Questions and Answers

And so with that, I'd like to go ahead and move to the – move to the question-and-answer session. We did receive a number of questions, so won't have time to run through all of these during our question-and-answer period, but we will provide answers in writing to all the questions submitted. We'll be posting those on the Web site and also once they've collected answers from all the presenters, we will e-mail those out. And I think Lauren mentioned that you should expect to see an e-mail for her.

So with that, I'd like to turn it over to Lauren to ask some of the questions that we did receive.

Lauren Pederson: Thank you, Neelam. I'm going to lead off with a couple of questions for you and then get into the case study questions we received.

The first question we have for you, in terms of the impact on water quality, what's the connection between the urban heat island and increased runoff?

Neelam Patel: Sure, I'd be happy to answer that.

One of the first connections between heat island mitigation and water quality is that the cause of oftentimes increased stormwater and this is not necessarily always the case because the sewer systems for transporting that stormwater are clearly a factor. But when it comes to what's on the surface, the roofs and pavements – traditional roofs and pavements that or I should say impervious roofs and pavements actually contribute to stormwater runoff.

The actual quantity of stormwater runoff, and a solution to those cooling and to reducing stormwater are strategies such as increasing vegetation and tree canopy, and that also overlaps with the green roof mitigation strategy. When we talk about increasing vegetation that can be opened space like open green space and so that is one of the techniques for reducing stormwater through low-impact development.

So essentially the connection is that a lot of the mitigation strategies that can potentially cool communities can also help reduce stormwater runoff, and the second connection is that the higher surface temperatures increased the temperature of the runoff that's going into our waterways, and if we're able to cool those surfaces, we would be able to in some ways reduce the temperature of the runoff and that would affect water quality as well.

There've been some recent studies that have come out showing that the higher water temperatures are actually affecting aquatic life, and this is part of a solution reducing the heat island effect as part of a solution that can decrease water temperatures.

Lauren Pederson: Great! Thanks, Neelam. And then the second question for you, are there any federal regulations for urban heat island? And if not, what are the reasons of using urban heat

island measures up to individuals or even local government rather than adjusting it on a federal level?

Neelam Patel: Great question. So there are no federal regulations specifically for urban heat island. Impacts are – excuse me – the urban heat island effects but there are some regulations that address some of the impacts of the urban heat island effect. For example, a funding that can come out of the U.S. Forest Service – funding for specific programs that come out of the U.S. Forest Service actually have an element as one of the many co-benefits that are included. There's an element to reduce the heat island effect.

So that would be an example, have some federal regulations that might address the heat island effect, but there is nothing specifically for the heat island effect. And the reason for leaving it up to individual, you know, state governments or local government, is because the conditions in each community are very specific and there is no "one size fits all" solution. We can't go out and say, that everybody should plant XY like provide plant X species of trees to get this amount of cooling in your community at a national level. We can't provide that type of solution or even recommend that, and that is because each community is so specific and unique. And so it's important to do local analysis to find the best combination strategies for your community.

Lauren Pederson: Great! Thank you, Neelam. We're going to move on to a couple of questions for Brian Stone from Georgia Tech University, and Brian the first question, to what extent is the heat island effect increasing estimates of the increasing world temperatures and given that many measuring stations are in urban areas?

Brian Stone: That's a great question. It kind of highlights the reason why there is a significant emphasis on global temperature and often there's not as much mention on urban temperatures, and that if you're interested in measuring how rapidly the planet is warming and you're going to be using the surface weather stations around the planet, and most of these stations are in or close to cities, and so because cities have their own warming mechanism, relying on too many of those urban stations will bias your global temperature record, and so the way that's dealt with is that these global databases that are looking at annual temperature change are statistically adjusting the urban weather stations.

And so that is, you know, essentially obscuring what's happening in the cities and if you're interested in global scale temperature changes, it's not such a big deal because cities only constitute two to three percent of the global land surface. So while cities are a small percentage of the planet as a whole in terms of geography, they account for most of the inhabitants on the planet, and so they're very important in the sense of the places people live and the places where we're generating large amount of greenhouse gases.

And so what we do is kind of exactly the opposite of what the global climate scientist are doing. We look just at the urban weather station. We don't statistically adjust them, and then we compare there warming trends to what's happening either right outside of them or globally to see how much more rapidly they're warming. That was that the idea – the amplification rate that I was talking about. And so most cities in the U.S. are amplifying that ground warming rates by about 100 percent. And so that's how we control for the global versus the urban trends.

