Transcript of February 7th Panel Discussion at the Ann Arbor District Library "A Carbon Price is Right: Harnessing the market to bring down carbon emissions"

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Barry Rabe
Lisa Del Buono
Sam Stolper

Knute: Thank you to those that have organized this discussion. It brings together a group of experts on policy and climate action and I'm pleased to work with them. I just want to provide a few brief introductory remarks. First, as the natural scientist on the table I want to make the point that there is strong and essentially irrefutable evidence that carbon emissions are heating the planet, and our best science predicts more extreme weather events, which we're observing, damage to human health, which we too often ignore, risks to food supplies, high economic costs, and challenges to global security. This is not a forum to discuss the science. I've provided some resources and we could talk about the science at other events. This is a forum, rather, to discuss confronting the problem by exploring market-based solutions for driving down carbon emissions, with this panel of experts.

Before I introduce them, I want to let you all know that I hope you have cards, and if you don't have a writing utensil raise your hand and someone will give you a pen or pencil so you can write questions and hand them in. We'll give you about 20 or so minutes as the panelists are speaking to write questions and you can even write them after that. But we'll do a brief collection in about 20-25 minutes.

So I'm really pleased to work with this group. We had a wonderful dinner and could have gone on for four hours because I've learned so much. The first thing I learned is that we have a new arrival in Michigan, who is Professor Sam Stolper. He's an assistant professor, at the very end of this table. Welcome him to Michigan! He just arrived in September to begin an appointment as assistant professor in the newly established School of Environment and Sustainability, or SEAS, where his work focuses on the design and implementation of environmental policies that are both efficient and equitable. Prior to joining SEAS, Sam was a postdoctoral associate at MIT, jointly through the Department of Economics and the Center for Energy and Environmental Policy Research. He received his Ph.D. in Public Policy from Harvard and a Bachelor of Science degree in biomedical engineering at Brown. So again, welcome to Michigan.

We welcome Dr. Lisa Del Buono *back* to Univ. of Michigan. Lisa traveled here all the way from Traverse City. She's a surgical pathologist specializing in G.I. and breast pathology. She trained at the U of M and currently practices at Munson hospital in Traverse City. Lisa has been an active member of the Grand Traverse Area Citizens' Climate Lobby since 2013. I think there are at least 12—but correct me if I'm wrong, there may be more—chapters in Michigan of the Citizens' Climate Lobby. So she's in the Grand Traverse Area Citizens' Climate Lobby. She served as co-leader and liaison to Representative Jack Bergman of the first US Michigan congressional district. As a member of the Climate and Health Action Team, Lisa frequently gives presentations to

the public about Citizens' Climate Lobby's Carbon Fee and Dividend proposal, and health impacts of climate change.

Sitting next to me is Dr. Barry Rabe. He's the Harris Family Professor in the Gerald Ford School of Public Policy at the U of M. He directs the Center for Local State and Urban Policy, or CLOSUP, one of the best acronyms I've run across at Michigan! Barry is a political scientist who examines the political feasibility of policy innovation and his newest book entitled *Can We Price Carbon?* will be published in April by the MIT Press. He is also a non-resident senior fellow at the Brookings Institute, which published three earlier books including *Statehouse and Greenhouse* which examined why some states have actively engaged in climate mitigation. I am charged with asking this knowledgeable panel questions to start, and so Barry I would like to ask you, "What is carbon pricing specifically and what is carbon tax versus cap and trade?"

Barry: [00:04:25] Sure. Thank you. And thanks so much to my panelists and the organizers of this event and for all of you for attending. It's really wonderful to be part of a community conversation not just about the particulars of carbon pricing, but thinking about constructive strategies that might be taken across levels of government in the United States and beyond, on this very challenging issue. I should just note that, to underscore what Knute said, I'm approaching this in many respects talking about politics—not politics as I would like, or as I would prefer the world to work. But to politics as I think we have seen evolve in this area over some time. Really for some time the issue of carbon pricing has been on the agendas of multiple governments in the United States. There are all kinds of ways that one can think about putting a price or attaching a monetary cost to the use of carbon fuels.

Couple of things to think about: One is the effort to try to actually measure the carbon emission damage of different fossil fuels. There are variations between coal, natural gas and oil and different permutations of them. This is an effort to link that environmental damage with some kind of a cost or pricing mechanism. Knute, you asked a very appropriate question: Questions of carbon tax versus cap and trade. Very quickly, the idea of a carbon tax is to use a taxation or a fee mechanism, however one wants to describe that, and add to that direct cost, that is then borne by those who choose to use that product, which is a legal product, its production is produced widely around the U.S., that has a very broad base of political support and use. But to adjust or to change that price by imposing directly a tax on each of those sources of fossil fuel, with the presumption then by driving that cost higher, you might discourage or deter that use and with it encourage the greater use of other kinds of energy alternatives. That's somewhat different than cap and trade, and yet both fall under the orbit of carbon pricing. If we think of early examples of carbon taxes, think of the five Nordic countries that between 1990 and 1992, with very different political coalitions, adopted some version of a carbon tax that cut across all fossil fuels and has been in place now for quite some time.

Cap and trade is a little different approach and a little different model, but at the end of the day you're moving toward a strategy that does not involve a strict, strident government regulation where all fossil fuel sources have to respond in exactly the same way, or the exact identical technology that has to be used. This is a different strategy than a regulatory strategy or other kinds of mechanisms, but the idea in this instance is that government makes a decision on a total cap on the amount of emissions from at least certain sectors, in some cases, that would come from the use of fossil fuels. Government sets the cap, but rather than saying to each participating or each contributor

that you have to reduce your emissions in the same way, at the same level, at the same time, it allows for some negotiation and flexibility, including the idea that money may change hands, that some who are able to find strategies to achieve emission reductions do so through a monetary exchange. And the way this is being practiced in many parts of the world--including 9, actually now 10 states with the recent decision of New Jersey to rejoin the Regional Greenhouse Gas Initiative in the northeast--is to allocate those allowances under the cap through an auctioning process. That produces revenue that goes to governments in those 10 northeastern states that they can then reallocate. So in effect you're creating a price through this cap and trade system in that case. But you're doing it through a little different mechanism than tax. Some important distinctions. But again for the most part both would fall under the umbrella of a carbon price.

Knute [00:08:28] Thank you Barry. And Lisa, you have been working with the Citizens' Climate Lobby for quite a while and you've been taking a deep dive into carbon fee and dividend so could you please explain to us what that is.

Lisa [00:08:43] Sure, and I want to echo what everybody else said. Thanks so much the turnout here is amazing. I'm so thrilled to see young people and people of all ages here. It is terrific. And a special shout out to Ginny and Barbara who really helped us organize everything, and all the co-sponsors.

Carbon fee and dividend: it's a proposal that's put forth by a non-partisan grassroots organization called Citizens' Climate Lobby for which, in the spirit of full disclosure, as you've already heard, I've been volunteering since March of 2013. It is what we feel is the best first step toward addressing climate change. You know when a bathtub is overflowing, this is equivalent to turning off the faucet. It doesn't solve everything but it's what we think is the critical first step. It is a type of carbon tax and it's one which we like to describe as a three-legged stool.

The first leg of the stool is the fee, and it's placed directly on fossil fuels, as far up on fossil fuel companies--not on the consumers--as far upstream as possible. So that's when the oil or the coal or the gas is coming out of the ground or into the country. Our proposal starts low and then goes up predictably. It starts low at about fifteen dollars per ton and then it increases very transparently and very predictably by ten dollars per ton, and that's of CO2 or CO2-equivalent. So it covers not only CO2 but other greenhouse gases as well. This fee then creates a very transparent and predictable market signal to businesses and entrepreneurs so that they can know that it's time to transition to the low carbon economy. We've essentially turned off the faucet to the bathtub. So that's the first leg.

