EPA Region 2

What is the Climate-Waste Prevention Connection?
June 4, 2009

EPA Regions 1 and 2 hosted the Northeast Forum on Climate-Waste Connections, a series of free web-based training sessions and discussions with experts and practitioners from the Northeast and beyond. The goal was to advance the discussion about materials management and the climate connection in practical ways that will help communities integrate waste reduction and recycling into climate plans. The goals of these training sessions were:

- Bring attention to the climate impacts from managing solid waste and recycling.
- Identify issues that would benefit from regional and national collaboration.
- Provide tools and assistance for incorporating materials management into climate action plans.

What is the Climate-Waste Prevention Connection?

- Materials Management the Untapped Approach to Reducing GHG Emissions
- Northeast States Climate-Waste Action Plans
- Local Communities Experience: Incorporating Waste Reduction into Climate Action Plan

Beginning of Transcription:

Adolph Everett: Introductions. Josh are you ready to begin?

Josh Stolaroff: Yes. I am a AAA Science and Technology Policy Fellow, I am working at USEPA in the Center for Program Analysis and Office of Solid Waste and Emergency Response. I have to give the disclaimer that I am not an EPA employee so my views do not necessarily represent those of the agency. However, I will be presenting some data from research that we did here in the Center for Program Analysis.

So as a basic background introduction, climate change is widely and generally recognized to be a serious global problem. There is a broad global agreement that we need to reduce green house gas emissions. A number of countries already have limits on green house gas emissions and recently we have seen a number of actions in the

US aimed at reducing green house gas emissions. For example, in President Obama's recent budget, he calls for a reduction of green house gas emissions, 14% below 2005 levels by 2020 and 83% below 2005 levels by 2050. In parallel, the EPA has proposed to regulate green house gases under the Clean Air Act, which you may hear referred to as the endangerment finding. The EPA and the Department of Transportation recently published a notice to establish vehicle green house gas emissions and corporate green house gas fuel economy standards aimed at reducing emissions from vehicles.

In the Congress, there are a number of bills that are working their way through to reduce emissions. The most prominent right now is the, I forget the acronym, but it is most commonly referred to as Waxman Markey. And in that they have a target to reduce emissions by 83% by 2050. Then at the state level and also at the local levels, their climate action plan is to reduce emissions. We recently completed a survey of states and found that 33 have climate action plans to reduce emissions. There are a number of efforts at various levels going on to reduce emissions and the targets that's sort of more than 80% by 2050 emissions reduction target is fairly in line with what scientists say is necessary to avoid dangerous interference in the climate system. That is obviously a pretty dramatic reduction from where we are today.

The question is, if we are going to make those kinds of reductions, how do we do it? There a number of proposals that are most commonly put forward or are already enacted in most cases. You have probably heard a lot about cap and trade. We have the corporate average fuel economy standards I just mentioned. There are newer appliance energy efficiency standards both in the 2007 energy bill and proposed in Waxman Markey. There are renewable electricity mandates in many states and the proposal for a federal one. Building energy use codes recently improved in the 2007 energy bill and also proposed new improvements. Carbon capture and storage technology or carbon capture sequestration technology at power plants often discussed and there are existing financial incentives to make that happen.

But, the question I am going to try to address today is does materials management fit among this suite of climate mitigation approaches policies. To answer that, we'll go first to this chart of US green house gas emissions. Which is a common place to start when thinking about climate policy. It essentially shows US green house gas emissions divided by economic sector; or in a sense the end of the pipes where emissions are coming out. So you might also think of this as an end of pipe view in that it is showing the sector where the emissions are being released. What you might conclude from this chart, as many people have, is that if you control emissions from the electric power industry and from transportation, then you've addressed the majority of emissions. If you also control industrial emissions, then you come close, at least in principle, to being able to get an 80% reduction in emissions.

What you don't see easily on this chart is where materials management can fit. In fact if you drew it in here and it's not normally shown, you could show the end of pipe emissions from waste as a 3% slice that would be half of that commercial slice. So that is where they are included here. But that of course that does not tell the whole story of emissions from materials management. That is only a small piece that comes out in the waste sector directly.

In our research we set to find a different way to look at this set of emissions that would tell us more clearly the role of materials management in green house gas emissions. That's what this next chart, part of what this next chart tries to do. In the systems view of green house gas emissions, rather than dividing emissions by economic sector, we tried to divide it by system where a system is all the parts of the economy working together to address a common need. The systems can be chosen many different ways. But we specifically tried to look at systems that would illustrate the role of materials management and of land management. This view you might also consider a life-cycle view because it gathers together emissions from a life-cycle of various products or services together in one slice rather than just where the emissions are coming out.

On the next slide this just shows that if you consider the provision of goods and the provision of food to be the donated materials management, then materials management actually influences 42% of US green house gas emissions which is a lot different than the 3% direct emissions from waste.

Since we also did this analysis for land management, I won't go into detail but I'll just show briefly that the land management picture is a bit more complicated but it also benefits from the systems view. We find that emissions from local passenger transport, there are 15% of the pie and emissions from the construction of infrastructure another 1%. Also the land sink, which is emissions absorbed by, mostly by forests that are growing, but by other US land are influenced by land management. Then an additional set of emissions that isn't in the US green house gas inventory right now, but that we did a rough calculation to see where, the scale of it, that the carbon emissions from the lost vegetation and soil carbon and green field development also add another 4% or on the order of 4% of emissions to the land management. So again the land management piece is more complicated, but it is also large in scale in its influence on total US green house gas emissions.

Going back to the materials side, if we agree that materials management actually influences a large share of green house gas emissions, then the next natural question to ask is can changes in materials management practices shrink those slices, so to speak. Can you make changes in materials management practices that significantly reduce emissions? That's what we tried to address with this next set of calculations. Here's a table of some estimates; these are estimates of the technical potential of green

house gas reductions that you can get from a number of materials management scenarios. The purpose of the technical potential calculation is just to say what is the order of the potential here, how big could it be and set aside for a moment the economic and practical considerations and just say is this something that's big enough to worry about? A number of these scenarios are about just seeing, ok if you could get all of it, if you could do the whole, recycle every, all MSW for example, what would be the green house gas impact? Is it be big enough to worry about? The question of how much could you get in the real world and what sort of policy levers you need to achieve those things would be the next step in the analysis. For now, we are just going to see where the potential is.

You can look down this list and see that there's a great deal of potential out in many of the examples of materials management practices that we analyzed and this is by no means an exhaustive list. In particular, there are numerous ways to do source reduction and we only addressed a few. But just to get a flavor of the kind of potential that's out there, if you reduce packaging use by 50% in the US, we estimate that would reduce green house gas emissions by 40 to 105 million metric tons of CO2 per year. Now for comparison, the total US green house gas emissions in 2006 was a little over a 7 thousand million metric tons. So, they compare, they're significant on the scale, total green house gas emissions. Also, they compare to the scale of a lot of other mitigation opportunities that we have been talking about for a long time to address climate change. Like, replacing light bulbs with compact fluorescents or using corn ethanol as a transportation fuel.

In other studies that have looked at those kinds of scenarios and the potential reductions that you get from them, a lot of them come out on the same order of 100 million metric tons reduction or up to a couple of hundred and down into tens. So these potentials are on the scale of a lot of other opportunities that we would consider for climate change mitigation.

I will just mention a few other ones on the list. There is a lot of potential in recycling construction material, 150 million metric tons in our estimation and that is probably an under estimate because we have only very old estimates of how much construction and demolition material there is out there.