Lauren Pederson: Great! Thank you. And then related to that question, a participant asked in your book Houston is showing a cooling while Atlanta is getting hotter. What are your thoughts on this trending scheme?

Brian Stone: I did look at the actual graphics, we have a number of graphics from the book where we're talking either about the increasing heat wave, the number of heat wave days or we're talking about the increase in the heat island and I'm – from my memory, I'm not sure which one Houston is found to be cooling, but just in general when we look across 50 cities just as we look across thousands of weather stations across the planet, not all of those weather stations are showing a warming trend. And so – and that's why you get into some debates particularly with those who are skeptical of climate change.

In general, there's a fair amount of cherry picking that goes on, just pick this cooling station. There are lots of microclimatic or regional climate anomalies or conditions that can result in a trend that's countered to the overall trend. And so the reason we look at a large number of cities and we look at a large number of years when we have data for every day or 50 years, is to get a sense of what is the overall dominant trend as opposed to this outliers.

But I wish I could speak specifically to Houston for the question. I know I can't interact directly with the person who's asking the question but like I mentioned before, if it's the heat island trends, we do tend to find that there are summaries into our heat islands that are not growing, and one of the reasons we see – it doesn't mean that the city is not warming every time in summaries, and we actually have rural areas that are warming at the same pace as the urban area and that typically happens in cities where you don't have rapid land cover change, but I can't speak directly to Houston because I don't actually had the data in front of me. I'm sorry about that.

Lauren Pederson: Brian, we can actually follow-up with that – the Houston…

Brian Stone: I'd love to do that. I can give you…

Lauren Pederson: … word of that question.

Brian Stone: … a better – a better answer to that particular case. I can do that.

Lauren Pederson: Yes, and we can follow up with that…

Brian Stone: Right.

Lauren Pederson: And provides an answer in writing as well.

Brian Stone: Great!

Lauren Pederson: Great! Thank you, Brian. And then we're going to move into some questions for Brendan Reed from Chula Vista. And Brendan, the first question that we received, a participant was curious with the science was that informing the working group. Were there any

studies done on specific conditions in Chula Vista, for example, related to the city's specific energy balance?

Brendan Reed: Sure. Well, we were very fortunate, I sort of mentioned it, but in our region there's the San Diego Foundation, and it's a community foundation and they created a study called "Focus 2050" to look at climate change impacts to our region in year 2050, and it was inspired by a similar study done up in King County in Washington, and they worked – we're also very fortunate we have a lot of local research institutions like Scripps Institution of Oceanography, a number of higher education institution.

So they worked to convene in a budget technical advisors again synthesize and summarize that information. And so we had a great starting point because they covered all of those sort of impact areas that you would imagine for climate adaptation. There were already some results of what the new normal looks like in 2050 for us.

Lauren Pederson: Thanks, Brendan, and then the next question we have is do you expect developers to resist requirement to comply with the new standard? How do you get them to buy in, and if this is required, how to comply with the new standards where the cost be passed onto the consumer and will this affect new home start?

Brendan Reed: OK. This is a great question there. So I guess I'll first answer it more broadly. When we had done a similar process and focus on climate mitigation, a stakeholder process maybe five years ago when I started at the city, you know, we really didn't have enough sort of business representatives and developers on the stakeholder group and we – that definitely caused trouble or problem later on.

So this time around with the climate adaptation strategies, like I said there were business representatives for small and large businesses. There were developers that participated. So you know it was definitely like no surprises environment and I think that has helped these kinds of initiatives, get political support and also, you know, to get support in the development community.

You know I think there were – in our – in our region where there tends to be known as a little bit, you know, out ahead and sort of progressive on environmental issues, sustainability issues, especially around sort of environmental justice. So I think they've gotten used to that a little bit, and before we are sensitive to sort of those things about the market and housing prices et cetera. But for example, the cool roof really, we found that in most cases they are already installing what we thought here as cool roof and I mean, really big extra cost for our tier 2 is minimal. So you know we are – we're – it is a balancing act.

Lauren Pederson: Thanks and then the next question is related to the cool pavement study.

Brendan Reed: Sure.

Lauren Pederson: And this participant was curious when the cool pavement study will be released to the public and also if it included a look at how the different paving technologies would hold up under high heat.

Brendan Reed: So the – it's under administrative draft for now but we do hope for the project or – excuse me – the study to be finalized. I think it was by the end of October that we're shooting for at this point. You know we did have a limited budget for this. So in a lot of instances, it's more of a qualitative analysis, the different applications, and the different technologies, but you know it did look at sort of full spectrum of what you would kind of want to consider when you're picking a pavement material. How obviously – how well it does in addressing urban heat island or sustainability issues but also the cost, the longevity, the maintenance requirements, where it's been done, elsewhere, its availability in the market which is actually even bigger a lot of times if it's even available locally. So it is robust in that regards.

