacturers by participating in the award activity. We hope to support test harmonization activities by providing international and comparable and transparent test results. We hope this helps to build test lab capacities in countries that don't yet have it and we hope that we can complement standards and labeling policies of all the participating governments.

So to kind of give you an idea of the competition as a whole, we've won two competitions so far. One on TVs, one on computer monitors. The TVs is now complete and we're in the sort of analysis mode and we're trying to understand what the effect of the completion had on the market and how

the award-winning models are doing on the market. Computer monitors just finished up. We're now in the stage where we're trying to work with the line of manufacturers on marketing strategies and also the technical analysis. So I think it's important to understand the competitions receive pretty significant media coverage—there's a picture of the Times Square billboard on the left, talking about the energy-efficient TVs, and we get pretty good media coverage generally.

In SEAD, we work with the marketing team to really optimize media coverage. So yeah, we hire people to reach out to the appropriate trade journalists or create press releases or reach out to advocacy groups so that not only the SEAD competition gets coverage but also the winners. And I think it's also important to understand that we have the big award ceremony at the yearly Clean Energy Ministerial meetings. So there's high visibility among the winners to the Energy Ministers. In fact, last year at the CEM meeting during the TV awards ceremony, Secretary Chiu along with some of the Indian ministers were able to give out awards and it really prompted a lot discussion for the rest of the meeting. The award ceremony happened on the first day and so early on the first day, there's a lot of talk throughout that first day and then moving on the second day about the winners—Samsung and LG—amongst everyone that's participated in the meeting.

So it's something that's easy to point to that Samsung and LG won a global efficiency medal. And, it just kind of fosters a lot of discussion in education about energy-efficiency in the appliances. So I think that's something that's really important to remember.

Now, coming to the Motors Awards Competition, again, we want to identify the single best product within a sub-category and a region, recognizing both established and emerging motors and emerging technology products. We'll then compare regional winners to determine a global winner and the winners will be selected from manufacturer nominations that's subject to verified testing. It's open to all manufacturers. The nomination period ends the end of this month, January 31st, so it was nomination—in. There's 18 available awards and winners will be determined in analysis some time September or October of 2014.

Why participate? Well, entry is confidential. Only people that know—only the awards organizers know who has entered. Entry form is very simple. It's two pages. It will only take you a few minutes to complete. There's no need to submit products so only the presumed winners are asked to provide samples. So if we get 10 nominations in the category, we look at whoever it has claimed the best efficiency and we ask for those motors. So we don't test all of 10. Probably bragging rights that winners have the most efficient products in the world and no one else can say that. And finally, again, free marketing. So SEAD will promote the winners and work with the winners to adapt the best marketing strategies—to highlight the awards. Finally, we're going to say this, this reason we have, we were

invited to present at an award ceremony at 2014 Motor Summit in Zurich—that's in the first or second week of October. So you'll be presented with your award at the Motor Summit in front of all your contemporaries and I think that could be an important thing here.

So with that, I feel like we've introduced pretty well the awards activity and Hugh Falkner is going to take over and talk a little bit more specifically about the motors competitions and rules itself, so go ahead, Hugh.

Hugh Falkner

Well, thank you, Chad. Yeah, I'm Hugh Falkner and I'm going to—taking you through the competition categories, and also about the energy process. So we've got two motor categories. The first is for Induction Motors, and the purpose is to award something for the very best standard motor. So if you go to a local motor distributor, they will fill you one of the induction motor. So the rules and details of the categories are revolving around that. Now, this table is quite interesting. So I'll just have a quick look of what's going on there. And my comments in regards to several regions—four regions: Australia, Europe, India, North America—the membership of SEAD initiative, so the government that's supporting the competition, and then we also have a final category as well, the internationally very best of all the regions.

Now, if you look at the top, the top three classes, what's called IEC Induction Motors. So the IEC, that's the International Founders for Motor Designs and that [Inaudible] [00:21:08] and it comes in kilowatt. So that's why we'll talk about the kilowatts. Now, for India and North America, we've got 3.7 kW and for Australia and Europe, we've got 4 kW and that's a last minute change because we're going with 4 kW everywhere, and then we discovered that actually in India and North America, 3.7 kW is more common. So that's what's going on there.