If you compost all food scraps, we estimated there would be a 20 million metric ton reduction in CO2. Although, there are ongoing discussions about how to calculate the benefits of the green house gas benefits of food scraps and there is the possibility that that number could be a lot larger.

Back to the source reduction side, if you extend the life of personal computers by 50%, which is just one product among many possible products that you could improve the durability of, you would get 25 million metric tons of CO2 reduction.

Now, just to give some comparison, I'll show a chart from the McKinsey report on green house gas reduction; this is on global green house gas mitigation opportunities. This is an influential and widely cited report in the climate policy community. What they tried to do was to look at the whole universe of green house gas reduction opportunities and calculate the average cost of each one and the potential, and then order them from lowest cost to highest cost.

So that is what this chart shows. On the left you have actually negative cost mitigation opportunities, things that save money and also reduce emissions, moving up to the higher cost things on the right and the width of each bar represents the potential reductions from each activity. In this report, for the first time, the first report came out in 2007, and this report, the updated version, included waste recycling for the first time. There is some other materials management and land management related activities that are circled in red there just to give you a sense of where these thing fall on the curve. They calculate a lot of them are on the negative side. Again, this is a global report and it's also very, sort of, general in its treatment of each individual activity. So it doesn't give us a lot of information about the potential for specific recycling programs in the US. But it does make a general argument that recycling is the low cost way to reduce green house gas emissions and these others materials management and land management opportunities; and that they have significant potential.

Our calculations, the pie chart, and the technical potential reductions don't address all the questions. The biggest outstanding questions are what is the cost of mitigation for specific materials management opportunities. We would like to say that in general it's low cost compared to end of pipe solutions, usually pollution prevention, options are. But we need to look at these things specifically and estimate that. If it turns out that it is low cost and it is something we want to do to mitigate climate change, then which policy levers can be used to do that. Then we have to face up to practical limitations and figure out how to overcome various market barriers to get those reductions and to make the materials management activities work.

One way that we can do that at the federal level, our perspective here has been mostly federal, but one place that we usually look for policy levers and for data about cost, is to the states and localities. So just to give you some examples, as I mentioned before, 33 states have completed climate action plans and another four have them in development. Out of those 33, 31 include materials management activities as part of the plan. So a lot of states have come to the same conclusion that I'm presenting here. That materials management has a part to play in climate change mitigation.

Some of the typical activities that we've seen in state climate action plans include recycling initiatives, waste to energy systems, and production or purchase of locally grown produce. On the other hand, there's always opportunities for states to do more. One mechanism that everyone should be aware of for doing that is in the American Recovery and Reinvestment Act of 2009. It provided 3.2 billion dollars for state block grants for energy efficiency and conservation. Those specifically allow for material conservation programs, including source reduction recycling, recycled content procurement, and reduction and capture of methane and green house gases generated by landfills or other waste related sources. So there's opportunities to use some money from the Recovery and Reinvestment Act for your materials management opportunities.

The main conclusions that I would try to suggest from this discussion is that the systems in life-cycle accounting, which is our second version of the pie chart, show the potential of materials management to reduce green house gas emissions. That's also shown through our technical potential calculations, almost all of which use the life-cycle approach to calculate benefits.

Given that significant potential and promise and what we know about states using these options and what we expect about the environmental co-benefits and other good reasons to do materials management, the materials and land management opportunities should be included in the response to climate change. At the federal level, in terms of the maturity of discussions for different climate policy options, materials management is relatively low on the radar screen. It hasn't been discussed as much and there aren't unified policy proposals the way there are for, let's say renewable energy, or even a specific option like renewable energy portfolio standard or for bio fuels or something like that. To get those things included, we do need a more developed policy proposals, and to do that we need economic analysis and specific policy options. That's something that probably a lot of people on this call can help with and think about and contribute to because the state and local experience will really help us and the community put together the pieces we need to, to have coherent policy proposals.

That is all I have to say right now. If we have time for questions, I will be happy to take them.

Adolph Everett: Josh, thank you very much. We do have a couple of questions now hopefully you can field. First has to do with one of your earlier presentations, one of your earlier slides that are out there, and it asks the question about why aren't appliances and devices included in that table under materials management?

Josh Stolaroff: Here the appliances and devices slice is the energy used by appliances and devices. The materials that make up the appliances and devices and the emissions from manufacturing them are still included in provision of goods. That slice is

unfortunately not totally clear, but that slice is just the energy use. Now you can argue that the choice of materials is part of the materials management process, influences energy use by appliances and devices. But I think if you want to use this chart as a tool to target policy options, then for the most part it is a different set of policy options that address the energy use of appliances and devices and that is really energy efficiency codes. The materials management approach is green design and pollution prevention, waste reduction, those things will go more to the manufacturing and processing side and that is already included in provision of goods.

Adolph Everett: ok great, thanks. The second question is when referring to and cataloging green house gas emissions as it relates to materials management, are you considering all GHT's like methane or you just focusing primarily on CO2?

Josh Stolaroff: It does include all GHTs that are in the US green house gas inventory, which is pretty much all of them that matter.

Adolph Everett: ok great. Thanks again Josh. Now Lynn we will turn it over to you.

Lynn Stoddard: I wanted to talk about, give you an example of what one state is doing on integrating climate and waste. I am going to talk to you about what we are doing here in Connecticut. I am going to focus on a few things. First of all, how we have kind of integrated climate change into our waste planning, recognizing the changes we have already incurred on the climate and we will look at that in our debris management plan. I will talk at the end a little bit on some regional planning going on in the northeast.

I am guessing most of the people on the phone are kind of waste professionals, so I am going to give a little bit of background on our Connecticut climate change plan and how it came about.

Connecticut was part of a group of New England states and inter-Canadian provinces that was really the first regional climate change action plan in the US in 2001, which included an agreement on regional green house gas reduction levels by specific states. The response to that, each state and province needed to develop a jurisdictional specific action plan to spell out exactly how they would meet these green house gas reduction goals which were regional.

Connecticut established a Governor's steering committee on climate change in 2002, which included the commissioners of these six agencies you see listed on the screen. The Governor's steering committee directed a nine month stakeholder process, including folks from academia, business, towns, governments, non-profits, pretty much every sector. We worked in five different workgroups, one focused on cleaner electricity, one on transportation, one on energy efficiency in residential, commercial and industrial sector. There was a workgroup focusing on agriculture, forestry, and waste emissions.

The last workgroup was on public education. So you can see from the start of our climate change planning waste was an integral part of the whole thing.

The plan was completed and presented to our general assembly in 2005, endorsed by four legislative committees. It includes 55 actions in those five sectors that I showed on the previous slide. Especially for each of these 55 actions, we projected the tons of potentially green house gas emissions reductions for each measure in the years 2010 and 2020, cause those were our target dates, and we also tried to project costs per ton of each of these actions.

I'll get to specifics for recycling and waste in a minute. Essentially if we were able to implement all these goals of these actions successfully, we would meet our green house gas reductions targets, which were 1990 levels by 2010 and 10% below that by 2020. Now since 2005, actually last year, our legislature created mandatory green house gas goals for Connecticut. We are one of a handful of states that has mandatory goals. They are similar to the goals you see on the screen, but go a little further. So it's 10% reductions by 2020 and 80% reductions by 2050. Needless to say, the plan I am talking about that was created in 2005, doesn't get us to those 80% goals. That's our next trick.