Lauren Pederson: Great! Thanks, Brendan. We received a number of other questions for you but we'll be following up …

Brendan Reed: Sure.

Lauren Pederson: … with the questions to the e-mail since we're getting a little bit close on time.

Matt Grubisich from the Texas Tree Foundation, we have a number of questions for you. One was related to the dollar benefit calculations that you performed. How did you estimate the benefit of tree planting? I think on one of your slides you had $102 million per year after 40 years. Did you use the i-Tree model and do you measure and verify these savings?

Matt Grubisich: Yes, we did use the i-Tree model and we're in the process that we've done numerous UFORE studies that are out at Dallas Forth Worth Area, so we are able to kind of even take those numbers and kind of even more centralized and for the Dallas Forth Worth Area and we haven't started to look at the what would benefit these trees are provided that we've just – we've just planted. This program is just a couple of years old so we're only about two or three years into the planting process.

So that's something that we're developing now, is how do we go back and look at this, and are we really making a difference and are those benefits really what they say they are? So hopefully I'll have something more in about five years on that one.

Lauren Pederson: Thank you. Where does your temperature come from? Is there is a publicly available database reflected in your data?

Matt Grubisich: The temperature data was done through HARC, the Houston Advanced Research Center through the grant through EPA through the Sustainable Skylines Initiative, and you can find the report on that online, just go to Dallas City Web site. You can find it there or there in Office Environmental Quality and the entire report is on there but that was a one-time snapshot of temperature values taken I think in the 2004. So that's something else that we would

plan on doing, probably in the next probably five to six years as redoing that study to see if we're having an effect in those areas.

Lauren Pederson: Great! Thank you. And then the next question for you, when planting trees, you take into consideration the overhead electric power distributions…

Matt Grubisich: Oh, always. And as I'd mentioned in the report that we are actually able to get the power line information from the power company, and so that was included in that roadmap and you know so there's some – of those 1.8 million locations, not one of them is underneath the power line, at least ones that we had GIS data for. In any project that we do, you know obviously, you have to go on and look at the site and that's how – it's the first thing that we take into consideration is overhead borrowing.

Lauren Pederson: And a final question for you. Is Texas following a native tree policy?

Matt Grubisich: Yes, we plant – we recommend all native trees or well adapted. It's hot and dry and so the heat is here, our choice is pretty limited and so the heat from getting too much a monoculture for instance. We have way too many red oaks and live oaks down here. So we don't plant a lot of those anymore, but we will – but everything that we do plant is either adapted or native.

Lauren Pederson: Great! Thank you. And we'll now move on to Norman Muraya from Austin Energy. Norman, the first question for you, in your slide you mentioned TPOs, acronym you use. What is TPO and a ballasted roof?

Norman Muraya: That would be – hold on a second. I remember what the acronym for TPO, the ballasted roof is where you have a flat built of roof and then you put rocks or pebbles or gravel on that which essentially ballast it so that it keeps the weight down on there, and the advantage of that rock as if they are least expensive and more reflective than the black rubber roof.

The TPO is just a – it's a type of membrane that would be put on there which would have that insulation, as well as that reflective surface. Some reason I – the – can't remember what the acronym but we can reply that with the questions that will be sent in. Actually, it means thermoplastic polyolefin.

Lauren Pederson: OK.

Matt Grubisich: So TPO is thermoplastic polyolefin.

Lauren Pederson: Great! Thank you. The next question for you, is there any way to treat asphalt roof tiles as part of a cool roof program? And this is sort of replacing the tile that you're aware of.

Matt Grubisich: Yes, it is. That was the other option – instead of the TPO, you could go with a spray paint. Paints do not last this long but you actually achieved initial much cooler

temperatures and, of course, if you're diligent, you can always come back a year or two later or a couple of years later since the cost is very low.

Lauren Pederson: Great! Thank you for that. And Neelam, do you want to give a wrap-up?

Neelam Patel: Yes, that'd be great. Thanks, Lauren. I want to thank the audience for all their questions. There's a lot of interest in this area. So we will be sure to follow up with written answers to your questions, and there will also be a transcript of this call available. So for those of you that could not stand the whole time, and we encourage you to fill out the optional feedback questions that will be provided when you exit this.

So once again, thank you to all the participants and to all of the presenters in helping us motivate our communities to take actions to reduce the heat island effect.

Take care.

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