[00:10:54] The second leg, and what distinguishes carbon fee and dividend from your typical carbon tax, is what is called the "dividend." Our proposal suggests that rather than the government keeping the money, it would return all of net revenues equitably back to US households in the form of an equal monthly dividend. That makes it a revenue neutral type of carbon tax. Each adult would get one share and each child up to two in a household would get a half a share. Now we understand the fossil fuel companies will likely pass that fee onto the consumer. Therefore the more carbon virtuous you are, i.e. the lower or smaller your carbon footprint is, the further that dividend check will go. In general, wealthier people consume more and have a larger carbon footprint. And studies have shown that low and middle income families actually

come out ahead. And this in turn stimulates the economy and creates jobs. I'll discuss that more later.

I want to end on the third leg of the stool, and that is a carbon border adjustment. It's an adjustment that's applied to businesses trading manufactured goods--not fossil fuels but manufactured goods--between countries: one country with a fee or a price on carbon and the other country without an equivalent price. And it does three things: It protects U.S. businesses from being undercut by foreign manufacturers, by placing a tariff on imported goods based on the amount of carbon content of the product. It discourages U.S. companies from relocating to a country where they can emit more CO2, so it prevents leakage by rebating through an equivalent price difference for all products except for fossil fuels. And then it encourages other countries to adopt similar carbon pricing policies thereby generating, hopefully, a global price on carbon. I can explain more of the policy if we have time in the questions.

Knute: [00:13:14] Thank you Lisa. Sam why do economists favor the market based approach of carbon pricing versus relying on regulation to reduce carbon emissions?

Sam: [00:13:27] Sure, thanks. And thanks everybody for coming and listening to all of us talk.
Carbon pricing is often contrasted with more prescriptive regulations, sometimes called “command and control”. These are specific requirements for specific technologies in the specific locations that can and do achieve benefits of emissions reductions or improved environmental quality. There are several reasons why carbon pricing is often touted as superior to the more prescriptive regulatory approaches. For me and I think for many, it's all about minimizing the cost to society of emissions reductions: climate action. We have a lot of different policy levers at our disposal and they are not created equally on cost grounds. So for example, an extreme example, we could decide as a society, or a government could decide, that we're going to retrofit every fossil fuel fired power plant with technology to capture and store the carbon dioxide, carbon capture and storage, CCS. This is one way to try and reduce emissions. It's a really costly way to do it, but it's a way to do it. That is an extreme example.

We have different levers falling all along the spectrum. In theory the most potential for cost savings, for cost minimization, comes through carbon pricing. And the reason for that is the flexibility of carbon pricing. The idea is you put a price on the very thing that causes the damage to society, the emission of greenhouse gas emissions. And then you flexibly allow those actors in the market, those people who actually buy and sell the good that produces pollution, to decide what's best for themselves, what's the best response for firms, what might be the cheapest mode or course of compliance. That allows, instead of picking winners, instead of forcing specific technologies . . . The regulator, the policy maker, or even a researcher, doesn't actually know what is the cheapest course of action. There's a lot of uncertainty and over the long haul it's just hard to know. So we put the price on the thing that does the damage and we let the actors in the market decide for themselves. In the end the costs really do matter. The benefits we think of keeping the planet from overheating are pretty self-evident. They're going to outweigh the costs. But there are costs, we might as well try and minimize them. Energy is a fundamental input into so many aspects of life. To heat our homes, to get to work, it costs, and why not keep those costs as low as possible? Carbon pricing stands the best chance of doing that.

Knute: [00:16:28] Thank you Sam. So Barry, we had some interesting starts to a conversation about political challenges to carbon pricing. So what are some of those?

Barry: [00:16:39] Well, this is not an easy lift in political terms. Not just in the United States, and not just at the point of adoption. If one looks at the track record of governments in North America and around the world it is feasible, in some circumstances, at times, to adopt a carbon price. And there's some really interesting examples and lessons that perhaps we can begin to talk about, but you were talking about the challenges. Carbon pricing, out of a galaxy of different options that jurisdictions can adapt, not because they're good economically but because they work politically, are among the less likely to be adopted. They are less likely to sustain high levels of support in public opinion polls. And they are among the most likely to be reversed if launched and adopted. Michigan for a time had a carbon price. Michigan was part of a regional Midwestern Greenhouse Gas Initiative that was started around 2007 and 2008. It has collapsed. It has all disappeared. Michigan walked away, Illinois, Wisconsin and other states – although other states have been able to stay with that in some respects, including the northeastern states. And with that I think there are some interesting lessons.

But what are some of the specific challenges? One is fossil fuels. They are legal to use in every state and every congressional district in the U.S. and every country in the world. In the United States they have a phenomenal base of economic impact in many states and communities. The dislocations from transition could be quite significant. The political base for support for sustained development and use is quite high and the opposition to disrupting that industry is quite substantial. Often comparisons are made between the relative scope of a product like tobacco--which has interesting perspectives as well--in terms of putting a price on smoking and tobacco use and the like. And yet if you look at the relative imprint and political economy imprint of tobacco, it is a minor, minor shadow of that of the fossil fuel industry in the US, but also a great many other countries. That's a challenging transition point to make because invariably people who can relate to that industry see this as a direct assault on their way of life and their wellbeing, including a great many states that rely on this.

Secondly there is the challenge of making the case, certainly in a tax averse country like the United States but other countries, to saying we are going to take this perfectly legal commodity and increase the cost. Perhaps to increase the costs substantially, so that in future generations there could be a broader benefit, although it's one that's going to be hard to measure and hard to fully understand. This is where the issues of revenue and revenue allocation are significant in terms of I think how you build and sustain a political coalition, quite aside from how you would reallocate that world in purely economic terms. But that's significant and challenging.

Again, think of how many times in recent memory have you been asked by a major political leader to accept a substantial short term sacrifice in your wellbeing, by reducing the use of a popular and legal commodity, by paying more for it, so that, not in the immediate near term but over time, there will be a broader benefit. Politically that's a hard argument to make and sustain, especially if you're in a democratic system and want to win election and re-election, regardless of political composition within your district.

Finally, I think Sam is quite right, there are alternatives there are not nearly as effective on economic grounds, but they're much more popular on political grounds. To mandate

increases in renewable energy, to mandate some of those scrubbers or other kinds of technologies, are clearly problematic from an economic standpoint, but politically it's much much easier to disguise the costs.

I was on a sabbatical and was telling Knute that a couple of years ago in Washington D.C., for a year I didn't drive a car because I had access to a great metro system and a bus system. I came back to Michigan and guess what? I had to buy a car. So I spent a lot of time actually asking as I was purchasing and looking at cars: How much of the purchase price of this car is because of government mandates that require increased fuel efficiency and reduced tailpipe emissions? The salesperson, the office manager looked at me as if I had gotten off of a spaceship. They had never been asked that question and they didn't know. I was buying a Honda for twenty five thousand dollars and I became a pest. Is it a thousand dollars? Is it three thousand? Is it eight thousand? They didn't know. I couldn't find a sticker price anywhere. That was a cost that was being borne. I was clearly paying more for that product than I would have otherwise, but I don't know what it is.

And then as I drove it off the lot, I drove past a very large service station in Wayne County, and guess what? The first thing I saw was the price of gasoline. From an economics perspective, the right thing to do would I think be to put a price on gasoline, and then let markets work and other fossil fuels. But I knew exactly how that price would have changed, in the matter of a day or a month because of the awareness and the sensitivity that we have. So if you put these forces and factors together--a strong base of support for fossil fuels, the existing of less desirable (from an economics perspective) but politically attractive alternatives--if you're going to do something, and then the issue of seeing a product that you know and use and is legal, continue to go up in price over time, that's a hard package and a hard sell. Again not an insurmountable one, but one that I think should not be taken lightly in any jurisdiction, again regardless of partisan composition, and regardless of nation state that we're talking about.

[00:22:42] Knute: Thank you Barry. Lisa, since we're talking about political challenges let's talk about opportunities. What are some of the political opportunities, for example ways that carbon fee and dividend appeals across the aisle?

