Goldstein Lecture 2020 Transcript

Christopher Phelan: Okay, I've gotten the okay to start

Christopher Phelan: So hello all my name is Chris Fallon. And I'm currently the chair of the Department of Economics here at the University of Minnesota.

Christopher Phelan: On behalf of the entire department and the College of Liberal Arts at the University of Minnesota. I want to welcome you. Unfortunately, virtually this year to the Department of Economics john Goldstein Memorial Lecture on economics and environmental policy.

Christopher Phelan: This annual event honors the legacy of one of our distinguished PhD alums john Heller Goldstein.

Christopher Phelan: The department is very thankful to another distinguished purely PhD alumnus Richard sand or and his wife, Ellen sand or for their genre generosity and making this lecture series possible. I especially like to welcome again virtually unfortunately

Christopher Phelan: Richard Allen John's wife and Patterson.

Christopher Phelan: Daughter Julia and their extended family and friends to this lecture today. I know that john held Professor Stevens in high regard

Christopher Phelan: John Goldstein devoted 35 years to public service as an economist working tirelessly to improve the environment and reduce Paul poverty through investment and human capital.

Christopher Phelan: In 1964 Dr. Goldstein earned his PhD in economics from the University of Minnesota, and went on to play several key roles in the Social Security Administration, the Department of Interior and on the Endangered Species committee.

Christopher Phelan: Dr Goldstein's distinguished career with a Department of the Interior his seminal work on weapons conservation and numerous articles on the impact of federal programs on wetlands will leave a lasting legacy on environmental policy.

Christopher Phelan: To introduce today's speaker, Professor Robert staff Stevens, a Harvard University and to moderate our program, I am happy to welcome my friend co author and colleague, Professor Vv Chari

V V Chari: Thanks, Chris. Let me add my welcome to Chris's it's a it's a pleasure to have all of you here in these strange times dominated by plague and politics.

V V Chari: That we're honored to have a professor Robert Stevens.

V V Chari: Give this year's john Goldstein Memorial Lecture Professor Stevens is the AGM mayor professor at the Kennedy School at Harvard.

V V Chari: Rob is a distinguished environmental economist who received his PhD in economics from Harvard.

V V Chari: A little while ago, I think.

V V Chari: And combines within him.

V V Chari: Three attributes which is very uncommon to see join in a single person.

V V Chari: He has first. He is a well known academic economist who has made significant and important disciplines economics as a science one illustration of the important work he has done is to re emphasize the importance of incentives economic behavior. One of his well known papers.

V V Chari: Shows very convincingly that increases in energy prices lead to

V V Chari: A fairly extensive amount of technological innovation in the air conditioning industry.

V V Chari: I think it's heartening for all of those all of us who believe that incentives important second he has

V V Chari: Used his professional knowledge, expertise abilities to guide and inform policy in a variety of ways. He's been lead author on

V V Chari: All the reports of the International Panel on on climate change, particularly focusing on the economics of climate change and helping guide that discussion in a useful and productive direction. Third, he has been a prolific commentator who has communicated to the general public.

V V Chari: The insights that economics can bring to studying the invite and clapping particular climate change. More recently,

V V Chari: Not only that, he's also had a very colorful career. He was a Peace Corps volunteer in his youth, and most important, I think, from my perspective, he was one of the I believe one of the founding members dissociation wine economists endeavor that early action felt led

V V Chari: And I think that in this time of plague in politics, even if it's the middle of the day. I think we should listen to Professor Stevens with the glasses 2018 mantashe

V V Chari: Next to us or any other wine that he would recommend so

V V Chari: Having said all that, let me welcome, Rob Stephens who will give this year's

V V Chari: Goldstein, the lecture before I do that, mechanics.

V V Chari: At the bottom of your screen you'll see a Q and A bar, please click on that and type in questions you might have. I think there's also a like button, which will enable us to see which questions have the most widespread support and then

V V Chari: Professor Stevens will talk for about a half an hour or so and then come back and try and ask as many of your questions as I can and then Professor single answer and so will run for Bob and power. So with all that Rob, take it away.

Robert Stavins: Well, thank you very much. Charlie and thank you Chris as well. I'm really delighted to be with all of you today and I'm quite honored to present the john Goldstein Memorial Lecture.

Robert Stavins: And I don't say that lightly. I say it for several reasons. One of the reasons is that the list of previous presenters includes

Robert Stavins: People who I know very well, and for whom I have great respect. Furthermore, I understand and recognize that this year's presenter was originally intended to be my late Harvard colleague and good friend, Marty Weitzman who might miss greatly

Robert Stavins: So it's particularly touching to be with you. But another reason that makes this special for me is that the fund for this lecture series was established by Richard and Ellen sander.

Robert Stavins: And if you don't know it. I will tell you that the name of Richard sand or is legendary among those of us who have worked on the design of environmental markets for the past 30 years

Robert Stavins: Finally, there's the very name of the lecture series itself. The john Goldstein Memorial Lectures, I knew john and worked with him rather closely.

Robert Stavins: In the late 1980s, when I was a new assistant professor at the Harvard Kennedy School, and he was the senior economist at the US Department of the Interior.

Robert Stavins: It's so happens that my PhD thesis in economics at Harvard in 1988 was on the depletion of forested wetlands. The topic of great interest and expertise.

Robert Stavins: For john so john somehow found out about my thesis. He contacted me and then over the subsequent years. We met regularly. When I was Washington in Washington.

Robert Stavins: Because I was working closely with the George HW Bush White House on what turned out to be the Clean Air Act amendments, the cap and trade system of 1990. And so during that period of time. I invited john to a whole series of conferences at Harvard.