I wanted to do a little closer look at the waste related actions in our climate plan. Some of them are ones that Josh just mentioned that are typical in state plans. So the first one, increasing source reduction recycling to 40%. At that time, 40% was our recycling goal in the state of Connecticut. So our climate plan basically, in this area and many other areas, land use preservation and what-not, took existing state goals and incorporated them into the climate plan for consistency and to kind of reinforce and highlight the green house gas benefits of some existing policies and efforts underway in the state.

We also have an action in our plan to capture methane from landfill gas. Then we have a handful of other policies, probably more than I listed, that are more general in nature, but have associations obviously with waste. So procurement of environmentally preferable products and services, which obviously a lot of those include recycled content. In our energy efficiency section, obviously one of the things we are pushing and subsidizing is compact fluorescent light bulbs. That has some implication for waste management as we all know on handling the mercury when these bulbs are spent.

Our transportation section, essentially you saw that is usually a very big chunk of the green house gas pie. We are trying to reduce vehicle miles traveled by any of the vehicles, have cleaner fuels, convert as much as we can to public transit and intermodal. So in terms of waste management, obviously there is a lot of transporting of waste through collection and to disposal sites. Trying to move from trucks to freight and

freight rail and increase intermodal opportunities so that connections between rail and truck and rail and barge are more viable.

Josh mentioned locally grown foods, which I didn't put on the slide, but that's also an important action in our climate action plan. He mentioned resource recovery, moving from landfilling to resource recovery, which has been actually a predominant theme in our solid waste planning in Connecticut for years. It's happening for the most part so we did not reiterate that in our climate plan.

I think this is kind of the obvious stuff. Some of the benefits of, the green house gas benefits from waste management practices, we are looking at life-cycle from beginning to end. It's the mining of raw materials and manufacturing through to a use of natural resources like trees, which have a great sequestration value for carbon. Transportation of materials and waste and landfilling, particularly states that rely heavily on landfilling; methane has a very high global warming potential so you get a pretty big bang if you are reducing methane.

A little more detail on the recycling actions in our plan. Again, I said 40% was our goal. We were looking to attain that by the year 2010 and maintain it through 2020. At that point, our recycling levels in that they were about 25%. Most of our MSW, as I said, goes to resource recovery, it's around 57%. So not a lot that's currently landfilled. So we kind of used these percentages to do the calculations and then used the waste reduction model from EPA to calculate green house gas savings from these changes in management practices. You can see the results of our calculations in 2010 and 2020. They're essentially getting close 1 million metric tons in each of those years.

As well as projecting green house gas benefits for each action in the plan, we've projected costs and you know Josh was pointing out the importance of this. Well this was pretty, best guess is, I would say, you know it's not that easy to project some of these things. We estimated getting to this recycling level of 40% would be about $45 a ton. But it was, again pretty rough, but something to go on.

So, how does recycling compare to the other 55 actions in our plan? If you look from the bottom up, you'll see how these, how our actions were ranked in terms of the greatest green house gas benefits. Near the top you will see natural gas and oil conservation funds, so that's becoming much more efficient with the fuel oils used to heat our buildings and water. RPS is our Renewable Portfolio Standard, which requires increasing amounts of renewable energy into our electricity grid in Connecticut. So that's a big one.

The fourth one is the cap and trade program, which you probably are aware that Connecticut and northeastern states are part of the first carbon cap and trade program in the country called RGGI, Regional Green house Gas Initiative. So at that point, we

were projecting pretty significant reductions through RGGI. Recycling and source reduction came up next. So that's pretty significant and it, that's from a state that relies mostly on resource recovery. So if you are a heavy landfill state or town, the recycling and waste reductions of green houses is going to be even more significant.

In the year 2020, it takes a little bit but recycling is still in the top ten. Some of our policies don't kick in or you don't really see the savings until later out. For example, some of the stricter car emission standards. So, it's just a little bit but recycling and source reduction is still very high on the list.

That's the summary of how we've incorporated waste management as a really important element of our climate plan. We've woven it through our other planning efforts as well. The following year we issued our revised solid waste management plan for the state. That plan increased our recycling goals from 40 – 58%, which obviously will give us more green house gas benefits.

The solid waste plan references the climate change plan and acknowledges the climate benefits of increased recycling and source reduction. Basically try to kind of weave the plans together and help them build upon each other. So I think the key in, you know there's integration of climate and waste into mutual planning efforts; it's certainly coordinated policies, but a lot of it is just kind of clearly communicating the multiple benefits of recycling from a green house gas perspective and vice versa. The climate plan, you know, communicating the pretty amazing potential that we can get from increasing recycling. It enables us to kind of leverage these programs against each other. I'll give some examples later on, but recycling is now seen as a climate solution and climate change is a driver for the recycling.

Those two efforts focused on mitigation. Again reducing on green house gas emissions. Our disaster debris plan, last year, actually acknowledges what we call climate adaptation. So it's the fact that regardless of everything and anything we do now, if all green house gas emissions stopped today, we still have got a lot of emissions in the pipeline that will be showing impacts for decades. We need to react to the climate that is already changing and will definitely continue to change over time. Our disaster debris plan acknowledges that, looks at general projections on increased storm intensity, sea level rise, and other climate impacts for New England and concludes that these things will very likely result in more debris that we have to manage in the state. We have a heavy coastal infrastructure in Connecticut, which is certainly subject to all of those impacts. So again we are weaving together climate and the waste management frameworks.

Those are kind of our formalized plans. We'll talk for just a minute about a couple of other things we are doing. Josh mentioned AARA and the opportunity for material

conservation programs being funded. I'll just add to that, I think that that is a good example of kind of leveraging programs, seeing recycling as an energy program, which it certainly has energy savings; take advantage of that funding. So we are doing some out reach to our towns in Connecticut to make sure they understand the availability of this funding and how they can take advantage of it and the connection between recycling and energy and climate. A couple of different agencies doing that outreach, the DEP, as well as our office of policy and management, who is managing some of that grant..

Some of the other things we are doing are more in the realm of education. We are actually right now working on packaging a lot of climate actions and resources for towns in the state so that they can better understand how to take action and that of course includes recycling programs as well as energy efficiency, transportation and so on. Pretty much we tried to include the link between energy and climate in whatever we are doing, presentations, publications, web sites, any kind of communication. I think in addition to integrating it into our planning, we have to kind of communicate it to the people so that they understand the link. Continuing on and taking those things further is going to continue to boost the visibility and the importance of recycling in this whole picture.

I wanted to just conclude; mention some regional efforts to integrate climate and waste. NEMOA is the Northeast Management Officials Association, it's a non-profit interstate organization serving the northeast, which focuses on pollution prevention and waste. In 2007, they began to actively address the climate and waste connection. They have developed a draft plan that includes flood climate mitigation and adaptation. Looking at improving recycling, renewable energy, greener site remediation, and recycling of disaster debris again. The draft plan includes background on how waste is managed in the northeast, how waste initiatives reduce green house gases, the benefits of regional collaboration, and the draft plan sets some guiding principles and recommendations.

Currently this draft plan is under review by the commissioners and you will be able to get more information on this during the third webinar in the series; and/or you can contact Terri Goldberg at NEMOA.

So this is just how you can find out a little more information and access the documents I talked about today. Our state climate change website ctclimatechange.com. If you click on publications, you'll find our 2005 climate change action plan as well as our inventory, green house gas inventory statewide and a million other things. That site has pretty much anything you would want to know about climate in Connecticut. Our solid waste and disaster debris plans can be found on the DEP website, the link there and feel free to contact me if you have questions or want further information. Especially if you have any great ideas that will help us go a little deeper on integrating climate and waste.

Thank you.