[00:22:58] Lisa: Yeah that's the 20 million dollar question. And that's one that we have a lot of experience with within Citizens' Climate Lobby. We just heard what a tough sell that is and we as volunteers across this country and actually across this globe are working to create that political will. That is our mission to create the political will for effective climate policies.

So how do we do that at a time when our country and our Congress have never been so deeply divided by partisan politics? Wel,l we believe in CCL that we cannot let this divisiveness be the end of the story. If we do it is game up for a lot of these young people. We believe that through educating and empowering everyday citizens like me and each of you to exercise their civic rights, we can in fact engage our members of Congress on both sides of the aisle in meaningful dialogue that will ultimately result in a carbon pricing bill being passed. And, we believe, in the not too distant future.

As most of you know, Democrats have been introducing carbon pricing legislation for years. Even Bernie Sanders supports a price on carbon. Unfortunately it has garnered little or no support from Republicans. That is why we in CCL think that for federal

legislation to pass it will have to be introduced by a group of Republicans or possibly in a bipartisan fashion.

So is there any hope for that happening? Well through our work and the work of the Friends Committee on National Legislation, in February of 2016 there was a very courageous Republican from Florida, named Representative Carlos Curbelo, who joined forces with a Democrat from Florida, Ted Deutch, to form what's now called the Bipartisan Climate Solutions Caucus. This caucus has grown steadily and currently is at 70 members. I have 68 written down here, we just got two more today. We have, I believe, three Republicans from Michigan.

So let's take a look at how carbon fee and dividend does appeal to both sides of the aisle. Both sides actually support reducing emissions quickly, creating jobs, growing the economy, saving lives, improving air quality, and decreasing our dependency on foreign oil.

Progressives support the idea of reducing emissions by holding fossil fuel corporations accountable for the pollution that their product emits. We have to pay to take out our garbage, don't we? In addition, progressives are correctly concerned for people who are most economically disadvantaged, who are suffering the greatest climate impacts right now, and who will feel the pressures of a rising cost of a carbon tax when it's instituted. What many people don't realize though is that there are several studies that have demonstrated that by rebating revenues directly back to the consumer, a regressive tax becomes a progressive fee, meaning that the most economically challenged will come out ahead if revenues are returned in the form of a dividend check. So those are things progressives like.

Conservatives, on the other hand, appreciate that carbon fee and dividend is a market rather than a regulatory approach. It is revenue neutral, doesn't grow the government, and allows for all forms of energy to compete on the market without subsidies or regulations, once the fee is placed. One more arrow in our quiver aimed at getting Republicans onboard is the fact that a group of Republican elders, in conjunction with some prominent businesses and environmental groups, are calling for a plan that's very similar to ours. Our plan is called “Carbon Fee and Dividend” and theirs is called the “Carbon Dividend Plan”. There are some key differences in our policies, which I would be happy to explain later if people are interested. But we do believe that's one more reason to have hope that we may in fact see a price on carbon in the not too distant future.

[00:27:27] Knute: Thank you Lisa. Get ready to hand in your questions after Sam talks please.
Sam, a social justice question: Social justice is of course related to climate change. There are frontline communities that suffer more than more economically empowered communities. So if a carbon tax is revenue neutral, what are the options for ensuring that everyone is treated fairly, including poor people and those in frontline communities?

[00:28:04] Sam: Sure great question. First of all, fairness here ultimately depends on the full set of distributional impacts of any environmental policy, in this case carbon pricing. And so it's not just to revenues but it's also how the price of energy rises and how that's felt by different families. How profits at firms erode, and who actually works at these firms, owns these firms, owns stock in these firms, you know, those are costs. There are

benefits from environmental protection. Not everybody is going to get the same benefit. Some people are already shielded from the effects of climate change, for instance. Ok, so revenue is one part of the equation. You can think of it as a nice corrective measure, or an insurance policy. If we could figure out with careful analysis what the distributional impacts are before using or deciding what to do with the revenues, then we could make a more informed decision about how to ensure fairness. Or maybe just generally some people prefer to use this to reduce inequality, whatever the initial impacts of the policy are.

There's actually a lot of competing interests for the revenue so I think it's assuming a lot to just say, well we're going to return these revenues to society to redistribute. It happens to be something that I personally believe in, but it's not what everybody believes in. But if we're going to use these revenues for redistribution to try and ensure fairness, there are a couple of key questions that I think are somewhat in the foreground. One of them is, what's the formula for determining how much a household gets back? And the second is, what is the vehicle through which the transfer is made? On the formula, this could be anything. In general it needs to be a function dependent on verifiable, observable characteristics of households. If you knew the impact of the carbon pricing initially on each family you could base the redistribution, the size of the check, on that. But you could also use income or wealth. You could use family size. I think these are obvious measures to consider.

I actually like CCL's proposal, which is to give the dividend back to each household purely as a function of how many adults there are in the household and how many children there are in the household. There is a clear simplicity to that and there's also a clear sense of absolute fairness. But there isn't really one definition of fairness here. I think there are different formulae that you could choose. It doesn't necessarily need to be flat in order to be considered fair. There's a lot of different options.

As far as the vehicle for the transfer, that could be a check in the mail, an electronic deposit, tax credits of a variety of kinds, such as we've seen in some other carbon pricing examples, in British Columbia for instance. Or you could make in-kind transfers. You could make investments targeted in certain communities for improved environmental quality, further improvements in infrastructure or education, any number of things. I think that probably the check in the mail is the best way to do it because that gives the family the option of, they get to decide what's the best use for the money. And we already know the IRS already sends checks in the mail through the tax code, so there's no added administrative complexity.

The last thing I want to say in this brief set of minutes that I have, is that one thing I hear maybe even more commonly than debate about what to do with the revenues in the context of fairness of social justice, is concerns that the poor and frontline communities actually see rises in pollution as a result of carbon pricing. I hear that a lot and that's a legitimate concern. The idea is that the flexibility of carbon pricing ensures only that a cap is met or that reductions overall in emissions are made but not where the reductions come from. And so we're at risk of pollution actually flowing from one area to another and you have hot spots of pollution. And the point I want to make here is that this is not an explicit problem of carbon pricing of greenhouse gas emissions. Because greenhouse gas emissions are a global pollutant, they mix in the atmosphere and they have damages on society and those damages are different. But any given ton of CO_2 imparts the same damage regardless of where it comes from. So that makes carbon

pricing not an issue for hotspots in terms of CO2 emissions, but CO2 emissions are correlated with local pollution, carbon monoxide, carbon, sulfur dioxide, nitrogen oxide, particulate matter in general. These are things that are local pollutants. They don't mix globally and we do really need to be careful that hotspots for these pollutants don't emerge. So when we enact our carbon pricing we might need another instrument, attention specifically to local pollution as well. Otherwise if the policy reduces overall emissions but increases inequality, to me that's a failed policy.

[00:33:34] Knute: Thank you Sam.

I think we'll take a minute or two for our organizers to collect comments and we'll just suspend our discussion for a bit until those cards are collected. If you haven't written your comments down yet, or your questions, please hold onto your card. Some of you may be inspired by later discussions. We'll go through one more round of questions from our panel and then we'll open it up to general discussions.

I would just like to inject a calculation before the next question. I'm not sure what our per-country emission of carbon is. Does anybody on the panel know what that is, in terms of billion metric tons of CO2 equivalents? But I'm guessing based on a 2 billion metric ton of carbon emission that we are emitting about 45 billion metric tons of CO2 equivalent. At ten dollars a ton, that would be 450 billion dollars. That's a lot of money to give back to families – just an observation. You know that the route of that calculation might be a little bit off, but it's still a lot of money.

Barry, what are some examples of carbon pricing elsewhere in the world? You touched on that a little before but I know you know a lot more about this.

Barry: [00:35:03] Sure, it's actually a very interesting moment to be thinking about this because a great many governments around the world have within the last three or four years adopted some form of a carbon policy: South Africa, Chile, South Korea. China formally launched its cap and trade program in January of this year; they're about a month in. Many of these are very small. Many of these are experimental. But it is interesting to note on multiple continents, not just North America, not just Europe, this idea has had some degree of traction and moving forward, literally within the last four or five years.