Robert Stavins: meetings at the White House meetings at Congress, and he was truly a wonderful colleague so that more than anything makes this very special for me.

Robert Stavins: And finally, I just want to thank, of course, it goes without saying, University of Minnesota. And it's Department of Economics. So with that, let me turn to the topic of my presentation today and for that I'm going to share my screen with you because I'm going to use some slides.

Robert Stavins: So as you can see, or as you may already have known my topic. Whoops, sorry. My topic is What can a economist possibly have to say about climate change policy now to the economists in the audience.

Robert Stavins: That's a question that doesn't have to be asked, but for the other 99.9% of the people in the world. That's quite a meaningful question because it's not necessarily clear

Robert Stavins: So, therefore I'm going to start by trying to describe what I believe is the value of an economic perspective when thinking about climate change policy.

Robert Stavins: And I'll start with the value of an economic perspective, even more broadly, just for environmental policy of any kind. And there are two reasons.

Robert Stavins: For this value. One is that the causes of environmental problems in a market economy, such as we have in this country and all but a handful of countries in the world. Now our economic

Robert Stavins: Environmental problems are essentially the unintended side effects of meritorious activities carried out by producers when they're producing

Robert Stavins: The goods and services that you and I want and sometimes are the unintended side effects of consumers activities. When we're using those goods and services. That's what economists referred to as externalities.

Robert Stavins: The other reason for the claim of value on my part is that the consequences of environmental problems have very important economic dimensions.

Robert Stavins: So surely if the causes of these problems are economic and the causes have economic dimensions that an economic perspective.

Robert Stavins: Can be very helpful. In fact, I would go further and I would say it's essential for a full understanding of environmental problems.

Robert Stavins: But you know, I sit in the Harvard Kennedy School of Government not in the Department of Economics and so I'm not interested.

Robert Stavins: Today in understanding just for the sake of understanding as wonderful as that may be, but rather because a full understanding can be extremely helpful.

Robert Stavins: For the design of solutions policy solutions that will be effective, by which I mean they'll actually reduce pollutant emissions as opposed to

Robert Stavins: For example, simply demonizing the bad guys that they'll he cannot be economically sensible, by which I mean that we do not unnecessarily and systematically shoot ourselves in the foot.

Robert Stavins: By spending more than we want to an environmental protection. After all, we don't only care about environmental protection, we care about the quality and quantity of healthcare.

Robert Stavins: Education, the price of food, the price of fuel on and on. And then finally, because of this they might be more likely to be politically pragmatic

Robert Stavins: Now, this kind of economic thinking, it turns out, is particularly important for the formulation of effective sensible and politically feasible climate change policies.

Robert Stavins: And I say this for two quite specific reasons, one has to do with the spatial nature of the problem of climate change and the other with the inter temporal nature of the problem.

Robert Stavins: And in both cases, we start with the science, go to the economics and it leads us to the geopolitics. So starting with the spatial greenhouse gases mixing the atmosphere.

Robert Stavins: So that means that the location of emissions has no effect whatsoever on impacts. Doesn't matter if a ton of carbon dioxide or another greenhouse gas comes from New York or from New Delhi, it has the same impacts in economic terms, climate change is a global commons problem.

Robert Stavins: That turns out to be quite important economically because it means that any jurisdiction that takes action incurs the cost of its actions.

Robert Stavins: Essentially, the cost of going from cold to petroleum to natural gas to renewables and possibly new killer for electricity generation greater energy efficiency across the board.

Robert Stavins: Different sorts of fuels for motor vehicles and the like. So the jurisdiction, whether it's a country such as the US or Korea.

Robert Stavins: It's a states such as California or a region such as the European Union incurs the cost of its actions, but the climate benefits are distributed distributed globally.

Robert Stavins: And surely the basic of arithmetic of that is then going to tell us that for virtually any jurisdiction.

Robert Stavins: The direct climate benefits. It reads from its actions will be less than the cost that it incurs

Robert Stavins: Despite the fact that the global benefits may be greater indeed much greater than the global or even the local costs of its actions.

Robert Stavins: This presents a classic free rider problem, which is why international if not fully global as I'll explain cooperation is essential. And it's why national policies.

Robert Stavins: Rather than sub national policies are preferable. Now remember, there's also a temporal dimension of the problem, scientifically, that takes us again from science to

Robert Stavins: Economics to politics and policy and that is the greenhouse gases accumulate in the atmosphere, the half life of carbon dioxide, for example, is on the order more than 100 years

Robert Stavins: And the damage is the degree of climate change is a function of the concentrations in the atmosphere, the stock, not the flow at a moment in time.

Robert Stavins: Indeed, a CO2 emissions were to begin falling tomorrow by 5% per year and to continue falling at that rate, which would be very significant. The rate of warming would not begin to change in a way that was detectable until after 20 years

Robert Stavins: So the greatest benefits of climate policies will be in the long term.

Robert Stavins: But those climate change policies and the intended costs of mitigation of those policies, those are upfront. When the policies are instituted

Robert Stavins: This combination of upfront cost and delayed benefits presents a massive political challenge because remember the political incentive and representative democracies is to give benefits to today's

Robert Stavins: Generation I today's voters and to place the costs on future generations. And we have abundant examples of that happening. In fact, the climate problem is asking politicians to do precisely the opposite, which is why a member of the US Senate from within my work for decades.

Robert Stavins: Always like to say that climate change of all the problems he thought about across the board, not just environment was the most difficult political challenge for the two reasons that I've laid out.

Robert Stavins: So together the global commons nature of the problem and this inter temporarily symmetry, make it not only a very tough political challenge, but they also suggest why economics can help with the design of better public policies.

