

Scott Tinker ([00:00](#)):

Next on Energy Switch, we'll look at policies to reduce carbon emissions, including taxes, incentives, and standards.

Billy Pizer ([00:08](#)):

A carbon tax is the only policy that simultaneously encourages every single activity to reduce emissions wherever it is efficiently.

Sasha Mackler ([00:18](#)):

So what we've been doing up to now, which has had actually a great deal of success is we've been using incentives and subsidies. So why don't we take those proven tools and scale them up at the federal level?

Scott Tinker ([00:29](#)):

Coming up on Energy Switch, policies to reduce CO2 emissions.

Speaker ([00:35](#)):

Funding for Energy Switch was provided in part by Microsoft and by the University of Texas at Austin.

Scott Tinker ([00:46](#)):

I'm Scott Tinker, and I'm an energy scientist. I work in the field, lead research, speak around the world, write articles and make films about energy. This show brings together leading experts on vital topics in energy and climate. They may have different perspectives, but my goal is to learn and illuminate and bring diverging views together towards solutions. Welcome to the Energy Switch. There have been many policies proposed to reduce CO2 emissions, a tax on carbon emitted or embodied in products. A cap on emissions with emissions permits that could be traded, subsidies for lower emission energies, and carbon emission and efficiency standards. Each have their pros and cons. And we'll talk about them all with my expert guests. Dr. William Pizer is a Harvard trained economist and the vice president for research and policy engagement at Resources for the Future. Sasha Mackler is the director of the energy project at the Bipartisan Policy Center, a Washington DC based think tank. He studies energy policy and markets. On this episode of Energy Switch, policies to reduce CO2 emissions. Let's jump right in. Let's start with carbon tax. What are the benefits of that approach?

Billy Pizer ([02:10](#)):

The arguments for a carbon tax are that you have all of these different places throughout the economy where you can reduce emissions. You can drive your car less, you can use cleaner fuels, you can install energy efficient air conditioner. A carbon tax is the only policy that simultaneously encourages every single activity to reduce emissions wherever it is efficiently. And that has the advantage of getting the cheapest reductions wherever they occur. It does have the disadvantage of potentially being horribly inequitable, but in terms of economic efficiency, it's the thing that does it the best.

Scott Tinker ([02:48](#)):

Right. So pricing CO2 is obviously a pretty big deal. How do we do it? How do we calculate a price on CO2?

Billy Pizer ([02:56](#)):

It basically comes down to this. You figure out what the temperature change or what the weather change and the climate change is going to happen from climate models based on increasing emissions. You turn those things into impacts. The storms, the wildfires, all that sort of stuff. And then you value it.

Sasha Mackler ([03:16](#)):

This isn't just an academic exercise. I mean, this is how, for example, the environmental protection agency looks at ways in which to design regulations and how far to go. Right?

Billy Pizer ([03:28](#)):

That's totally true. Every regulation in the United States, at least at the federal level of a certain size, has to go through an analysis to say do the benefits outweigh the costs. And so this number becomes really important, how we value the benefits. And so we have to figure out ways that we can encourage the emission reductions that may cost a hundred dollars a ton, but without charging consumers a hundred dollars a ton in the process.

Scott Tinker ([03:54](#)):

Before we start talking about mechanisms, what's a reasonable price?

Billy Pizer ([03:58](#)):

You mean a price to charge a tax or do you mean a price to use to value?

Scott Tinker ([04:02](#)):

Whichever.

Billy Pizer ([04:04](#)):

Well, I think the right number to use to make decisions is probably on the border of a hundred dollars a ton. That's, I think, where the evidence is going to lead us.

Scott Tinker ([04:12](#)):

And that's global?

Billy Pizer ([04:13](#)):

That is based on global benefits. You have put your finger on a very sensitive issue, which is when we talk about our efforts to reduce emissions here in the United States, how do we think about the fact that everybody in the world shares in those benefits? And you think about the US economy as 25% of the world, so maybe we get 20, 25% of those benefits. Should we really be counting those benefits if most of them are occurring outside the country?