But I actually think while there are a great many international examples, one outside the U.S. that's especially interesting to think about is our Canadian neighbors. Both what a few provinces have done over the last decade or so, and also what the country is trying to do more broadly right now. Perhaps most significantly, about 10 years ago British Columbia--a government which was a politically represented by a center right party--decided to do something about growing concern about climate change and actually outflanked opposition on its political left. A premier made the case to create a straight-up carbon tax that would jump over time to 30 dollars a ton, which is actually pretty big by global comparative standards, and based its re-election campaign on that. It won. It won re-election. And you can look over a period of a number of years, political support for that tax has grown to the point where there is no opposition to that tax in British Columbia among any party. And now the party that originally opposed that, won power in the last year, and is proposing elevating that tax from 30 dollars a ton to 50 dollars a ton. In that province a carbon tax – it makes no bones about being a tax, they use the "T" word – is a good thing. And a big part of the strategy and recipe there is immediate and

total transparency about how the revenue is used. There the proposition was not a dividend, but revenue neutrality through other tax cuts and reductions as well as an initial rebate dividend of about one hundred dollars per family. But it's a fairly clear, clean, straightforward mechanism.

That particular policy has not diffused widely. Although interestingly, neighboring Alberta, which some have called the Texas of Canada, has adopted a variation of it. In Quebec there's an interesting formal partnership with the Canadian province of Quebec and the state of California. And now Ontario is joining, and with it becomes a very interesting question in a neighboring system that looks a lot like us in terms of energy profile, and a lot like us politically, and it invests enormous power not at the federal level but within individual provinces. Just like on a great many constitutional and political issues in the U.S. on energy and environment issues, an enormous amount of the power is held within individual states, whether that's each state making its own decisions, or its representation in a body like the U.S. Senate. And there the Trudeau government, a Liberal Party government, is proposing creating a pan-Canadian carbon price, which basically says to every Canadian province and territory: we're saying you have to create a price, and you cannot work your way out of it, but you get to set the terms. And with it, you also get to keep the revenue and decide how that revenue is going to be utilized, rather than sending it to the capital in Ottawa and hope it's being returned. So that becomes an interesting experiment, particularly directly across our border. And I do think it's quite interesting to note that you can drive over to the Ambassador Bridge tonight and be in a jurisdiction that's embraced carbon pricing. And keep driving to the east to Quebec and it's a jurisdiction that has done that as well as a levy on carbon emissions for nearly a decade.

If you want to go to a plane, go out to Vancouver, you'll go to a jurisdiction where there's no political problems on this issue at all, however you look across the political continuum. And so I think in particular that British Columbia case becomes intriguing. Of all the ones around the world, not just in terms of the technical details of how this has operated and all the aspects of how this has worked, but this has really worked in political terms. This shows that under certain circumstances you can actually build a constituency where you have an initial divide and cleavage, build a broader base of support over time – again to the point where you don't talk badly about this tax and survive in British Columbia politics, on the right, on the center, and on the left. So even right across our border, even though so much of the focus and attention understandably is on these experiments in Asia, Africa, and other places, appropriately so, just in our own backyard there are some very, very interesting models. And indeed one of the concerns that many of my Canadian friends and colleagues have is, what happens if say the NAFTA agreement disappears, and what happens to U.S. political will there? And yet they're really looking at ways to move forward on this. So I think that's what I would cite for a special interest to this audience.

[00:40:19] Knute: Thanks. That is of interest, for sure. Lisa, going back to the question of economic fairness and social justice, what are the benefits the Citizens' Climate Lobby sees in returning the revenue by equal dividends to individuals?

[00:40:38] Lisa: The key really from our point of view is in the dividend. You know when CCL went in to talk to our legislators, there were a couple of questions that continue to come up: how would carbon fee and dividend impact our economy and how would the economically most-challenged people fare if we placed a fee on fossil fuel companies,

knowing that the companies would likely pass that fee on to the consumers? So we decided our efforts will go a lot further if we had solid data to answer those questions, and we commissioned two studies to be done. The first is one that we call REMI, it stands for Regional Economic Modeling Inc., and that's a company that is both reputable and non-partisan. It works on the federal, state, and local levels with government and state institutions, including the University of Michigan. It's worked for a variety of businesses such as National Gas Association, the Nuclear Energy Institute. And Scott Nystrom, who authored the REMI report, says he's agnostic on climate. So it was a fairly unbiased study and the study was designed to evaluate a variety of economic metrics, over a 20 year period of time, introducing carbon fee and dividend legislation, holding all other parameters the same, and comparing those metrics to baseline.

So what did they find? Well most importantly, REMI did demonstrate that with carbon fee and dividend we would see a significant reduction in emissions. That's the whole point of it, right? 33 percent below baseline in ten years, 52 percent below baseline in 20 years. That's 50 percent of 1990 levels. And interestingly enough, carbon fee and dividend can do in just four years, in terms of emission reductions, what the Clean Power Plan would take 15 years to do.

So carbon fee and dividend is clearly efficient and effective, but what about the economy? What the REMI study demonstrated is that it would create jobs: 2.1 million new jobs over baseline in 10 years, 2.8 million new jobs in 20 years, with a slight increase in GDP of 0.5 percent above that baseline.

But why would this happen? Well the key lies in the dividend check. Several studies--only one of which was commissioned by CCL--have demonstrated that directly rebating the net revenues back to the consumer is the most progressive form of revenue return. These studies include the one that CCL commissioned called the “Household Impact Study.” And then one performed by the Office of Tax Analysis for the Department of Treasury, and an independent research institution that's located in D.C. called Resources For the Future. And all of these studies demonstrated that you can take a regressive tax and make it a progressive fee if you return net revenues directly back to the consumer. In fact, according to the Household Impact Study, with carbon fee and dividend almost 90 percent of those below federal poverty level would come out ahead. Similarly people of color would tend to do better than white people. People in rural areas did about the same as the national average and slightly better than suburban areas. Many of these findings we think are related to the fact that in general the wealthier one is, the more one consumes, and the bigger one's carbon footprint.

Why do we see job creation? The answer to that lies in what people do when they have more money in their pockets, especially those who are more economically challenged. Many of them would go take care of their health, go shopping, go out to eat, fix up their home. And that's where we see the job growth according to the REMI report. So the bottom line is that the equal dividend check is critical to the equation because it protects the most economically vulnerable during the transition, while at the same time stimulating the economy.

Knute: [00:44:49] Thank you, Lisa. Sam, corporate world, corporate influence in the U.S. and the world: How do large corporations look at carbon pricing?

Sam: [00:45:02] Well I think the obvious and simple logic is that it's a cost. It's a cost that firms didn't have to pay before the prospect of carbon pricing. And that's real, definitely. But I think if you peel back that first layer of the onion, there are several more nuanced logics that imply the possibility of support for carbon pricing, which we actually do see in certain cases in the United States and elsewhere. First, there may be more than a single bottom line for some firms to the extent that social impact, or for instance keeping the planet from overheating, is something that shareholders care about. Then a firm may see it as valuable to actually support carbon pricing.

The second is regulatory certainty. Corporations, businesses of all kinds, they don't like uncertainty. It's hard to strategically plan for the future when you don't know what the regulatory framework or environment is going to be like in the future. So there's some certain modest cost that actually is preferable to regulatory uncertainty, to not knowing what's coming down the pipeline from the regulator. Third, and sort of relatedly, if you have that certainty that there is going to be some form of regulation of greenhouse gas emissions, then for sure without question corporations are going to prefer carbon pricing. That's the one that stands the best prospect of allowing them to minimize costs. It's also gives them the most power, the ball's in their court how they are actually going to comply with this policy that I think is really powerful. If there's going to be policy, firms want it to be carbon pricing not necessarily because they want to game the system or because they want to take advantage of consumers (though that may happen in cases, we have to be careful of that), but because they're actually trying to minimize costs, and we want that. Fourth, it's a show of support for carbon pricing. Could be good for branding for marketing, PR, reputation, whatever you want to call it. And fifth, and I think especially interesting to me as an economist at least, is competitive advantage. Maybe it's the case that all firms that have emissions in their cost structure, in their production process, actually face a cost. But imagine two firms that are actually competing with each other, producing the same good. One has a more emissions-intensive process than the other. Well then that first firm, with the less emissions-intensive process, it may see rises in cost but less than its competitor. And that could give it an advantage. Similarly there could be a first mover competitive advantage as well. You show your support early. You invest in figuring out ways to lower your compliance cost curve and that can get you started as well give you an advantage. So I think there's lots of reasons why corporations could actually support carbon pricing and do.