So why didn't pick 4 kW and 11 kW? What we were trying to reflect is motors by which a lot were sold around the world... And the consideration is very pragmatic, you know, it might be interesting to talk about 750 kW motor, but it's going to be heavy among several things, so it will be impractical shape. So that form we have—sizes we have, underneath, we've got what's called the NEMA Induction Motors and this is simply a different pro-start, it's a different spur of induction motor which is found almost exclusively within North America. And they're in HP, that's what we used over there and you'll find that 11 kW and 15 HP are pretty much the same, similarly by 5 HP and 4 kW is pretty much the same. So that's how we got to the induction motor categories.

We're now going to take a look at the New Technology Motor categories. Now, what we do have—looking for future and you can say, “What are the most efficient motors of any type you can buy?” So this is looking beyond an induction motor. We have specified that it has to be line starts and run—and the reason for this is that we wanted it to be a motor which

you could use as a direct replacement for the induction motor. So it could start a line without a controller. And this controller question that's actually quite appropriate during the development of the competition, but ultimately, we couldn't and can't include motors that have a controller simply because there isn't an—standard, so that's why the new technology in motor category is only for line starting in motors.

Right with the induction motors, they're a competition within four regions. The up to 75 kW class, it's pretty—to think that out of the 50 Hertz class and yet to [Inaudible] [00:24:14] it covers the 60 Hertz class. Now, the question is why we set up 75 kW? The reason is that we're not actually expecting any entries of 75 kW. What we've said is that we're looking for the smallest motor that just probably exceeds the IEC 4 efficiency classification medal. Say, we're looking for the smallest one; it's that we know it's hard, progressively harder and harder to make small motors that's very efficient. And we're looking for the smallest motor that—just about IE for efficiency level. It's certainly doesn't have to be 75 kW to 100 HP or anything like that. So those are the new technology motor categories, okay?

So now, we're now moving on to the Eligibility criteria. So the first category is for the NEMA—the North American Induction Motors. Now, if you look through here and if you're a motor manufacturer, you'll realize this is the slide in standard motor that you will buy—its purpose, it's the Hertz, totally enclosed, fan-ventilating, and so on. So we just have the standard induction motors.

When we look at IEC Induction Motors, again, purpose, it's Hertz and so on, so it's the stem with the IEC Induction Motor.

The criteria for the New Technology Motors are—it's more relaxed. So, what we're saying there is that they can be in any sort of line start motor. And in fact, there's a mistake here, that's not electronically commutated or synchronous reluctance. It's just as any line start motor that can run without a controller.

Okay, so the Test Methods. When we started out, we have a vision that we'd be using common IEC test methods for assistance. So in what we have now, there's IEC test methods that got pretty much—support in the US. They were using their test methods that are incredibly similar. So it's really intense and the purpose is they get to do the same thing.

Now, what we're going to change though is—obviously, we've given awards for a motor that's actually going to be seen on the market, because if you've given award for something that's not going to be seen out, it's a mistake in award. So for that reason, we've specified some minimum shipment thresholds. And we've got minimum shipments that's—should

have every intention of meeting within two years of the competition date, okay.

We're now moving on to Nomination Process. As I mentioned, it's a sole nomination process. So if you don't enter—the competition, it's actually very easy to enter. The application form is very straightforward. It's basically who you are, what your motive is, and how efficient you say it is. And there's a lot of backup information available on the website to help with your entering.

The Selection of Winners, we'll be looking at all the nomination forms received by the end of this month. A group of people from CLASP, involved in the competition, will review all entries and then for each of the classes, decides which got the highest—they claim to be the most efficient. And then those winners will be informed and then will be asked to send sample products for testing. And the request should be send within 30 business days. The time scale between when to generate and the awards ceremony in October may seem short but I'm sure there are a few that are familiar with doing international testing and product diagnosis to realize you can get quite long delays in posting.

So to Select the Motors, we ask that you actually details for these 10 units and then the CLASP will actually select 2 sample products. And believing that two products that they asked for is—I guess really from the television competition where when you're shipping televisions around the world, there's a chance that they may get damaged. So that's why we're asking for two motors. So one of these will be tested and if it has a problem and then the second one will be tested as well. Hopefully, the product does actually meet the claims of the entry, which they will award then the winner. Otherwise, the next best motor in the list will be selected, and then the manufacturer informed in the verification test, and probably will start again. Okay, so that's what's on testing.

So the Announcement of Winners—these will be announced September 2014. There will be a presentation at the Zurich Motor Summit in October. It's a big event. It could get about 200 people from around the world and -seeing people within this motor world. There will be a comprehensive communication plan as well. That will be SEAD and also the winners will be given support as well as to how they can use the awards for maximum benefits. And then in April 2015, there'll be a much bigger global award ceremony planned. Chad, I come back to you to finish up.