Robert Stavins: Now policy analysts and not just economist, but much broader set of policy analyst in most parts of the world tend to favor carbon pricing.

Robert Stavins: So first let me say, what do I mean by carbon pricing. Well, there are two major approaches. One is a carbon tax, and one is emissions trading.

Robert Stavins: So a carbon tax or a levy. If you don't want to use the T word

Robert Stavins: Would be attacks on the carbon content of fossil fuels not um CO2 emissions per se. Too many sources to monitor, but on the car.

Robert Stavins: On the carbon content of the three fossil fuels called petroleum and natural gas. And then that revenue from the tax can be used for a variety of purposes.

Robert Stavins: Including the economist favorite of reducing distortionary taxes, making a revenue neutral policy.

Robert Stavins: The revenue can also be used to compensate burden policies burden parties, whether that's specific sectors of the economy or specific sectors of the geography.

Robert Stavins: And could also be used for example to fund our end with the carbon tax. The good news is that the compliance costs certain and the other hand, the quantity of resulting emissions is uncertain, although we can certainly estimated

Robert Stavins: The other major approach a emissions training system, the type that I'm thinking of is what is referred to as cap and trade.

Robert Stavins: And this case, the government allocates allowances permits for the carbon content of fossil fuels. Again, not emissions.

Robert Stavins: And again, at the point at which they enter the economy, the mind mouth the wellhead. The point of import

Robert Stavins: This location can be by a free distribution or they can be sold by auction if their auction than the revenues can be used for the same set of purposes. I just mentioned in regard to a carbon tax.

Robert Stavins: In any event, the important thing is that trading is allowed.

Robert Stavins: And the result is is that those who can control emissions at lower cost of an incentive to take on more of the burden those for whom it's very costly take on less of the burden. That's the same thing that happens with a carbon

Robert Stavins: Tax and in this case it's the supply and demand for the allowances that generates a price, the quantity generates a price, rather than the price generating a quantity

Robert Stavins: And here the quantity of courses set. So that's good news to some, but the compliance costs, then, is going to be on certain

Robert Stavins: Now these approaches and I'll just take them in general as carbon pricing are highly favored by policy analyst. So as I said, So now let me

Robert Stavins: address the question of why and it's not for ideological reasons. It's not because economist or others like the market. It's rather for very

Robert Stavins: pragmatic reasons. The first is no other feasible approach can provide a me meaningful emissions reductions. So if we're talking about net zero by 2050

Robert Stavins: Or even the target that was talked about just a few years ago was an 80% reduction.

Robert Stavins: By 2050 it's inconceivable that that could be done through conventional approaches, because we're not just talking

Robert Stavins: About putting in place a performance standard or a technology standards for power plants, it would be all manufacturers.

Robert Stavins: All commercial facilities all residences all motor vehicles all backyard barbecue grills and lawn mowers it's inconceivable.

Robert Stavins: And that's why I say the first reason that carbon pricing is favored so much by analysts is free feasibility.

Robert Stavins: The second reason is is economic that because the cost of abatement vary tremendously across sources by a factor of 10,000 to one.

Robert Stavins: That the least costly approach in the short run is going to be one that equates these marginal abatement costs, if you will, across all sources. So it's the least costly approach in the language of economics, it'll be cost effective.

Robert Stavins: Also, the third reason has to do with the long term. So if the tight of targets that are discussed politically and certainly by natural scientists

Robert Stavins: Were to be achieved a tremendous amount of technological change would be required. And I don't mean simply diffusion of existing technologies.

Robert Stavins: I mean invention of new ones and commercialization of those IE innovation of technologies to push the economies in a more carbon friendly direction.

Robert Stavins: Carbon pricing can provide those long term price signals to induce that kind of technological change.

Robert Stavins: Now, for those reasons, even narrow minded neoclassical economists like myself, would it most claim the carbon pricing is necessary, we would not claim that it is sufficient.

Robert Stavins: And why is that it's because there are some other market failures in addition to the environmental externality market failure that are present.

Robert Stavins: There are principal agent problems, for example, that are associated with energy efficiency investments in renter occupied buildings and in Q AMP a

Robert Stavins: Happy to talk about any of these and then even more important is the public good nature.

Robert Stavins: Of information spillovers. That means, even with a perfect carbon pricing that there would be an inefficient amount and insufficient amount of basic R amp D and so additional policies in that case technology policies could be wise to try to put in place.

Robert Stavins: Now, what's the worldwide status of carbon pricing. So there are major emissions trading regimes in place and announced in

Robert Stavins: Europe, New Zealand, the Northeast United States California Korea and 2020 by the end of this year, the Chinese have said and I was just in meetings in virtually in Beijing last week and they still say it'll happen in 2020 a very large system which will dwarf the European system. In fact,

Robert Stavins: But there are also carbon taxes and related energy taxes in many parts of the world. I'm going to

Robert Stavins: quantify these on the next slide. I don't put numbers here, because many of these are broader energy taxes. And so it's hard to tease out to which

Robert Stavins: To what degree their CO2 taxes and also many of these countries provide exemptions for industries that are particularly concerned about protecting

Robert Stavins: But it's important to recognize that other jurisdictions. In fact, most jurisdictions around the world won't employee carbon pricing at all, but will use a non cost effective.

Robert Stavins: Approach, but there's still a shadow price on carbon. It doesn't mean it's free. It's just as costly. In fact, it's more costly because they're not cost effective.

Robert Stavins: But it's less obvious analysis is required. So let's take a look.

Robert Stavins: At some numbers with regards to carbon prices and emissions covered. So what I've done is that on the horizontal axis. What we're looking at is the scope

Robert Stavins: That's covered in various policies around the world.