Adolph Everett: Lynn, thank you very much. We have a question concerning the status of the goals of the Connecticut plan to date, given the action that you've taken, can you comment on that?

Lynn Stoddard: In other words, how close we've gotten? I'm assuming that's the question. Well, this is this lag between real time and getting a green house gas inventory and all the data that goes into doing that. Our most recent green house gas inventory, I believe is like for 2001 or 2002 or 3 and you know we are approaching 2010 in trying to measure progress through that goal. So we don't have a comprehensive inventory in place yet but we've kind of looked at how close we have come. We certainly are tracking, among other things about vehicle miles traveled increasing and energy generally increasing significantly each year. It's a tricky thing to do, to actually be on top of the measurement because of the lag in data and access to data and because it is such a huge universe and we don't have a reporting system for individual sources at this point yet. We rely on kind of an inventory. Having said all that, it's probably not a secret that we haven't attained the 2010 goal, pretty sure about that. We do know it's a huge challenge, even as we get better efficiency, fuel efficiency standards for cars, we are all driving more miles per year. That has overshadowed any gains we've made in achieving efficiency. Similar story in the electricity as appliances get more efficient. We are still using a lot more of them in each household so it's hard to stay ahead of the curve. The economy will help and work out that. We know we are not reaching our goals. We do track certain measures. We know, for example, of the reductions we have obtained from our renewable portfolio standard or cap and trade, or any of those things which are significant. We just don't have a really quantifiable way of viewing them in light of our entire emissions inventory at this point.

Adolph Everett: Great, thanks. We have another question. Do you feel the climate and waste connection has been accepted and validated within Connecticut DEP and other stakeholders?

Lynn Stoddard: Oh yes. Definitely. I think there wasn't even an issue in our climate planning, of course waste was one of the things that was; local sewage and agriculture took a little more convincing of people to see that connection, but no I think it is very deeply rooted in our work here in Connecticut and we are doing a lot more integration into other programs here at DEP into energy conservation of water programs and general air quality programs and that kind of thing. So it's a good story from that standpoint.

Adolph Everett: Great. We have another question concerning has Connecticut thought of reaching out to the manufacturing and industry sectors to help access the carbon that is embedded into the supply chain. Are you able to comment on that?

Lynn Stoddard: I am not familiar with any efforts to do that. Some of the folks in our waste program deal more directly with manufacturers of products, so they can maybe chime in afterwards or something and if we have done that, but I don't know of any efforts to look at carbon in manufacturing of products

Adolph Everett: OK great. Lynn thank you very much. At this point I would like to turn it over to Bob McCoy if you are ready. Again we have a schedule to maybe take some additional questions toward the end. But for now let's turn it over to Bob, are you ready.

Bob McCoy: Yes, I am ready. I am from Maplewood, New Jersey. It's a community of 24,000 about 15 miles due west of Manhattan. We are a substantially built out and substantially residential community, very little manufacturing. A few small businesses but not very much. Therefore we have special challenges. We're a progressive community in many ways, we're both economically and racially diverse. People are here because they appreciate that. So in many ways we have, in some ways we have it easy. We don't have a lot of arguments about whether we need to do environmentally beneficial things. A lot of people are here because it is a good community to raise our children. We are thinking about the future and the environment and climate change are issues that people are aware of and concerned about.

We also have a supportive government. Our township committee has five members and has been really consistently, unanimously, in varying degrees, but unanimously in support of it, no opposition to it.

One of the things we have sort of embarked upon this process in 2006, we decided to go on a formal way. Like 2006, we got some support from an intern who was provided to us through an organization clean air cool planet non-profit in the northeast. That helped us focus our efforts and to think of the environment in a more systematic way, things we have been doing.

One of things we quickly recognize as we start to think about our communities impact on climate change, was that it wasn't all what was happening locally. A lot of what was involved were the decisions we made as consumers. As I said, we don't make a lot here so, as consumers and as residents, those were the decisions. The other thing we realized was that we have an opportunity to show, and to figure out and to show, what could be done at the local and household level. As we remember 2006, probably most of us were concerned about these things. The national government wasn't, in our point of view, wasn't moving forward at the rate that it should have been and were thinking about waste. But that actually lead, in some ways, to a fortuitous realization which was

that a lot of these decisions are made at the household level anyway. That we shouldn't be looking to the national government or even the state. Some of the things that Lynn was talking about, those all have to be implemented at the local level, at the household level. There are decisions that the individual households have to make.

As we set about this, we felt like we were somewhat making it up ourselves as we were going. Other communities obviously set good examples for us. Some in New Jersey, some elsewhere around the world. But we had to set it out and figure it out ourselves. So actually the first thing we did was do the work backwards, which was to figure out if we were to make, what we needed to do, what kind of changes, what level of changes we needed to have an impact. At the time, actually New Jersey's governor directed to reduce green house gases 20% by 2020. There was no thicker content to it at that point. It later became a law, and we are working out as a state how to do that; somewhat similar to what Connecticut is doing. We decided that as a community where things were easier to get done, that we would push that up and set a 10 year goal, 20% reduction by 2015 in those things that we could do something about.

We set up the goal, without actually having a clear way of getting there and actually we realized there was a challenge to make that happen. That we needed to figure out as we went along things that worked and things that didn't. There were not a whole lot of other examples for us and therefore we needed to work things out as we went.

One of the things we started out, we started out exaggerating the amount we thought, the contribution of the local government. The local government, we realized, played some role but when you, especially if you go beyond emissions, actually all emissions that the local government is just a few percent of the total. The role local government could play; however, wasn't limited to that, it could set an example but also there were some things, and especially the are of waste reduction that the local government was a key player and in recycling because they set policies that affect how local households make their decisions. One of the valuable things though was we have a recycling coordinator who was in some ways in front of this. At various levels of the government, some government officials, township employees are on top of these things and eagerly involved in it. In the recycling they were positive, in other areas, there is actually an area where they had to be educated and were sometimes almost barriers to it.

One of the key areas we also decided at that point was to follow what Joshua called the systems view, in many communities and actually some of theirs, there's actually various, we've encountered where they are encouraged to almost look at end of pipe view, where you are looking at emissions that are occurring locally. We decided that because we were primarily consumers and residents, that we needed to look at the things that had to do with our decisions and our household decisions.

We said about the process, we wanted to do an inventory of locally caused green house emissions and we locally caused, as opposed to locally sourced, locally generated. The goal of the inventory was to quantify the magnitudes of the reductions. Estimates were adequate and that is really all we could do. A lot of areas, precise data wasn't available. We could not find thing on, for instance, on the vehicle miles traveled by our residents. Ideally we would have known the amount of gas that people bought, that that was next to, that proved to be impossible to find. So the goal of inventory was to get the magnitudes because we wanted to focus ourselves on the areas that mattered most. That required defining what those were.

One of the things we also did was we started our estimate recognizing that the average American produced something like 24 tons of carbon dioxide equivalent per year and therefore we had no reason to think we were that much different. So we started with that to try to figure out how we could explain specific areas, where we could do something about it, where we could define it and do something about it. We took the 575 kilotons, 575 thousands tons, that is basically 24 thousand people times 24, divided it into somewhat the same way that Josh's slide did. There were two major divisions. One which was for the non-local emissions. There were some that there was just no way we could account for and a lot of that had to do with our consumption, but it had to do with things that were at the state and federal level as well. We just could not account for those locally. Many of them we could focus on the solid waste part of it. We rounded everything, because of the lack of precision, we rounded everything to 5 thousand tons of carbon dioxide. In the solid waste was that 50 kiloton slice in the green corner there.