Scott Tinker ([04:45](#)):

How does a carbon tax capture that price, whatever that price is? Let's just say it's a hundred bucks. How does the tax capture that price?

Sasha Mackler ([04:55](#)):

Well, so it would be reflected in the product in some way that whatever you're buying, whether it's a gallon of gasoline, a dollar, a ton of CO2 would be about a penny a gallon. And so it would just flow through to the consumer. It could be embedded in the energy that has gone into making a ton of steel. And so that steel price, it'll be in the products.

Scott Tinker ([05:14](#)):

But it's not dollar a ton, it's a hundred dollars a ton. So that's a buck a gallon on top of three bucks or whatever it is today or something like that. So is that kind of the range, 20, 25% on things? If we go to that a hundred dollar range and see things go up?

Billy Pizer ([05:27](#)):

I think it's the right range for gasoline, but there aren't that many things that are quite as carbon intensive or mission intensive as gasoline. So the effect on electricity would be less.

Sasha Mackler ([05:39](#)):

The political reality that waiting for a policy that brings us to a hundred dollars per ton in some explicit form from a policy perspective is really not the smartest thing to be doing because carbon pricing is politically hard and we need political buy-in to get started so we have enduring policies that are durable across changes in administration. So instead of focusing on what's the right price, I think really we should be focusing on what's our goal from either an emissions perspective or an energy mix perspective, and then kind of walking back from that.

Billy Pizer ([06:20](#)):

I would just caution, I don't think we're Sasha, I think we're going to hundred dollars a ton anytime soon.

Sasha Mackler ([06:24](#)):

No, that's sort of the analytical number, but when you think about sort of how that filters through to what's possible, or probably what's the right place to start, it's probably much lower.

Scott Tinker ([06:34](#)):

Let's talk about cap and trade a little bit. Different approach. How does that look instead of a carbon tax?

Sasha Mackler ([06:40](#)):

The big difference between a cap and a tax is really with a tax, you set the price that you're willing to pay on any sort of, on what you want to reduce. Like for example, carbon emissions. With a cap, you set the level of the emissions that you're willing to tolerate, and you let the price kind of fluctuate. Those are the core differences. We have a successful track record of running an environmental market based cap and trade systems in this country through the environmental protection agency. I actually used to work there in the clean air markets division of the EPA, where we were setting up sulfur dioxide trading programs, nitrous dioxide trading programs. And they've worked very well in smaller sort of much more contained markets like utility, power regulations, really coal plants, for example. Because there was a whole push for an economy wide cap and trade program about a decade ago, which didn't gain traction. And it really hasn't come back.

Scott Tinker ([07:37](#)):

Is it a scale challenge? I mean, why has it sort of faded?

Sasha Mackler ([07:39](#)):

It is a scale challenge in the sense that covering the whole economy, it's just a lot of entities to regulate in some way.

Billy Pizer ([07:46](#)):

One of the great things about both of these programs, whether it's a tax or a cap and trade, as long as it's technology neutral and it doesn't say you have to do a particular thing, people will find cheaper ways to do everything,

Scott Tinker ([07:58](#)):

Let the markets compete.

Billy Pizer ([07:59](#)):

Let the markets compete. And so I think that's one of the most important messages, flexible regulation.

Sasha Mackler ([08:04](#)):

Entrepreneurial nature of finding the right solutions and giving people the right signals and then letting really our entrepreneurs and our business community pursue.

Scott Tinker ([08:13](#)):

So the unintended consequences of perhaps going down the tax road or the cap and trade or some other mechanism are what?

Billy Pizer ([08:22](#)):

I'd say they're intended consequences that you raise the price of fuels and products in a way that makes it more transparent and politically more difficult and creates a massive amount of redistribution. If you were doing a \$50 a ton tax and you were creating a couple hundred billion dollars in revenue in the process, you've got hundreds of billions of dollars of transfers from the people who are paying for the tax to the government who will then do something with it. Maybe give it back to them, but not back to exactly the people who had the higher costs. And it's that additional redistribution and very visible cost that I think creates a political liability.

Scott Tinker ([09:00](#)):

Isn't it a consumer issue more than the producer issue? I mean, we want all this stuff. Shouldn't we pay if we consume more for the taxes? Why should the people make in the energy that we're demanding pay? Why shouldn't we pay on the consuming end?