Robert Stavins: In carbon pricing policies in terms of millions of tons of emissions and then of the vertical axis we have the carbon price, which would either be the level of the tax or the

Robert Stavins: Allowance price generated by the market cap and trade system.

Robert Stavins: And then I placed in blue. The carbon taxes and in green, the existing cap and trade systems. So what should we note from this

Robert Stavins: Well, the first thing is that there are some carbon taxes in Sweden here as you can see as an outlier that are much higher levels than cap and trade allowance prices and that's certainly the case.

Robert Stavins: If we wanted to ask the question, which I find interesting of what right now is most important. I'm not making a judgment on the merits, what right now is more important in the world. Well, I think would want to multiply the stringency by the

Robert Stavins: Which is represented by the carbon price by the scope of action of coverage and other words what's the area of these various rectangles. So if you do this, you'll see there's a lot more green and blue, which is why it's easy to see that as of now.

Robert Stavins: Right that cap and trade systems are more important than the world, in turn, then carbon taxes.

Robert Stavins: Now, importantly, they'll remember this only adds up to about 15% of CO2 equivalent admission CO2 equivalent. I mean, CO2 plus the other greenhouse gases, but in CO2 terms and in regard to radiate a forcing

Robert Stavins: Importantly, China accounts for about 30% of global CO2 emissions there. Now, the world's largest emitters since 2006 when they surpass the United States.

Robert Stavins: And China's emissions trading system which is actually not cap and trade, per se.

Robert Stavins: That is pledged to come in to implementation by the end of this year, they say, eventually, not immediately eventually it'll cover half of their emissions. So that means that it would cover 15% of global emissions. So the China's system.

Robert Stavins: If it eventually. Does that would push out this graph, all the way to the right side of the page, and there would be another area of green at approximately the same price by current forecasts bringing up it out here.

Robert Stavins: So those are the that's the basic status of carbon pricing. Now I want to turn an answer. What are the consequences.

Robert Stavins: Of carbon pricing and starting with the fossil fuels. So the greatest impact globally are I'm cold due to the high carbon content of coal. This is principally for electricity generation.

Robert Stavins: Their immediate impact on electricity dispatch. There are long term impacts on the investment of new capacity that is delaying it and long term in tax on earlier retirement of existing capacity. That's all. In theory,

Robert Stavins: Natural gas. There are much smaller impacts because of the much lower carbon content of natural gas compared to call and there could actually a carbon price could inspire an increase in

Robert Stavins: Natural gas used in the short term because of substitution for coal. This is would particularly be the case in the in the United States.

Robert Stavins: But we should emphasize that the likely effects of carbon pricing at the levels that they're frequently talked about

Robert Stavins: Would be relatively small in this regard in US electricity generation compared with what the effects have already been of two technologies.

Robert Stavins: With just the market itself horizontal drilling and hydraulic fact fracturing combined

Robert Stavins: Essentially referred to as fracking, which have opened up unconventional sources of natural gas and oil.

Robert Stavins: And have therefore lowered the price. And we've seen tremendous substitution from coal to natural gas in the US for electricity for oil.

Robert Stavins: The potentially significant impacts may be muted, at least in the short term, because there are limited substitutes for thought for liquid fuels in the transportation sector, in other words the marginal cost of CO2 emissions reductions.

Robert Stavins: The marginal abatement cost is higher in this sector than in the electricity.

Robert Stavins: Generation sector. So a cost effective portfolio. If you weren't using carbon pricing, but we're targeting specific industries in the short term, it wouldn't target oil.

Robert Stavins: But there will be effects on the oil markets, but largely through suppressing demand due to increased energy efficiency and then in the long run.

Robert Stavins: Saying substitutes essentially for electric vehicles, assuming that the source of electricity for the electric for the electricity is itself a renewable

Robert Stavins: So speaking of renewables I've emphasized that carbon pricing would be bad news for coal holding else everything else constant

Robert Stavins: Even the short term mixed for natural gas and probably muted for oil in the short

Robert Stavins: Term, but very good news for renewables wind and solar as well as others and possibly for nucular but there are political issues there in terms of citing

Robert Stavins: Interestingly, and other sectors climate policies increased costs. So there's a simple rule of thumb, they're bad news for sectors that use energy

Robert Stavins: That's all sectors, but it's actually have to go a little deeper because carbon pricing.

Robert Stavins: That is increasing energy costs can be very good news for producers of energy consuming durable goods take Boeing

Robert Stavins: Aircraft or Airbus as examples because the reason that commercial airlines by the new generation of aircraft.

Robert Stavins: Is not because they want blue lights in the ceiling, instead of white lights, it's because they're cheaper to operate because jet fuel is their principal variable cost. That leads them to be in the black or the red from year to year so

Robert Stavins: We have a more rapid turnover, the capital stock in aviation when jet fuel prices go up great news for producers of energy consuming durable goods.

Robert Stavins: But that also tells us there particularly bad news for some of those consumers of those same energy consuming or durable goods United Airlines Lufthansa or whatever.

Robert Stavins: And David's interesting if you look at who supports in different industries different companies who have in the past supported climate change policy.

Robert Stavins: Or not, or have been silent or opposed it. Putting aside for obvious reasons, the fossil fuel industry, which is always resistant

Robert Stavins: A lot of is explained by this so us cap which was an industry consortium trying to put in place a cap and trade system. Other climate policies in the Obama administration was led by General Electric.