One of the ways we were able to calculate this was actually a very useful EPA document The Solid Waste Management Green House Gases, there's a link down at the bottom there. This was a very, very good source that explained the link of both green house gases and also a lot of detailed tables about different materials. For instance, if you want to know what happened to aluminum, and how important aluminum was to relative to others, that is all quantified in there. It also enabled us to do a general calculation of what are, what the consequences of our solid waste disposal was. It's not really intended for that but we stretched that a little bit because we couldn't find that information anywhere else. Two aspects of that. One is it helped us figure out which materials were important to recycle and also it gave us some specific values to go by. So here is the general way we went about calculating it. We took an estimate, we actually had a value for the municipal solid waste, multiplied that by an estimated carbon dioxide equivalent, in this case four, four tons of carbon dioxide equivalent per ton was the value we ended up using. That gave us an overall value, that 50 kilotons we looked at earlier. Then we could also again, from reporting data, we could determine our recycling tonnage and therefore deduct that. The idea here, we were thinking about waste, not just what it takes to dispose of it, but also the content.

So we decided that, when you're looking at consumption, you have to account for it somewhere, was hard. But one of the things we could be sure, that was in our case, when it goes to an incinerator where some of it is recovered as electricity, but once it goes to that stage then certainly any green house gases that have been contributed by that product are gone and lost. Recycling recovers some of those and makes the process of manufacturing other materials less green house gas offensive so we give ourselves credit for that. One of the things that did was it showed two opportunities to reduce green house gas impact. We could both reduce disposal and also we could reduce the recycling rate.

Here is a, just how it fits in, on the slide coming up, is how it fits into a general plan. In this case what we tried to do was find reduction opportunities in a variety of areas to reach that 20%. Broad categories and then set reduction targets within those. The solid waste ends up being the, we estimated being the third largest contributor of that. We put down some reduction goals that are obviously not comprehensive for each of those.

Here's some of the measures. So then that lead us to specific measures, some of which were underway. At the beginning of 2007, we went to a new recycling regimen. We had previously had an early curbside recycling program that required residents to divide our recycling into eight different categories, we reduced that to three. We added some materials, a couple of grades of plastic, cardboard, and those went to the curbside pickup. At about the same time we initiated a program to allow our residents to drop off electronics for recycling. We ended up actually being able to expand that to an almost monthly drop off day by cooperating with another town, so we alternate between two towns, over who does it each month.

And the other thing that happened, our residential garbage is picked up by commercial haulers. One of them has now gone to a single can option where previously there have been two cans, you were allowed to fill up two cans every garbage pickup, and you could save a little money by agreeing to only do one. The thing that this year we went to a, we extended this further to a single stream curbside, you could put everything into one can. A lot of people still haven't, some people still divide into the categories even beyond the three. But we changed to a single stream and as everybody knows, the recycling market is not particularly attractive right now but that will allow us to add additional plastics and things like that in the future.

The other broad area that we wanted to work on was community education on the links between consumption, disposal decision, the green house gas emissions. That's a more nebulous area. It involved some of the things that Lynn had talked about, but also just on a local level, some in the schools but just educating people so that they realized that when they were not recycling or when they were recycling, either way, that they had an impact on green house gases that our community was causing.

This slide coming up is just something, the kind of education we wanted to do. One of the things we find important is to help people understand the relative impacts of these things. People are interested and eager to do can to reduce our environmental impact, but they just don't have good quantification of what's important. I added on this. This is something from a website and also a presentation but I added on this. This is something, we don't want to discourage people from doing anything this good but we realized that the most popular things are recommended as to avoid plastic bags in grocery stores and just to quantify that, one realizes that, well that's important for a number of reasons. It's not a big hitter when it comes to green house gas reduction.

So here is just some summary of the progress we've made so far. The last two or three years, our municipal solid waste has been reduced about 10%, 1,200 tons. Residential recycling has increased 370 tons or about 16%. What that yields is a total disposal, the difference between recycling and, subtracting recycling from the reduction, the increased recycling from the reduction, because were actually still disposing of it, of about 830 tons of solid waste, which we calculate to be, multiplying by four, about 3.3 kilotons carbon dioxide equivalent. And by a similar type process, recycling has recovered about 800 tons of green house gas that would have otherwise been wasted. If you recall our overall goal was 13 kilotons in this area. So we're making progress.

This is, as Lynn talked about the data, the data is very hard to feel very strongly about. This is accurate by reported information, but I think we want to go a number of years at these rates and continue to increase before we feel real confident. Especially since in some cases, I think we can account for the residential recycling. We have a harder time accounting why our overall solid waste has been reduced as much as it has. The idea of using data to check on ourselves and to set goals.

Where does the future go? We have a number of steps we need to take to further reduce our solid waste impact. Continue to simplify our residential recycling, which is the big one. Like I said before, adding additional plastics, adding additional materials that can be recycled. We are exploring the possibility of adding a more uniform container; larger that doesn't, as right now, if you came by our street on recycling day, you would see all different size containers. We think there is an opportunity to have larger and more uniform containers that might allow simplification of the recycling.

Our small businesses have had a very hard time complying with the law. They need pickups more often then residences. Residences, we don't have back alleys. We're reluctant to put recycling out on the street so it can get picked up. It's been one of the challenges. We need to make it easier for small businesses.

Once we've accomplished those things, we need a stricter enforcement of recycling laws. People continue to think that recycling is optional and only, sort of it's a good thing

to do, but you don't really have to do it. Including a variety of settings, our schools have been hesitant to recycle and things like that. Sporting events, people consider it an optional thing, so we need to continue in that direction.

The other areas, we don't currently have a way, other than the small amount with the two different cans, of making people or rewarding people of disposing of less, making them pay for the amount they dispose. Again because of the very specifics of our, how are garbage is picked up, it's pretty much a flat rate and you pay the same whether you're frugal or whether you throw a lot away at a time.

Another area we are exploring, is facilitating the composting of food waste, which remains one of the, a major challenge in a place where this not a whole lot of land to do it.

You can probably tell that we are finding our way into this. We welcome comments from people who are listening now. Otherwise, these are things that are valuable. Please get in contact with us if you've solved some of the problems we are working on or have other ideas or there are things that we've done that might be helpful to you. Thank you and I guess it is my time to take some questions.

Adolph Everett: We do have a couple of questions for you. The first one is, promoting the use of responsible purchasing decisions tools, the example was given good guide by consumers where you can compute carbon emissions and other factors at the time of purchase by the use of bar codes. Are you looking into anything like that?

Bob McCoy: I guess that is new to me and I would appreciate hearing more about it. That would definitely be something we would be interested in. Our sense is that there is not a lot of that kind of information available right now, but whatever there is would be helpful.

Adolph Everett: Another question concerning how does Maplewood account for commercial privately hauled waste that you may not be receiving all, the basic point is you may not be getting all the information on tonnage. Can you comment on that?

Bob McCoy: Yes I can. I tried to indicate that the information is very hard. What can I say about that. We want to do something about it. I am not sure, we don't have any good answers is probably the right thing. This was especially true, our commercial recycling rate, our reported commercial recycling rate went down recently in the last year. It's the suspicion of people involved in it. The beginning of 2008 at least prices were very good and that people were recycling things privately and they weren't getting reported accurately. That is something the state of New Jersey could probably help us with because there should be that kind of information, but we haven't solved that. That's why I hope I was sufficiently hesitant about talking to, even though I used some of the

3.3 and .8 on the recycling. We want indicators, we don't want to be flying blind, but we also recognize that information is really important. In other areas, besides solid waste, it's been even harder to get reliable information that we can compare year to year, but we are working on that. As Lynn thinks about what the state of Connecticut is doing, I would think about it in New Jersey. That's an opportunity to standardize those kinds of things to help us. Because there is a lot of value to be able to report back to the community that we are making progress. That seems to help a whole lot, yet we don't want to be making up facts, we want things to be accurate. So I hope that helps. It means we are not really, we don't really have great assurance but we are aware of it and want to do something about it if we can.