Billy Pizer ([09:16](#)):

Certainly the economists would say, yeah, you should make them pay so they'll figure out ways to reduce their fuel use. Yeah. But I think politically it's just very unpopular. The other dimension is the

trade. So if you do a very transparent carbon price, you raise the price of all of our products and that creates even more trade.

Scott Tinker ([09:35](#)):

What if it doesn't happen, Billy, globally then? We put these prices on in Europe, in the US, and it's 25 years before those who are producing the most emissions today, say, yeah, we might get there. So what's the unintended consequence of that?

Billy Pizer ([09:49](#)):

It would be our carbon intensive industries would relocate to these less regulated jurisdictions. So the only way it really works at some point, regardless of what policy you use, is to have some sort of trade mechanism.

Scott Tinker ([10:02](#)):

At that border?

Billy Pizer ([10:03](#)):

At that border. And it can actually be an incentive to get people to take action where the people who are taking action have agreed that we're going to price stuff at the border from all the countries that are not.

Scott Tinker ([10:13](#)):

My question is if some of us put border taxes on and the country producing this stuff has to pay the border tax, but they have a different market to sell their stuff and they send it to the emerging and developing markets.

Sasha Mackler ([10:27](#)):

I think a point that you're making, which I really agree with is that this is going to be messy. It's going to be very messy. It's going to take time. And we shouldn't judge success or failure. And really by the metric of are we able to get everybody to do the same thing on day one? This is going to be-

Scott Tinker ([10:46](#)):

So in a transparency sense, we need to say what you just said. It's going to take time. It's going to be messy. There are going to be costs. We have to adapt.

Billy Pizer ([10:55](#)):

People I think tried out carbon tax as kind of a boogeyman to scare people, that we're going to go out there and suggest a hundred dollars a ton as a tax.

Scott Tinker ([11:04](#)):

Right. That scares me.

Billy Pizer ([11:04](#)):

It scared you. It scared me. It'd scare anybody listening. I don't think anybody thinks that we ought to have a carbon tax as the main policy. Anybody who's serious about solving climate change is proposing a carbon tax to be the main policy.

Sasha Mackler ([11:16](#)):

Also, I think if we put this into some historical context, a decade ago or more, there were a number of proposals on the table to price carbon, either through a tax or through a cap and trade program which we've had a price. And then we've been working on those ideas since then, and nothing has been implemented. We haven't made the sale on that policy mechanism.

Scott Tinker ([11:39](#)):

It's a tough one. Politically tough,

Sasha Mackler ([11:41](#)):

Politically difficult.

Scott Tinker ([11:42](#)):

Public doesn't like it.

Sasha Mackler ([11:43](#)):

It's unpopular. And so I think as we think about carbon pricing, we should think about it as something that we will probably eventually need, but maybe we don't need to start with carbon pricing. We start with the things that we know have worked.

Scott Tinker ([11:58](#)):

What are those? So what do we do?

Sasha Mackler ([11:58](#)):

So what we've been doing up to now, which has had actually a great deal of success on certain things like solar and wind bringing down the cost is we've been using incentives and subsidies. And we've also been creating policy mechanisms at the state level that require certain amounts of renewable energy to come into the system. That is actually proven both popular and effective. So why don't we take those proven tools and scale them up at the federal level?

Scott Tinker ([12:25](#)):

Okay. So like a renewable portfolio standard at the states? [inaudible 00:12:29] structures.

Sasha Mackler ([12:30](#)):

Something like that, but maybe we should broaden it to be a little bit more than renewable and to focus on clean, on carbon free energy that would include-

Scott Tinker ([12:37](#)):

Love that idea.

Sasha Mackler ([12:38](#)):

...carbon capture, would include nuclear as well as wind and solar.

Scott Tinker ([12:41](#)):

Geothermal hydrogen.

Sasha Mackler ([12:42](#)):

All of the above.

Scott Tinker ([12:42](#)):

If you're not emitting and you can beat on price, you're in, you get some incentives.