Chad Gallinat

Yeah, thanks Hugh. So I think that pretty much ends it. Thanks for participating. We'd like to open it up for questions. We wanted to make this pretty sure, we do, we have half hour in and we have plenty of time for questions from manufacturers and I think Sean will help mediate the questions at the period.

Sean Esterly Yeah, thank you Chad, and thank you again for Mia and Hugh for the presentations. I do want to remind the audience at this point that you can use the question pane when you go to webinar box to submit any questions that you might have. And I will go ahead and start with our first question. That question is, “Why don’t you have a category for the really high efficiency motor such as permanent magnet or synchronous reluctance that needed controller?”

Mia Forbes Pirie Hugh, do you want to answer that?

Hugh Falkner Yes, thank you. When we started looking at this competition, we think do we want to get out of it? We had in mind that some of these really efficient products that not only efficient at fixed flows but we go to various speed where you get really big fixed savings. We hope one of those would be the winner but we will see the sort of low phase by which the motor manufacturers will put it together and test the speed for that. And we realized that it was never going to happen—not in time.

 What we could have done is that, say, we’ll appear to test methods that’s one complete using—why didn’t you have a go with doing that? We could then see that a manufacturer might use that test method with their interpretation of it and think—particular efficiency. But then when the motor got to one of our test labs, the test lab would use whatever standard we have suggested with their interpretation of it, and then it will be different. And, that will be—well, so in the end we—back off, so that’s why at this stage we are only looking for line start, buying one motor that will operate without a controller. Maybe next time if there is another round in the competition and there is a good and robust international testing that’s in place then we could do that. I hope that answers the question.

Sean Esterly Yeah, thank you Hugh. Oh, you’re throwing up something there?

Mia Forbes Pirie I was just going to say that I mentioned that at the beginning that there was quite an intricate process that people that developed the rules went through, so I think that’s one of those examples of that.

Hugh Falkner Yeah, thank you—in the slide that at one stage we actually have got you know, from the magnitude [Inaudible] [00:34:50] motors that’s specifically in the rules and it’s like a last minute decision that we realized we just couldn’t do it.

Sean Esterly Great. Thank you, Hugh. We’ll move on to the next question now and the question is, “How are the regional categories supposed to be used given that many motors are marketed and sold globally?” So for example, on what regions should an entry being made?

Hugh Falkner I see. I guess this is probably one that Mia do --

Mia Forbes Pirie And maybe Debbie has something to add.

Hugh Falkner Yeah, but what we are themed to do is very much where motors are used rather than where they're made. Especially now it's becoming more of a global business, so you know, there'll be American-European manufacturers but you'll find that most of the standard products in particular are made in Eastern Europe of China and so on. So although we've got the four regions specified, that's very much about where the motors are sold rather than where they're made. So if you're a manufacturer selling in multiple regions, then you're—the motor in those regions.

Debbie Karpay Weyl And just to add that, yeah, please enter the motor in each region and you also—it would be helpful if you could submit a separate form for each region just so that we have the goal laid out. Yeah, where the motor is sold, and please enter everywhere where it is—where it's being shipped—for results.

Sean Esterly Great. Thank you, Hugh and Debbie. The next question that we have is, “Will anyone outside of SEAD know a manufacturer has failed verification testing?”

Debbie Karpay Weyl I can take that one. The short imperative as you know, nobody else will know if the manufacturer has failed verification testing. Just the lab—actually, even the lab that has the products won't know. They test the products, they send us the test results and so only CLASP and SEAD know whether the test results met or failed to meet the claims submitted in the nomination forms.

Mia Forbes Pirie Great. Thank you.

Sean Esterly Thank you, Debbie. The next question is, “Could you explain this 45 kW limit for new technology motors, and what the purpose of that is?”

Mia Forbes Pirie Maybe Hugh would speak again.

Hugh Falkner Thank you. Yeah, it was a bit confusing. What we were trying to do is roll over then—say, you could make a new technology motor with a particular power, we wanted you to do a bit more—submit a motor or whatever product they like. The reason being that you know, when you're developing new technologies you want to develop a whole range, you may just have one or two—so we want to find a way of giving people that freedom. So we are aware that it's more of a challenge to make a small motor of whatever type that meets one of our IE methods, and in this case the IE 4 level.

