

Webcast Agenda and Meeting Logistics

Slide 1: Title Slide

Operator: Good afternoon. My name is Sandra and I will be your conference operator today. At this time, I would like to welcome everyone to the U.S. EPA Heat Island Reduction Program webcast. All lines have been placed on mute to prevent any background noise. If you should need assistance during the call, please press star then zero and an operator will come back on line to assist you. Thank you. Ms. Patel, you may begin.

Slide 2: Introduction Slide

Neelam Patel: Thank you. I'd like to start by welcoming everyone to the Cool Pavements and Sustainable Pavement Technology webcast hosted by EPA's Heat Island Reduction Program. My name is Neelam Patel, and I am the program manager. I'm very excited to let you know that we have over 200 people registered on the call today and we have received a lot of interest on Cool Pavements and Sustainable Pavement Technology. One of the reasons we're interested, here at EPA's Heat Island Program, in Cool Pavements, is because it is a huge opportunity to help reduce the heat island impact in urban centers. Cool Pavements actually refer to a range of established and emerging materials and these technologies tend to hold or store less heat and often times have lower surface temperatures compared to conventional products.

So in the industry - the pavement industry, the conventional products tend to be impervious pavements which can reach peak summer's high temperatures of over 120 degrees Fahrenheit. Both the pavement and asphalt industries have been making advancements and helping introduce emerging materials into the market. So today, not only will you hear about topics related to heat islands and pavements, but because this is also the audience that works on heat island reduction through the pavements, this audience is also interested and puts effort into sustainable efforts at the local level related to pavements. We will – you will hear some presentations and initiatives related to sustainable pavements as well.

And we have an especially interesting city program, the Chicago Sustainable Street Pilot Program, which is what we'll be closing out with and this program really brings together not only heat island issues but also other environmental issues and ties together multiple different types of initiatives all in one program.

Slide 3: Webcast Agenda

So this time, I'd like to quickly run through today's agenda. I, Neelam, will be giving an overview of EPA's Heat Island Reduction Program followed by Kamil Kaloush from Arizona State University, The Center of Excellence. He'll be giving a scientific overview of pavements and heat islands. After that, we'll have brief introduction of the U.S. Department of Transportation, Federal Highway Administration's Sustainability Initiatives by David Carlson. And this is just to introduce some of the new topics that are being discussed at the Department of Transportation. And following David, we will have Matthew Corrigan from the Federal Highway

Administration. He's an expert on warm-mix asphalt technology. This is the sustainable pavement technology that uses less energy, so while it's not directly related to heat island impacts, again, it's a topic of interest to those who work on pavement technologies at both the state and local level. And again, as I already mentioned, Janet Attarian from the city of Chicago will be talking about the Chicago Sustainable Street Pilot Program.

At the end of all the presentations, we will have a question and answer session. I encourage everyone to be submitting questions using the GoTo meeting question function throughout the webcast and please include the name of the presenter that your question is directed to. And now, we'll have Nikhil from ICF go over logistics for the webcast. Nikhil?

Slide 4: GoTo Webinar Software Logistics

Nikhil Nadkarni: Yes, just a few – quickly - logistics here. First of all, as Neelam mentioned, you will be muted throughout the webcast and you'll be able to ask questions using the GoTo webinar format which I'll get to in just a second. This session today is being recorded and will be available for download in a few weeks at the URL shown on the screen. And, the URL has also been shown in the chat window on your right and the GoTo meeting window. Should you have any technical difficulties during the program with go to webinar, please feel free to email Lauren Pederson at Lpederson@icfi.com. Next slide, please.

Slide 5: Attendees (GoTo Meeting)

To see who is attending the webinar as well as who's presenting, you should be able to see this in the attendees window on the right and then go to webinar window. Next slide, please.

Slide 6: Questions (GoTo Meeting)

For questions, please use the questions in the GoTo webinar window. Just type it in and hit send, and we'll be compiling all the questions before the end and asking them to the panelists. To make the process as smooth as possible, please be sure to include the name of the panelist who should be answering your questions, so we can compile them accordingly. Next slide, please.

Slide 7: Optional Feedback (GoTo Meeting)

And finally, at the end, a pop-up window will appear once you exit webinar. Please take a minute to answer these questions and your feedback will be very useful. And, that's it for logistics.