Robert Stavins: A producer of energy consuming durable goods. Who else was in there. Well, Caterpillar

Robert Stavins: The automobile companies, but who was not in there will United Airlines, the consumers. So again, when, when I look at the positions of many

Robert Stavins: Companies on climate change policies, I tend not to judge them in terms of the basis of values of that their ethics are good or bad or match mine or don't, they're usually operating in their own economic interest, or at least their judgment of their own economic interest.

Robert Stavins: So there's a reminder, I should offer at the very end here, and that is this is a global commons problem so international cooperation is necessary. I'm going to mention just very briefly the Paris Climate Agreement.

Robert Stavins: The good news is that it was a landmark climate Accord. It was a dramatic departure from the structure of the previous 20 years of which I had been critical

Robert Stavins: It provides a broad foundation for meaningful future progress due to I'll show you it's expanded

Robert Stavins: Scope and so it could turn out to be a key step forward, but whether the agreement is truly successful is not going to be known for decades, anyone who comes to you and says the Paris Climate Agreement is going to succeed.

Robert Stavins: That they're talking about their hopes, anyone who says it's going to fail. They're talking about their priors not from analysis.

Robert Stavins: Because the Paris Agreement does provide an opportunity because there are two necessary conditions for ultimate success. One is adequate scope of participation.

Robert Stavins: The Paris agreement has taken us from 14% one for under the Kyoto Protocol, the European Union Plus New Zealand to 97% under the Paris Agreement.

Robert Stavins: The United States, as you may know, dropped out officially of the Paris Agreement just yesterday that drops that 97% to 85% which is still a lot better than the 14%

Robert Stavins: But the other key necessary condition is adequate ambition of policies and of course successful implementation. And what that means is that it's really up to the individual.

Robert Stavins: Countries, the hundred and 87 parties to the Paris Agreement and we can talk more about that, including about this country if you like afterwards.

Robert Stavins: So, but thinking beyond Paris final words they the talks were a success in my judgment, but we're not going to know of the success of the agreement itself for many years.

Robert Stavins: International cooperation is essential because it's a global commons problem, but the key action will be at the national levels.

Robert Stavins: And the Paris Agreement provides an opportunity for a new path forward. We've met one of the two necessary conditions. The second one, we're still waiting on

Robert Stavins: But you have to remember the Paris Agreement, the numbers in there were just the first five years every five years, the countries renew their sort of their targets.

Robert Stavins: But even this first set of targets was quite a striking that if everyone was in including the US, then the effect would be to bring down. What would be business as usual five to seven degrees centigrade warming

Robert Stavins: Two, three and a half degrees centigrade. The Montreal Protocol and stratospheric ozone depletion reason changes, bring it down another half a degree. So that's three degrees. See

Robert Stavins: That's much higher than the two degrees C, or the one and a half degrees. See that are now political targets, but this is the first five years and it's so I would say it's certainly a step in the right direction.

Robert Stavins: In the years to come. The major locus of international cooperation may continue to be the UN f triple C or it may be others that we can talk about

Robert Stavins: But under any of these venues for international cooperation, whether it's the UN or some other one, the importance of carbon pricing and I will argue economic thinking are going to remain

Robert Stavins: So I went through a lot, particularly if this is new to you.

Robert Stavins: You can get more information from the hybrid project and climate agreements which I direct the environmental economics program.

Robert Stavins: Which is 30 faculty members across the university, I have the pleasure of directing that my website, my blog or you can follow me on on Twitter, but I warn you if you follow me on Twitter.

Robert Stavins: Today, although some of my commentary is on the Paris Agreement withdraw yesterday much will be on the current election and the various controversies. There have. So with that, I will say thank you very much.

V V Chari: Hey. Thank you. That was

V V Chari: Exceptionally informative and very interesting. Let me kick it off.

V V Chari: For we

V V Chari: Before you get a chance to answer questions from the audience at large, with a question that I think as an is at the heart of your talk.

V V Chari: You eloquently made the case that was policy analyst and essentially all economists like the idea of putting a price, either through attacks or through a market system on on on carbon.

V V Chari: But there are a number of people I think out there, number of influential people

V V Chari: Including proponents of the so called the green new deal and so on.

V V Chari: Who think that a different way to go is better and that involves centrally direct regulation. So we will mandate that every car be electric we will mandate that every house.

V V Chari: Have the right kind of energy efficient roof and so on and so forth. That's the only practical way of doing things, relying on a market system to achieve these goals and self defeating because the the market just won't work for all of these things.

V V Chari: I think it's important for us to try and and argue, you, you, in part, said it was not feasible.

V V Chari: And I think their attitude is, oh sure it's feasible, we just pass a law and we enforce we send the cops out. So what would

V V Chari: What would your argument be to people who think that that a better approach is. And by the way, that's the approach that the United States, certainly, and many countries followed, which is an approach of direct regulation and directing

Robert Stavins: So direct regulation, such as a uniform performance standard or a standard that mandates particular technologies be adopted.

Robert Stavins: Are feasible. They're not cost effective, but they're feasible for a lot of environmental problems, including a requirement that there's a catalytic converter and your car and my car.

Robert Stavins: But that doesn't mean that they're feasible in the case of climate change because of the fact that we're not talking. We're now talking about very disparate set of sources.

Robert Stavins: And it's absolutely impossible to specify technologies that would affect all of those sources. So I said, it's not just electricity generation.

Robert Stavins: Sector. It's all of manufacturing, it's all commercial it's every residence. It's every motor vehicle. It's every airplane, on and on.

Robert Stavins: So what's essential is affecting the price of the fossil fuels. The reason that it's so effective. In this case, and this

Robert Stavins: You know may may sound more like rhetoric, but it, you know, it's Adam Smith. I mean, that's what that's what an economy does it sends information about relative scarcity. I don't need to

Robert Stavins: Say this to you or any of the economists, of course, and that's why it's feasible, however, I would agree that, in the short term.