Adolph Everett: Ok thanks. We have another question. As you are measuring and monitoring your MSW reductions, are you considering participating in the voluntary carbon market for these reductions?

Bob McCoy: Again, the answer would be no. Although it might be a good idea. That's where the town would find a way to financially be rewarded for reducing waste or is that what you were talking about? Is that the question?

Adolph Everett: I think that was the question.

Bob McCoy: That's an idea. Certainly. Some of that would fit in, I don't know what the actual, sort of monetary value of those things are. We were down set off with what we are communicating to our citizens. But again that is a good idea and probably worth exploring.

Adolph Everett: Ok great. We'll take one more for you at this time. Have you had success encouraging people to do backyard composting?

Bob McCoy: Yes, some. We have made available, through our public works department, backyard composters. We're a fairly compact town. A lot of places it's a bit of struggle, but it is certainly something we want to work with. That's where I mentioned earlier, the exploring of taking it off site might be of some value in our community. We want to support it but people have problems with pests and things like that as tightly and compact as we are as a town. We are pushing that where it's possible and certainly it's an area of interest.

Adolph Everett: Great. Well thanks again for your time and we should have more time at the end for more questions. But right now I am going to turn it over to Eric. Eric, are you ready? We may have lost Eric for a second. We will try to get him back. Let's see if we can take a couple more questions. Bob, we have one question and maybe you have a good perspective on this. Very few local communities have included consumptive

materials in their inventories. Have you received any negative criticism for doing so or any positive feedback?

Bob McCoy: Really neither. I've had some discussions with people who have been responsible for other inventories and just sort of question what we want to do in the state of New Jersey and since a lot of communities are similar to ours, we haven't had criticism for it. It also hasn't been something that people have caught on to really. I assume many of you are familiar with the kinds of things, when I see, not to pick on anybody, but New York city talks about it's carbon footprint. Everybody knows what New York city is like but you realize very little is made there. I shouldn't use them as an example too much but various communities talk about, what seems like fairly low carbon footprints and they end up concluding that is that they don't look at consumption decisions. They use more or less an end of pipe analysis. People have different reasons for doing carbon footprints but for us, I think we've concluded that it's at least something we can do something about at the local level. Those are broader than just our energy use and limited number of municipal functions and things like that. So that's where we are. It hasn't been yet controversial. I think some people might even appreciate it. It's hard to know.

Terri Goldberg: There is another question for you. One is, you talked a little bit about enforcement for the recycling laws, tickets, warnings, etc. Is it based on the presence of recyclables in the garbage containers?

Bob McCoy: Yes, I think the violation would be putting in their regular garbage, things that are on our list of things that need to be recycled. The garbage collectors come to back of our houses to pick up the garbage. We don't put our cans out so that makes it doubly hard to enforce that. By the time it's on public property, it's already been picked up so they would have the option. In a few commercial cases, I think we sort of encourage the garbage pickup people not take garbage where there is a lot of recycling in it. But apart from that, that is the form we would take.

Terri Goldberg: (some technical difficulties getting Eric's slides up) Ok Eric, why don't you get started.

Eric Weiss: First of all let me apologize to everybody, although it wasn't really my fault. Everything was running fine a few minutes ago. My name is Eric Weiss and I am the administrator for the Hilltown Resource Management Cooperative. The Hilltown Resource Management Cooperative is made up of ten towns in the rural areas of Hampshire and Franklin counties in western Mass. For any of you people familiar with the area, it is an area just west of North Hampton. So we are about 130 miles west of Boston and all of these are small towns. We couldn't be more different from Bob's

community in terms of the character of the area. It is a very rural area just to the eastern side of the Berkshires.

The HRMC was formed back in 1989 by its member communities when there was the “garbage barge” waste disposal crisis that occurred. At that time what was going on was all these towns had small rural landfills that were closing and they were looking for a way to get rid of both their solid waste and recycling. The HRMC was formed ,originally it was looked at that they might do a whole countywide blue toteto manage solid waste and recycling for the region. What grew out of that was really the HRMC which was ten of the small towns in the region.

The way we are structured, there is a municipal agreement, memorandum of understanding between the towns that all towns signed off on back in 1989. There is a set of bylaws that governs the operation of the HRMC where we have a chairman, vice chairman, and treasurer. We get assessments for the towns, so we are municipally funded and the assessment right now is based on 30% on the types of solid waste and recycling the town produces and 70% on the population of the town.

Since 1989, I have been the administrator of the HRMC and it has been a very successful venture for the towns. We got a big boost initially that the state was building a recycling center in Springfield, a regional recycling center in Springfield. We managed to coordinate with that as well as the fact that we had access through the city of North Hampton to their landfill. All these took having somebody like me in place to monitor and to take care of things for the towns. I want to emphasize to everybody here that these are small rural towns. They have volunteer local boards that manage their programs for them, so it would be the board of health or the board of selectmen that would have responsibility or possibly the DTW and that’s it. So there was nobody really looking at everything in place.

I’ll go over some of the numbers in a minute, but became relevant here as part of the discussion with EPA about green house gases is that in one of our meetings in 2006, I made a strong recommendation to the board as we were redoing our bylaws, that we add the simple word of sustainability or sustainability issues to our core mission of solid waste and recycling. What I saw coming was that recycling was becoming part of the sustainability equation and that the primary focus that was placed on recycling in this region was going to be replaced. That recycling was going to be part of what people can do. As Bob said, at the local level, people can do a lot with regards to recycling but there was also going to be new emphasis on the solar wind and sustainability aspects of what’s going on.

The other thing that is really important is that there is no one local board responsible in these little communities that are all run by volunteers that would be responsible for

sustainability issues that might fall to the board of select, it might fall to the board of health. The towns are just beginning to set up either sustainability or energy committees to look at these things. It's a fairly progressive region, so the idea of looking at sustainability issues and looking at recycling issues was not a big shift for people to make. But what was new was the fact that there wasn't one place and it was clear at the state level of Massaschusetts that the Massachusetts DEP was also beginning to integrate sustainability with its recycling. Where they had traditionally offered recycling programs and recycling grant money, they are now coupling that with sustainability.

So on behalf of the towns, the HRMC is now pursuing both recycling and sustainability issues. We are still heavily weighted towards the recycling side, but as new opportunities in the sustainability area come up, we want to be ready to take them on.

The next slide you will see describes the region to you and that slide said we couldn't be much more different than Bob's region. It's 13,000 people spread over about 300 square miles, maybe 350 square miles. It's a very rural region. It's a place people like to go to see a rural region. As you can see the towns, one are small and two, they contribute a portion of our budget, but we also get a significant portion of our annual operating budget from the programs that we run for the towns. So $45,000 or so comes in from the towns directly and an additional $320 or so comes in directly from programs that we manage on behalf of the towns and I'll explain those in a minute.

Sort of on the opposite end of the spectrum, from what Bob was just talking about, recycling has been here since 1990 or 1989. These towns have established recycling programs. We have a comprehensive mix of materials that we accept from residents and all ten towns haul their recyclables to the Springfield materials recycling facility, which is a 90 town mirth located in Springfield that takes in recyclables for 90 towns in Mass. I also happen to be chairman of the board that oversees the operation of that and that is sort of a three-legged stool in which the towns, the Mass DEP, and Recycle America, Waste Management, which is the operator of that mirth.