Introduction to the Urban Heat Island Effect and EPA's Heat Island Reduction Program

Slide 8: Title Slide

Neelam Patel: Great. Thank you, Nikhil. So I will – this is Neelam, I will quickly go through EPA's Heat Island Reduction Program.

Slide 9: Outline

Neelam Patel: I'll provide a brief overview of the heat island effect. Kamil Kaloush will also be expanding on this during his presentation. I'll spend some time going over our program and resources. Also, some heat island implementation activities, how to leverage funding if you want to pursue these activities in your own jurisdiction. And lastly, just a quick list of upcoming meetings and recent initiatives related to heat islands and pavements.

Slide 10: Heat Island Effect Overview

Neelam Patel: So the heat island effect is as follows. Basically, in densely built-up areas, the temperature in these areas can be from 9 to 27 degrees higher than surrounding suburban and rural areas. And this impacts human health and causes other types of environmental issues, so what we'd like to do – what this program does - is focus on mitigation strategies, which I'll talk more about in a moment. But - some of the land use patterns and infrastructure in these dense areas that lead to the heat island impact which is the hotter central temperatures come from reduced vegetation and the materials used to build urban infrastructure and the support pavements come in. Roofing is another area that can be used to mitigate heat islands. And lastly, is the design, the urban geometry which limits air flow and kind of traps in some of the radiative heat.

Slide 11: Energy and Air Quality Impacts

Neelam Patel: So some of the impacts I'll quickly go through include energy and air quality impacts. Impacts in these urban areas that tend to be hotter is increased energy use in the summers because people use more air conditioning to cool down their buildings and other offices. At homes, the electricity demand is higher in these areas and has longer peak periods which adds pressure to electrical grid often leading to blackouts and brownouts. Air quality is affected from the warmer temperatures. And also, because of increased energy use, there's increased greenhouse gas emissions.

Slide 12: More Impacts

Neelam Patel: Other impacts include warmer water that is running off from these hard surfaces in cities. And also, there's human health impact such as respiratory difficulties, people having more asthma. There's heat exhaustion, and in the case of extreme heat events, there's also

mortality associated with the high temperatures. And EPA actually offers a resource guide to help address this issue. There's a picture of a guide that helps cities prepare and set up systems to help get people in their cities that are most susceptible to heat events to safe places and getting the proper resources they need to live through those situations.

Slide 13: Mitigation Strategies

Neelam Patel: So while - those are some of the impacts, our program focuses on mitigation strategies and these are things that communities can do to help reduce the urban heat island effect. There are four main mitigation strategies – trees and vegetation, green roofs, cool roofs, and cool pavements. Trees and vegetation and green roofs focus on the vegetating surfaces, whereas, cool roofs and cool pavements focus on other factors such as heat - holding capacity and also solar reflectance. And one of the main messages I'd like to send at this time is that, using cool pavements is a good approach for reducing heat island mitigation, but oftentimes, pairing these strategies together can have the most impact in reducing the heat island effect.

Slide 14: Mitigation Strategy: Trees and Vegetation

Neelam Patel: With trees and vegetation, you want to strategically plant trees around buildings to help maximize energy savings and also reduce greenhouse gas emission.

Slide 15: Mitigation Strategy: Green Roofs

Neelam Patel: With green roofs, again, the focus is on creating vegetative surfaces on the top of buildings.

Slide 16: Mitigation Strategy: Cool Roofs

Neelam Patel: Cool roofs, is – you can do this on different types of buildings with different types of roofs. So for example, low-slope roofs and steep-slope roof, but this is based on the reflectivity of and the emissivity of these materials. And more information about each one of these mitigation strategies is available on the EPA Heat Island website.

Slide 17: Mitigation Strategy: Cool Pavements

Neelam Patel: Cool pavements are the topic of today and we'll spend a lot of time on that. But cool pavements tend to be a little bit more difficult to recommend because there are not established standards like there are for a cool roof for example.

Slide 18: U.S. EPA Heat Island Reduction Program

Neelam Patel: Our program is basically a communication infrastructure between different parts of the heat island community which includes policy makers, program designers, researchers, industry and the general public.