Knute: [00:48:10] Thank you. This is great fuel for audience questions. Please bring audience questions to the front. Thanks. So Barry or Lisa, or both of you: There is a carbon cap and dividend bill proposed by Senator Chris Van Hollen from Maryland, Democrat, and Representative Don Beyer, Democrat from Virginia. They plan to introduce a so-called Healthy Climate and Family Security Act. Could you tell us what you think about that and maybe a little bit about what it is?

Barry: [00:49:10] Sure. This is not the first time Chris Van Hollen, either as a senator or representative, has introduced a bill like this. This is not the first time, actually over a period of 15 or 18 years, we've routinely seen legislators introduce some version of a carbon price bill into the house or the Senate. The challenge here, what is important in this case, is that it signifies that there is continuing interest from some members in Congress to do exactly the sort of thing that we're talking about. But I also think it underscores some of the political issues and difficulties. This would involve a dividend return, a quarterly dividend return. It proposes reducing emissions by 80 percent level from 2005 levels by 2050. A pretty significant hit on those emissions and that carbon

use. But, there are no Republican cosponsors. There are relatively few Democratic cosponsors thus far. And politically we all know that the possibility that the current Congress, or the next Congress after the 2018 elections, working with the current president and vice president, this is not an environment that suggests much political likelihood of any kind of a carbon price, symbolic or otherwise, working. And yet what it does suggest is an ongoing discussion and debate with proposals moving forward, and actually counterparts to this legislation moving forward in a number of states as well. Which then really creates the question that this is an intriguing time to begin to sort through some of these options, and some of these strategies. But there are those clear political impediments, although under other circumstances, potentially future circumstances, one could perhaps envision a path forward.

Lisa: [00:51:03] Yeah, the only thing I would add is, you know, we are really thankful for the bipartisan Climate Solutions Caucus because we see this as an opportunity for them to talk about bills like this, to come forward in a bipartisan fashion, and we're really thankful to both Senator Van Hollen and Representative Beyer for introducing the bill because we do think that it can build momentum especially because that's a bicameral bill. We prefer a fee over a cap because we feel that it's more transparent and simple. But we love the fact that they they're using a progressive system of dividends. So I think any time legislation like this is introduced it keeps the discussion going in the right direction and maybe that will be food for discussion in a bipartisan way in the caucus.

Knute: [00:52:03] Thank you Lisa and Barry. I have a question about the caucus: the caucus presently is 70 congressional representatives, no senators right? Is that a strategic . . . what is the possibility or the likelihood that there might be a parallel bipartisan Senate caucus?

Lisa: [00:52:28] I can tell you the history of how the caucus started, but why it started in the House, I can't tell you exactly. You know, things happen for the most interesting reasons. So you know, literally, I think this is the brainchild of one of our really committed CCL volunteers named Jay Butera, who happened to run into Ted Deutch in the cafeteria when he was in D.C. lobbying. And what happened was Jay kind of thought, boy you know Florida, Florida, Florida—it's getting hit! And so he took the initiative on his own dime, go down to Florida, start CCL chapters, create a Florida leaders' letter, engage their representatives on both sides, and found Carlos Curbelo to join forces with Ted Deutch. And there it was. So that's how it happened to be on the House side as far as I know. And what's the likelihood of something similar in the Senate? I'm not sophisticated enough politically.

Knute: Then there's no particular structural reason that the Senate couldn't go forward?

Lisa: Not that I know of.

Barry: [00:53:50] I'd only note that I think it's so interesting to hear that one of Senator Whitehouse from Rhode Island's favorite lines, he says, 'it's amazing how many members of the United States Senate are willing to talk about this as long as the door is closed.' That includes Republicans. And we have had significant changes in the United States Senate over the last 10 years. It wasn't that long ago that legislators like John McCain, Norm Coleman from Minnesota, John Warner from Virginia—all Republicans—not only said they would support but actually cosponsored cap and trade legislation or in some cases other versions of carbon pricing. So that is gone. And yet there are

legislators, a little bit of crossover into the Republican side, that do engage these conversations. What form that takes, how that moves forward, it's not clear but I wouldn't rule that out entirely.

Knute: [00:54:40] Thank you both. I think I want to commend Lisa in particular for getting, working to get, three of our Republican congressional representatives in Michigan on board.

Lisa: [00:54:55] I only worked hard. . .Thanks to all CCL members here. I had the good fortune of having a lot to do with Representative Bergman, our congressman, to get on board. And so did my son over there, David Meyer. I'll be real brief, but it is such a great hopeful story. I brought a group of high school students...I had been bringing David since he was 14 with me to D.C. and he loved it. So then he had a couple of friends, they went home and got more friends, and we brought, I don't know, 14 high school students who met directly with Rep. Bergman and touched his heart. And he was the first Republican in Michigan to join. And he committed to the students, to join. So you guys, you young people, you have so much power. And again they started from a point of appreciation: they connected to the fact that he was a Marine. It hit him here. And he said that in an NPR interview. And so yeah, we can do this! We can do this by listening, talking, and finding common ground.

Knute: [00:56:09] Great example.There are so many good questions here from the audience it's hard to prioritize them. Following on from the example of the Canadian provinces, and some of our individual states that are taking action (any one of you three could probably address this question from the audience): How can we lobby for carbon pricing at a state level? Oftentimes states are laboratories for national policy. And, should we? Is that a stimulus or is that a hindering if states all do their own carbon pricing policies?

Lisa: [00:56:41] I can take part of that, but I think then I would ask my more sophisticated, more educated people, to speak. At least from our point of view, from CCL's point of view, we had originally always been focused on federal legislation. But clearly there's been a change of tide in the current political milieu and we recognize that if states were in fact to lead the way with carbon pricing that that would be a great thing. So where there are CCLers who are interested in leading state initiatives, to whatever extent that we have the reserve, we've tried to support those states and those people working on States' initiatives. And there are a large number of states in which case I think we have CCLers working in Washington State and in Oregon and in Utah and in Massachusetts and a whole variety of them. I don't have them all memorized but I'd say about 10 or so. So we think if they were to pass the Carbon Pricing legislation that that might send us a signal. Now what that does, what kind of other things that might happen because of that, I would defer to the experts.

Sam: [00:58:03] I would really just add to what you said Lisa, I don't have a different perspective. And you, I think, have done a lot more lobbying than me, but it sure seems like given recent experience with pushing back on some of the current administration's ideas and policies that our making phone calls does actually make a difference. In the state that I moved to Michigan from—Massachusetts—I went to give public comment in front of the Department of Environmental Protection. (They actually got in trouble for not holding enough public forums. I think somebody caught them on that. They were violating a rule and they listened!) I gave my recommendation about carbon pricing

versus regulation, and the interaction of different policies, and what to be careful for. It's hard to track the impact down the pipeline. But I think that's what we have to do.