Robert Stavins: It could well be that for political reasons, carbon pricing is not feasible.

Robert Stavins: For example, the situation that we're now facing the United States for the next four years, even if Mr. Biden is elected president republicans if they do maintain control of the Senate, which we will only know on January 5

Robert Stavins: If they do, then it's, it's probably virtually impossible to put in place a carbon price of any meaningful magnitude either attacks or a cap and trade.

Robert Stavins: Remember that was impossible in the Obama administration when Democrats controlled both houses of Congress, we still couldn't do it.

Robert Stavins: So in that context, then I would want to turn to second best instruments. Sometimes that economists are not eager to do

Robert Stavins: A lot more eager in the Journal of Economic perspective than in the Journal of Economic Theory, perhaps, and the second best instruments, then we can apply our economic training to design those to be

Robert Stavins: As good as possible, make them a little less costly than otherwise. And I could if I wasn't taking more time, I can give examples of those. So I'm actually engaged in research right now with a

Robert Stavins: Friend former student Billy pizer Duke University in which we're looking at policy instruments in terms of their deterministic a

Robert Stavins: Net Present Value for different policy instruments and then multiplying that through expert elicit solicitation of views from staff in the Congress my probability of implementation.

Robert Stavins: Because, and then you'll get the expected net present value of the instrument and that leads you to a different set of instruments, not to the ideal ones that's

V V Chari: That's wonderful. I was actually while you were talking

V V Chari: I did want to suggest one part possible hands are are partially answered my own question which is related to your career and your accomplishments. So

V V Chari: We tried direct regulation and in with the environment with the initial Clean Air Act, and pretty soon we'll talk about the details of how does link. We had a severe problem with acid rain with the Clean Air Act amendments we introduced markets.

V V Chari: And those markets worked so marvelously well then

V V Chari: You know, as we know, we don't talk about acid rain and you're right, it's a serious economic issue. So I think economists have

V V Chari: And you in particular have have contributed a lot to this specific thing have a lot to be proud of in terms of using markets and economic tools to address social problems.

V V Chari: But I think Chris me have a question, then I'll turn to some of the questions from the floor.

Robert Stavins: I think you're muted.

Christopher Phelan: Found the mute button. This question is about enforcement internet because you talked a lot wonderfully about the the world tragedy of the commons issue. And I'm going to end rather long question with asking a question about whether or not

Christopher Phelan: Whether or not we have the technology to detect cheating. So the basic idea that I think is true is that if you produce a widget in the United States per widget, you're going to have less carbon impact than if you produce that same widget in China.

Christopher Phelan: So at least one possibility that I worry about is that if we put on an effective carbon tax, and they don't

Christopher Phelan: Because of either lack of enforcement or not passing the law then widgets that would be produced in the United States become more expensive to produce.

Christopher Phelan: Less expensive to produce in China. Right. And they get produced in China and in fact the net impact on World carbon goes up, because they're not using scrubber you know they're using less energy efficient technologies.

Robert Stavins: Or at least it stays the same. We

Robert Stavins: are awesome. The United States lost competitiveness and done nothing for the

Christopher Phelan: Is there any technological way to even tell whether other countries are cheating.

Robert Stavins: Well, so there there are two different there are really two fundamentally different questions there.

Robert Stavins: One is on cheating at the country level, then there's a whole other issue, which is at the monitoring and enforcement is gonna be at the national level.

Robert Stavins: But there's the what I really started with with your question is the issue of emissions leakage, which of course to politicians is very, which is what that's called. When you just described.

Robert Stavins: And now the politicians they don't care about admissions leakage unless they're very green they care about what goes along with it, which is the leakage of

Robert Stavins: Jobs, right. So that's that. So it's a very big political issue. Now it turns out it's an issue for a few industries, you know. Cement, Portland cement production would be the poster child here because of the great energy intensity

Robert Stavins: Both for the process admissions and also for the production. So there are certain areas where this is a big factor, but in fact analysis that's been done, such as in the European Union where a cement producing plant is going to be in competition with plants that are in

Robert Stavins: Algeria, where they don't have the targets, they have in Europe. And then the question comes up, so are our the is the French company going to locate its next facility.

Robert Stavins: In Algeria and that's equivalent to what you're describing, so it turns out the empirical analysis is

Robert Stavins: Seriously, is that it's a trivial effect. It is lost in the noise, the noise is due to the fact that the differences in labor costs so swamp all of these relatively minor differences in costs of production due to environmental

Robert Stavins: Policies that said, there are mechanisms to address this. Now the obvious one.

Robert Stavins: Is a border adjustment mechanism and the Europeans want to put one on the United States, we'll see where that goes, depending on the future politics.

Robert Stavins: In this country. There's also an approach that the Obama administration used with its cap and trade system. It has an unfortunate.

Robert Stavins: Name and output based updating allocation mechanism. What it means is if you had a larger production last year of widgets, you'll get more allowances to admit the given polluted.

Robert Stavins: But that does. That's a subsidy that's on the margin. It's not in for marginal it's marginal and affects competitiveness. Now, of course, it introduces like any subsidy.

Robert Stavins: In efficiencies, but it's a way in which economies have sought to address this and I can tell you, like my discussions in Beijing, where we're working on the design of they're

Robert Stavins: Called a tradable performance standards slightly different. This is a huge issue for them. As you can imagine, and this is the sort of thing they're looking at

V V Chari: So let me let me summarize a couple of the questions, a number of the questions that people have asked I deal with communication and area in which

V V Chari: You've made significant contributions. So there are two parts to we're thinking about it, a phrase the overall communication. Question one communication question is

V V Chari: What, if anything, is it possible to say to those who deny the possibility of climate change symmetrically. What, if anything, can we say to those who say that the challenge of climate change requires that we all turn to a pre industrial society.