Sasha Mackler ([12:46](#)):

Then you're in. That would be a very productive place to start. And that's something we're really working on with bipartisan policies.

Billy Pizer ([12:52](#)):

Yeah. Just to put a point on it, what you want to do is you want take every sector, electricity, transportation, whatever, and you want to say what do you produce? You produce electricity. Okay. We need to lower the carbon per megawatt hour. And we're going to give you a standard. You figure out, you industry as a whole, how you're going to do it cheapest. You give them that standard, you give them flexibility. They figure it out and they do it at the lowest cost. You don't have to pick the winner. You don't have to pick-

Sasha Mackler ([13:17](#)):

You don't have to pick the price.

Billy Pizer ([13:18](#)):

You don't have to pick the price. You just give them the standard. So you're basically setting up what would be called a carbon performance standard.

Scott Tinker ([13:26](#)):

Then do it and compete. Because that moves us down the road before we get stuck and mired in attacks or a cap and trade, which goes down like a poison pill.

Billy Pizer ([13:37](#)):

Poison pill or a lead balloon. But these flexible policies can put a price on carbon, but they're not being passed on to the consumers the way a tax would. So you have a low carbon fuel standard for fuels that may have a fairly high price, but it's not raising the price of gasoline by a dollar or anything like that. And so I think those are the kinds of flexible sectoral policies that could be really effective.

Sasha Mackler ([14:02](#)):

Number one of them being more popular so we can actually get moving. Number two, they bring down the costs of dealing with climate over time. So that if we eventually realize which I expect that we will,

that we will need to have a more economy wide or even global system to manage CO2 at some point, we've already been on our way. And it reduces the cost of that policy when we turn to it.

Scott Tinker ([14:26](#)):

And we've developed technologies.

Sasha Mackler ([14:27](#)):

We've developed the technology.

Scott Tinker ([14:29](#)):

Had the economies of scale.

Sasha Mackler ([14:30](#)):

Exactly because one of the shortcomings of something like a carbon price or tax is that it doesn't really help so much with the technology development side of things. We need complimentary policies there to bring those forward.

Scott Tinker ([14:42](#)):

So instead of a tax or a cap, is it more affordable, effective, to like directly encourage the CO2 reductions?

Billy Pizer ([14:52](#)):

Yeah, I think so because you're starting with trying to encourage cleaner technologies or lower carbon emitting technologies without discouraging the product itself. So you're not getting into whether steel is good or bad because of the carbon that's in it. You're trying to encourage the steel manufacturers to produce with less carbon.

Scott Tinker ([15:14](#)):

Right. You might even add some jobs as you bolt something else on and the steel jobs don't go away.

Billy Pizer ([15:19](#)):

That's right. So I think all of these sectors where you're trying to encourage new technologies, potentially you're going to take more jobs to do it.

Scott Tinker ([15:30](#)):

Subsidies. We mentioned them before for solar and wind and other things. Who pays for that, how does it get translated?

Sasha Mackler ([15:37](#)):

Well, so it really depends on the subsidy. If it's in the tax code, which is how we've done a lot of our incentive structuring up to now for wind and solar and other technologies, that's the federal taxpayer that pays. It's all of us.

Scott Tinker ([15:51](#)):

Everybody pays.

Sasha Mackler ([15:52](#)):

Everybody pays.

Scott Tinker ([15:53](#)):

And there's downsides to that. If I make less money.

Sasha Mackler ([15:58](#)):

So there are downsides but there are also upsides. It's less regressive. It has less of an impact on the poorer populations because it's spread more broadly. The other I think big challenge with subsidies is that we can't subsidize our way to a net zero future. Because of the amount of infrastructure that's needed to be built and the scale of the energy system, we really need to have the private sector and the business community and the markets themselves see this as their way of doing business.

Billy Pizer ([16:32](#)):

You don't want the government to be subsidizing everything, you want to set the rules of the road for the industries and kind of unlock their efforts.

Scott Tinker ([16:41](#)):

It's true if I strap an eight kilowatt solar panel system on my house and charge the Tesla in my garage and put the power wall in my house, I can afford that. And it's subsidized. A lot of people that can't afford that. Aren't they paying for my Tesla? Isn't that a little regressive?