Barry: [00:59:00] And I wouldn't underestimate what individual states or groups of states can do. Probably making small dents in emissions, but also the learning and modeling that comes from that, when we take something like carbon price and move it from theory and broad, abstract discussion, into real world practice. And so we can actually say now, which we could not say ten years ago, what is involved in sustaining a multi-state coalition on carbon pricing among nine, now 10 states (soon to be 11, with the likely joining, of Virginia's joining of the Regional Greenhouse Gas Initiative) and possibly other states. Despite changes in all the governors who created that policy, shifts in the legislature, major needs to make adjustments, one can actually point empirically to a real world case of cap and trade that doesn't solve the problem, has all kinds of constraints, but actually has indeed worked. And I think what's going on on the west coast, not just with California, but California looking to other partners, does become significant. I mentioned earlier Ontario and Quebec. The possibility within the next three months that both Washington state and Oregon will join. There's a kind of momentum there. There's an experience to be gained. And if indeed the academic arguments, the theoretical arguments on behalf of carbon pricing are true, the more we see that in real world time these work and they do what they are supposed to do, then that creates a kind of momentum. If we get into real world situations and for whatever reasons they flop, that's another story. But thus far there are these very, very interesting stories.

I would actually argue, you know, if you look at the electricity power sector in the U.S., no one would have thought possible 10 years ago that U.S. emissions would be down 15 to 20 percent below where they were 10 years ago. We've seen a huge change in the electricity sector and that's due a number of factors. We crashed our economy. We found new renewable options, the fracking revolution, but there's also a piece of this that does relate to some of these early carbon pricing initiatives. And that's also true when you look in other places. So you can actually, I think, really leverage this in a number of ways.

Knute: [01:01:20] Thank you. This is a question that anyone can take a stab at. It gets back to social justice. A person from the audience asked, why not give a higher dividend or amount of money to families most impacted by CO2 emissions?

Sam: [01:01:40] I think ideally we do want to do that. Well, it depends who you ask. I think there's a compelling argument for that. I think really it's just a difficult political terrain to navigate with respect to the use of these revenues. Barry was just telling me earlier, that as positive as our experience has been with British Columbia's carbon tax, the intended revenue neutrality has maybe been eroded a little bit. In theory there's always been a lot of talk about using revenues to incentivize, you know, on some level “bribe” firms into actually getting onboard with this because they really have a pretty hefty lobby back against carbon pricing. Or at least they have in the past, or environmental regulation in general. But I like the idea of using revenues for redistribution or reducing poverty, reducing inequality, and the more that we can get to do that the better, personally.

Lisa: [01:02:50] Yeah and I would say, personally I would love to give it in a non-equal fashion but I think politically at least, the reason I think the reason CCL supports equal dividend checks is one, that it's very clear it's very transparent, there's no question who's

getting more. There's no ability to shuffle the deck or to do something sleight of hand. It's just straight forward. And I should point out that according to the REMI study the average family of four, after ten years would be bringing home a check just shy of 300 dollars a month. That's a lot of money. And then after 20 years just shy of 400 dollars a month. So if you're somebody who is struggling, that's a lot of money to use during that transition. So I think if we could get even an equal redistribution, or equal rebate, that would be a great thing.

Knute [01:03:58]: I like your answer partly because it kind of validates my calculation on the back of the envelope. Can the audience have access to the REMI report?

Lisa: [01:04:16] Yeah I think it's on the handout sheet we're passing out. We have references. So the REMI report, the Household Impact Study, and a variety of other studies that each of us have contributed will be on there. And the REMI study, you should know, looks at things nationally and then it breaks it out for regions. Actually we do really well in terms of regions. We're called the “East North Central.” Doesn’t that just roll off the top of your head! I always call this the Midwest...

Knute [01:04:16]: Well we are in the eastern time zone! So here's an interesting question about dealing with unintended consequences. So one of you wrote: Is it possible that a carbon tax could get it wrong, or carbon fee and dividend, get it wrong by trading regulations for the tax of fee and dividend. Could we create conditions for worse pollution because of dismantling regulations? For example, if regulations for capturing methane, or flaring methane off at well sites went away, was an example the questioner asked. So is there a tradeoff that might result in less pollution reduction?

Lisa: [01:05:38] I feel like I'm jumping in too much. . .I don't deal with regulations in a lot of detail. The only thing I would say is as a physician I am very concerned about regulations and the preservation of the Clean Air Act. And I think anything we do that reduces greenhouse gas emissions is going to be excellent for our health AND address climate. And CCL's proposal does cover methane. And I think you know there are huge health impacts that come from fracking and that come from leakage, and that come from the quality of our water. And so our proposal does not say that there shouldn't be a Clean Air Act or other regulations. The REMI report just shows in terms of greenhouse gas emissions it reduces quicker than the Clean Power Plan, but we're not advocating for a rollback or anything like that.

Sam: [01:06:45] To answer your question, without taking anything away, I don't see a possible way that carbon pricing could increase overall emissions. If you take something away and trade it for carbon pricing, in principle it could be a worse outcome. It just depends on the levels that you actually choose for these things. If you choose a carbon tax of one dollar to replace the Clean Power Plan, then you're probably going to get fewer emissions reductions. So it's all about setting these things at the right level. And you don't necessarily want to set them too high, at least initially, either. A lot of times you see these start modestly. You definitely want to make sure you work in the legal flexibility to actually ramp these things up. But if you set a tax level high enough, or if you set a cap, and a cap and trade tight enough, then you're going to accomplish the same things, hopefully at lower cost than the regulations that we may be trading off. I think we have to be really careful about not using multiple policy instruments for the exact same outcome, because that policy interaction actually is not good for costs. But there are some regulations that we really do want to keep. It would be wrong to advocate for the

rollback of all regulations and just have this carbon tax. For a case in point, what I described earlier about local air pollution, that just wouldn't be a good idea. But a carbon tax or a cap and trade, as a replacement for more prescriptive regulation of carbon dioxide, that is a good idea and can easily accomplish the same outcomes at reduced cost.

Barry: [01:08:30] If I might pick out one word in that question and that is the “M-word” of methane which we haven't talked about tonight. Often in policy discussions including carbon pricing the assumption is the only focus is carbon dioxide. I tend increasingly to think not only are we underestimating the impact of methane, especially in a nation like the US that has huge methane releases—although uncertain because we don't measure it all that carefully—related to oil and gas production. And here I do think there are some real issues and opportunities, and with it limits of regulations. Because clearly from what we know a number of states have adopted regulatory regimes, but they're very leaky, very unpredictable. In North Dakota in the last three or four months the flare rate reported is over 15 percent actually up to 29 percent on the Fort Berthold native reservation, which is a large oil producer. What's so interesting about this to me is that when you turn to issues of oil and gas production all but one state taxes them in what are known as severance taxes at the point of extraction. In fact in some cases the more conservative a jurisdiction—the more Republican they are—the higher the rate of tax. So in North Dakota there's a 10 percent tax on the gross value of oil. At one level you could argue that's the highest carbon tax we have in the United States. Methane is intriguing not only because of greenhouse gas issues but because it is the permanent loss of a natural resource that is non-renewable. And yet for the most part it completely escapes the orbit of taxation at the state level. I think states are actually only beginning to wake up to this issue and look at this question.

Where it emerges is even less on the tax side as what happens when individual land owners and ranchers are asking, “Wait that's a flare, that's revenue, I should be getting a royalty payment.” And so I've actually found myself in fascinating conversations with politicians, state legislators, including of all places Bismarck, North Dakota, which wouldn't be caught dead adopting a carbon price in all likelihood, but it's very, very proud of having one of the most robust oil production taxes in the country. Broad political support. And beginning to ask the question of, why not methane, and how you work that in?

One last point in this regard. British Columbia has a carbon tax but they also produce a lot of fossil fuels. They produce a lot of natural gas. They're hoping to not only maintain a carbon tax regime but expand LNG production (liquefied natural gas production) for the first time in B.C., they're looking at how you might expand that carbon tax to methane. So this is another kind of permutation and direction on this that that we might weigh into these considerations which, in some respects, are reflecting a failure of regulation, but I'm not sure we would want to do away with those provisions and standards and rely purely on a price. That's a tricky one.

Lisa: [01:11:36] Just so you know, our policy proposes that, whatever the price of CO2 is, for any methane leakage, it’ll be twenty five times that per ton, because methane is 25 times, on average, a greenhouse gas.