V V Chari: That's one way of doing it a more focused way of asking this question is the IPCC is going to produce the sixth annual assessment report.

V V Chari: How. How successful do you think the the IPCC has been in its past five reports and how successful is it likely to be on the under 60

Robert Stavins: So, you know, we already know and we now have demonstration from the pandemic that one way we can effectively reduce CO2 emissions is by putting in place global recession.

Robert Stavins: But obviously that's not a desirable approach so CO2 emissions have fallen for obvious reasons in in all parts of the world.

Robert Stavins: During this terrible recession brought about by responses to the pandemic. So then the question becomes, are there ways that we can minimize what the impacts on cost and that take us back to those cost effective.

Robert Stavins: Policies, so it's it's certainly not the case that one needs to go back to the Stone Age.

Robert Stavins: A very aggressive climate policy in the US, very aggressive would represent a cost of perhaps 1% of GDP 1% of G. That's a big number 1% of GDP is well spent by EPA

Robert Stavins: Not the other department just EPA on all other environmental pollution, so it'd be doubling it now. Does that, does that mean you know sending us into

Robert Stavins: Depression. No, but what it does, does it mean that the rate of economic growth on an annual basis would be less than otherwise is putting aside the economic benefits of reducing the risk of climate change, productivity impacts. Yes. And those are

Robert Stavins: Those are the two, to my mind, those are the trade offs, but they don't those trade offs from all of the analysis that I've either participated in or read, they don't justify a lack of action to people who are you know the climate skeptics.

Robert Stavins: It's important to recognize that we're almost unique in the United States. This is not an issue that comes up. So I spent a huge amount of time in other countries.

Robert Stavins: And nowhere does one here it like one does here. So yes, there are minor little pockets on the internet everywhere, but here it's been a fundamental part of

Robert Stavins: One of the political parties to some degree for a while. I think that's now fading. But this is relatively unique. The US is a unique country, alas,

V V Chari: By the way, I think it's interesting point out that that the

V V Chari: George HW administrative Bush administration which was a Republican administration play a central role in setting up the sulfur dioxide markets. So it is a little bit puzzling what has happened. We ask

V V Chari: What I did just to

Robert Stavins: Just to emphasize what you said it's important for people to keep it in mind because nowadays, YOU KNOW, DEMOCRATS good guys republicans bad guys on environment and climate change.

Robert Stavins: And it's true. We've had this dramatic political polarization and things have sorted out.

Robert Stavins: But if you go back, not very many years at least by my age. If you go back a couple of decades. This was a bipartisan issue. It was a regional issue geographically

Robert Stavins: But it was bipartisan. So not only was it the George HW Bush White House, which I work closely on the design of that emissions trading program, not only did they do that.

Robert Stavins: But the first significant emissions trading program was the leaded gasoline phase down a decade earlier that was in the Reagan administration was a tradable performance standard standard among refineries, that's how we got the lead out of gasoline.

Robert Stavins: And that was the, you know, people think of as the arch conservative Reagan Administration so times have changed.

V V Chari: Okay, more direct question. What do you think it would be an appropriate level of the carbon tax now and how rapidly should grow if I would drip, drip,

V V Chari: Represent the social cost of greenhouse gas emissions by single number for today, what would be the corresponding carbon tax in your assessment.

Robert Stavins: So when you said the appropriate number. It would depend upon if what you want. If my answer is to be in terms of what would be the theoretically

Robert Stavins: Correct number that would bring about the efficient amount and economic terms.

Robert Stavins: If implemented or if by appropriate you mean conditional upon implementation and what the likelihood is of such attacks being implemented, what's the appropriate one

Robert Stavins: So the second question is easy to answer, because we don't have to make political judgments and the social cost of carbon as estimated

Robert Stavins: By the Obama administration and now it's being updated by Resources for the Future collaboratively with several universities that was so it's probably now at about $50 per ton

Robert Stavins: For admissions in the year 2030 about $50 per time that's representing the present discount value 100 years out back to 2030 of the damages.

Robert Stavins: But if you were asked the question. Instead, what kind of carbon tax. Should we start with thinking about the politics as well as everything else.

Robert Stavins: My answer would be, get the structure, right, if it's going to be a carbon tax, get the structure right provided and political incentives so that even though it's not first best like reducing distortionary taxes because that lowers

Robert Stavins: The social cost, you know, maybe it's sending checks to everyone with their Congressman's return address that makes it more feasible and then put in place a trajectory of it increasing over time.

V V Chari: So let me follow that question on the state of Washington as a success so that people state of Washington.

V V Chari: Defeated to referenda, both of which were intended to put a low price on on carbon.

V V Chari: Revenues are supposed to be used in various ways. Pretty decisively.

V V Chari: President micron in France, trying to increase the gas tax and middle class Frenchman said not when we've got yellow jackets, you don't

V V Chari: So one question is, do you think that these defeats reflect an essential aspect which are emphasized in your presentation, which is that this is a global problem.

V V Chari: And local incentives to to address this problem locally necessarily are weak and so that was that what the problem was. Our was it in some sense.

V V Chari: Reflecting perhaps more skepticism about this. The idea of climate change. What's your assessment, why they like it.

Robert Stavins: I think it's all of the above plus a few others if this was 15 years ago, then I would say yes. People are unwilling, there's not a lot of acceptance to pay a

Robert Stavins: Carbon tax and use instead a cap and trade mechanism because the cap and trade mechanism does a better job of sweeping under the rug. The cost, essentially, it's not as obvious, but that's that that political advantage of cap and trade in my opinion.