Sasha Mackler ([17:01](#)):

There's an equity part of that I think really does need more scrutiny. But-

Scott Tinker ([17:08](#)):

Because as you start taking the subsidies away, then it gets to the point where the people who need it the most don't get a subsidy.

Sasha Mackler ([17:15](#)):

Well, they don't get the subsidy, but they're also paying for you to enhance the quality of your life or the value of your home. So that's a dimension of energy and climate policy that in the environmental justice component of how we design policy has really been under thought.

Billy Pizer ([17:32](#)):

We get wealthy people who are contributing to technology development. But I think what's happened is we've gotten to this point where it is actually a net benefit and it's really benefiting the wealthy. And so we have to rethink some of those dimensions.

Scott Tinker ([17:44](#)):

Policy has to [inaudible 00:17:46].

Sasha Mackler ([17:46](#)):

Policy has to evolve. It has to evolve.

Scott Tinker ([17:48](#)):

I think that's a real [inaudible 00:17:51].

Sasha Mackler ([17:50](#)):

We need to be able to learn and adapt as we move ahead. And there's also, it's very important I think to recognize that if we're going to innovate and innovate quickly, we need to actually accept some failures. Failures technologically, and failures from a policy perspective. And then we need to learn.

Scott Tinker ([18:09](#)):

Yep. Absolutely. So now renewable standards or power purchase plants and other things like that, those tools. Who pays for those and how do they work?

Billy Pizer ([18:18](#)):

The renewable standards basically are being paid for by rate payers ultimately who have to pay slightly more for their electricity in order for the local utility to buy the renewable energy credits that then become a subsidy to the renewable sources. It's a way of kind of internalizing the cost of that subsidy within the rate payer base. But the thing to think about with renewable subsidies, as we talked about a couple times is there are targeted on a couple of technologies, not necessarily all the carbon reducing technologies, and they don't do anything to try to encourage cleaner fossil technology or cleaner carbon emitting technologies. So I think rethinking those sorts of policies with an eye on carbon emissions could be quite powerful.

Scott Tinker ([18:59](#)):

Is it happening? Are we seeing it start to happen? Or is there still just a giant push away from the fuels?

Billy Pizer ([19:04](#)):

There's always been talk about some sort of national clean electricity or carbon performance standard, but I don't think it's caught on too much or it hasn't...

Sasha Mackler ([19:12](#)):

Well, this is something that I spent a lot of time working on at the Bipartisan Policy Center. It really does need to now expand to moving beyond just wind and solar, to other clean sources that we know we're going to need if we're going to have a deeply decarbonized power sector. This is really a policy mechanism for electricity alone. We should expand it so we can bring in more technologies. And we should think about ways in which we can expand the politics, the supporters of those different technologies and of those different regions of the country. So we can start to get moving on the federal level. And we are starting to see that. There's a bipartisan bill in Congress right now that has a Republican and a Democrat that are putting together a clean electricity standard for the federal government. And there's increasing momentum. Although I wouldn't say we're there yet politically.

Scott Tinker ([20:05](#)):

So what would be the unintended consequences of these kinds of purchase plans and standards mostly in the states? Have there been anything you say, oops, I'd change that, fix it when we go federally?

Sasha Mackler ([20:16](#)):

Well I think focusing only on wind and solar, I think that's an unintended consequence. We haven't necessarily cultivated the other technologies as much. And in some cases we are letting some of our most important clean energy generating resources fall out of the system, which is just digging a deeper hole for ourselves. And I'm referring to our existing nuclear fleet when I say that. That's a lesson. We can't let those clean, safe, and very affordable actually power stations go away if we're actually going to try to be successful in taking all the carbon out of our system in time.

Billy Pizer ([20:57](#)):

One thing about the performance standards, the fact that they don't differentiate between technologies is a plus and a minus, because on the one hand, it's not limiting you, but on the other hand, it's not thinking about what are the incumbent technologies and what are the new cutting edge technologies that may need more time. So I think it's important to realize that there's not a silver bullet here. You need a package of policies, but you're going to need other policies that kind of bring the newer promising technologies to market.