So the numbers you see in front of you are the recycling numbers for each community for the last annual year. All the towns have very similar programs. The biggest variation between the towns is that some of the towns have a per bag fee and some of the towns don't. That is a very much by local choice. All of these towns are drop off centers, there is no curbside available here. People drive their own stuff to the transfer station to get rid of it. They drive all their own stuff to the transfer station to get rid of it.

So where are we involved directly with the town's mirth as well We are directly involve with managing the Murphy recycling program, which is the program I just told you about in Springfield which is a dual stream facility, bottles and cans on one side, paper and cardboard on the other. All the towns have established electronics recycling programs.

We are in the process of setting up fluorescent light recycling programs. Five of the towns have it and five will have it by the time the summer time rolls around.

We have an established paint recycling program, there are paint swaps in many of the towns. We do an annual regional hazardous waste collection on behalf of the towns to get some of the toxics out of the waste stream. Things the things the towns have come to rely upon us for, our technical assistance, especially when it comes to required things that need to be sent to the DEP every year. When you run a facility, there are requirements that have to be met, and the towns turn to the HRMC and say hey, you submit that. I spend a considerable amount of time both addressing and going to local meetings. As I said, I am chairman of the mirth advisory board, which meets in our region and there are other state boards that I am part of and to say with ten towns I spend a lot of time meeting with a lot of local officials is an understatement, but it is part of the job.

The HMRC also does a lot with just trying to provide of information. We try to help the towns with the handouts they give out, we'll publish information in the local papers or at the transfer stations. We've been successful in acquiring grants to help promote what we try to do. Earlier I talked about how there is a difference between a $45,000 budget and a $360,000 budget. The money for all the programs that we've run, collecting electronics, paint, hazardous waste, we actually manage the cost disposal for the towns of the North Hampton regional landfill. All that money simply passes through our budget. So that is part of what bumps up our budget. The other things are when we get grants and or other projects for other regions, that money comes directly into our budget.

So it is very much intended to be the towns pay for what they use. If they have a lot of tons of solid waste, we do send them the bills for that. But what we've begun to do, and this is all the new stuff and this is why I was interested in participating today. As we have begun to look at the interaction between green house gas emissions and what the savings from recycling programs and efforts can be.

Specifically I have begun to look both at the EPA WARM model and the NERC model, which is a more local model developed in which I am going to try to produce information from my towns to demonstrate to them how much their recycling programs are saving them in terms of green house gases. So it is sort of the opposite approach to what Bob was taking, in which we have the recycling programs in place and now I going to try to show some information as to what savings that is producing for the towns in terms of green house gases. It's going to take time, but I think the models will be accurate and we just have to sort of have to break down the materials and account for the manner in which we collect materials and things like that.

The other thing that's become very obvious is that there is a need in the region to begin to promote the idea of sustainability. We are starting to become relied upon for that as well, that when I hear information say of a state program or the federal stimulus money, I am getting the information and local officials who are volunteers are either confused or don't know what to do or it's just overwhelming to them. So I'm trying to decipher at least the sustainability side of this.

What makes that work and why I have this slide up is that we've been regional for a long time. Some of these towns are very conservative on their approach to life. But they all share the fact that they want to preserve the quality of life. They like how nice it is here. They like the green hills and everything else. They know that in these rural areas that the regional approach, whether it is a group like ours, possibly a regional school or whatever, towns can't afford to do things on their own anymore. Although they would very much like to. It is sort of a New England credo to do things yourself. But they know there are ways they need to share and we've been able to demonstrate regional cost savings and by having one person work in ten towns.

So there is that common desire to protect that region we live in and to allow for us to save and there are sustainability groups, either sponsored by the towns or not sponsored by the towns popping up. Like I said, North Hampton is a very progressive town or city. The surrounding towns have very significant progressive people in them. All who would like to see more going on in the sustainability area. The discussions that the HRMC board has been having lately is what can we do to help promote sustainability in the region. One, we can promote recycling as part of the sustainability equation, which we have been doing but we need to talk about it that way. We talked about it in terms of a good thing to do for the environment, save energy, cut down pollution. But in terms of the new language of sustainability, the green house gas emissions,we need to start describing it that way.

On the second window, my board gave me permission to join what is now call the Pioneer Sustainability Network and I have become the first ever chairman of that group. That is a network of professionals and advocates and all kinds of people in this region who are working on solar projects and wind projects, Habitat for Humanity. It's a whole network of people; land use planning, water protection. We are just trying to get people to network and share their information. That is the only goal. We are not trying to stand in the way of those groups and all the work they are doing. We are just simply trying to get those groups to communicate with each other. We have a website, we have meetings every other month to try to get people to communicate.

I am beginning to look at, again through the models of the WARM model and the NERC model is that this idea of carbon footprint or ecological footprint and that we will begin to

describe that to the towns and how we can help them do that. That is the big picture and that is a long ways to come.

Finally, in our meetings over the last three to six months, I have said to the towns we need to sort of reprioritize our budget. They allowed me to sort of reconfigure our budget, to allocate more money to be spent towards looking at sustainability issues. Because of the way things are structured here in Massachusetts, there is some money available through the state government and I guess through the stimulus package. I am beginning to hear that for municipal sites to be looked at in terms of school buildings, town halls. I ever hear that they are talking about putting solar panels on closed landfills. But that we need to find a way to look at those things. We need to do some sort of assessment of what the potential municipal sites are in the region for those things and nobody is trying to inventory that now.

Specifically, town home sites and schools, again it is a hilly region, we get pretty nasty winter weather up here and there are places where we have town buildings and schools where anythime you are there the wind is blowing or whatever and people say what a great spot for a windmill. To be honest, the first place we are beginning to look at is a school that is in the town of Chesterfield, it is 1400 feet. I got permission from my board about a month ago to pursue this and I got permission from the school board that runs that school. It's a regional school run by two towns, it is small elementary school. To go ahead and apply for what is a site assessment through the math technology collaborative, which is a group that is run by money that is added to electric bills that they created. Its sole goal is to pursue green projects on behalf of Massachusetts.

So we will be submitting an application. Everything looks good for this site to branch out and look at the potential for wind power. Just so people are wondering why a recycling guy got into wind power, my background is one in wind power. I got my bachelors and masters in alternative energy and energy engineering from the University of Massachusetts. back in 1984 and my intent all along was to do stuff in wind and solar. The world economy just didn't work in my favor for a while.

But I will say again and this is where I will close is that we have an established organization that already has connections with the towns and has developed a level of trust with the communities it works with. So for us to say to them, we want to look at green house gas emissions associated with the savings of recycling or we would like to see if there is potential wind and solar sites at any municipal site in your towns, what do you think? The towns will respond to that.

So that is where we are today and that news I just gave you about the approval was done last night at the ([inaudible] elementary school, school board meeting, to allow me to submit the application. So that is where we are.

Terri Goldberg: There are a few questions. But there are not any questions for you Eric right at this moment. But if people do have questions, that would be great. Before we go to questions for everyone, I have a couple of slides about some resources that I wanted to share with you. I just wanted to let you know that next week; we should have all the slide presentations up so if anybody would like to get these resources or would like to share the slides or presentations, they will be up on this sustainable communities website. I just wanted to remind you about the next two webinars that we have scheduled and if you haven't signed up already, please do so. We are looking forward to seeing you then.