Knute: [01:11:53] And my understanding in my interactions with atmospheric scientists is that methane leakage is a difficult thing to measure on large scales. There are some

recent papers of flyovers of Pennsylvania . . . you can add up what the extractors think the methane leakage is, but when you do the budget on a regional level, it's a lot higher. And that's a problem too. So methane, you can think of methane and natural gas as the same thing, although there is a little mixes of other gases.

Lisa: There are human health impacts of releasing methane as well.

Knute: [01:12:30] I know when I walk to the bus, there is a there is a natural gas smell. They put a sulphur compound in natural gas so you can smell it, and this smell pops up about every two weeks, and then I think neighbours are calling the gas company. Yeah, it's on High Lake Road. When I walk over to Jackson Road I smell it all the time. And I see gas trucks they're servicing. Well, that's anecdotal but I just think there's a lot more of that leakage then we account for. So Barry, two people want to know, and maybe you don't have those numbers right on the tip of your tongue: How much did the Scandinavian countries that have various carbon taxes or fees, how much have they reduced their emissions? And could that model be applied in the US?

Barry:[01:13:27] Sure. So again these are the Scandinavian countries all adopting some version of the same tax, literally between 1990 and 1992. There is some literature on this. These are countries that generally have been able to achieve a fairly significant level of greenhouse gas reductions. The one country that has struggled the most to meet their targets is Norway. The issue there is Norway is an extraordinary producer of oil and natural gas, particularly offshore. So managing that production issue is really quite remarkable, although I would note Norway banned flaring in 1971. The whole process for dealing with oil and gas production in Norway is pretty fundamentally different than anything we have in North America. So it has played a role. It does get complicated for two reasons in those countries. One is the commingling of all these policies. To the point that we were talking about earlier, many of these are jurisdictions that have other overlapping regulatory and other kinds of policies. And so it's hard in many cases to know how that is working. There's also been an effort in those countries to transition some portions of the tax away to play into, or be part of, the European cap and trade system. So there are some issues there, but again I would argue that these are fairly popular politically. They have proven generally fairly durable and at least there's some empirical evidence from those individual countries which actually, when you think about their pie size in terms of population, tend to look a lot like American states, that there has been some driving down over time, certainly from where we might have been in the absence of them.

Knute: [01:15:05] Thank you. Are there more questions that have come in? While we're getting those questions, there's one that came in earlier: Is there any way to measure causality? Causality being, if a carbon tax or carbon fee and dividend process is put in place and emissions go down, is there a way to measure how much of that downward movement in emissions is a result of a carbon fee and dividend or a carbon tax?

Sam: [01:15:37] Yeah. It's not easy. With a cap, the cap is supposed to actually make sure that you hit a certain target so you know the outcome. If the cap is working, you know what your current level actually is. But it's hard to know what it would have been in the absence of the cap, and the same is true with a tax. You may see how emissions changed from before to after you implemented the tax, but other things are happening at the same time . . . it's hard to know what would have happened in the absence of these policies. That's kind of what empirical economics' fundamental challenge is. And so

we've developed ways to try and attack that. It's not easy. You have to control for all these confounding factors, all these other things happening at the same time. One of the most common strategies is to try and isolate, try and identify, a similar area or a set of firms or a geographic location that has not received the policy but has otherwise been exposed to similar circumstances. If you can compare the two of these before versus after, you kind of have a natural experiment where you have a treatment group for the state that got the carbon tax before and after, and you have some control group, some other area, or a set of firms for instance, that you observed before and after but they just didn't get the policy. And if you're careful with that, you can come up with an estimate of the causal impact of these policies, but that's an ongoing challenge.

Knute: [01:17:23] Thank you. That was a great question by the way, I thought, and a really interesting answer. So interesting to have different perspectives, for sure. One question from the audience is: Many people believe CO2 pricing is considered a regressive tax, due to the fact that poorer families do not have the extra resources to pay for alternative energy sources. How will carbon tax address this regressive aspect? And the person directed this towards Lisa or Sam, or both. So is there an element of regression?

Lisa: [01:18:05]] Again I'll speak to carbon fee and dividend, I think I've already addressed that. The dividend can actually make it progressive, and more than offset the cost of living increases that would occur because of the fee. But I think the other thing that's often not factored into it is the fact that direct health impacts that occur often with families that are living very close to processing plants, or live in urban areas, that have to deal with the burning of fossil fuels. Again when we're talking about this—these direct health impacts—we're really not talking about greenhouse gas emissions. What we're talking about are things like ozone and fine particulate matter that lead to hundreds of thousands of premature deaths every year. Right here in the US, hundreds of thousands of E.R. visits due to asthma, missed school days and hundreds of billions of dollars in health care cost every year.

In fact there's an MIT study that says that because carbon pricing would encourage the transition to a low carbon economy, just the improvements from air quality that would occur from transitioning would offset the cost of implementation of the policy by 8-10 times. That's an MIT study. So I think when you're thinking about this, you have to realize that if we can address and encourage this transition to a low carbon economy, we are by nature helping those people who are suffering from the burning of fossil fuels. That's a very simplistic look, obviously. Again, we're talking about slightly different particles but whatever we can do to encourage that transition, I think is a good thing.

Sam: [01:19:58] I would just add that, like I said earlier, there's lots of impacts of carbon pricing and we need to really track all of them to make an ultimate determination as to whether this policy is regressive or progressive, or something in between, distributionally neutral. There's a conventional wisdom, long held, that things that cause energy prices to rise such as a carbon tax, are regressive because the poor devote more of their budget to energy consumption of all kinds and so their effective tax rate ends up being a higher percentage of their income than richer counterparts. I think that's true in some cases. I think it's actually—incidentally like the dissertation that I wrote that helped get me this job was really about that subject, we can talk more about that if anybody's interested—but I think that's less true than we tend to think it is. But to the extent that the poor devote more of their income to energy, then that component of carbon pricing is

going to be regressive. I mean the first line of defense against that is what we have been talking about the whole time: dividend, this revenue usage. OK. That's really the main vehicle for making something regressive versus progressive, as Lisa said earlier. I also think that the benefits of the avoided climate damages are, if anything, more likely to accumulate, to accrue, to poorer folks. You know they live closer to the pollution, they're less able to adapt because of their shorter incomes, potentially. So I think that that actually could be a progressive aspect as well. We want to add all these things up, and then if it's regressive to start with, we can use the revenues to make it into something progressive.

Barry: [1:21:53] I just would note that I think it's extremely important to be looking at issues like regressivity and fairness. If I would go back 10 years ago and critique how we framed a lot of the discussions on carbon pricing in the U.S. and beyond, many of these issues were really not taken seriously. The fairness and equity concerns were largely dismissed. I've been really concerned in watching the evolution in California, which I think has done many many laudable things, in the rather dismissive way California authorities (including the California Air Resources Board) has been, until very recently, with concerns about equity, fairness and the distributional dimensions of this. It's been a hard, hard thing to talk about and think about. And now, 12 years after the passage of the Global Warming Solutions Act in California, the one thing that I think could undermine political support for carbon pricing in that state—I don't think it's going to happen but it's on the table—is this ongoing debate about how you think about and frame fairness. Not just in conceptual terms, but actually delivering revenue or allocating or re-allocating revenue.

And if in fact in the U.S. we're going to be moving toward carbon pricing, mindful of the fact that we've seen substantial expansion in employment in the oil and gas sector related to fracking in so many parts of the U.S. in the last seven or eight years. And we're talking about a pricing mechanism that is going to probably transition people out of work. We've had these conversations in coal, and some very raw ways in American politics in the last year. But transitioning away from oil and gas, which are far far bigger sectors and have gotten far far bigger. This will have really significant consequences in some states, some families. And I don't think we have to this point engaged what that would mean to how energy-intensive or energy production communities seriously transition away from that, as a further part of this calculation. Again, it's one thing if we're talking about coal which is becoming increasingly marginalized anyway. But if we're talking about sectors that have been expanding on a fairly regular basis over the last decade or so, those are important transitional questions and somehow that has to be offered into the calculus. It's not going to be easy.