Slide 19: Messages to Heat Island Community

Neelam Patel: We cover topics that are of interest to this community, including the heat island science, measurement, modeling, and also the emerging innovative technologies coming out on each one of the mitigation strategies.

Slide 20: Key Program Features

Neelam Patel: The way we get this information out to people is through our website. There is scientific information available on each one of the mitigation strategies and the heat island effect itself.

We have a calendar of events which I'll refer to later in the presentation. And also, we track two other things - heat island in the news. So anything related to any of the four mitigation strategies or modeling and measurement that comes up in localities. All of those articles are listed on our website.

Slide 21: Database

Neelam Patel: We have a database and our newest addition is a science corner where we connect to scientific papers that are submitted to different types of conferences. So of our resources, we have a database and this has examples of different heat island projects throughout the country. If you know of heat island projects or plans that you'd like to have added to this database, please let us know.

Slide 22: Compendium

Neelam Patel: We've a compendium of strategies, and it covers heat island basics, the three mitigation strategies that we're now focusing on, and the cool pavements.

Slide 23: Cool Pavements Compendium Chapter

Neelam Patel: Lastly, there's a heat island reduction activities after the talks about different policy and voluntary programs. The one I'd like to highlight for you is the cool pavements compendium chapter. Please take a look at this as you develop programs.

Slide 24: Webcasts

Neelam Patel: We offer webcasts through our program, and as you know, today is one of our webcasts. We'll be having another one in about three months. Some local – some heat island reduction activities that are happening and ways to get them integrated into your communities is our next topic. Basically, because heat islands are a multimedia type of issue, we try to fold heat island strategies into other types of programs. So for example - water quality, stormwater mitigation programs, land use programs, and green building initiatives.

Slide 25: Heat Island Reduction Implementation Activities

Slide 26: Heat Island Connections to Other Programs

Neelam Patel: And lastly, there's a huge focus on climate adaptation and how we can help improve the quality of life as the climate is – the climate will vary, and so linking heat island mitigation strategies into that is also a helpful way to address heat islands in your communities.

Slide 27: Urban Heat Island Mitigation and LEED

Neelam Patel: One thing to bring to light is the U.S. Green Building Council has a rating system, and under this rating system, there is a credit related to heat island reduction, there is a sustainable site program that includes for the heat island credit.

Slide 28: LEED and Pavements

Neelam Patel: There is the Sustainable Sites Program for the U.S. Green Building Council through LEED. And using this 7.1 credit, you can receive credit through many of the different LEED rating systems such as new construction, existing buildings, and commercial interiors. The LEED rating system for schools, for homes, for neighborhood development, and basically, you can see the criteria for this credit to get heat island credit through the LEED rating system. And Janet will also mention how that integrated into their program.

Slide 29: Implementation at the Local Level Activities

Neelam Patel: Other ways to integrate heat islands programs for local level is through volunteer in policy efforts. And also, as part of energy sustainability, water-air quality programs.

Slide 30: Heat Island Reduction- Voluntary Efforts

Neelam Patel: Here's the list of some voluntary efforts and more information on this is available in the heat island compendium.

Slide 31: Heat Island Reduction- Policy Efforts

Neelam Patel: Examples of policy efforts are listed and here are some programs that have heat island activities.

Slide 32: U.S. EPA Heat Island Supported Projects

Slide 33: EPA and Kansas City Project: Parking Lots to Parks

Neelam Patel: The one I'd like to focus on is in Kansas City, the Parking Lots to Parks Program. Using a small amount of grant funding, the city – Kansas City and a local regional alliance came together with EPA and focused on how to design parking lots to help reduce the heat island impact and reduce storm water runoff. And to learn more about this program, the websites are listed below, they actually have some interesting case studies listed as well.

And, the one I'd like to call out for people that are interested in learning more about this, is the vehicle impound facility parking lot, and here, they've taken different types of landscaping and partnered it with pavement to help reduce the heat island effect.

Slide 34: Cool Communities Program California-based Initiative

Neelam Patel: Another program that the State of California is supporting through the California Air Resources Board, the California Energy Commission and Lawrence Berkeley National Lab is the Cool Communities Program. This is a California-based initiative. It's part of the voluntary – it's developing a voluntary program to support the Global Warming Solutions Act of 2006 that was passed in the State of California.