I also wanted to bring your attention to EPA's Region 2 Planning for Sustainable Future, A Guide for Local Governments. This is very helpful information about and if you want to learn more about researches that they have put together in Region 2. But again it is really helpful for any local community who is looking at sustainability issues.

Regions 9 and 10 last year did a series of forums on climate change, waste prevention, recovery and disposal. There is a lot of good information on their website. You can go back and look at some of their presentations and listen to them as well. I would highly recommend if you are interested in hearing about what they've done and what they are doing, to check out their website and also on the third webinar, we will be talking with them and hearing from them and learning more about what's happening on the west coast.

Region 4 has developed a municipal government toolkit that has information on recycling and information on climate and the recycling connection. Again, it would be very useful to any municipality. There is a website link right there with it.

I also wanted to highlight a regional resource from the Northeast Recycling Council. They have put on their website a document that provides an overview of solid waste master plans and management plans in 13 northeast states. It's based on information that was available as of April, two months ago. At this time Massachusetts and New York are currently updating their plans, but this would be a great place. There are web contacts, links, and information about product stewardship, climate change along with information about waste hierarchy's and goals and objectives for each of those states.

I am going to turn this over to Adolph and if there are more questions for the panelists, we are going to un-mute the panelists so if anybody has a question, then they can all respond as appropriate.

Adolph Everett: Thanks Terri. Eric we do have one question that came in for you. It's concerning the budget, with a budget of $45,000, how many full time employees are in that group and did you need grants to pay for salaries, things like that.

Eric Weiss: The answer is yes to all of that. We get our money from a couple, three,r four sources. There is municipal money. There is money that comes in directly from recycling revenue which last year was a whole lot better than this year. It is very much a part of the group to go after grants to support the types of efforts we are trying to do. So the 45 is sort of seed money to make sure everything else happens. I would like it to be more, but that's what these towns seem to want to afford.

Adolph Everett: Ok great. There is a posted question just for you and Bob and your reaction. What medium or media are using to educate the public?

Bob McCoy: There is a variety, none of particular focus. One of the things we have done is committed ourselves to semiannual updates on our progress, so we have community meetings with 60, 70, a 100 people sometimes. That's one of the ways. We have a local newspaper that publishes, that's looking for content so we could publish things there. The town puts out recycling notices, things like that. There is both a town website and a town newsletter that comes out quarterly. We've done sort of less formal things with school groups and that kind of thing. We don't have what you would call a systematic approach to it, it's sort of when opportunities arise.

Eric Weiss: That's very similar to what we do it. It's a rural region, there's a small regional local newspaper that we use quite a bit. There is also a newspaper based in North Hampton that some people get, called the Hampshire Gazette. We don't have anything posted electronically. We are not relying upon that at this point with the population we serve. A lot of our information we put out directly at the transfer stations where people would go to drop their stuff off. There are places like the library and post office, we would set up announcements. We have our meetings, we haven't done yet, but we've started to talk about community meetings related to sustainability stuff as they arise. We haven't done any of those yet. So any of the information that would come out of that is something that is sort of in process and that we are working on.

Adolph Everett: Ok thanks. Josh, we have a question for you. A participant would like you to discuss your experience and challenges of finding data and evaluating the quality of data to measure different ways that might be related to contributions to green house gas emissions and reductions. Would you like to comment on that?

Josh Stolaroff: Sure. So in similar ways my job at the national level is easier than the jobs for these folks at the state and local levels. There are a lot of good data sources for national level for green house gas emissions, energy use and different things. As far as the pie chart, the sort of accounting side of it, most of our data comes from US green house gas inventory and then we used a variety of other data sources to slice it up in different ways including surveys from the Department of Transportation, and energy consumption surveys from energy information agency. Then in certain places, we use

more primary data sources where we needed to look at specific, like for the land use things, we need to look at specific journal articles and get emissions factors. We used a life cycle assessment model in a couple of places. But for the most part it was putting together pieces from federal reports.

On the potential calculations that gets more difficult and most of those on the materials side came from the EPA's waste reduction model, which was mentioned before. Also just sort of back of the envelope calculations, making bold assumptions about things and putting them together.

So, data is always a challenge. One of the things that personally I have been fighting for my time here is for better and more complete data collection to use in life cycle models. That is something that is, as we move towards the life cycle perspective of green house gas emissions and other environmental impacts that we really need data and it does become a difficulty. It is something that states and localities may have to go out and get eventually to initiate programs around data collection. I hope that answers the question.

Adolph Everett: Great, thanks. Josh, we have one more question for you at this time and then I think we will need to wrap up due to time constraints. The question is most of the benefits of recycling may likely accrue outside of a state or jurisdiction, because of recycling and manufacturing may occur outside of that area. The examples given of paper [audio disturbance; inaudible] in the US, maybe we manufacture in China. How is the issue of counting and crediting green house gas emission reductions managed?

Josh Stolaroff: In our analysis we essentially only counted domestic emissions. In fact, if you wanted to do it, let's say direct domestic emissions, and if you wanted to do an accounting style where you were counting up emissions from goods consumed in the US and not just produced in the US, then the materials picture actually gets a bit bigger and you would see an increase in the materials management slice of the pie.

It's a similar story from a local or state perspective. Where you have direct emissions then you also have, if you do a consumption based accounting, you have emissions that occur outside of your area, but can be controlled by decisions you make. We visited this question a little bit but I think it's good to point out that we've danced around this issue a bit. That you do have to make a decision about how you do the accounting. If you are only going to be responsible for the emissions that occur within your boundaries, be it local, state or national, then it takes some options off the table. If you are worrying about the emissions that you influence and not that just occur in your boundaries, it actually gives you a lot more options to make reductions. So in one sense you might say, if you're a locality and your talking about whether your climate action plan should include the life cycle emissions from the materials you use. On the one hand, your emissions total is bigger if you include those materials. On the other hand, now you've got more

tools on your table to make reductions. So if you set a reduction target, all of the sudden you can use purchasing decisions or waste management decisions or waste reduction decisions to help you meet your target. Whereas if you're just restricted to the emissions that occur within your boundaries, then you are much more limited.

The flip side of this is that the things that are under state and local control, if your looking at ways you can influence the green house gas picture, whereas in the total picture maybe there are larger things like electric power policy or international transportation emissions or something like that. In the local picture, materials management and land management are among the biggest things you can influence. On the flip side, from the federal perspective, they are two of the hardest things to influence in our current stated policy. In a way we need state and localities to really worry about the materials and their land management and find innovative ways to make green house gas reductions there. It is harder to influence those things top down. From the state and local perspective, if you want to make reductions, those are good places to start.

I think there is a larger discussion that we all need to have about consumption based accounting, is one way to put it, or life cycle assessment or life cycle accounting for emissions and other environmental issues. Those are sort of the things that will allow us to be more innovative in our ways to address climate change and other environmental issues.

Adolph Everett: Ok great. That is all the time that we have for today. We'll need to wrap up but I just wanted to thank Josh, Lynn, Bob and Eric. Thank you for your presentations, they were very informative. We think it will be helpful to the participants on this webinar. Hopefully you can all join us for our next sessions on June 24th and July 23rd. We really hope you can participate. Just as a reminder, we have all applied to any question that was received that was not addressed during this webinar session. Last but not least, please don't forget to get us feedback on this session. We will be compiling these responses and presenting them during our July call. Again this will help us provide information to help us enhance our future calls. With that, Terri is there anything else you need to mention?

Terri Goldberg: No, I think that's it. Thank you very much and thanks to all our speakers.