Robert Stavins: No longer exists as a result of the debates that took place in the Congress over the Waxman marquis legislation when conservative Republicans and cold state Democrats successfully demonized cap and trade as cap and tax.

Robert Stavins: And whenever they use that phrase cap and tax I write a little bit because I wanted the legislation to go forward, but I also recognizable, they were right, because the auction.

Robert Stavins: The allowances. We're going to be auction. So it really was like a tax. I think the answer probably is a second best policies in in the short term, I was in a meeting. Very recently, Lisa Murkowski who at least

Robert Stavins: At least until January 5 is chair of the Energy Committee in the in the Senate, and I heard openness to carbon pricing if part of a larger package.

Robert Stavins: at a relatively low number and then what do you do with the revenue I want I want the revenue to go back to my constituents. So I think that there are possibilities there. Another would be if you know

Robert Stavins: If the Congress decided to face up to budgetary deficits of the order we have now where are we looking for sources of revenue. Well one possibility would be a consumption tax.

Robert Stavins: Low hanging fruit and energy tax and now we're, you know, a step away from a carbon tax. So I think there are possibilities, but I agree with the premise of your question, politically, as I said at the outset, it's extremely difficult.

V V Chari: Okay, let me. Um, this is sort of a question related to that, which is

V V Chari: There are other kinds of

V V Chari: Technologies one thinks of nuclear fission or fusion on the one side inside perhaps geo engineering on the other side, and so on.

V V Chari: What sort of a role can either alternate that sources of energy, other than the usual solar and wind can play and role play role and direct technological attempts to limit.

V V Chari: The effects of greenhouse gases. How does that play in your judgment in terms of policy.

Robert Stavins: The nature of this problem and the political challenges to addressing it. And the terrible consequences if it's not addressed justify again to use that cliche and all of the above.

Robert Stavins: Approach. So nuclear power if it were politically feasible, it's questionable whether it is in this country and at new locations anyway at new sites that ought to be part of this story.

Robert Stavins: Along with along with renewables and good climate policies, a cap and trade or a carbon tax would provide incentives for nucular power they same as they would for renewables, but also for large scale hydro and small scale hydro

Robert Stavins: Geoengineering is certainly justified in terms of research.

Robert Stavins: And I think that's the way a lot of both the scientific and engineering communities who are working on as well as the few economists, such as Scott buried at Columbia and a few others.

Robert Stavins: Who have really examine the economics would say that we ought to be carrying out research. It turns out it presents very interesting problems of governance.

Robert Stavins: I won't take time to talk about them. They're the opposite of the global commons problem instead of a free rider issue, it is to use the phrase of Marty Weitzman, a free driver issue.

Robert Stavins: And so there are other issues, but also adaptation, because, you know, if we, you know, stop all super climate.

Robert Stavins: I mean greenhouse gases tomorrow morning. There's going to be climate change. So adaptation is an important part of the story. And unfortunately, various interest groups.

Robert Stavins: Historically, and even today will block out some of the options and somewhat of an ideological basis. I don't mean to disparage them by ideological but it's not clear that its scientific or economic and I think that that's misguided.

V V Chari: Okay, so, um, we're sort of coming to the end and normally in these kinds of

V V Chari: Situations.

V V Chari: I like people who added an optimistic note but but I leave it up to you, given sort of the political developments, we've seen given

V V Chari: Also the international development, in particular the seriousness with which leaders in countries like China or India or Europe seem to take this kind of problem.

V V Chari: What is your sense about the hope for.

V V Chari: A rejuvenation of the Paris accord a more serious focus on implementation on as Chris emphasize on enforcement. And so one both say over the next five years. And also, perhaps over the next 2025 years. What's, what's your sense about how all this is going to play out.

Robert Stavins: So based upon everything we've talked about and really focusing on an economic perspective in a technocratic

Robert Stavins: Perspective, it would be easy to be very pessimistic about the future, because you know of the realities, the temporal nature, you know, to temporarily symmetry, as well as the global commons nature of the problem.

Robert Stavins: I derive one. What I think is an extremely important source of optimism about the future and that is young people, both in Europe and the United States and other parts of the world who have over the past 24 to 36 months risen up with his new movement of youth activism on climate change.

Robert Stavins: I don't always agree with many of the things that they say, but it's extremely encouraging.

Robert Stavins: The question is, is the large degree to which youth take climate change much more seriously, on average than people

Robert Stavins: Of a generation older, let alone of my generation, the question of course is whether that's a function of age or of cohort.

Robert Stavins: You know, as they become older, will they become more conservative as many people do I believe there's a fundamental changes and

Robert Stavins: When my kids went through primary school they were you know someone from the right would say they were indoctrinated to start being concerned about climate change.

Robert Stavins: That didn't happen. Probably to the classes, five years before there's. So that's my source of optimism. It's the youth of the world.

V V Chari: Great on that, on that cheery note, thank you very much. Rob statements that are what I think is it has been a wonderful talk.

V V Chari: I tried my best to channel the disparate questions of the of the audience into a small number. I hope I didn't do a HUGE INJUSTICE but thank you again very much and thank you to everybody in the audience.

V V Chari: for attending. I hope you enjoyed it and always remember economists are your only hope for productive sensible social policy in the future. We are indispensable to the world. That's what we keep telling ourselves. Thank you very much again.

Robert Stavins: Thank you very much.

Christopher Phelan: Thank you, Robert. And thank you, everybody.

Robert Stavins: Thank you. Thank you.