Slide 35: Cool Communities Program Pavement Training Task

Neelam Patel: The Cool Communities Program is taking out a number of different tasks which are being implemented by Lawrence Berkeley National Lab and of those, two relate to pavements, and this is the Cool Communities – Cool Communities Program Pavement Training Task. Basically, they are putting together workshops on how to get pavements into city planning efforts, and they're bringing together different partners to design and participate in these workshops. If you're interested in more information, you can contact Haley Gilbert and her contact information is on the slide.

Slide 36: Cool Communities Program Pavement Study Task

Neelam Patel: Another task that they're pursuing at Lawrence Berkeley National Lab is doing a study on cool pavements, and it is similar in some ways to a literature review where different types of information on pavements is being collected and the results will be looked at in August of 2010. If you have information that will be helpful to the folks at Lawrence Berkeley National Lab, please contact Ronnen Levinson who is the project lead for this task.

Slide 37: Leveraging Federal Funding

Neelam Patel: So there's a lot of things going on in the field, and oftentimes, communities at the local level or state level might be interested on learning about – might be interested in pursuing some of these and you saw there's a lot of activity happening, but the question is how can you get funding to do these things.

Slide 38: Heat Island Funding Opportunity in ARRA 2009 (DOE)

Neelam Patel: And so one thing that I would like to just mention is there's way to leverage Federal funding and through the American Recovery and Reinvestment Act that was passed in February of 2009. Department of Energy received billions of dollars, but each one of these line items, the Weatherization, the State Energy Program, the Energy Efficiency Conservation Block Grant Program, each one of those programs can actually – the money that's coming out through those programs can be used to increase energy efficiency by including heat island mitigation

strategies into the plans and into the projects. So I encourage people to think creatively about how heat island mitigation strategies can fold into existing programs.

Slide 39: ARRA Tax Credits - Roofing

Neelam Patel: Another thing I want to bring to attention – bring to your attention, this is basically focused on roofing, but through the American Recovery and Reinvestment, there was an extension to the tax credits that are available for energy efficiency, and if you're interested in – as an individual or as a building owner, using this money for roofing, you can get a tax credit and these tax credits are available through December 31, 2010. More information is available at the URL at the bottom.

Slide 40: Heat Island Funding in Climate Showcase Communities Grant

Neelam Patel: And the last thing I'd like to mention is the Climate Showcase Communities Grant. In 2009 and in 2010, the EPA received money through the Appropriations Bill for a 10,000 – oh, excuse me – a \$10 million competitive grant to assist local governments in pursuing climate change initiatives, and one of the categories in this grant is heat island management. So the next solicitation for this grant will be opened in late spring of 2010. If you're interested, I encourage you to see if you have a project or a program in your community that can relate to heat island mitigation and reduce greenhouse gas emissions.

Slide 41: Meetings and Initiatives Related to Heat Islands and Pavements

Neelam Patel: Lastly, there are some meetings that are upcoming.

Slide 42: Meetings and Initiatives

Neelam Patel: There's a Concrete Sustainability conference in April that's going to happen in Arizona, urban pollution - Urban Environmental Pollution conference in June in Boston. The American Meteorological Society is having symposium on the urban environment in August and that is in Colorado. And lastly, the Transportation Research Board Subcommittee on pavements in the urban environment will be hosting a meeting in January of 2011. Kamil Kaloush is about to speak in – tackle a bit more about that, but I want to point out that for the urban environment symposium through the American Meteorological Society, there's a call for papers, so if you have topics of interest, you can submit and also the TRB Subcommittee on pavements is accepting papers as well.

Last thing, before Kamil goes into his presentation, I'd like to mention is – a Concrete Sustainability Hub that MIT in Boston has created and this was created in October of 2009. There's interdisciplinary collaboration that will help accelerate science and engineering when it comes to sustainability of concrete, basically over five years, \$10 million is going to go into this research center. And, folks from MIT School of Engineering, of architecture and planning, and the school of management are going to participate in research activities. So there'll be some interesting pavement and sustainability topics coming out through that.

Slide 43: Contact Info

Neelam Patel: If you have more questions, this is my contact information and our website, and with that, I would like to introduce Kamil Kaloush.