Sasha Mackler ([21:26](#)):

Yeah. There's no silver bullet from a policy perspective and there's no silver bullet from a technology perspective. We really do need to be really, really working at multiple levels here to get this transition underway.

Scott Tinker ([21:39](#)):

We've mentioned nuclear, hydrogen, CCS. We've talked about solar and wind as sources, switching just from coal to gas. It doesn't get you all the way there, but you can make a pretty quick transition to lower emissions if you're able to do that. Some big levers, and those should have a fairly reasonable path because of the timeframes.

Billy Pizer ([22:00](#)):

There's almost like three things you could think about. There's getting the technologies that we have ready deployed. So getting more renewables and nuclear and whatever CCS is feasible in the near term. There's the very short term, easy stuff that you mentioned, like the switching from coal to gas, which isn't really about a new technology deployment. It's about redistributing what we have in some sense. And then there's a longer term technology investment.

Sasha Mackler ([22:29](#)):

And what you really need is bipartisan political will. That's probably the most important thing of all to get this transition underway and to take us through all the way to its success, because the amount of capital that needs to be invested into this transition is trillions of dollars, and companies I think are reluctant to bet their business on a one party agenda that could change every two to four years. And so we really need bipartisan agreement so we can get started.

Scott Tinker ([23:06](#)):

There's another big wedge we haven't talked about, and that's just doing more with less efficiency. We consume so much energy in wealthy nations, but it's hard to motivate that. How do we get efficiency just translated into the economy? What are the strategies here?

Billy Pizer ([23:23](#)):

I think you're really thinking about households and consumers who may not really be constantly trying to get everything they can out of everything. The evidence is pretty compelling that it seems like people are not paying attention and they're missing opportunities. And a lot of the talk we had earlier about carbon taxes, part of the reason you want a carbon tax is to encourage consumers to do those sorts of things.

Scott Tinker ([23:50](#)):

Right. The stick.

Billy Pizer ([23:51](#)):

Yeah. The stick to raise the price of gasoline, to raise the price of electricity, get them to use less. And in some sense, the whole efficiency argument is based on them doing that. And yet there's very little evidence that's true. So I think that's the reason we turn to other policies where we set efficiency standards. That's been the approach that we've had for buildings, for appliances, for automobiles. Most energy using consumer devices are regulated one way or the other because of this problem.

Sasha Mackler ([24:23](#)):

But I think it's important to recognize we're never going to conserve our way through the climate problem. It really is too big for that.

Billy Pizer ([24:31](#)):

It's a wedge.

Sasha Mackler ([24:33](#)):

If you look at the economics of things that we can be doing, it's usually the most cost effective thing to be doing. So we should be doing it first across all of these different applications and sectors.

Billy Pizer ([24:44](#)):

I would also just add that it is hard. If you've ever tried to find somebody to do the work on your house that's a quality person who knows what they're doing, knows your house well enough to know how to do it, it gets hard. So part of this is a little bit about scale that doing every house [inaudible 00:25:04].

Sasha Mackler ([25:04](#)):

The transaction costs.

Billy Pizer ([25:04](#)):

Transaction costs get higher. So I think sometimes people look at these things and they say it's low hanging fruit, and they kind of forget these transaction costs and frictions that happen for the

homeowner. And we've thought about it at RFM. I'm not totally sure this is going to be where we... This may be one of the last places we actually go.

Sasha Mackler ([25:22](#)):

At the home level.

Billy Pizer ([25:24](#)):

Retrofitting homes.

Scott Tinker ([25:25](#)):

Interesting. We talked about a carbon tax to put a price on CO2 emissions and cap and trade, which sets a limit, not a price. But both of these are unpopular and politically difficult. Some countries have adopted one or the other. The US most likely won't anytime soon. Instead, we could broaden subsidies and incentives at the federal level to include all energies that can reduce CO2 emissions. And we could try to adopt low carbon performance standards. While these costs are less transparent to the consumer, we still bear them. So we need them to be equitable and we need bipartisan support for these policies, or they won't happen.

Speaker 4 ([26:36](#)):

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