Lisa: [01:24:10] It's important I should tell you, just so that you know, I've had the good fortune to get to know many of the handful of staff that are part of CCL and one of the things that we recognize is that we're really working hard on this carbon fee and dividend policy, but in the end what may be produced is some sausage, if you will, something that's not exactly like what we want. But one of the criteria that keeps coming up is we want to hit a level of pricing that actually brings down emissions quickly enough to have a real effect. That's number one, but two is making sure low and middle income families are not suffering during the transition—that keeps coming up. That has to be a criteria before we are going to support it. What CCL, that's what I've heard in discussion, informal discussion among the staff, and I think that that's true because of that concern about fairness.

Knute: [01:25:15] I'm not sure if the time will allow further discussion maybe a few more questions. Yes. Barbara one more question. Well, the final question. Final question. There's someone in the audience wants to know: Who will administer the dividend? Will this become another bureaucracy?

Lisa: [01:25:33] It's so funny that you guys ask that question because we get this question all the time from our members of Congress and at least in terms of what we have done with a carbon fee and dividend, we've had the really good fortune of working with a guy by the name of Alan Lehrman, who actually works for the Department of Treasury and developed the rebates in 2008 and, I forget the other year, 2003. And he actually helped develop those rebates and has figured out how it would be administered. And so at least in terms of our proposal and what he suggests, is that it would be the backbone of the IRS and the Department of Treasury and it would be a direct deposit for most people. And when you look at the costs of it, at first obviously the pie is smaller because the fee is smaller. And so starting out administrative costs are estimated at being about 6 percent of that whole pie. And then over time it goes down because that pie gets larger. And after about six years it's considered to be less than 2 percent. So I don't know if that's on our list of resources, but we can probably get it for you, where it's actually been described how this would happen. But in terms of carbon pricing I think that people feel that this is a fairly simple and fairly easy to administer in the big scope of things. Would you guys agree?

Sam: [01:27:11] I just think that one of the advantages of a carbon tax is that we have a tax system already. And so we have agencies who have experience already dealing with this sort of policy. But you know I don't have anything to add really about the administration, other than that.

Knute: [01:27:33] Thank you. I think what I'd like to do now is just ask each of the panelists and myself to make some concluding remarks so who would like to go first?

Sam: [01:27:47] Thanks everybody for coming. I really appreciate it. I think we all really appreciate it. I think most of us in the room are probably on the same page that we need some sort of climate policy. Hopefully many of you think that carbon pricing is a way to do it. I think the thing to keep in mind is that this room, that may or may not be representative of what everybody else feels, and that we need policy that is going to minimize costs and is also going to be fair to everybody, whether it's the people who are going to lose their jobs from fossil fuel sector or poor families. And you know that's just as important as the overall win of carbon pricing.

Lisa: [01:28:38] I guess I would just like to thank you so much for your attention for being here and to tell you that in my four years that I've been privileged to work with CCL I have learned what it means to work with just amazing people who are incredibly committed and devoted and we really are helping to change the conversation. And I just encourage you not to give up hope and recognize that for us to change what's happening right now in our democracy we have to learn to talk to each other. We have to listen, to learn to listen to each other, and that's really been the key to the movement that we've seen with CCL. And so don't give up hope, because we are truly seeing changes.

Barry: [01:29:34] I don't think you'll find it surprising that my points will really talk about politics, and the fact that one challenge here is how you do begin politically to create a

coalition and build it over time. And I think in some circles and in many places the idea has been you gather people to the left of center and find some way to win an election and jam through a bill or regulation. And hope it sticks. What we've seen including the United States and around the world that recipe really tends not to work. And I would argue there are lessons in carbon pricing that suggest unusual coalitions but also unusual times and moments that emerge that make it possible. It's not a clear, clean, crisp analytical process that lead you from an idea to policy.
It often follows really quirky unusual unpredictable paths.

The first government in North America, through democratic channels, to adopt a carbon price was New Hampshire. I used to live there. License plates say “Live Free or Die.” Least likely state imaginable, quirky flukey set of circumstances led them to pass a cap and trade bill for them at that time 3 coal burning power plants. That has now morphed into something known as ReGGI, the Regional Greenhouse Gas Initiative. It can happen. Relatedly, I do think one thing that we have learned, and this is that point on the dividend to sort of chime in on this last part of the panel, I do think there really is something to coming together around a story that is compelling, it is clear and convincing and on which government can reasonably deliver on results.

I often wonder what would have happened if the bill that passed the U.S. House of Representatives in May 2009 the Waxman-Markey legislation had ever gotten to the Senate. When it got through the house, there were 1427 pages in that bill. Three hundred were added the night before the legislation and most legislators, whether they were for or against it, couldn't find a copy of the bill that they were voting on. Talk about adding layers of complexity, but also uncertainty, gimmicks, challenges, and problems. And where we have a couple of interesting examples in North America are really interesting to think about. I'm just going to say a word about British Columbia, but I also want to say a word about Alaska.

One of the things that really worked in the case of British Columbia was a very clear and compelling narrative, given the unique circumstances that I described before. But it also was very simple. You did not need to create a bureaucracy, it was not handed over to the environment minister. It was handed over to the Minister of Finance and, just as you suggested Sam, she worked within the existing tax structures and systems, and within six months you had an operational tax, a clear benefit program, and a website you could go to to figure out whether you were a net winner or loser. It was as transparent as you can imagine. But Alaska... It's not long from now that many of us will be filling out our 1040’s and there are some more still on Page One is a question “Did you receive income this year from the Alaska Permanent dividend fund?”. Now we can debate the merits of a sovereign wealth fund and an extraction tax, and all the rest. But interesting to think in the case of Alaska the policy that called for creating a dividend for every citizen of Alaska to receive a dividend check was put together largely by a Republican governor and a coalition at a point where Alaska knew it was going to be sitting on a massive bounty of revenue and was very concerned that they would blow that revenue. Try in Alaska politics, regardless of your political persuasion, to touch the dividend--it's hard to do! It's clear, it's clean.

We can debate whether it's the best policy but there is something in the design and came together in a very, very unique story at that point in time for those folks in Alaska. So that’s part of the challenge here. But it's also part of the opportunity, and I think for jurisdictions, whether it's in the United States, the state of Michigan, a city of

Ann Arbor. Or the University of Michigan, which has talked about a carbon tax and a carbon price including a great proposal put forward by a student, that was chopped to pieces because some faculty raised concerns about what impacts it would have on their laboratories and research programs, and all the rest. We all can do it. And wouldn't it be great that the next time we come together there are multiple jurisdictions that we can really talk about real world cases and examples, building on the kinds of ideas all my colleagues have suggested and your questions have brought forward. So thank you all very much.

Knute: [01:34:40] Thank you. Thank thank you all for coming. Thanks to the Citizens' Climate Lobby and League of Women Voters and all the other organizations and people who made this possible. I want to just a little bit of a short personal history. When I first moved to Woods Hole to become a practicing ecologist in the mid 1980s I studied in Alaska, I looked at impacts on the North Slope tundra, and climate change was becoming really important to ecologists, environmental scientists. And something Barry said and all of you have touched on is the fact that it's much more than ecology, it's much more than science, it's much more than abstract. The costs are real. And we're talking about a carbon fee and dividend where we're redistributing fees and dividends. But we've touched a little bit on the cost to health, which are astronomical, the cost to infrastructure, Think about the severe weather we've had in the fires in the West, that all has to be rebuilt. And now people even in Texas are talking about building resilient, resistant communities, that takes money. There are huge costs to the climate crisis, and they're only going to get higher if we don't attenuate it. I am very optimistic tonight, we'll see what I am tomorrow, that there are potential solutions that are really mostly wins, with some negatives that have to be addressed, some dislocation. But it's really encouraging to see not only our panelists with their great expertise in policy, economics, and actually medicine and also citizen activism, here talking in a very informative way with you all about potential solutions. I'm optimistic. So thank you for coming.

This program was recorded on February 7th 2018 at the Ann Arbor District Library.