So what we've said is you know, whoever can make a smallest motor that meet or just exceed the IE 4 level, then that is the best motor, best new technology motor. The manufacturer has climbed the biggest hell to

achieve that level. And the 75 kW, that's just the absolute [Inaudible] [00:39:06] not expecting and really—would want to test them if they're quite that big. So yeah, that's the reason behind it.

Mia Forbes Pirie Thanks, Hugh. Just anyone else that got anything to add? Great. Can we have the next question?

Sean Esterly Yeah, we just received another question and that is, “When SEAD asks manufacturers for sample products for testing, is there a risk that manufacturers can provide revised products such as more efficient other than the original ones?”

Mia Forbes Pirie Who wants to answer that?

Debbie Karpay Weyl Okay, Chad, can you repeat that? Did you say “revised” products?

Sean Esterly Yeah. So when SEAD asks manufacturers for sample products for testing, is there a risk that manufacturers could provide revised products? So, more efficient products other than the original ones.

Mia Forbes Pirie So I think the idea is to—I'm not sure if I got this right but I think the idea is that the manufacturer may alter a product?

Sean Esterly Yes.

Mia Forbes Pirie -- from the original products that it would normally sell.

Debbie Karpay Weyl I can take that one as well. So our hope is that that is not the case. We ask manufacturers to provide us—it's just for that reason that we ask manufacturers to provide us with 10 random product samples—oh, sorry, not product samples but 10 random serial numbers and of that, we choose two. So manufacturer doesn't know ahead of time which of the products we'll choose to have them send for testing, and we do make sure that the products that we've selected are the ones that arrived at the lab for testing. So we intend for this to be a random sample and it shouldn't be sort of a revised or more efficient product than what is sold.

Mia Forbes Pirie So it sounds like you have a pretty solid methodology.

Sean Esterly Yes.

Debbie Karpay Weyl Thanks.

Sean Esterly And that is actually the last question that I have received today. So at this point, I think I'll open it up to the panelists for any closing remarks—if there's anything that they like to add to their presentations, or any additional information.

Chad Gallinat This is Chad. I just wanted to thank Debbie, Mia, and Hugh for attending the panel today, and remind everyone that the 31st of January is the nomination deadline, so you got a couple more weeks. It should only take a few minutes to nominate your product, so get those nominations in, and thanks for attending.

Mia Forbes Pirie Thank you very much.

Debbie Karpay Weyl This is Debbie. I would just like to add, if anybody has any further questions, we can make sure that this e-mail address goes on the Clean Energy Solutions Center website with the webinar. If you have any additional questions, there's an e-mail address that you can send those to and it is award@superefficient.org. So look that up, and if you think of additional question in the coming days, please do send them along and we'll be happy to respond.

Mia Forbes Pirie Great. Thank you everyone for attending.

Sean Esterly And Debbie, I'll send out—oh, never mind. Heather just took care of it for us. I was about to send out my e-mail address, but...If you look at your chat box in the GoToWebinar panel, you'll see that e-mail address that was just mentioned and we will put it up on the Clean Energy Solutions Center as well.

Debbie Karpay Weyl Thank you, Sean.

Sean Esterly Yeah. Did anyone else have any closing remarks?

Mia Forbes Pirie I think we're all good. Thank you.

Sean Esterly Yeah, all right, very good. Well, thank you again to all the panelists. We appreciate you taking time and you put out a great webinar. And at this point, we would like to ask our audience to just take a minute to answer a quick survey. We just have three short questions for you. This helps us evaluate our webinar and improve for future ones. So Heather, can you please display the first survey question? The question is "The webinar content provided me with useful information and insight." And you can use your GoToWebinar to answer.

And next question, please, Heather. The second question is "The webinar's presenters were effective."

And then the final question of the survey is "Overall, the webinar met my expectations."

All right, great. Thank you for answering our survey and on behalf of the Clean Energy Solutions Center, I just like to extend our thank you to each of our panelists and to our attendees for participating in today's webinar. We had a great audience today and we very much appreciate your time and I do invite our attendees to check the Solutions Center website over

the next couple of days or weeks if you would like to view the slides and listen to a recording of today's presentations as well as any previously held webinars.

Additionally, you can find information on there of the upcoming webinars for those Solutions Center and other training events. And please, we invite you to inform your colleagues and those in your networks about the Solution Center resources and services including the no-cost policy and support.

Hope everyone has a great rest of your day and we hope to see you again at future Clean Energy Solution Center events, and this concludes our webinar.

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